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TM

SECTION

TRANSAXLE & TRANSMISSION

TM

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

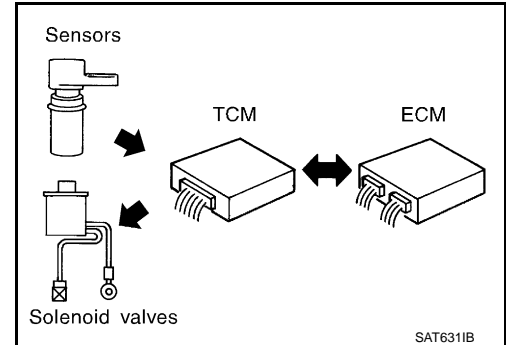
How to Perform Trouble Diagnosis For Quick and Accurate Repair

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INTRODUCTION

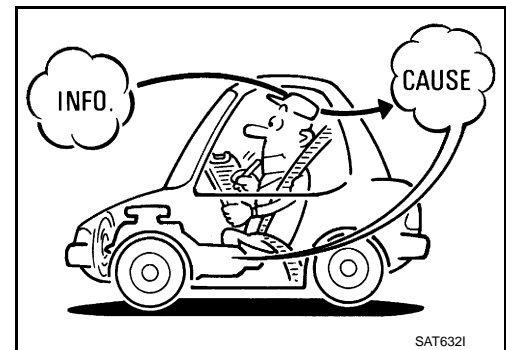
The TCM receives a signal from the vehicle speed sensor, accelerator pedal position sensor (throttle position sensor) or PNP switch. Then provides shift control or lock-up control via A/T solenoid valves. The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.

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



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

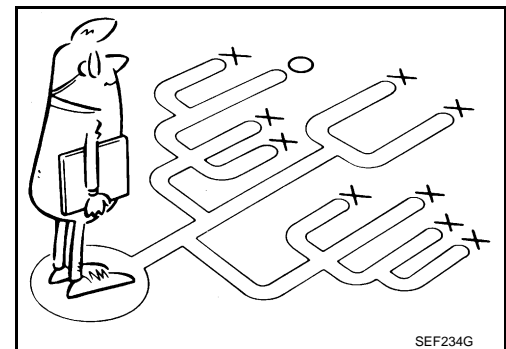
A visual check only may not find the cause of the errors. A road test with CONSULT-III (or GST) or a circuit tester connected should be performed. Follow the "DETAILED FLOW".



Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such errors, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A "Diagnostic work sheet" as shown on the example (Refer to [TM-7](#)) should be used.

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

Also check related Service bulletins.



DETAILED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using diagnosis worksheet. Refer to [TM-7, "Diagnostic Work Sheet"](#).

>> GO TO 2.

2. CHECK SYMPTOM 1

Check the following items based on the information obtained from the customer.

- Fail-safe. Refer to [TM-121, "Fail-Safe"](#).
- A/T fluid inspection. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).
- Stall test. Refer to [TM-186, "Stall Test"](#).
- Line pressure test. Refer to [TM-187, "Line Pressure Test"](#).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

>> GO TO 3.

3. CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is detected.
 - Record DTC.
 - Erase DTC. Refer to [TM-33. "OBD-II Diagnostic Trouble Code \(DTC\)".](#)

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 6.

4. PERFORM DIAGNOSTIC PROCEDURE

Perform "Diagnosis Procedure" for the displayed DTC.

>> GO TO 5.

5. PERFORM DTC CONFIRMATION PROCEDURE

Perform "DTC CONFIRMATION PROCEDURE".

Is DTC detected?

YES >> GO TO 4.

NO >> GO TO 6.

6. CHECK SYMPTOM 2

Try to confirm the symptom described by the customer.

Is any malfunction present?

YES >> GO TO 7.

NO >> INSPECTION END

7. ROAD TEST

Perform "ROAD TEST". Refer to [TM-190. "Check Before Engine Is Started".](#)

>> GO TO 8.

8. CHECK SYMPTOM 3

Try to confirm the symptom described by the customer.

Is any malfunction present?

YES >> GO TO 2.

NO >> INSPECTION END

Diagnostic Work Sheet

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INFORMATION FROM CUSTOMER

KEY POINTS

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

Customer name MR/MS	Model and Year	VIN
Trans. Model	Engine	Mileage
Malfunction Date	Manuf. Date	In Service Date
Frequency	<input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent (times a day)	

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

Symptoms	<input type="checkbox"/> Vehicle does not move. (<input type="checkbox"/> Any position <input type="checkbox"/> Particular position)	
	<input type="checkbox"/> No up-shift (<input type="checkbox"/> 1st → 2nd <input type="checkbox"/> 2nd → 3rd <input type="checkbox"/> 3rd → 4th <input type="checkbox"/> 4th → 5th)	
	<input type="checkbox"/> No down-shift (<input type="checkbox"/> 5th → 4th <input type="checkbox"/> 4th → 3rd <input type="checkbox"/> 3rd → 2nd <input type="checkbox"/> 2nd → 1st)	
	<input type="checkbox"/> Lock-up malfunction	
	<input type="checkbox"/> Shift point too high or too low.	
	<input type="checkbox"/> Shift shock or slip (<input type="checkbox"/> N → D <input type="checkbox"/> N → R <input type="checkbox"/> Lock-up <input type="checkbox"/> Any drive position)	
	<input type="checkbox"/> Noise or vibration	
	<input type="checkbox"/> No kick down	
	<input type="checkbox"/> No pattern select	
	<input type="checkbox"/> Cannot be changed to manual mode	
<input type="checkbox"/> Others ()		
AT CHECK Malfunction indicator lamp (MIL)	<input type="checkbox"/> Continuously lit	<input type="checkbox"/> Not lit
Malfunction indicator lamp (MIL)	<input type="checkbox"/> Continuously lit	<input type="checkbox"/> Not lit

DIAGNOSTIC WORK SHEET

1	<input type="checkbox"/> Read the item on cautions concerning fail-safe and understand the customer's complaint.		TM-121	
2	<input type="checkbox"/> A/T fluid inspection, stall test and line pressure test			
	<input type="checkbox"/> A/T fluid inspection	<input type="checkbox"/> Leak (Repair leak location.) <input type="checkbox"/> State <input type="checkbox"/> Amount	TM-180	
3	<input type="checkbox"/> Stall test			
	<input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Front brake <input type="checkbox"/> High and low reverse clutch <input type="checkbox"/> Low coast brake <input type="checkbox"/> Forward brake <input type="checkbox"/> Reverse brake <input type="checkbox"/> Forward one-way clutch	<input type="checkbox"/> 1st one-way clutch <input type="checkbox"/> 3rd one-way clutch <input type="checkbox"/> Engine <input type="checkbox"/> Line pressure low <input type="checkbox"/> Except for input clutch and direct clutch, clutches and brakes OK	TM-186	
	<input type="checkbox"/> Line pressure test - Suspected part:		TM-187	
4	<input type="checkbox"/> Perform self-diagnosis. — Check detected items to repair or replace malfunctioning part.		TM-35	
5	<input type="checkbox"/> Perform road test.			
	5-1	<input type="checkbox"/> Check before engine is started	TM-190	
	5-2	<input type="checkbox"/> Check at idle	TM-190	
	5-3	Cruise test	<input type="checkbox"/> Part 1	TM-191
			<input type="checkbox"/> Part 2	TM-193
<input type="checkbox"/> Part 3			TM-194	
<input type="checkbox"/> Check malfunction phenomena to repair or replace malfunctioning part after completing all road test. Refer to TM-152, "Symptom Chart" .				
5	<input type="checkbox"/> Drive vehicle to check that the malfunction phenomenon has been resolved.			
6	<input type="checkbox"/> Erase the results of the self-diagnosis from the TCM and the ECM.		TM-33	

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

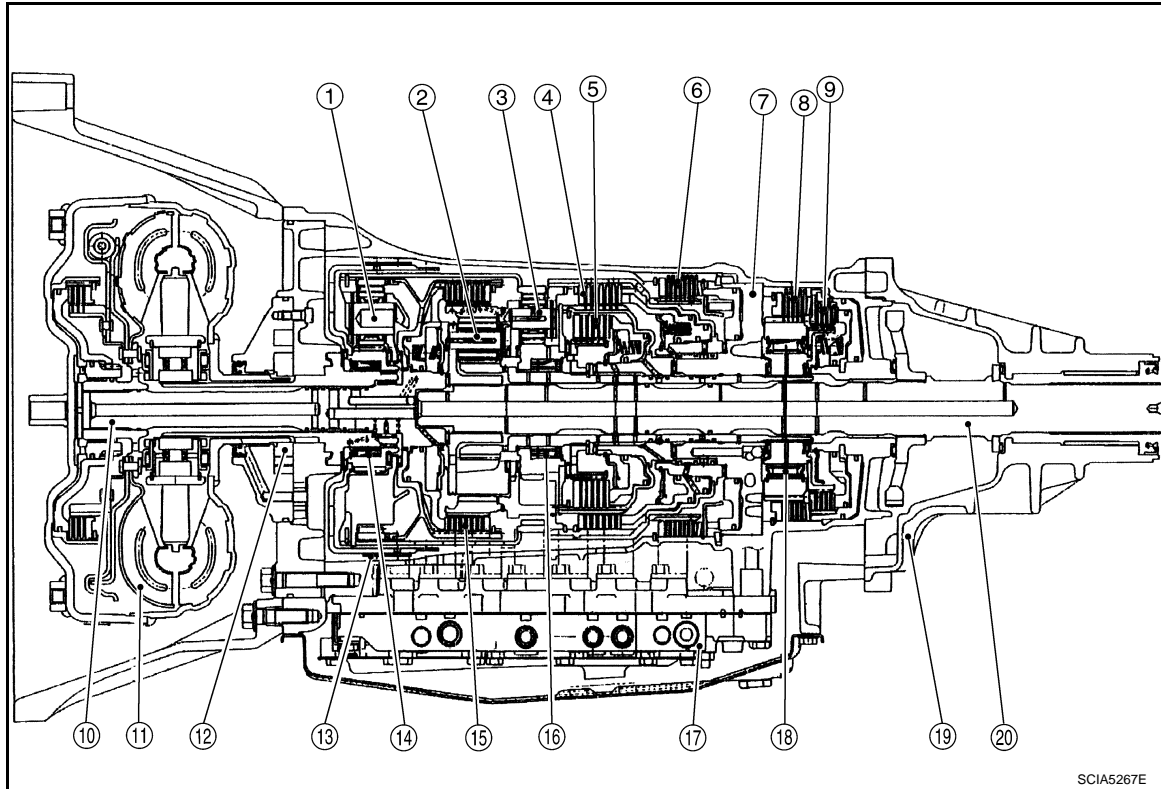
FUNCTION DIAGNOSIS

A/T CONTROL SYSTEM

Cross-Sectional View

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2WD models

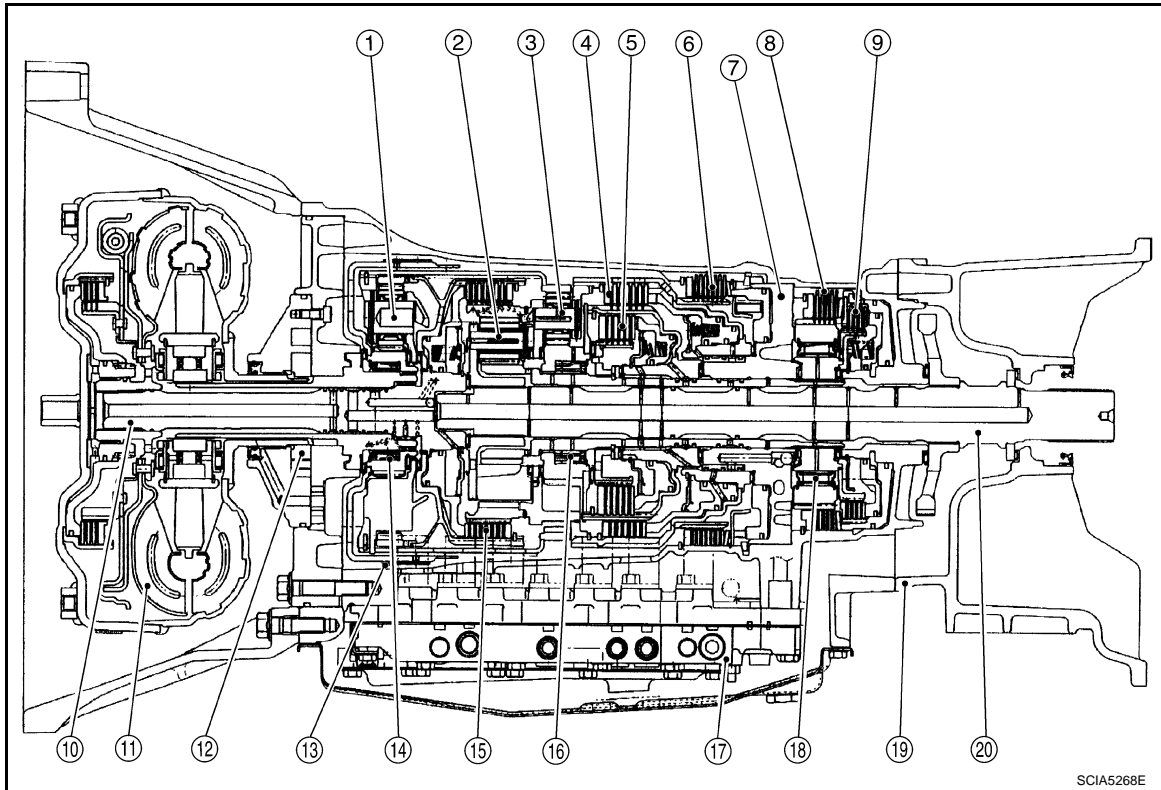


- | | | |
|-------------------------|--------------------------------|----------------------------|
| 1. Front planetary gear | 2. Mid planetary gear | 3. Rear planetary gear |
| 4. Direct clutch | 5. High and low reverse clutch | 6. Reverse brake |
| 7. Drum support | 8. Forward brake | 9. Low coast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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

4WD models



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

Shift Mechanism

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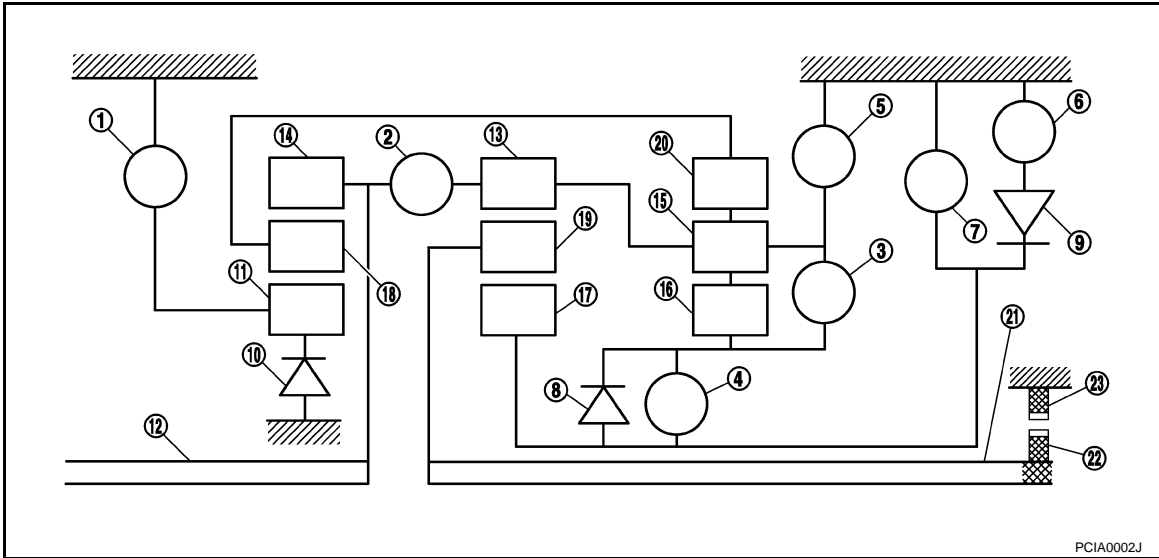
The automatic transmission uses compact triple planetary gear systems to improve power-transmission efficiency, simplify construction and reduce weight.

It also employs an optimum shift control and super wide gear ratios. They improve starting performance and acceleration during medium and high-speed operation.

CONSTRUCTION

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



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

FUNCTION OF CLUTCH AND BRAKE

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

CLUTCH AND BAND CHART

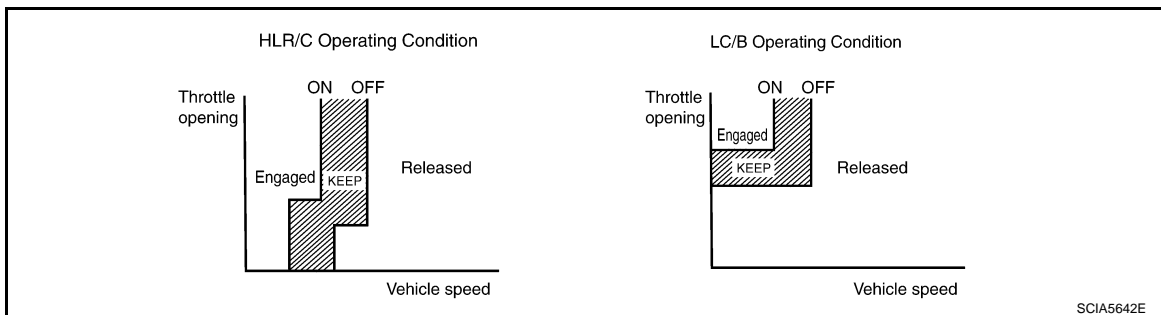
Shift position	I/C	HLR/C	D/C	R/B	FR/B	LC/B	Fwd/B	1st OWC	Fwd OWC	3rd OWC	Remarks
P		△			△						PARK POSITION
R		○		○	○			☆		☆	REVERSE POSITION

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

Shift position	I/C	HLR/C	D/C	R/B	FR/B	LC/B	Fwd/B	1st OWC	Fwd OWC	3rd OWC	Remarks
N		△			△						NEUTRAL POSITION
D*1	1st	△*			△	△**	○	☆	☆	☆	Automatic shift 1↔2↔3↔4↔5
	2nd		○		△		○		☆	☆	
	3rd		○	○		○	△	★		☆	
	4th	○	○	○			△	★			
	5th	○	○			○	△	★		★	
3	1st	△*			△	△**	○	☆	☆	☆	Automatic shift 1↔2↔3↔4
	2nd		○		△		○		☆	☆	
	3rd		○	○		○	△	★		☆	
	4th	○	○	○			△	★			
2	1st	△*			△	△**	○	☆	☆	☆	Automatic shift 1↔2↔3↔4
	2nd		○		○	○	○		☆	☆	
	3rd		○	○		○	△	★		☆	
	4th	○	○	○			△	★			
1	1st		○		○	○	○	☆	☆	☆	Locks (held stationary in 1st gear) 1↔2↔3↔4
	2nd			○	○	○	○		☆	☆	
	3rd		○	○		○	△	★		☆	
	4th	○	○	○			△	★			

- Operates
- ☆—Operates during “progressive” acceleration.
- ★—Operates and effects power transmission while coasting.
- △—Line pressure is applied but does not affect power transmission.
- △*—Operates under conditions shown in HLR/C Operating Condition
- △**—Operates under conditions shown in LC/B Operating Condition. Delay control is applied during D (4,3,2,1) ⇒N shift.
- *1: A/T will not shift to 5th when overdrive control switch is set in “OFF” position.



POWER TRANSMISSION

“N” Position

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

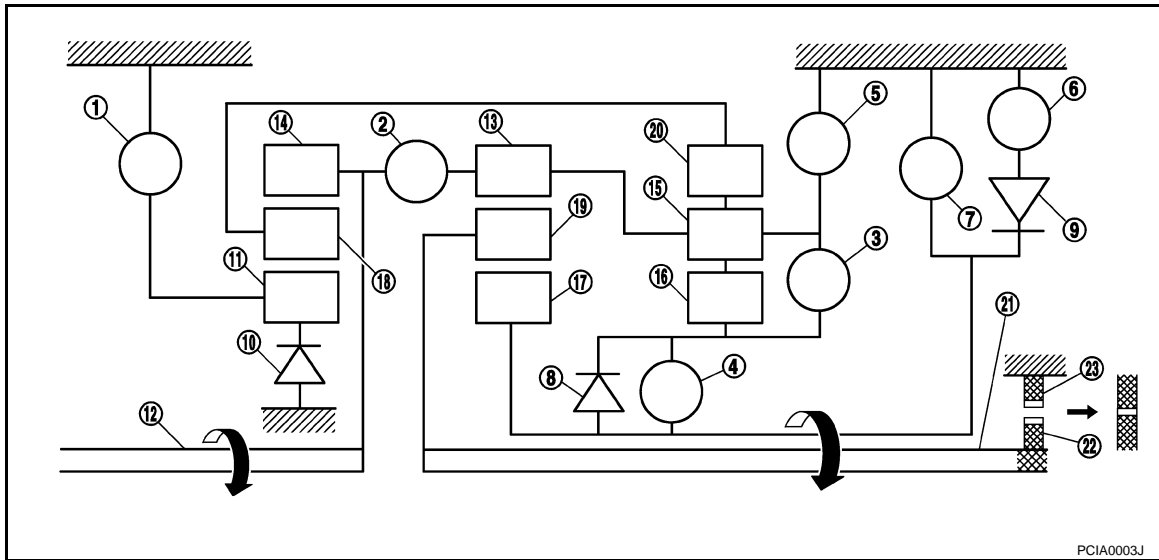
“P” Position

- The same as for the “N” position, both the forward brake and the reverse brake are released, so torque from the input shaft drive is not transmitted to the output shaft.

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

- The parking pawl linked with the select lever meshes with the parking gear and fastens the output shaft mechanically.



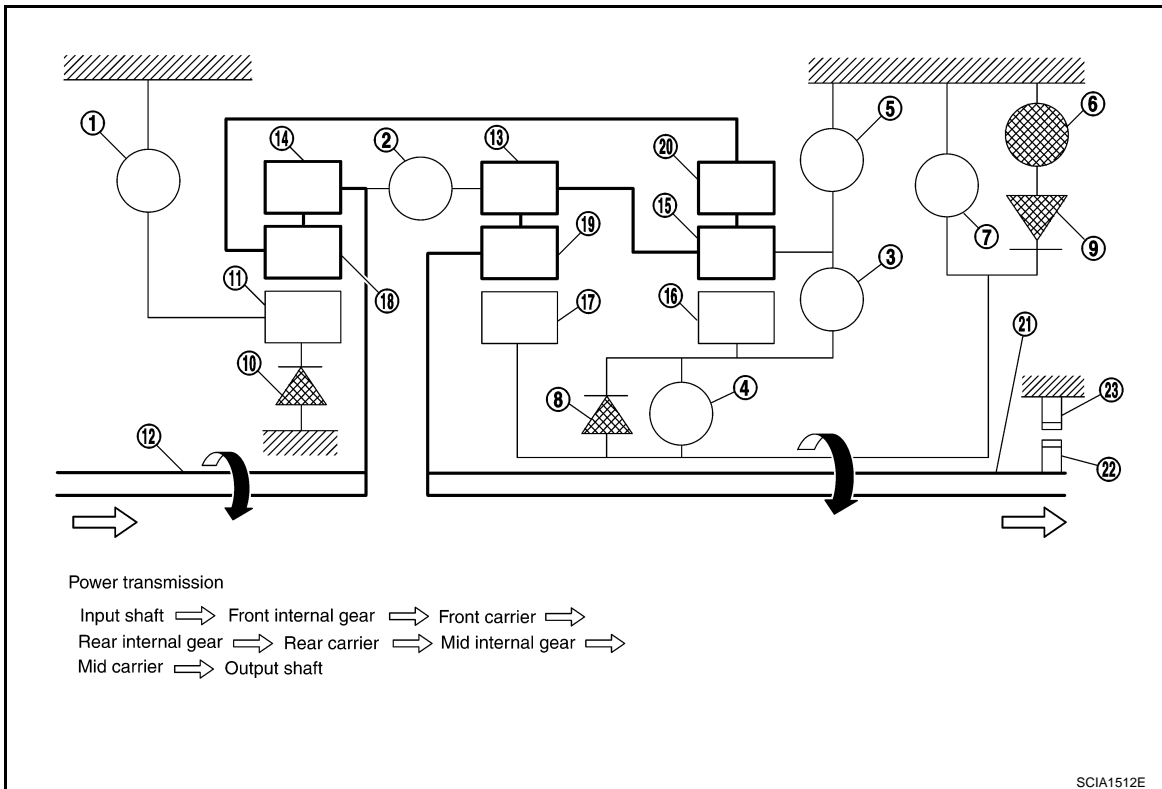
- | | | |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake | 2. Input clutch | 3. Direct clutch |
| 4. High and low reverse clutch | 5. Reverse brake | 6. Forward brake |
| 7. Low coast brake | 8. 1st one-way clutch | 9. Forward one-way clutch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

"D", "3" and "2" Positions 1st Gear

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



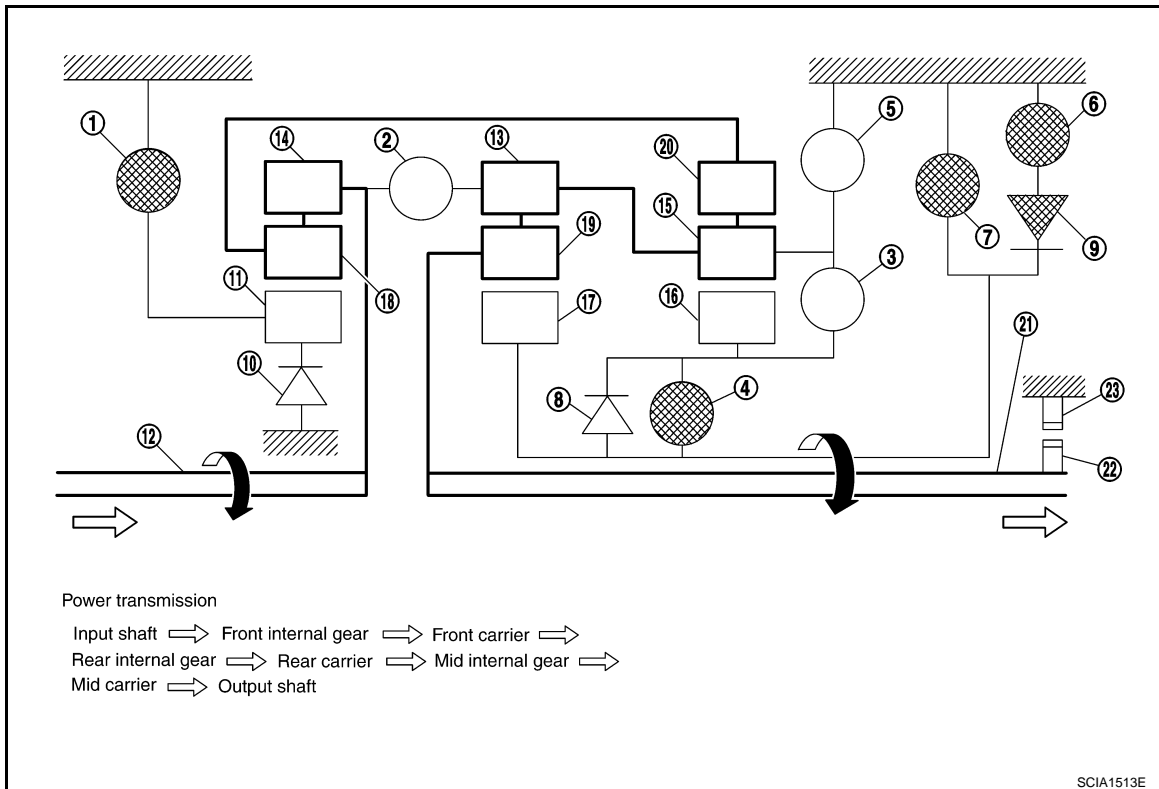
- | | | |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake | 2. Input clutch | 3. Direct clutch |
| 4. High and low reverse clutch | 5. Reverse brake | 6. Forward brake |
| 7. Low coast brake | 8. 1st one-way clutch | 9. Forward one-way clutch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

"1" Position 1st Gear

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



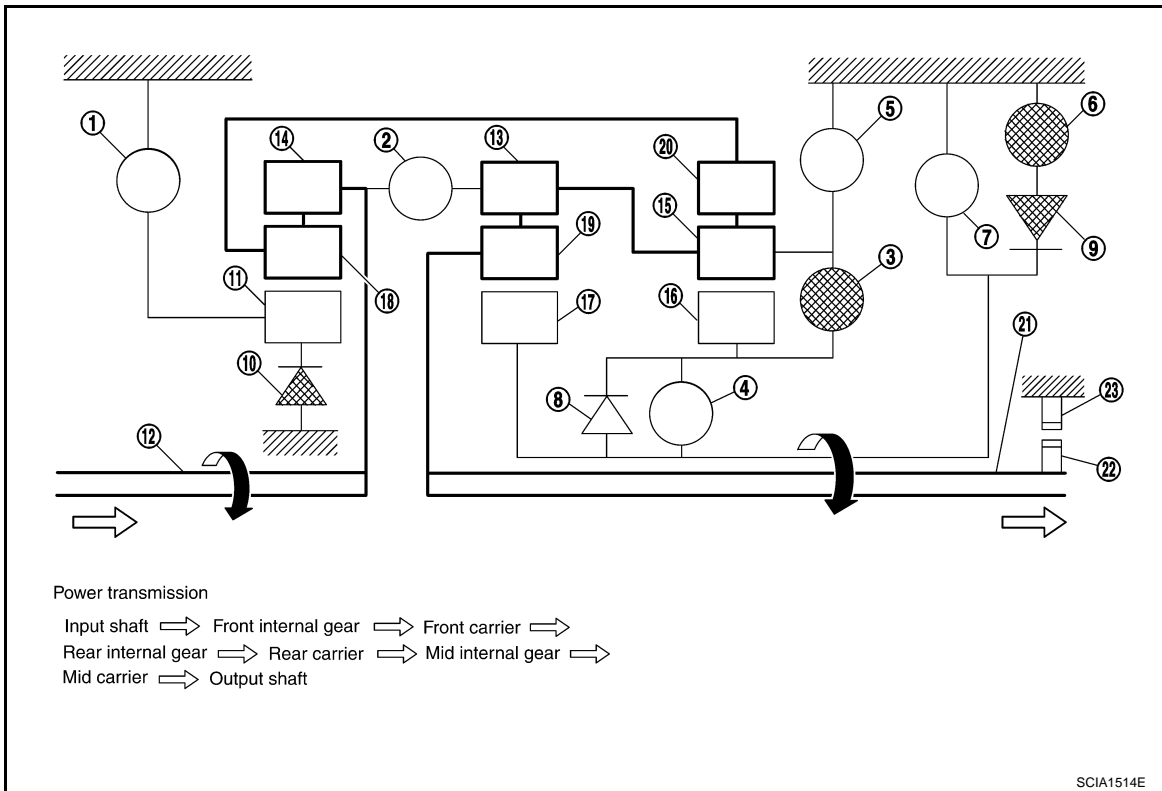
- | | | |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake | 2. Input clutch | 3. Direct clutch |
| 4. High and low reverse clutch | 5. Reverse brake | 6. Forward brake |
| 7. Low coast brake | 8. 1st one-way clutch | 9. Forward one-way clutch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

"D" and "3" Positions 2nd Gear

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



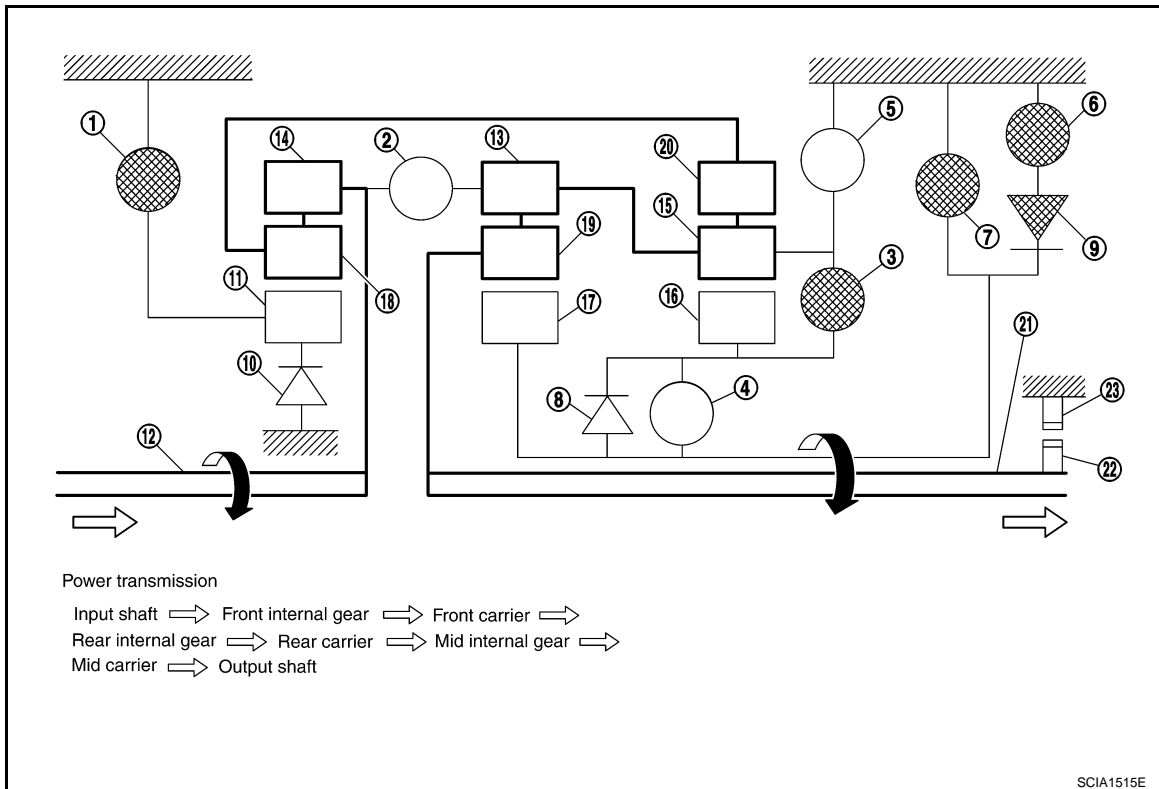
- | | | |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake | 2. Input clutch | 3. Direct clutch |
| 4. High and low reverse clutch | 5. Reverse brake | 6. Forward brake |
| 7. Low coast brake | 8. 1st one-way clutch | 9. Forward one-way clutch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

"2" and "1" Positions 2nd Gear

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



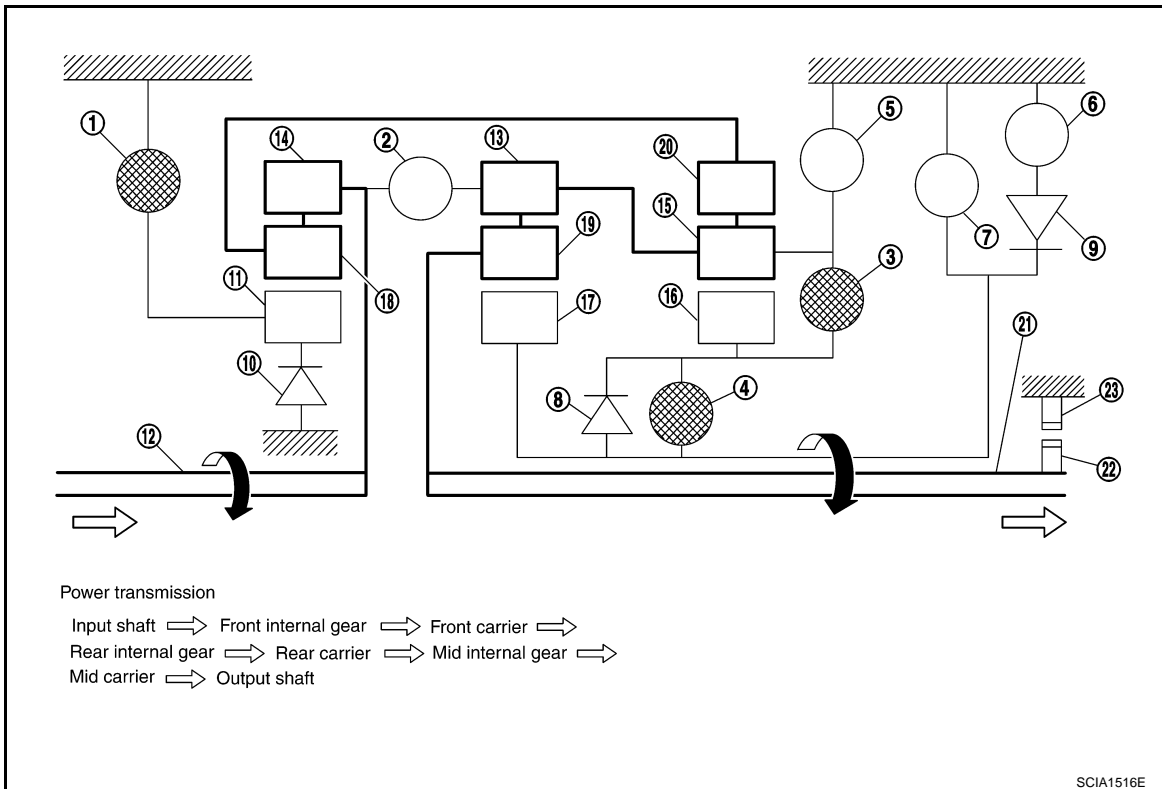
- | | | |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake | 2. Input clutch | 3. Direct clutch |
| 4. High and low reverse clutch | 5. Reverse brake | 6. Forward brake |
| 7. Low coast brake | 8. 1st one-way clutch | 9. Forward one-way clutch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

"D" and "3" Positions 3rd Gear

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



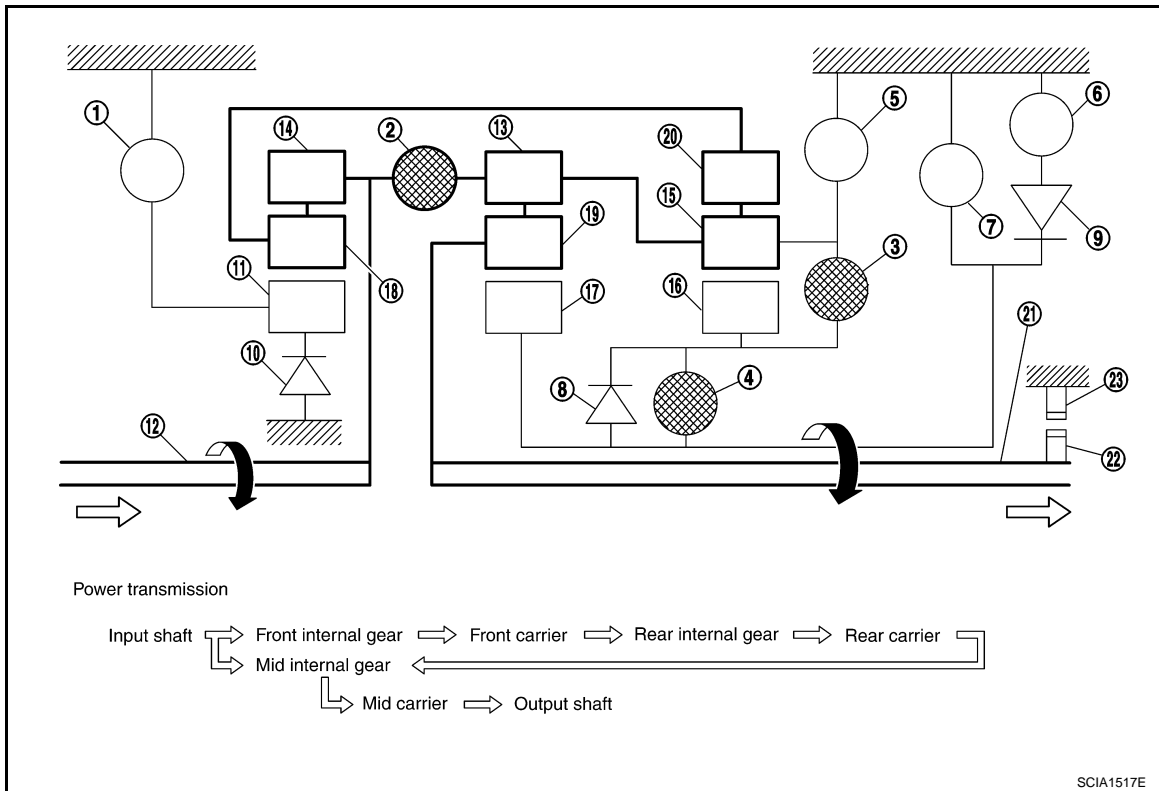
- | | | |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake | 2. Input clutch | 3. Direct clutch |
| 4. High and low reverse clutch | 5. Reverse brake | 6. Forward brake |
| 7. Low coast brake | 8. 1st one-way clutch | 9. Forward one-way clutch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

"D" Position 4th Gear

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



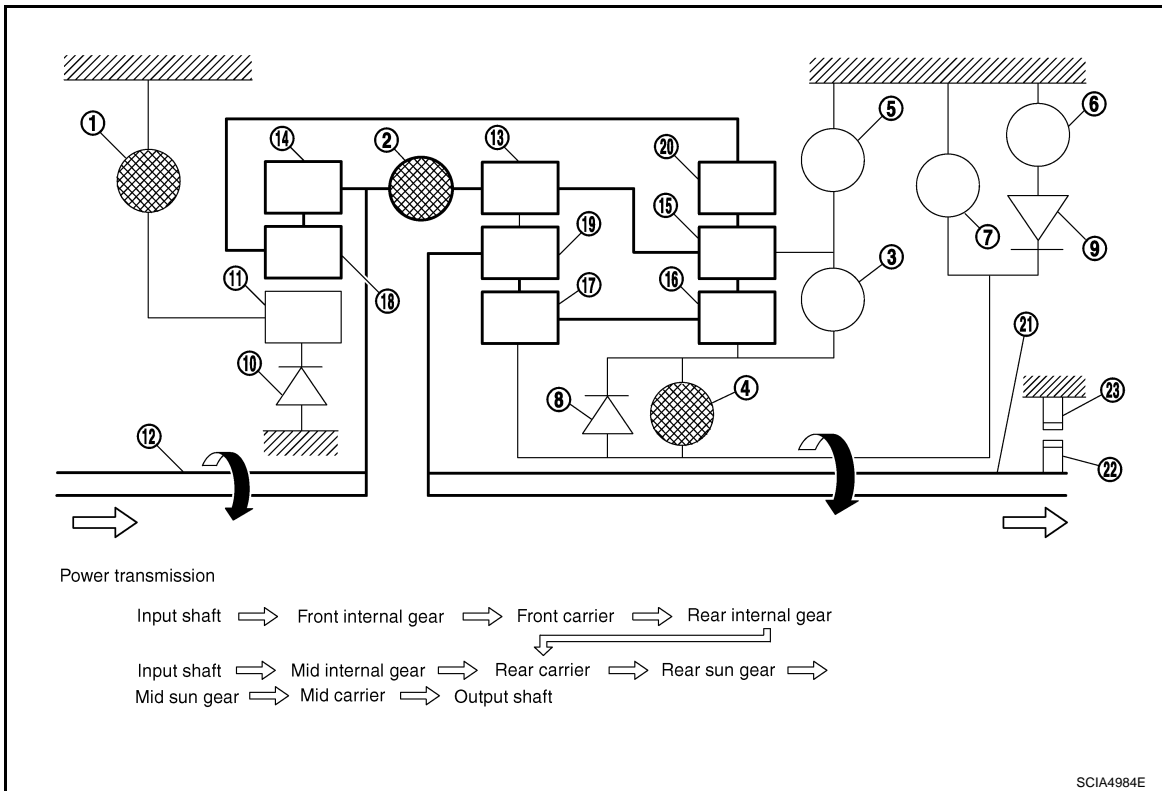
- | | | |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake | 2. Input clutch | 3. Direct clutch |
| 4. High and low reverse clutch | 5. Reverse brake | 6. Forward brake |
| 7. Low coast brake | 8. 1st one-way clutch | 9. Forward one-way clutch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

“D” Position 5th Gear

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



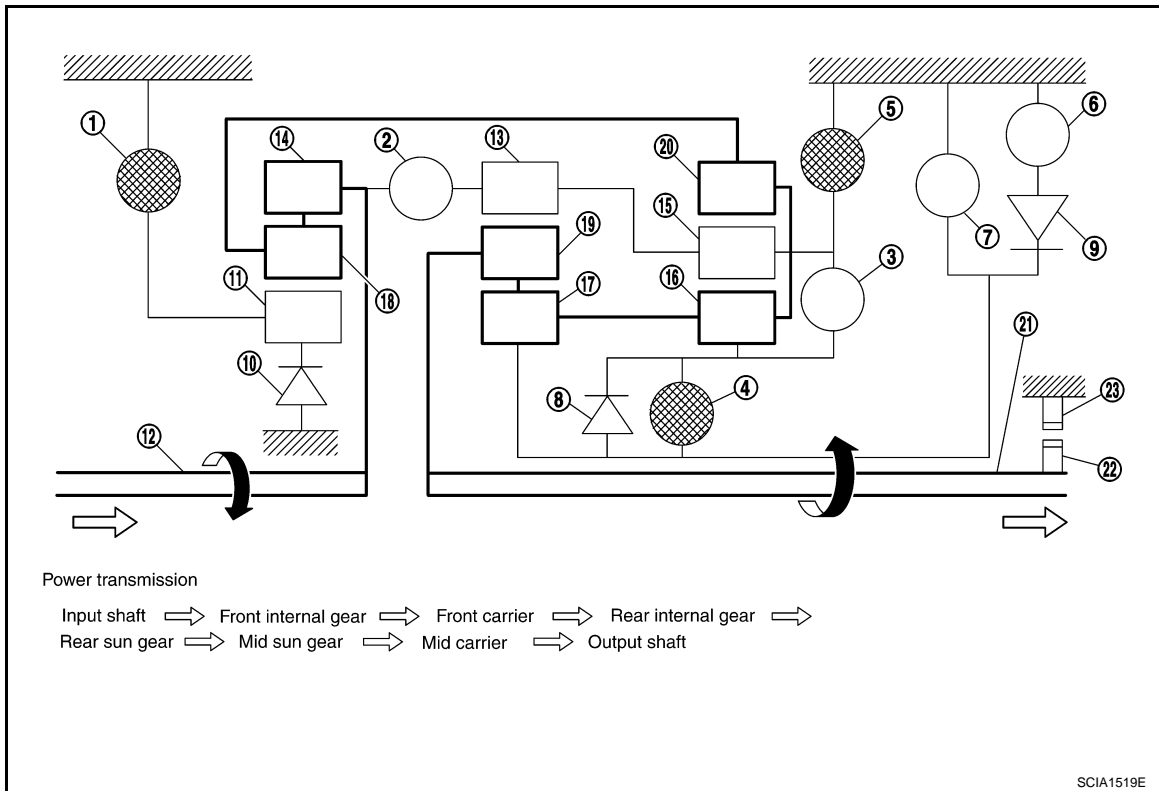
- | | | |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake | 2. Input clutch | 3. Direct clutch |
| 4. High and low reverse clutch | 5. Reverse brake | 6. Forward brake |
| 7. Low coast brake | 8. 1st one-way clutch | 9. Forward one-way clutch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

"R" Position

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



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

TCM Function

INFOID:000000001282730

The function of the TCM is to:

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

CONTROL SYSTEM OUTLINE (WITHOUT MANUAL MODE)

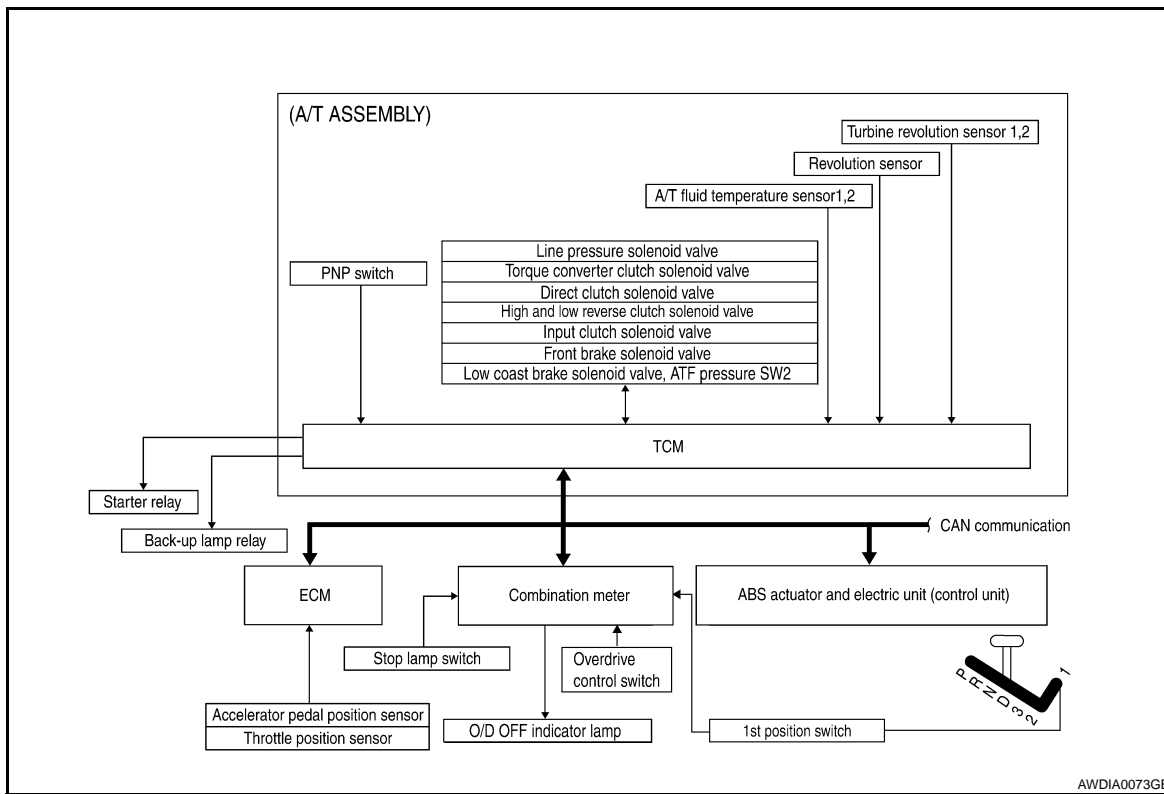
The A/T senses vehicle operating conditions through various sensors or signals. It always controls the optimum shift position and reduces shifting and lock-up shocks.

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

SENSORS (or SIGNALS)		TCM		ACTUATORS
PNP switch Accelerator pedal position sensor Closed throttle position signal Wide open throttle position signal Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed signal Stop lamp switch signal Turbine revolution sensor 1st position switch signal Overdrive control switch signal ATF pressure switch signal	⇒	Shift control Line pressure control Lock-up control Engine brake control Timing control Fail-safe control Self-diagnosis CONSULT-III communication line Duet-EA control CAN system	⇒	Input clutch solenoid valve Direct clutch solenoid valve Front brake solenoid valve High and low reverse clutch solenoid valve Low coast brake solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve O/D OFF indicator lamp Starter relay Back-up lamp relay

CONTROL SYSTEM DIAGRAM



CONTROL SYSTEM OUTLINE (WITH MANUAL MODE)

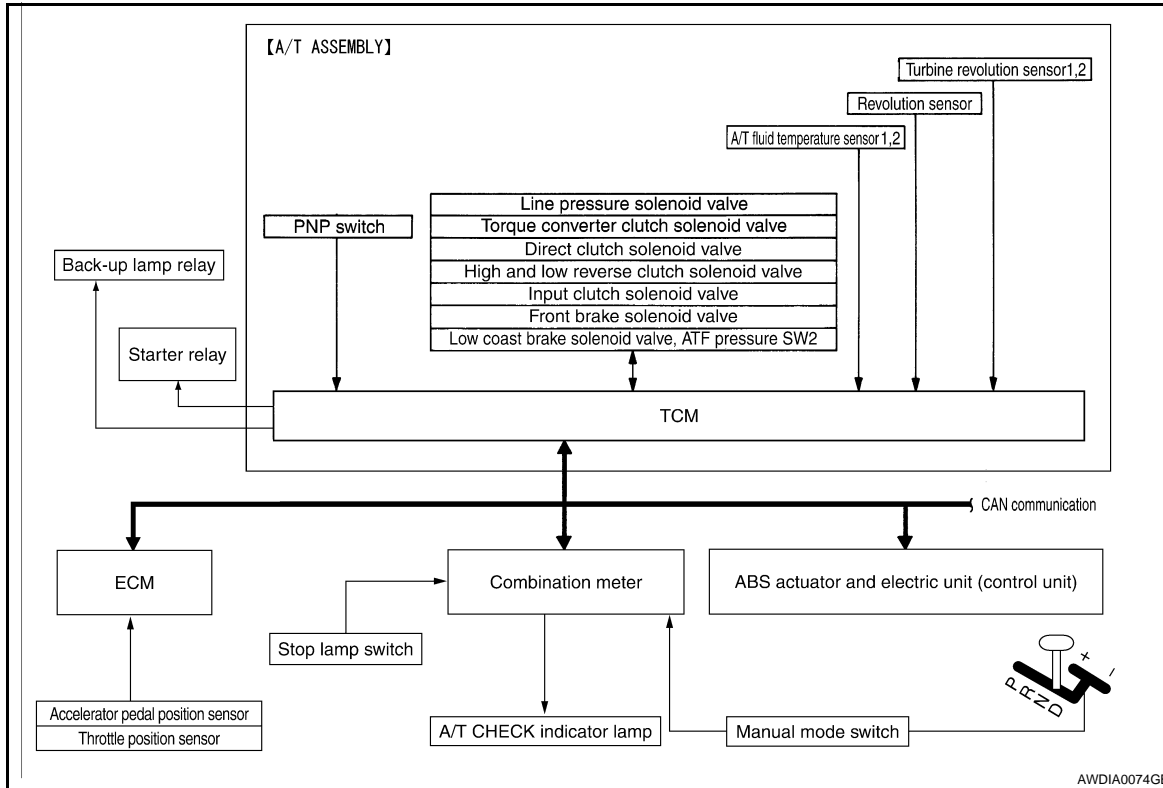
The A/T senses vehicle operating conditions through various sensors or signals. It always controls the optimum shift position and reduces shifting and lock-up shocks.

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

CONTROL SYSTEM DIAGRAM



CAN Communication

INFOID:000000001282731

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to [LAN-56. "CAN System Specification Chart"](#).

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

Input/Output Signal of TCM

INFOID:000000001282732

Control item		Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function (*3)	Self-diagnos- tics function	
Input	Accelerator pedal position signal (*5)	X	X	X	X	X	X	X	
	Vehicle speed sensor A/T (revolution sensor)	X	X	X	X	X	X	X	
	Vehicle speed sensor MTR(*1) (*5)						X		
	Closed throttle position signal(*5)		X(*2)	X	X		X	X(*4)	
	Wide open throttle position signal(*5)						X	X(*4)	
	Turbine revolution sensor 1		X		X	X	X	X	
	Turbine revolution sensor 2 (for 4th speed only)		X		X	X	X	X	
	Engine speed signals(*5)	X	X	X	X	X	X	X	
	Stop lamp switch signal(*5)		X	X	X			X(*4)	
	A/T fluid temperature sensors 1, 2	X	X	X	X		X	X	
	ASCD	Operation signal(*4)		X	X	X			
		Overdrive cancel signal(*5)		X					
Output	Direct clutch solenoid (ATF pressure switch 5)		X	X			X	X	
	Input clutch solenoid (ATF pressure switch 3)		X	X			X	X	
	High and low reverse clutch solenoid (ATF pressure switch 6)		X	X			X	X	
	Front brake solenoid (ATF pressure switch 1)		X	X			X	X	
	Low coast brake solenoid (ATF pressure switch 2)		X	X		X	X	X	
	Line pressure solenoid	X	X	X	X	X	X	X	
	TCC solenoid				X		X	X	
	Self-diagnosis table(*6)							X	
Starter relay						X	X		

*1: Spare for vehicle speed sensor-A/T (revolution sensor)

*2: Spare for accelerator pedal position signal

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

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

*5: Input by CAN communications

*6: Output by CAN communications

Line Pressure Control

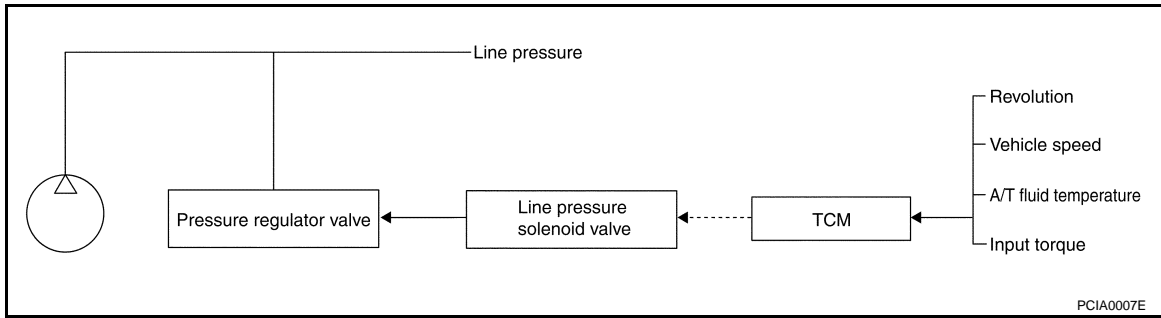
INFOID:000000001282733

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

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

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

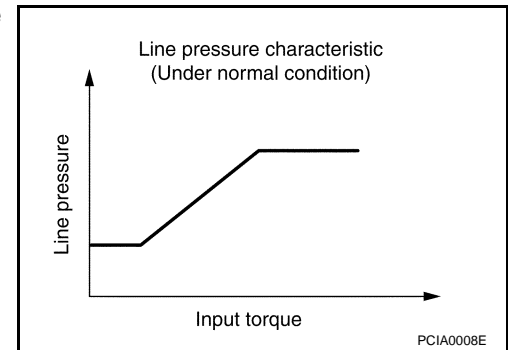


LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

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

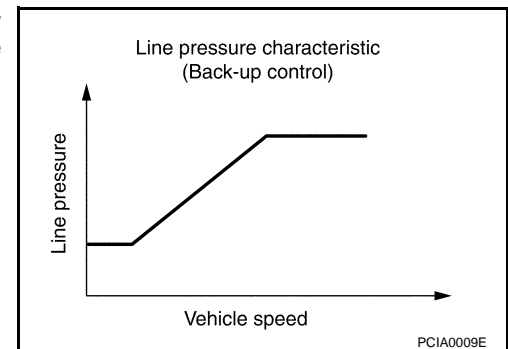
Normal Control

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



Back-up Control (Engine Brake)

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

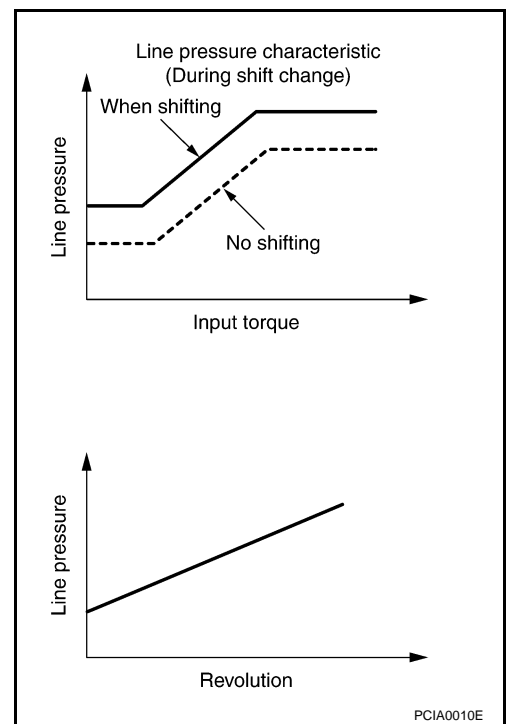


During Shift Change

A/T CONTROL SYSTEM

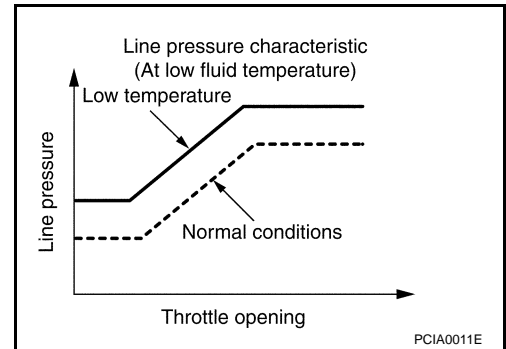
< FUNCTION DIAGNOSIS >

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



At Low Fluid Temperature

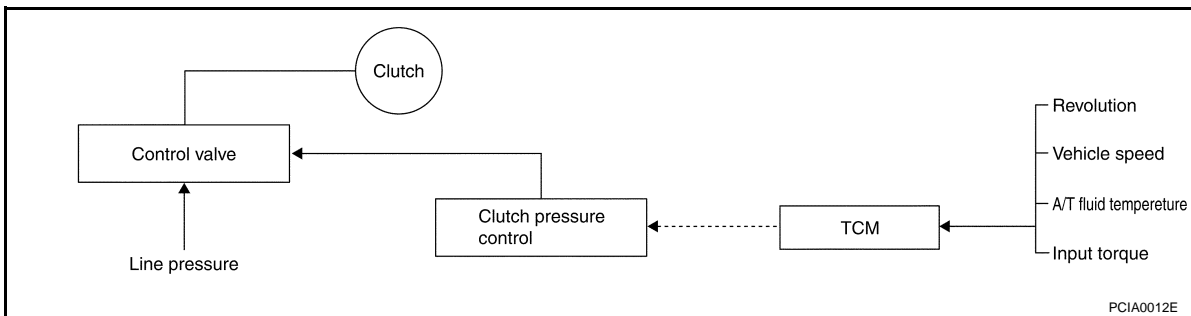
When the A/T fluid temperature drops below the prescribed temperature, in order to speed up the action of each friction element, the line pressure is set higher than the normal line pressure characteristic.



Shift Control

INFOID:000000001282734

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



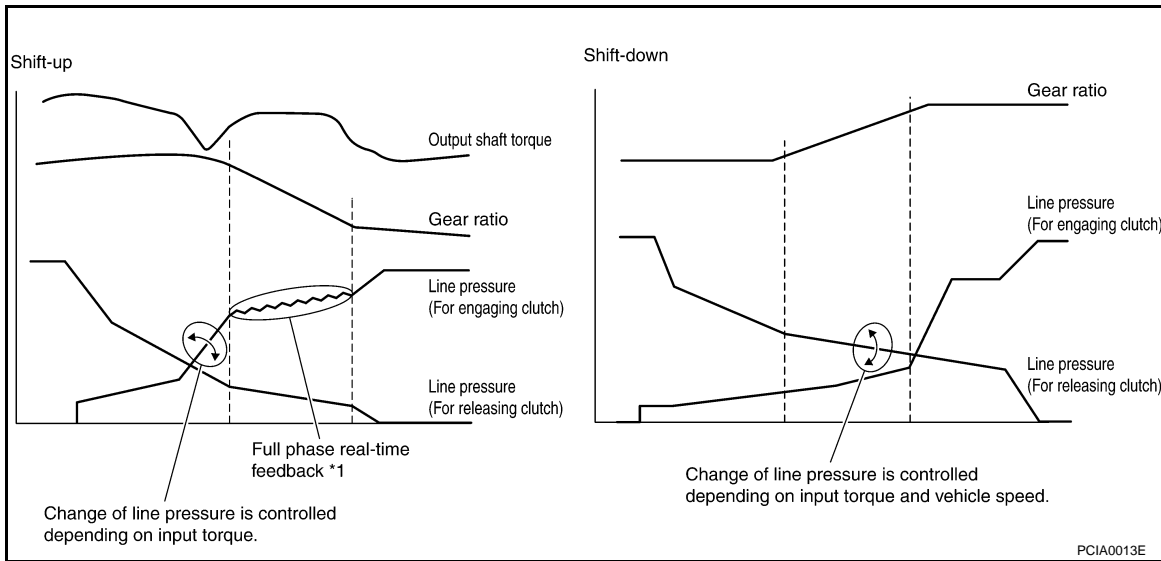
SHIFT CHANGE

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

Shift Change System Diagram

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >



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

Lock-up Control

INFOID:000000001282735

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

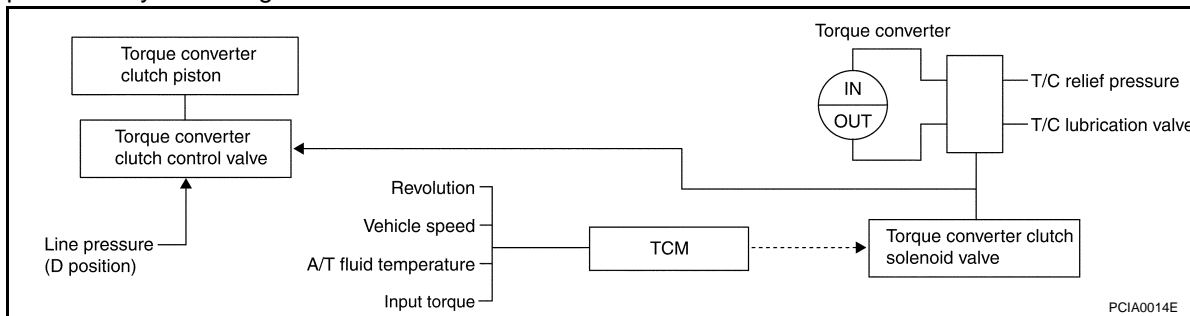
The torque converter clutch control valve operation is controlled by the torque converter clutch solenoid valve, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

Lock-up Operation Condition Table

Select lever	D position		3 position	2 position
Gear position	5	4	3	2
Lock-up	×	—	—	—
Slip lock-up	×	×	—	—

TORQUE CONVERTER CLUTCH CONTROL VALVE CONTROL

Lock-up Control System Diagram



Lock-up Released

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

Lock-up Applied

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

SMOOTH LOCK-UP CONTROL

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

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

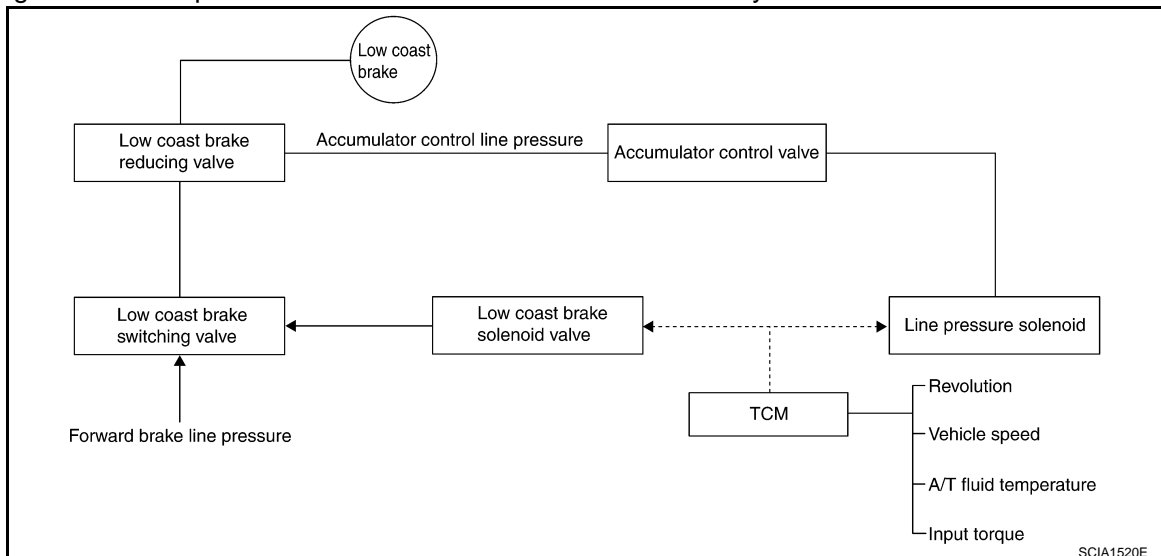
Slip Lock-up Control

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

Engine Brake Control

INFOID:000000001282736

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



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

Control Valve

INFOID:000000001282737

FUNCTION OF CONTROL VALVE

Name	Function
Torque converter regulator valve	In order to prevent the pressure supplied to the torque converter from being excessive, the line pressure is adjusted to the optimum pressure (torque converter operating pressure).
Pressure regulator valve Pressure regulator plug Pressure regulator sleeve	Adjusts the oil discharged from the oil pump to the optimum pressure (line pressure) for the driving state.
Front brake control valve	When the front brake is coupled, adjusts the line pressure to the optimum pressure (front brake pressure) and supplies it to the front brake. (In 1st, 2nd, 3rd, and 5th gears, adjusts the clutch pressure.)
Accumulator control valve	Adjusts the pressure (accumulator control pressure) acting on the accumulator piston and low coast reducing valve to the pressure appropriate to the driving state.

A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

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

FUNCTION OF PRESSURE SWITCH

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

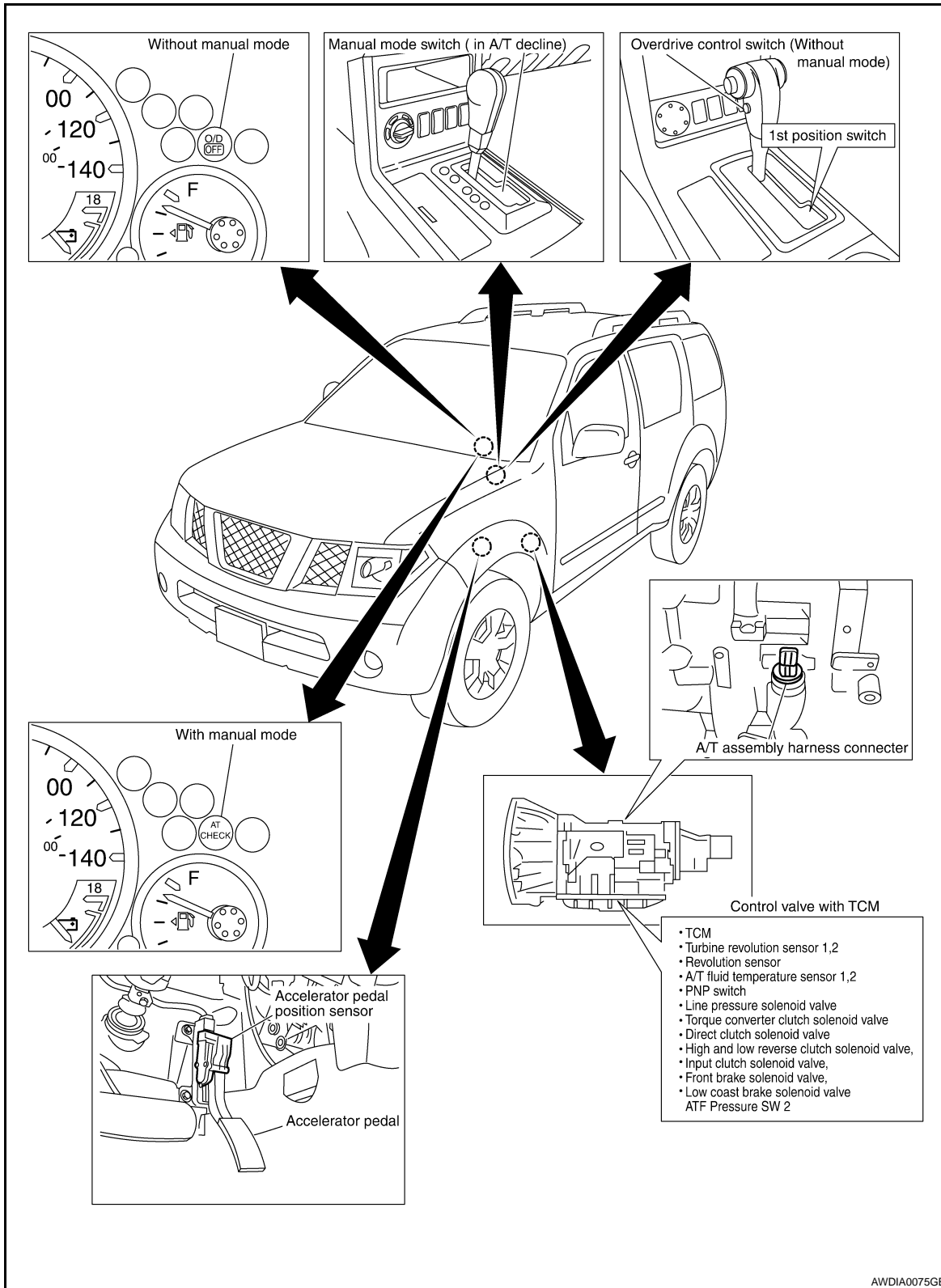
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A/T CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

A/T Electrical Parts Location

INFOID:000000001282746



A/T SHIFT LOCK SYSTEM

< FUNCTION DIAGNOSIS >

A/T SHIFT LOCK SYSTEM

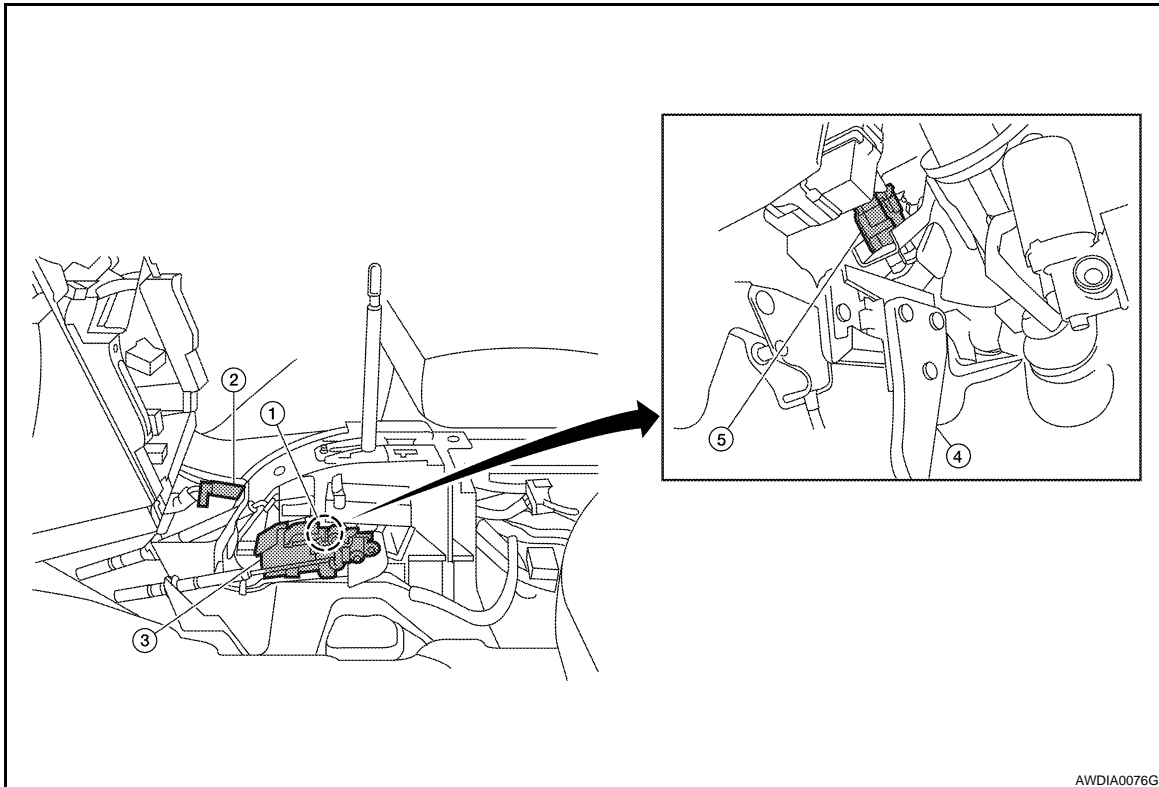
System Description (With Manual Mode)

INFOID:000000001282971

- The mechanical key interlock mechanism also operates as a shift lock:
With the ignition switch turned to ON, the selector lever cannot be shifted from "P" (parking) to any other position unless the brake pedal is depressed.
With the key removed, the selector lever cannot be shifted from "P" to any other position.
The key cannot be removed unless the selector lever is placed in "P" position.
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder, respectively.

Shift Lock System Electrical Parts Location (With Manual Mode)

INFOID:000000001282972



System Description (W/O Manual Mode)

INFOID:000000001712153

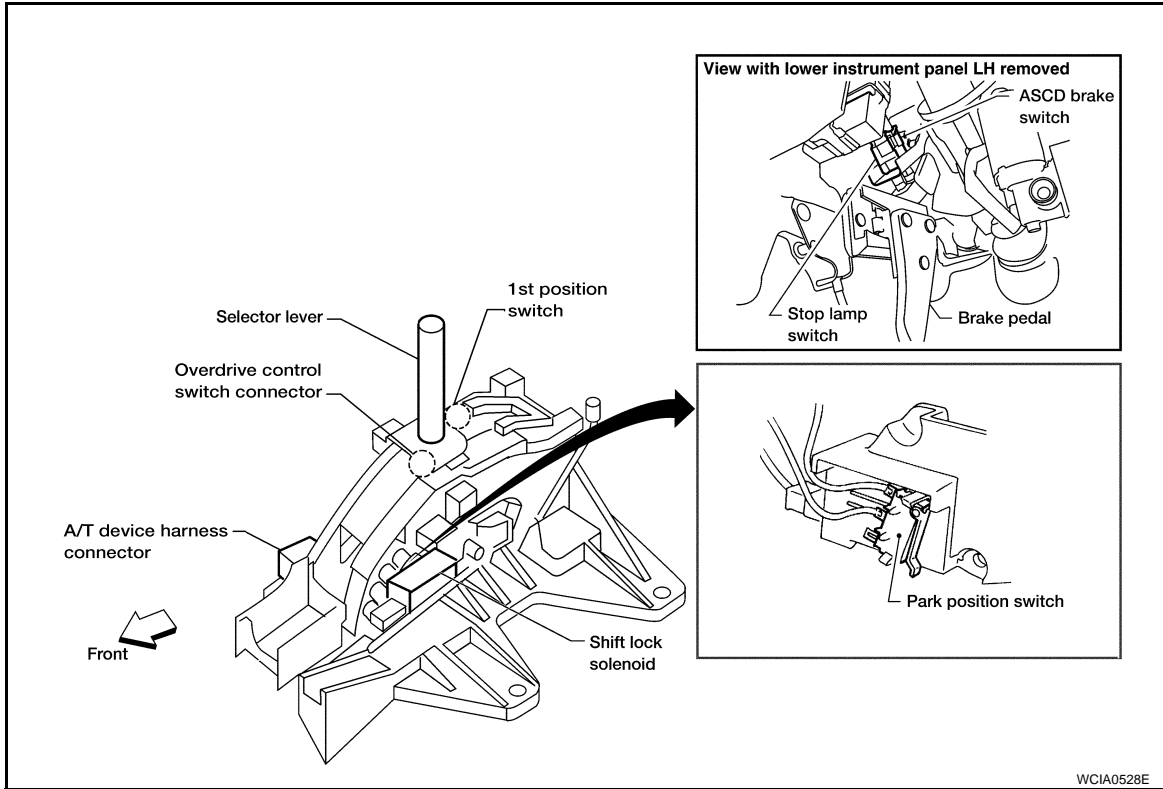
- The mechanical key interlock mechanism also operates as a shift lock:
With the ignition switch turned to ON, the selector lever cannot be shifted from "P" (parking) to any other position unless the brake pedal is depressed.
With the key removed, the selector lever cannot be shifted from "P" to any other position.
The key cannot be removed unless the selector lever is placed in "P" position.
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder, respectively.

A/T SHIFT LOCK SYSTEM

< FUNCTION DIAGNOSIS >

Shift Lock System Electrical Parts Location (W/O Manual Mode)

INFOID:000000001712178



ON BOARD DIAGNOSTIC (OBD) SYSTEM

< FUNCTION DIAGNOSIS >

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Introduction

INFOID:000000001282738

The A/T system has two self-diagnostic systems.

The first is the emission-related on board diagnostic system (OBD-II) performed by the TCM in combination with the ECM. The malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory but not the TCM memory.

The second is the TCM original self-diagnosis indicated by the A/T CHECK indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For detail, refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

OBD-II Function for A/T System

INFOID:000000001282739

The ECM provides emission-related on board diagnostic (OBD-II) functions for the A/T system. One function is to receive a signal from the TCM used with OBD-related parts of the A/T system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part. The other function is to indicate a diagnostic result by means of the MIL (malfunction indicator lamp) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.

The MIL automatically illuminates in One or Two Trip Detection Logic when a malfunction is sensed in relation to A/T system parts.

One or Two Trip Detection Logic of OBD-II

INFOID:000000001282740

ONE TRIP DETECTION LOGIC

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

TWO TRIP DETECTION LOGIC

When a malfunction is sensed during the first test drive, it is stored in the ECM memory as a 1st trip DTC (diagnostic trouble code) or 1st trip freeze frame data. At this point, the MIL will not illuminate. — 1st Trip

If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — 2nd Trip

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

OBD-II Diagnostic Trouble Code (DTC)

INFOID:000000001282741

HOW TO READ DTC AND 1ST TRIP DTC

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

( with **CONSULT-III** or ( **GST**) CONSULT-III or GST (Generic Scan Tool) Examples: P0705, P0720 etc.

These DTC are prescribed by SAE J2012.

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

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

Freeze Frame Data and 1st Trip Freeze Frame Data

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

Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-III or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-III screen, not on the GST. For detail, refer to [TM-33](#).

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

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ON BOARD DIAGNOSTIC (OBD) SYSTEM

< FUNCTION DIAGNOSIS >

longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

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

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

HOW TO ERASE DTC

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

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

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to [EC-54, "Emission-related Diagnostic Information"](#) (VQ40DE), [EC-522, "Emission-related Diagnostic Information"](#) (VK56DE).

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

HOW TO ERASE DTC (WITH CONSULT-III)

1. The emission related diagnostic information in the TCM and ECM can be erased by selecting "4" "4" "4" "4".

HOW TO ERASE DTC (WITH GST)

1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 10 seconds and then turn it "ON" (engine stopped) again.
2. Select Mode 4 with the Generic Scan Tool (GST). For details refer to [EC-83, "Generic Scan Tool \(GST\) Function"](#) (VQ40DE), [EC-551, "Generic Scan Tool \(GST\) Function"](#) (VK56DE).

HOW TO ERASE DTC (NO TOOLS)

1. Disconnect battery for 24 hours.
2. Reconnect battery.

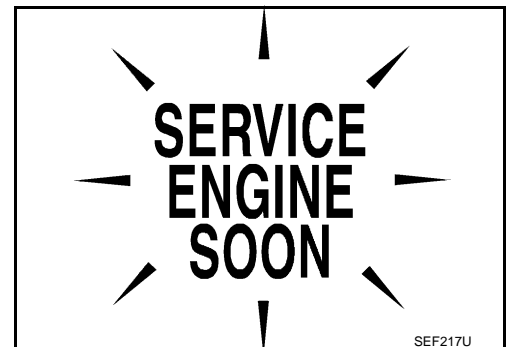
Malfunction Indicator Lamp (MIL)

INFOID:000000001282742

DESCRIPTION

The MIL is located on the instrument panel.

1. The MIL will light up when the ignition switch is turned "ON" without the engine running. This is a bulb check.
 - If the MIL does not light up, refer to [MWI-17, "WARNING LAMPS/INDICATOR LAMPS : System Diagram"](#).
2. When the engine is started, the MIL should go off.
If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

DIAGNOSIS SYSTEM (TCM)

CONSULT-III Function (TRANSMISSION)

INFOID:000000001282758

FUNCTION

Diagnostic test mode	Function	Reference page
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	"SELF-DIAGNOSTIC RESULT MODE"
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.	"DATA MONITOR MODE"
Data monitor	Input/Output data in the TCM can be read.	"DATA MONITOR MODE"
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.	LAN-60
Function test	Conducted by CONSULT-III instead of a technician to determine whether each system is "OK" or "NG".	—
DTC work support	Select the operating condition to confirm Diagnosis Trouble Codes.	"DTC WORK SUPPORT MODE"
ECU part number	TCM part number can be read.	—

CONSULT-III REFERENCE VALUE

NOTICE:

- The CONSULT-III electrically displays shift timing and lock-up timing (that is, operation timing of each solenoid).
Check for time difference between actual shift timing and the CONSULT-III display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) may be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
- Shift schedule (which implies gear position) displayed on CONSULT-III and that indicated in Service Manual may differ slightly. This occurs because of the following reasons:
 - Actual shift schedule has more or less tolerance or allowance,
 - Shift schedule indicated in Service Manual refers to the point where shifts start, and
 - Gear position displayed on CONSULT-III indicates the point where shifts are completed.
- Display of solenoid valves on CONSULT-III changes at the start of shifting, while gear position is displayed upon completion of shifting (which is computed by TCM).

Item name	Condition	Display value (Approx.)
ATF TEMP SE 1	0°C (32° F) - 20°C (68°F) - 80°C (176°F)	3.3 - 2.7 - 0.9 V
ATF TEMP SE 2		3.3 - 2.5 - 0.7 V
TCC SOLENOID	When perform slip lock-up	0.2 - 0.4 A
	When perform lock-up	0.4 - 0.6 A
SLCT LVR POSI	Selector lever in "N", "P" positions.	N/P
	Selector lever in "R" position.	R
	Selector lever in "D" position.	D
	Selector lever in "3" position.	3
	Selector lever in "2" position.	2
VHCL/S SE·A/T	During driving	Approximately matches the speedometer reading.
ENGINE SPEED	Engine running	Closely matches the tachometer reading.
LINE PRES SOL	During driving	0.2 - 0.6 A

DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

Item name	Condition	Display value (Approx.)
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.
ATF PRES SW 1	Front brake engaged. Refer to TM-10	ON
	Front brake disengaged. Refer to TM-10	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to TM-10	ON
	Low coast brake disengaged. Refer to TM-10	OFF
ATF PRES SW 3	Input clutch engaged. Refer to TM-10	ON
	Input clutch disengaged. Refer to TM-10	OFF
ATF PRES SW 5	Direct clutch engaged. Refer to TM-10	ON
	Direct clutch disengaged. Refer to TM-10	OFF
ATF PRES SW 6	High and low reverse clutch engaged. Refer to TM-10	ON
	High and low reverse clutch disengaged. Refer to TM-10	OFF
I/C SOLENOID	Input clutch disengaged. Refer to TM-10	0.6 - 0.8 A
	Input clutch engaged. Refer to TM-10	0 - 0.05 A
FR/B SOLENOID	Front brake engaged. Refer to TM-10	0.6 - 0.8 A
	Front brake disengaged. Refer to TM-10	0 - 0.05 A
D/C SOLENOID	Direct clutch disengaged. Refer to TM-10	0.6 - 0.8 A
	Direct clutch engaged. Refer to TM-10	0 - 0.05 A
HLR/C SOL	High and low reverse clutch disengaged. Refer to TM-10	0.6 - 0.8 A
	High and low reverse clutch engaged. Refer to TM-10	0 - 0.05 A
ON OFF SOL	Low coast brake engaged. Refer to TM-10	ON
	Low coast brake disengaged. Refer to TM-10	OFF
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	Selector lever: + side	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever: - side	ON
	Other than the above	OFF
STARTER RELAY	Selector lever in "N", "P" positions.	ON
	Selector lever in other position.	OFF
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8/8
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF
OD CONT SW	Releasing overdrive control switch	OFF
	Holding overdrive control switch	ON
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

SELF-DIAGNOSTIC RESULT MODE

After performing "SELF-DIAGNOSTIC RESULT MODE", place check marks for results on the [TM-7, "Diagnostic Work Sheet"](#). Reference pages are provided following the items.

Display Items List

X: Applicable, —: Not applicable

Items (CONSULT-III screen terms)	Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)	Reference page
		"A/T" with CONSULT-III	MIL indicator lamp*1, "ENGINE" with CONSULT-III or GST	
CAN COMM CIRCUIT	<ul style="list-style-type: none"> When TCM is not transmitting or receiving CAN communication signal for 2 seconds or more. 	U1000	U1000	TM-45
STARTER RELAY/ CIRC	<ul style="list-style-type: none"> If this signal is ON other than in "P" or "N" position, this is judged to be a malfunction. (And if it is OFF in "P" or "N" position, this too is judged to be a malfunction.) 	P0615	—	TM-46
TCM	<ul style="list-style-type: none"> TCM is malfunctioning. 	P0700	P0700	TM-49
PNP SW/CIRC	<ul style="list-style-type: none"> PNP switch 1-4 signals input with impossible pattern "P" position is detected from "N" position without any other position being detected in between. 	P0705	P0705	TM-50
TURBINE REV S/CIRC	<ul style="list-style-type: none"> TCM does not receive the proper voltage signal from the sensor. TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2. 	P0717	P0717	TM-52
VEH SPD SEN/CIR AT (Revolution sensor)	<ul style="list-style-type: none"> Signal from vehicle speed sensor A/T (Revolution sensor) not input due to cut line or the like Unexpected signal input during running After ignition switch is turned ON, unexpected signal input from vehicle speed sensor MTR before the vehicle starts moving 	P0720	P0720	TM-54
ENGINE SPEED SIG	<ul style="list-style-type: none"> TCM does not receive the CAN communication signal from the ECM. 	P0725	—	TM-57
A/T 1ST GR FNCTN	<ul style="list-style-type: none"> A/T cannot shift to 1st gear 	P0731	P0731	TM-60
A/T 2ND GR FNCTN	<ul style="list-style-type: none"> A/T cannot shift to 2nd gear 	P0732	P0732	TM-62
A/T 3RD GR FNCTN	<ul style="list-style-type: none"> A/T cannot shift to 3rd gear 	P0733	P0733	TM-64
A/T 4TH GR FNCTN	<ul style="list-style-type: none"> A/T cannot shift to 4th gear 	P0734	P0734	TM-66
A/T 5TH GR FNCTN	<ul style="list-style-type: none"> A/T cannot shift to 5th gear 	P0735	P0735	TM-68
TCC SOLENOID/CIRC	<ul style="list-style-type: none"> Normal voltage not applied to solenoid due to cut line, short, or the like 	P0740	P0740	TM-69
A/T TCC S/V FNCTN	<ul style="list-style-type: none"> A/T cannot perform lock-up even if electrical circuit is good. TCM detects as irregular by comparing difference value with slip rotation. 	P0744	P0744*2	TM-71
L/PRESS SOL/CIRC	<ul style="list-style-type: none"> Normal voltage not applied to solenoid due to cut line, short, or the like TCM detects as irregular by comparing target value with monitor value. 	P0745	P0745	TM-73
TP SEN/CIRC A/T	<ul style="list-style-type: none"> TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM. 	P1705	—	TM-75

DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

Items (CONSULT-III screen terms)	Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)	Reference page
		"A/T" with CONSULT-III	MIL indicator lamp*1, "ENGINE" with CONSULT-III or GST	
ATF TEMP SEN/CIRC	<ul style="list-style-type: none"> During running, the ATF temperature sensor signal voltage is excessively high or low 	P1710	P0710	TM-77
VEH SPD SE/CIR-MTR	<ul style="list-style-type: none"> Signal (CAN communication) from vehicle speed sensor MTR not input due to cut line or the like Unexpected signal input during running 	P1721	—	TM-80
A/T INTERLOCK	<ul style="list-style-type: none"> Except during shift change, the gear position and ATF pressure switch states are monitored and comparative judgement made. 	P1730	P1730	TM-82
A/T 1ST E/BRAKING	<ul style="list-style-type: none"> Each ATF pressure switch and solenoid current is monitored and if a pattern is detected having engine braking 1st gear other than in the "1" position, a malfunction is detected. 	P1731	—	TM-84
I/C SOLENOID/CIRC	<ul style="list-style-type: none"> Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like TCM detects as irregular by comparing target value with monitor value. 	P1752	P1752	TM-86
FR/B SOLENOID/CIRC	<ul style="list-style-type: none"> Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like TCM detects as irregular by comparing target value with monitor value. 	P1757	P1757	TM-88
D/C SOLENOID/CIRC	<ul style="list-style-type: none"> Normal voltage not applied to solenoid due to cut line, short, or the like TCM detects as irregular by comparing target value with monitor value. 	P1762	P1762	TM-90
HLR/C SOL/CIRC	<ul style="list-style-type: none"> Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like TCM detects as irregular by comparing target value with monitor value. 	P1767	P1767	TM-92
LC/B SOLENOID/CIRC	<ul style="list-style-type: none"> Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like 	P1772	P1772	TM-94
LC/B SOLENOID FNCT	<ul style="list-style-type: none"> TCM detects an improper voltage drop when it tries to operate the solenoid valve. Condition of ATF pressure switch 2 is different from monitor value, and relation between gear position and actual gear ratio is irregular. 	P1774	P1774*2	TM-96
MANU MODE SW/CIRC *3	<ul style="list-style-type: none"> When an impossible pattern of switch signals is detected, a malfunction is detected. 	P1815	—	TM-98
NO DTC IS DETECTED FURTHER TESTING MAY BE REQUIRED	<ul style="list-style-type: none"> No NG item has been detected. 	X	X	—

*1: Refer to [TM-34, "Malfunction Indicator Lamp \(MIL\)"](#).

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

*3: With manual mode.

DATA MONITOR MODE

Display Items List

DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

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

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU IN-PUT SIG-NALS	MAIN SIG-NALS	SELEC-TION FROM MENU	
VHCL/S SE-A/T (km/h)	X	X	▼	Revolution sensor
VHCL/S SE-MTR (km/h)	X	—	▼	
ACCELE POSI (0.0/8)	X	—	▼	Accelerator pedal position signal
THROTTLE POSI (0.0/8)	X	X	▼	Degree of opening for accelerator recognized by the TCM For fail-safe operation, the specific value used for control is displayed.
CLSD THL POS (ON-OFF display)	X	—	▼	Signal input with CAN communications
W/O THL POS (ON-OFF display)	X	—	▼	
BRAKE SW (ON-OFF display)	X	—	▼	Stop lamp switch
GEAR	—	X	▼	Gear position recognized by the TCM updated after gear-shifting
ENGINE SPEED (rpm)	X	X	▼	
TURBINE REV (rpm)	X	X	▼	
OUTPUT REV (rpm)	X	X	▼	
GEAR RATIO	—	X	▼	
TC SLIP SPEED (rpm)	—	X	▼	Difference between engine speed and torque converter input shaft speed
F SUN GR REV (rpm)	—	—	▼	
F CARR GR REV (rpm)	—	—	▼	
ATF TEMP SE 1 (V)	X	—	▼	
ATF TEMP SE 2 (V)	X	—	▼	
ATF TEMP 1 (°C)	—	X	▼	
ATF TEMP 2 (°C)	—	X	▼	
BATTERY VOLT (V)	X	—	▼	
ATF PRES SW 1 (ON-OFF display)	X	X	▼	(for FR/B solenoid)
ATF PRES SW 2 (ON-OFF display)	X	X	▼	(for LC/B solenoid)
ATF PRES SW 3 (ON-OFF display)	X	X	▼	(for I/C solenoid)
ATF PRES SW 5 (ON-OFF display)	X	X	▼	(for D/C solenoid)
ATF PRES SW 6 (ON-OFF display)	X	X	▼	(for HLR/C solenoid)
PNP SW 1 (ON-OFF display)	X	—	▼	
PNP SW 2 (ON-OFF display)	X	—	▼	
PNP SW 3 (ON-OFF display)	X	—	▼	
PNP SW 4 (ON-OFF display)	X	—	▼	
1 POSITION SW (ON-OFF display)	X	—	▼	1st position switch
SLCT LVR POSI	—	X	▼	Selector lever position is recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.

DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
OD CONT SW (ON-OFF display)	X	—	▼	
POWERSHIFT SW (ON-OFF display)	X	—	▼	Not mounted but displayed.
HOLD SW (ON-OFF display)	X	—	▼	
MANU MODE SW (ON-OFF display)	X	—	▼	
NON M-MODE SW (ON-OFF display)	X	—	▼	
UP SW LEVER (ON-OFF display)	X	—	▼	
DOWN SW LEVER (ON-OFF display)	X	—	▼	
SFT UP ST SW (ON-OFF display)	—	—	▼	Not mounted but displayed.
SFT DWN ST SW (ON-OFF display)	—	—	▼	
ASCD-OD CUT (ON-OFF display)	—	—	▼	
ASCD-CRUISE (ON-OFF display)	—	—	▼	
ABS SIGNAL (ON-OFF display)	—	—	▼	
ACC OD CUT (ON-OFF display)	—	—	▼	Not mounted but displayed.
ACC SIGNAL (ON-OFF display)	—	—	▼	
TCS GR/P KEEP (ON-OFF display)	—	—	▼	
TCS SIGNAL 2 (ON-OFF display)	—	—	▼	
TCS SIGNAL 1 (ON-OFF display)	—	—	▼	
TCC SOLENOID (A)	—	X	▼	
LINE PRES SOL (A)	—	X	▼	
I/C SOLENOID (A)	—	X	▼	
FR/B SOLENOID (A)	—	X	▼	
D/C SOLENOID (A)	—	X	▼	
HLR/C SOL (A)	—	X	▼	
ON OFF SOL (ON-OFF display)	—	—	▼	LC/B solenoid
TCC SOL MON (A)	—	—	▼	
L/P SOL MON (A)	—	—	▼	
I/C SOL MON (A)	—	—	▼	
FR/B SOL MON (A)	—	—	▼	
D/C SOL MON (A)	—	—	▼	
HLR/C SOL MON (A)	—	—	▼	
ONOFF SOL MON (ON-OFF display)	—	—	▼	LC/B solenoid
P POSI IND (ON-OFF display)	—	—	▼	
R POSI IND (ON-OFF display)	—	—	▼	
N POSI IND (ON-OFF display)	—	—	▼	
D POSI IND (ON-OFF display)	—	—	▼	

DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

Monitored item (Unit)	Monitor Item Selection			Remarks	
	ECU IN-PUT SIG-NALS	MAIN SIG-NALS	SELEC-TION FROM MENU		
4TH POSI IND (ON-OFF display)	—	—	▼		A
3RD POSI IND (ON-OFF display)	—	—	▼		B
2ND POSI IND (ON-OFF display)	—	—	▼		C
1ST POSI IND (ON-OFF display)	—	—	▼		TM
MANU MODE IND (ON-OFF display)	—	—	▼		
POWER M LAMP (ON-OFF display)	—	—	▼		
F-SAFE IND/L (ON-OFF display)	—	—	▼		E
ATF WARN LAMP (ON-OFF display)	—	—	▼		
BACK-UP LAMP (ON-OFF display)	—	—	▼		F
STARTER RELAY (ON-OFF display)	—	—	▼		
PNP SW3 MON (ON-OFF display)	—	—	▼		G
C/V CLB ID1	—	—	▼		
C/V CLB ID2	—	—	▼		H
C/V CLB ID3	—	—	▼		
UNIT CLB ID1	—	—	▼		I
UNIT CLB ID2	—	—	▼		
UNIT CLB ID3	—	—	▼		J
TRGT GR RATIO	—	—	▼		
TRGT PRES TCC (kPa)	—	—	▼		K
TRGT PRES L/P (kPa)	—	—	▼		
TRGT PRES I/C (kPa)	—	—	▼		L
TRGT PRE FR/B (kPa)	—	—	▼		
TRGT PRES D/C (kPa)	—	—	▼		M
TRG PRE HLR/C (kPa)	—	—	▼		
SHIFT PATTERN	—	—	▼		
DRV CST JUDGE	—	—	▼		N
START RLY MON	—	—	▼		
NEXT GR POSI	—	—	▼		O
SHIFT MODE	—	—	▼		
MANU GR POSI	—	—	▼		P
VEHICLE SPEED (km/h)	—	X	▼	Vehicle speed recognized by the TCM.	
Voltage (V)	—	—	▼	Displays the value measured by the voltage probe.	

DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Frequency (Hz)	—	—	▼	The value measured by the pulse probe is displayed.
DUTY-HI (high) (%)	—	—	▼	
DUTY-LOW (low) (%)	—	—	▼	
PLS WIDTH-HI (ms)	—	—	▼	
PLS WIDTH-LOW (ms)	—	—	▼	

DTC WORK SUPPORT MODE

Display Items List

DTC work support item	Description	Check item
1ST GR FUNCTN P0731	Following items for "1st gear 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"> Input clutch solenoid valve Front brake solenoid valve Direct clutch solenoid valve High and low reverse clutch solenoid valve Each clutch Hydraulic control circuit
2ND GR FUNCTN P0732	Following items for "2nd gear 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) 	
3RD GR FUNCTN P0733	Following items for "3rd gear 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) 	
4TH GR FUNCTN P0734	Following items for "4th gear 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) 	
5TH GR FUNCTN P0735	Following items for "5th gear 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) 	

Diagnosis Procedure without CONSULT-III

INFOID:000000001282759

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to [EC-83, "Generic Scan Tool \(GST\) Function"](#) (VQ40DE) or [EC-551, "Generic Scan Tool \(GST\) Function"](#) (VK56DE).

OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to [TM-34, "Malfunction Indicator Lamp \(MIL\)"](#).

TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Description

When the ignition switch is switched "ON", the O/D OFF indicator lamp lights up for 2 seconds. As a method for locating the suspect circuit, when the self-diagnostics start signal is input, the memory for the malfunction location is output and the O/D OFF indicator lamp flashes to display the corresponding DTC.

Diagnostic Procedure

1. CHECK O/D OFF INDICATOR LAMP

1. Start the engine with selector lever in "P" position. Warm engine to normal operating temperature.
2. Turn ignition switch ON and OFF at least twice, then leave it in the OFF position.

DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

3. Wait 10 seconds.
4. Turn ignition switch ON. (Do not start engine.)

Does O/D OFF indicator lamp come on for about 2 seconds?

YES >> GO TO 2.

NO >> GO TO [TM-126. "O/D OFF Indicator Lamp Does Not Come On \(Without Manual Mode\)".](#)

2.CHECK VEHICLE EQUIPMENT

Is vehicle equipped with manual mode?

YES or NO?

YES >> GO TO 3.

NO >> GO TO 4.

3.JUDGEMENT PROCEDURE STEP 1 (WITH MANUAL MODE)

1. Turn ignition switch OFF.
2. Keep pressing shift lock release button.
3. Move selector lever from "P" to "D" position.
4. Release accelerator pedal. (Set the closed throttle position signal "ON".)
5. Depress brake pedal. (Stop lamp switch signal "ON".)
6. Turn ignition switch ON (Do not start engine.)
7. Wait 3 seconds.
8. Move the selector lever to the manual shift gate side. (Manual mode signal "ON".)
9. Release brake pedal. (Stop lamp switch signal "OFF".)
10. Move the selector lever to "D" position. (Manual mode signal ON.)
11. Depress brake pedal. (Stop lamp switch signal "ON".)
12. Release brake pedal. (Stop lamp switch signal "OFF".)
13. Depress accelerator pedal fully and release it.

>> GO TO 5.

4.JUDGEMENT PROCEDURE STEP 1 (WITHOUT MANUAL MODE)

1. Turn ignition switch OFF.
2. Keep pressing shift lock release button.
3. Move selector lever from "P" to "D" position.
4. Release accelerator pedal. (Set the closed throttle position signal "ON".)
5. Depress brake pedal. (Stop lamp switch signal "ON".)
6. Turn ignition switch ON. (Do not start engine.)
7. Wait 3 seconds.
8. Move the selector lever from "D" to "3" position.
9. Release brake pedal. (Stop lamp switch signal "OFF".)
10. Move the selector lever from "3" to "2" position.
11. Depress brake pedal. (Stop lamp switch signal "ON".)
12. Depress accelerator pedal fully and release it.

>> GO TO 5.

5.CHECK SELF-DIAGNOSIS CODE

Check O/D OFF indicator lamp.

Refer to "Judgement Self-diagnosis Code".

If the system does not go into self-diagnostics. Refer to [TM-50. "Diagnosis Procedure"](#), [TM-104. "Diagnosis Procedure"](#), [TM-105. "Diagnosis Procedure"](#), [TM-98. "Diagnosis Procedure"](#).

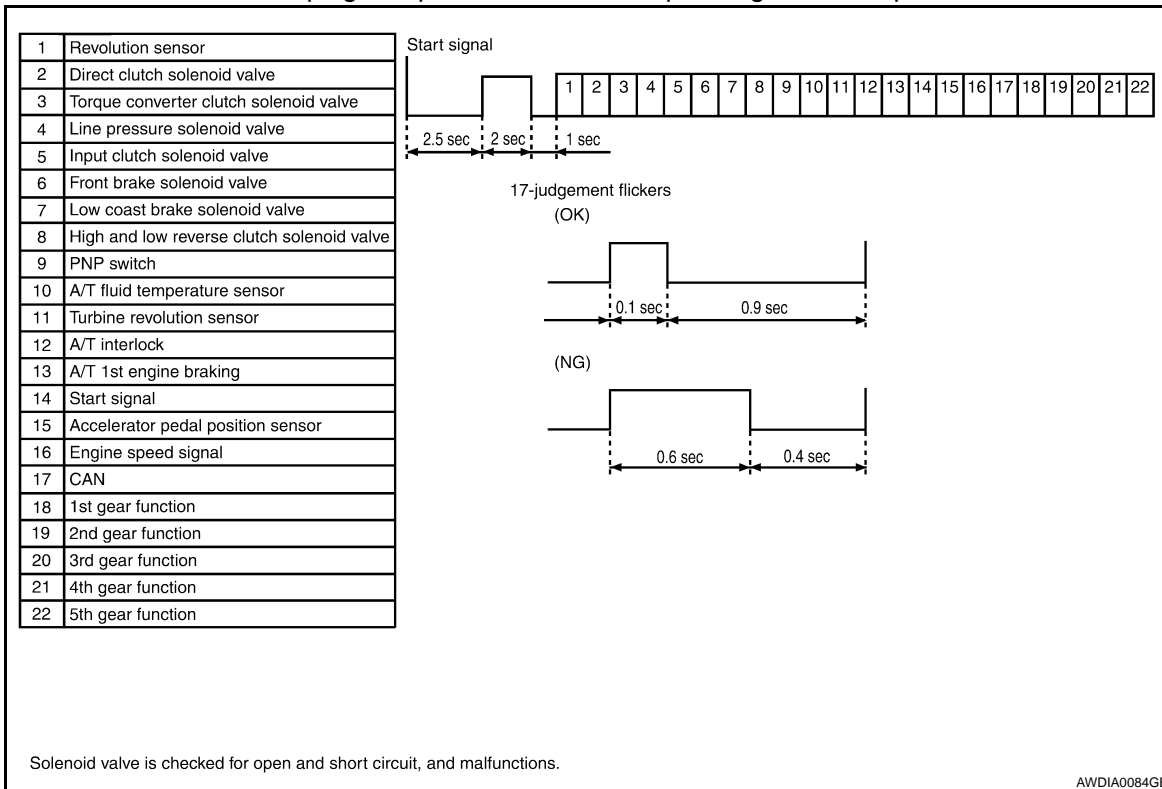
>> **DIAGNOSIS END**

Judgement Self-diagnosis Code

DIAGNOSIS SYSTEM (TCM)

< FUNCTION DIAGNOSIS >

If there is a malfunction, the lamp lights up for the time corresponding to the suspect circuit.



Erase Self-diagnosis

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

DTC U1000 CAN COMMUNICATION LINE

< COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS

DTC U1000 CAN COMMUNICATION LINE

Description

INFOID:000000001282760

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

On Board Diagnosis Logic

INFOID:000000001282761

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "U1000 CAN COMM CIRCUIT" with CONSULT-III or 17th judgement flicker without CONSULT-III is detected when TCM cannot communicate to other control units.

Possible Cause

INFOID:000000001282762

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

DTC Confirmation Procedure

INFOID:000000001282763

NOTE:

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

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

④ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-III.
3. Start engine and wait for at least 6 seconds.
4. If DTC is detected, go to [TM-45, "Diagnosis Procedure"](#).

④ WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282765

1. CHECK CAN COMMUNICATION CIRCUIT

④ With CONSULT-III

1. Turn ignition switch "ON" and start engine.
2. Select "SELF-DIAG RESULTS" mode for "TRANSMISSION" with CONSULT-III.

Is any malfunction of the "CAN COMM CIRCUIT" indicated?

- YES >> GO TO LAN section. Refer to [LAN-13, "How to Use CAN Communication Signal Chart"](#).
NO >> **INSPECTION END**

DTC P0615 START SIGNAL CIRCUIT

< COMPONENT DIAGNOSIS >

DTC P0615 START SIGNAL CIRCUIT

Description

INFOID:000000001282766

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282767

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

On Board Diagnosis Logic

INFOID:000000001282768

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

Possible Cause

INFOID:000000001282769

- Harness or connectors
[The park/neutral position (PNP) relay (starter relay) and TCM circuit is open or shorted.]
- Park/neutral position (PNP) relay (starter relay)

DTC Confirmation Procedure

INFOID:000000001282770

NOTE:

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

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

④ WITH CONSULT-III

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Drive vehicle for at least 2 consecutive seconds.
5. If DTC is detected, go to [TM-46, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001282772

1. CHECK STARTER RELAY

④ With CONSULT-III

1. Turn ignition switch ON. (Do not start engine.)
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “STARTER RELAY” ON/OFF.

⊗ Without CONSULT-III

1. Turn ignition switch ON. (Do not start engine.)

DTC P0615 START SIGNAL CIRCUIT

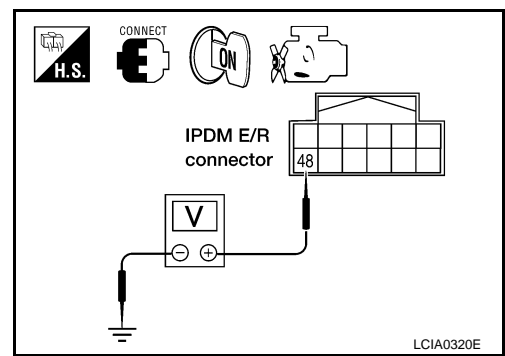
< COMPONENT DIAGNOSIS >

2. Check voltage between the IPDM E/R connector and ground.

Item	Connector	Terminal	Shift position	Voltage (Approx.)
Starter relay	E122	48	Ground	Battery voltage
			"N" and "P"	0V
			"R" and "D"	0V

OK or NG

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



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

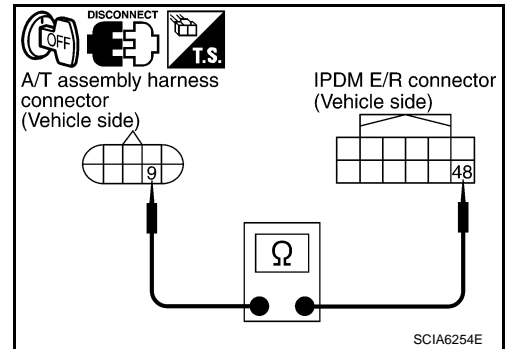
1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector and IPDM E/R connector.
3. Check continuity between A/T assembly harness connector and IPDM E/R connector.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F9	9	Yes
IPDM E/R connector	E122	48	

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

OK or NG

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



3. CHECK TERMINAL CORD ASSEMBLY

1. Remove control valve with TCM. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminal and TCM connector terminal.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F9	9	Yes
TCM connector	F502	8	

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

OK or NG

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

4. DETECT MALFUNCTIONING ITEM

Check the following.

- Starter relay, Refer to [STR-4](#).
- IPDM E/R, Refer to [PCS-4](#).

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Repair or replace damaged parts.

5. CHECK DTC

Perform [TM-46. "DTC Confirmation Procedure"](#).

DTC P0615 START SIGNAL CIRCUIT

< COMPONENT DIAGNOSIS >

OK or NG

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

DTC P0700 TCM

< COMPONENT DIAGNOSIS >

DTC P0700 TCM

Description

INFOID:000000001282773

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

On Board Diagnosis Logic

INFOID:000000001282774

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

Possible Cause

INFOID:000000001282775

TCM.

DTC Confirmation Procedure

INFOID:000000001282776

NOTE:

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

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

④ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to [TM-49. "Diagnosis Procedure"](#).

④ WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282777

1. CHECK DTC

④ With CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "SELF DIAG RESULTS" mode for "TRANSMISSION" with CONSULT-III.
3. Touch "ERASE".
4. Turn ignition switch "OFF" and wait at least 10 seconds.
5. Perform [TM-49. "DTC Confirmation Procedure"](#).

Is the "TCM" displayed again?

- YES >> Replace the control valve with TCM. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NO >> **INSPECTION END**

DTC P0705 PARK/NEUTRAL POSITION SWITCH

< COMPONENT DIAGNOSIS >

DTC P0705 PARK/NEUTRAL POSITION SWITCH

Description

INFOID:000000001282778

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282779

Item name	Condition	Display value
SLCTLVR POSI	Selector lever in "N","P" positions.	N/P
	Selector lever in "R" position.	R
	Selector lever in "D" position.	D
	Selector lever in "3" position.	3
	Selector lever in "2" position.	2
	Selector lever in "1" position.	1

On Board Diagnosis Logic

INFOID:000000001282780

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0705 PNP SW/CIRC" with CONSULT-III or 9th judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM does not receive the correct voltage signal from the PNP switch 1, 2, 3, 4 based on the gear position.
 - When no other position but "P" position is detected from "N" positions.

Possible Cause

INFOID:000000001282781

- Harness or connectors
[The park/neutral position (PNP) switch 1, 2, 3, 4 and TCM circuit is open or shorted.]
- Park/neutral position (PNP) switch 1, 2, 3, 4

DTC Confirmation Procedure

INFOID:000000001282782

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

Ⓜ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
ACCELE POSI: More than 1.018V
5. If DTC is detected, go to [TM-50. "Diagnosis Procedure"](#).

Ⓜ WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282784

1. CHECK PNP SW CIRCUIT

Ⓜ With CONSULT-III

1. Turn ignition switch ON. (Do not start engine.)
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.

DTC P0705 PARK/NEUTRAL POSITION SWITCH

< COMPONENT DIAGNOSIS >

3. Check if correct selector lever position (N/P, R, D, 3, 2 or 1) is displayed as selector lever is moved into each position.

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

Check the following.

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

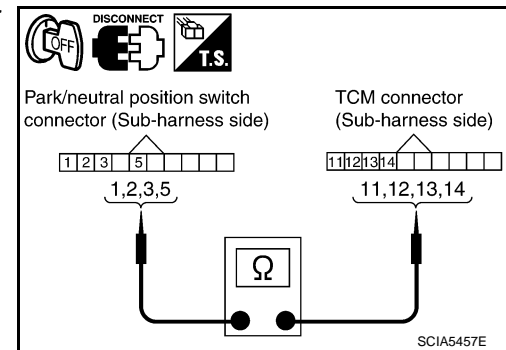
OK or NG

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

4.CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	1	Yes
TCM connector	F503	13	
Park/neutral position switch connector	F505	2	Yes
TCM connector	F503	11	
Park/neutral position switch connector	F505	3	Yes
TCM connector	F503	12	
Park/neutral position switch connector	F505	5	Yes
TCM connector	F503	14	



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

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5.CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-50, "DTC Confirmation Procedure"](#).

OK or NG

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

DTC P0717 TURBINE REVOLUTION SENSOR

< COMPONENT DIAGNOSIS >

DTC P0717 TURBINE REVOLUTION SENSOR

Description

INFOID:000000001282785

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282786

Item name	Condition	Display value (rpm)
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.

On Board Diagnosis Logic

INFOID:000000001282787

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0717 TURBINE REV S/CIRC" with CONSULT-III or 11th judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM does not receive the proper voltage signal from the sensor.
 - When TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2.

Possible Cause

INFOID:000000001282788

- Harness or connectors
(The sensor circuit is open or shorted.)
- Turbine revolution sensor 1, 2

DTC Confirmation Procedure

INFOID:000000001282789

CAUTION:

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

NOTE:

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

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

Ⓟ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
 - VHCL SPEED SE: 40 km/h (25 MPH) or more**
 - ENGINE SPEED: 1,500 rpm or more**
 - ACCELE POS: 0.5/8 or more**
 - Selector lever: "D" position**
 - Gear position (Turbine revolution sensor 1): 4th or 5th position**
 - Gear position (Turbine revolution sensor 2): All position**
 - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
4. If DTC is detected, go to [TM-52, "Diagnosis Procedure"](#).

Ⓟ WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282790

1. CHECK INPUT SIGNAL

Ⓟ With CONSULT-III

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Vehicle start and read out the value of "TURBINE REV".

DTC P0717 TURBINE REVOLUTION SENSOR

< COMPONENT DIAGNOSIS >

OK or NG

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

A

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

B

OK or NG

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

C

3.DETECT MALFUNCTIONING ITEM

Check the following.

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

TM

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Repair or replace damaged parts.

E

4.CHECK DTC

F

Perform "DTC Confirmation Procedure".

- Refer to [TM-52, "DTC Confirmation Procedure"](#).

G

OK or NG

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

H

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P

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

< COMPONENT DIAGNOSIS >

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

Description

INFOID:000000001282791

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282792

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

On Board Diagnosis Logic

INFOID:000000001282793

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0720 VEH SPD SEN/CIR AT” with CONSULT-III or 1st judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM does not receive the proper voltage signal from the sensor.
 - After ignition switch is turned “ON”, irregular signal input from vehicle speed sensor MTR before the vehicle starts moving.

Possible Cause

INFOID:000000001282794

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

DTC Confirmation Procedure

INFOID:000000001282795

CAUTION:

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

NOTE:

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

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

④ WITH CONSULT-III

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle and check for an increase of “VHCL/S SE-A/T” value in response to “VHCL/S SE-MTR” value.
If the check result is NG, go to [TM-55. "Diagnosis Procedure"](#).
If the check result is OK, go to following step.
4. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-III.
5. Start engine and maintain the following conditions for at least 5 consecutive seconds.
VHCL SPEED SE: 30 km/h (19 MPH) or more
THRTL POS SEN: More than 1.0/8
Selector lever: “D” position
Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
If the check result is NG, go to [TM-55. "Diagnosis Procedure"](#).
If the check result is OK, go to following step.
6. Maintain the following conditions for at least 5 consecutive seconds.
ENGINE SPEED: 3,500 rpm or more
THRTL POS SEN: More than 1.0/8
Selector lever: “D” position
Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
If the check result is NG, go to [TM-55. "Diagnosis Procedure"](#).

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

< COMPONENT DIAGNOSIS >

WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282797

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start the engine.
4. Read out the value of "VHCL/S SE-A/T" while driving.
Check the value changes according to driving speed.

OK or NG

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

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

3. DETECT MALFUNCTIONING ITEM

Check the following.

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

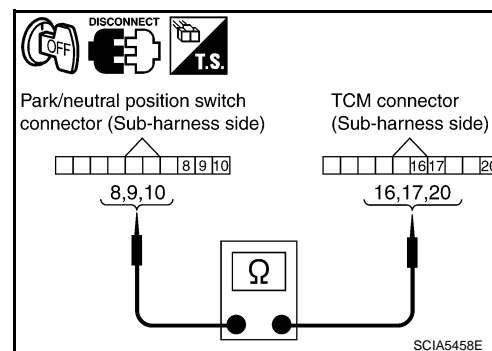
OK or NG

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

4. CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	8	Yes
TCM connector	F503	20	
Park/neutral position switch connector	F505	9	Yes
TCM connector	F503	17	
Park/neutral position switch connector	F505	10	Yes
TCM connector	F503	16	



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

OK or NG

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

5. REPLACE THE REVOLUTION SENSOR AND CHECK DTC

1. Replace the revolution sensor. Refer to [TM-253](#).
2. Perform "DTC Confirmation Procedure". Refer to [TM-54, "DTC Confirmation Procedure"](#).

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

< COMPONENT DIAGNOSIS >

OK or NG

OK >> **INSPECTION END**

NG >> Replace the control valve with TCM. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

6. CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-54. "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

DTC P0725 ENGINE SPEED SIGNAL

< COMPONENT DIAGNOSIS >

DTC P0725 ENGINE SPEED SIGNAL

Description

INFOID:000000001282798

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282799

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

On Board Diagnosis Logic

INFOID:000000001282800

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0725 ENGINE SPEED SIG" with CONSULT-III or 16th judgement flicker without CONSULT-III is detected when TCM does not receive the ignition signal from ECM during engine cranking or running.

Possible Cause

INFOID:000000001282801

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

DTC Confirmation Procedure

INFOID:000000001282802

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

④ WITH CONSULT-III

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Start engine and maintain the following conditions for at least 10 consecutive seconds.
VHCL SPEED SE: 10 km/h (6 MPH) or more
ACCELE POSI: More than 1/8
Selector lever: "D" position
3. If DTC is detected, go to [TM-57, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001282803

1. CHECK CAN COMMUNICATION LINE

Perform the self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

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

- YES >> Check CAN communication line. Refer to [TM-45](#).
NO >> GO TO 2.

2. CHECK DTC WITH TCM

④ With CONSULT-III

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. While monitoring engine speed, check for engine speed change corresponding to wide-open throttle position signal.

OK or NG

- OK >> GO TO 3.
NG >> Check the ignition signal circuit.
• Refer to [EC-400, "Diagnosis Procedure"](#) (VQ40DE) or [EC-870, "Diagnosis Procedure"](#) (VK56DE).

DTC P0725 ENGINE SPEED SIGNAL

< COMPONENT DIAGNOSIS >

3. CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-57, "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 4.

4. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

NG >> Repair or replace damaged parts.

DTC P0731 A/T 1ST GEAR FUNCTION

< COMPONENT DIAGNOSIS >

DTC P0731 A/T 1ST GEAR FUNCTION

Description

INFOID:000000001724380

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

On Board Diagnosis Logic

INFOID:000000001724381

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0731 A/T 1ST GR FNCTN" with CONSULT-III or 18th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:000000001724382

- Harness or connectors
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:000000001724383

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Start the engine and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Make sure that "ATF TEMP 1" is within the following range.
ATF TEMP 1: 20°C – 140°C
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select "1ST GR FNCTN P0731" of "DTC WORK SUPPORT" mode for "TRANSMISSION" with CONSULT-III.
4. Drive vehicle and maintain the following conditions.

With manual mode:

MANU MODE SW: ON

GEAR: "1" position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

Without manual mode:

Selector lever: "1" position

GEAR: "1" position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

DTC P0731 A/T 1ST GEAR FUNCTION

< COMPONENT DIAGNOSIS >

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0731 is shown, refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

If "COMPLETED RESULT NG" is detected, go to [TM-60, "Diagnosis Procedure"](#).

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
 - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
 - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to [TM-190, "Check Before Engine Is Started"](#).
 - Perform [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

Diagnosis Procedure

INFOID:000000001724384

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#), [TM-42, "Diagnosis Procedure without CONSULT-III"](#).

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

- YES >> Check CAN communication line. Refer to [TM-45, "Diagnosis Procedure"](#).
- NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

3. DETECT MALFUNCTION ITEM

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

OK or NG

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

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Perform [TM-59, "DTC Confirmation Procedure"](#).

OK or NG

- OK >> **INSPECTION END**
- NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [TM-190, "Check Before Engine Is Started"](#).

DTC P0732 A/T 2ND GEAR FUNCTION

< COMPONENT DIAGNOSIS >

DTC P0732 A/T 2ND GEAR FUNCTION

Description

INFOID:000000001724385

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

On Board Diagnosis Logic

INFOID:000000001724386

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0732 A/T 2ND GR FNCTN” with CONSULT-III or 19th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:000000001724387

- Harness or connectors
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:000000001724388

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
2. Make sure that “ATF TEMP 1” is within the following range.
ATF TEMP 1: 20°C – 140°C
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “2ND GR FNCTN P0732” of “DTC WORK SUPPORT” mode for “TRANSMISSION” with CONSULT-III.
4. Drive vehicle and maintain the following conditions.

With manual mode:

MANU MODE SW: ON

GEAR: “2” position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

Without manual mode:

Selector lever: “2” position

GEAR: “2” position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

CAUTION:

DTC P0732 A/T 2ND GEAR FUNCTION

< COMPONENT DIAGNOSIS >

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0732 is shown, refer to "[TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#)".

If "COMPLETED RESULT NG" is detected, go to [TM-62, "Diagnosis Procedure"](#).

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
 - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
 - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to [TM-190, "Check Before Engine Is Started"](#).
 - Perform [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

Diagnosis Procedure

INFOID:000000001724389

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#), [TM-42, "Diagnosis Procedure without CONSULT-III"](#).

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

YES >> Check CAN communication line. Refer to [TM-45, "Diagnosis Procedure"](#).

NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

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

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Perform [TM-61, "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [TM-190, "Check Before Engine Is Started"](#).

DTC P0733 A/T 3RD GEAR FUNCTION

< COMPONENT DIAGNOSIS >

DTC P0733 A/T 3RD GEAR FUNCTION

Description

INFOID:000000001724390

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

On Board Diagnosis Logic

INFOID:000000001724391

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0733 A/T 3RD GR FNCTN" with CONSULT-III or 20th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:000000001724392

- Harness or connectors
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:000000001724393

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Start the engine and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Make sure that "ATF TEMP 1" is within the following range.
ATF TEMP 1: 20°C – 140°C
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select "3RD GR FNCTN P0733" of "DTC WORK SUPPORT" mode for "TRANSMISSION" with CONSULT-III.
4. Drive vehicle and maintain the following conditions.

With manual mode:

MANU MODE SW: ON

GEAR: "3" position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

Without manual mode:

Selector lever: "3" position

GEAR: "3" position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

DTC P0733 A/T 3RD GEAR FUNCTION

< COMPONENT DIAGNOSIS >

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0733 is shown, refer to "[TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#)".

If "COMPLETED RESULT NG" is detected, go to [TM-64, "Diagnosis Procedure"](#).

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
 - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
 - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to [TM-190, "Check Before Engine Is Started"](#).
 - Perform [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

Diagnosis Procedure

INFOID:000000001724394

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#), [TM-42, "Diagnosis Procedure without CONSULT-III"](#).

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

- YES >> Check CAN communication line. Refer to [TM-45, "Diagnosis Procedure"](#).
- NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

3. DETECT MALFUNCTION ITEM

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

OK or NG

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

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Perform [TM-63, "DTC Confirmation Procedure"](#).

OK or NG

- OK >> **INSPECTION END**
- NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [TM-190, "Check Before Engine Is Started"](#).

DTC P0734 A/T 4TH GEAR FUNCTION

< COMPONENT DIAGNOSIS >

DTC P0734 A/T 4TH GEAR FUNCTION

Description

INFOID:000000001724395

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

On Board Diagnosis Logic

INFOID:000000001724396

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0734 A/T 4TH GR FNCTN" with CONSULT-III or 21th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:000000001724397

- Harness or connectors
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:000000001724398

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Start the engine and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Make sure that "ATF TEMP 1" is within the following range.
ATF TEMP 1: 20°C – 140°C
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select "4TH GR FNCTN P0734" of "DTC WORK SUPPORT" mode for "TRANSMISSION" with CONSULT-III.
4. Drive vehicle and maintain the following conditions.

With manual mode:

MANU MODE SW: ON

GEAR: "4" position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

Without manual mode:

Selector lever: "D" position

GEAR: "4" position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

DTC P0734 A/T 4TH GEAR FUNCTION

< COMPONENT DIAGNOSIS >

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0734 is shown, refer to "[TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#)".

If "COMPLETED RESULT NG" is detected, go to [TM-66, "Diagnosis Procedure"](#).

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
 - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
 - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to [TM-190, "Check Before Engine Is Started"](#).
 - Perform [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

Diagnosis Procedure

INFOID:000000001724399

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#), [TM-42, "Diagnosis Procedure without CONSULT-III"](#).

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

YES >> Check CAN communication line. Refer to [TM-45, "Diagnosis Procedure"](#).

NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTION ITEM

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

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Perform [TM-65, "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [TM-190, "Check Before Engine Is Started"](#).

DTC P0735 A/T 5TH GEAR FUNCTION

< COMPONENT DIAGNOSIS >

DTC P0735 A/T 5TH GEAR FUNCTION

Description

INFOID:000000001724400

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

On Board Diagnosis Logic

INFOID:000000001724401

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0735 A/T 5TH GR FNCTN" with CONSULT-III or 22th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:000000001724402

- Harness or connectors
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:000000001724403

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Start the engine and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Make sure that "ATF TEMP 1" is within the following range.
ATF TEMP 1: 20°C – 140°C
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select "5TH GR FNCTN P0735" of "DTC WORK SUPPORT" mode for "TRANSMISSION" with CONSULT-III.
4. Drive vehicle and maintain the following conditions.

With manual mode:

MANU MODE SW: ON

GEAR: "5" position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

Without manual mode:

Selector lever: "D" position

GEAR: ""5" position

ACCELE POSI: 0.6/8 or more

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

ENGINE SPEED: TURBINE REV – 50 rpm or more

TURBINE REV: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

DTC P0735 A/T 5TH GEAR FUNCTION

< COMPONENT DIAGNOSIS >

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0735 is shown, refer to "[TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#)".

If "COMPLETED RESULT NG" is detected, go to [TM-68, "Diagnosis Procedure"](#).

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
 - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
 - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to [TM-190, "Check Before Engine Is Started"](#).
 - Perform [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

Diagnosis Procedure

INFOID:000000001724404

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#), [TM-42, "Diagnosis Procedure without CONSULT-III"](#).

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

- YES >> Check CAN communication line. Refer to [TM-45, "Diagnosis Procedure"](#).
- NO >> GO TO 2.

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

3. DETECT MALFUNCTION ITEM

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

OK or NG

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

4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Perform [TM-67, "DTC Confirmation Procedure"](#).

OK or NG

- OK >> **INSPECTION END**
- NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [TM-190, "Check Before Engine Is Started"](#).

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

< COMPONENT DIAGNOSIS >

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

Description

INFOID:000000001282804

- The torque converter clutch solenoid valve is activated, with the gear in D4, D5 by the TCM in response to signals sent from the vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Torque converter clutch piston operation will then be controlled.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282805

Item name	Condition	Display value (Approx.)
TCC SOLENOID	When performing slip lock-up	0.2 - 0.4 A
	When performing lock-up	0.4 - 0.6 A

On Board Diagnosis Logic

INFOID:000000001282806

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0740 TCC SOLENOID/CIRC" with CONSULT-III or 3rd judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
 - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:000000001282807

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

DTC Confirmation Procedure

INFOID:000000001282808

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

④ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-III.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
 - VHCL SPEED SE: 80 km/h (50 MPH) or more**
 - ACCELE POS: 0.5/8 - 1.0/8**
 - SELECTOR LEVER: "D" position**
 - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
4. If DTC is detected go to [TM-69, "Diagnosis Procedure"](#).

④ WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282809

1. CHECK INPUT SIGNAL

④ With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

< COMPONENT DIAGNOSIS >

3. Start engine.
4. Read out the value of "TCC SOLENOID" while driving.

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-69, "DTC Confirmation Procedure"](#).

OK or NG

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

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

< COMPONENT DIAGNOSIS >

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

Description

INFOID:000000001282810

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282811

Item name	Condition	Display value (Approx.)
TCC SOLENOID	When performing slip lock-up	0.2 - 0.4 A
	When performing lock-up	0.4 - 0.6 A

On Board Diagnosis Logic

INFOID:000000001282812

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0744 A/T TCC S/V FNCTN" with CONSULT-III or 3rd judgment flicker without CONSULT-III is detected under the following conditions.
 - When A/T cannot perform lock-up even if electrical circuit is good.
 - When TCM detects as irregular by comparing difference value with slip rotation.

Possible Cause

INFOID:000000001282813

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

DTC Confirmation Procedure

INFOID:000000001282814

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Start engine.
2. Select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Drive vehicle and maintain the following conditions for at least 30 consecutive seconds.
 - ACCELE POSI: More than 1.0/8**
 - SLCT LVR POSI: "D" position**
 - TCC SOLENOID: 0.4 - 0.6 A**
 - VEHICLE SPEED: 80 km/h (50 MPH) or more**
 - Driving locations: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
4. If DTC is detected, go to [TM-71, "Diagnosis Procedure"](#).

WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282815

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.

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

< COMPONENT DIAGNOSIS >

3. Start the engine.
4. Read out the value of "TCC SOLENOID" while driving.

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-71, "DTC Confirmation Procedure"](#).

OK or NG

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

DTC P0745 LINE PRESSURE SOLENOID VALVE

< COMPONENT DIAGNOSIS >

DTC P0745 LINE PRESSURE SOLENOID VALVE

Description

INFOID:000000001282816

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282817

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

On Board Diagnosis Logic

INFOID:000000001282818

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

Possible Cause

INFOID:000000001282819

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

DTC Confirmation Procedure

INFOID:000000001282820

NOTE:

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

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

④ WITH CONSULT-III

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-III.
2. Engine start and wait at least 5 second.
3. If DTC is detected, go to [TM-73, "Diagnosis Procedure"](#).

④ WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282821

1. CHECK INPUT SIGNAL

④ With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start the engine.
4. Read out the value of "LINE PRES SOL" while driving.

OK or NG

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

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

3. DETECT MALFUNCTIONING ITEM

DTC P0745 LINE PRESSURE SOLENOID VALVE

< COMPONENT DIAGNOSIS >

Check the following.

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

OK or NG

OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-73, "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

DTC P1705 THROTTLE POSITION SENSOR

< COMPONENT DIAGNOSIS >

DTC P1705 THROTTLE POSITION SENSOR

Description

INFOID:000000001282822

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282823

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

On Board Diagnosis Logic

INFOID:000000001282824

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1705 TP SEN/CIRC A/T" with CONSULT-III or 15th judgement flicker without CONSULT-III is detected when TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.

Possible Cause

INFOID:000000001282825

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

DTC Confirmation Procedure

INFOID:000000001282826

NOTE:

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

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

Ⓜ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine and let it idle for 1 second.
4. If DTC is detected, go to [TM-75. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001282827

1.CHECK CAN COMMUNICATION LINE

Perform the self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#).

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

YES >> Check CAN communication line. Refer to [TM-45](#).

NO >> GO TO 2.

2.CHECK DTC WITH TCM

Ⓜ With CONSULT-III

1. Turn ignition switch ON. (Do not start engine.)
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Depress accelerator pedal and read out the value of "ACCELE POSI".
4. Select "SELF-DIAG RESULTS" mode for "TRANSMISSION" with CONSULT-III. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#).

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

3.CHECK DTC WITH ECM

DTC P1705 THROTTLE POSITION SENSOR

< COMPONENT DIAGNOSIS >

ⓑ With CONSULT-III

1. Turn ignition switch ON. (Do not start engine.)
2. Select "SELF-DIAG RESULTS" mode for "ENGINE" with CONSULT-III. Refer to [EC-74, "CONSULT-III Function \(ENGINE\)"](#) (VQ40DE) or [EC-542, "CONSULT-III Function \(ENGINE\)"](#) (VK56DE).

OK or NG

OK >> GO TO 4.

NG >> Check the DTC detected item. Refer to [EC-74, "CONSULT-III Function \(ENGINE\)"](#) (VQ40DE) or [EC-542, "CONSULT-III Function \(ENGINE\)"](#) (VK56DE).

- If CAN communication line is detected, go to [TM-45, "Diagnosis Procedure"](#).

4. CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-75, "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 5.

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

NG >> Repair or replace damaged parts.

DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

< COMPONENT DIAGNOSIS >

DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

Description

INFOID:000000001282828

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282829

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

On Board Diagnosis Logic

INFOID:000000001282830

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

Possible Cause

INFOID:000000001282831

- Harness or connectors
(The sensor circuit is open or shorted.)
- A/T fluid temperature sensors 1, 2

DTC Confirmation Procedure

INFOID:000000001282832

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

Ⓜ WITH CONSULT-III

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-III.
3. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)
VHCL SPEED SE: 10 km/h (6 MPH) or more
THRTL POS SEN: More than 1.0/8
Selector lever: “D” position
4. If DTC is detected, go to [TM-77. "Diagnosis Procedure"](#).

Ⓜ WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:000000001282834

1. CHECK A/T FLUID TEMPERATURE SENSOR 1 SIGNAL

Ⓜ With CONSULT-III

1. Start engine.
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Read out the value of “ATF TEMP SE 1”.

OK or NG

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

2. CHECK A/T FLUID TEMPERATURE SENSOR 2 SIGNAL

Ⓜ With CONSULT-III

DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

< COMPONENT DIAGNOSIS >

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Read out the value of "ATF TEMP SE 2".

OK or NG

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

3.CHECK A/T FLUID TEMPERATURE SENSOR 1

Check A/T fluid temperature sensor 1. Refer to [TM-79. "Component Inspection"](#).

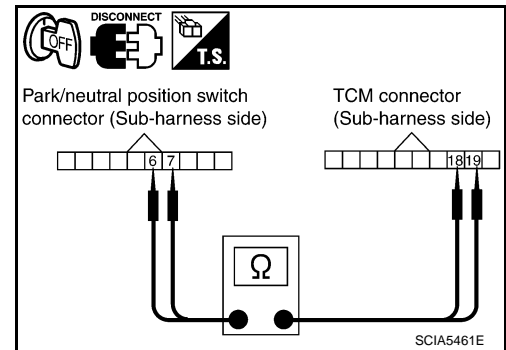
OK or NG

- OK >> GO TO 4.
 NG >> Replace the control valve with TCM. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

4.CHECK SUB-HARNESS

1. Disconnect park/neutral position switch connector and TCM connector.
2. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	6	Yes
TCM connector	F503	19	
Park/neutral position switch connector	F505	7	Yes
TCM connector	F503	18	



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

OK or NG

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

5.CHECK A/T FLUID TEMPERATURE SENSOR 2

Check A/T fluid temperature sensor 2. Refer to [TM-79. "Component Inspection"](#).

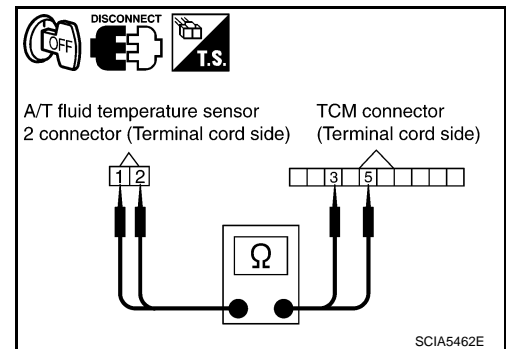
OK or NG

- OK >> GO TO 6.
 NG >> Replace the A/T fluid temperature sensor 2. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

6.CHECK TERMINAL CORD ASSEMBLY

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

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



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

OK or NG

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

DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

< COMPONENT DIAGNOSIS >

7. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

1. Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).
2. Reinstall any part removed.

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Repair or replace damaged parts.

8. CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-77, "DTC Confirmation Procedure"](#).

OK or NG

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

Component Inspection

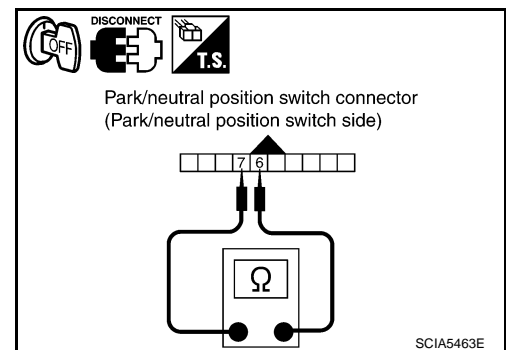
INFOID:000000001282835

A/T FLUID TEMPERATURE SENSOR 1

1. Remove control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check resistance between terminals.

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

3. If NG, replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

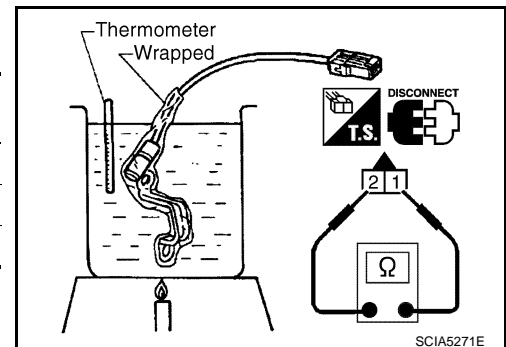


A/T FLUID TEMPERATURE SENSOR 2

1. Remove A/T fluid temperature sensor 2. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check resistance between terminals.

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

3. If NG, replace the A/T fluid temperature sensor 2. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).



DTC P1721 VEHICLE SPEED SENSOR MTR

< COMPONENT DIAGNOSIS >

DTC P1721 VEHICLE SPEED SENSOR MTR

Description

INFOID:000000001282836

The vehicle speed sensor-MTR signal is transmitted from combination meter to TCM by CAN communication line. The signal functions as an auxiliary device to the revolution sensor when it is malfunctioning. The TCM will then use the vehicle speed sensor-MTR signal.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282837

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

On Board Diagnosis Logic

INFOID:000000001282838

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1721 VEH SPD SE-MTR" with CONSULT-III is detected when TCM does not receive the proper vehicle speed sensor MTR signal (input by CAN communication) from combination meter.

Possible Cause

INFOID:000000001282839

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

DTC Confirmation Procedure

INFOID:000000001282840

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

Ⓟ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
ACCELE POS: 1/8 or less
VHCL SPEED SE: 30 km/h (17 MPH) or more
4. If DTC is detected, go to [TM-80, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001282841

1. CHECK CAN COMMUNICATION LINE

Perform the self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is malfunction in the CAN communication indicated in the result?

- YES >> Check CAN communication line. Refer to [TM-45](#).
NO >> GO TO 2.

2. CHECK INPUT SIGNAL

Ⓟ With CONSULT-III

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Drive vehicle and read out the value of "VHCL/S SE-MTR".

OK or NG

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

3. CHECK COMBINATION METERS

Check combination meters. Refer to [MWI-6, "METER SYSTEM : Component Description"](#).

DTC P1721 VEHICLE SPEED SENSOR MTR

< COMPONENT DIAGNOSIS >

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-80, "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 5.

5.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6.DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

NG >> Repair or replace damaged parts.

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DTC P1730 A/T INTERLOCK

< COMPONENT DIAGNOSIS >

DTC P1730 A/T INTERLOCK

Description

INFOID:000000001282842

- Fail-safe function to detect interlock conditions.

On Board Diagnosis Logic

INFOID:000000001282843

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

Possible Cause

INFOID:000000001282844

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

DTC Confirmation Procedure

INFOID:000000001282845

NOTE:

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

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

Ⓟ WITH CONSULT-III

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
Selector lever: “D” position
5. If DTC is detected, go to [TM-83, "Diagnosis Procedure"](#).

Ⓢ WITH GST

Follow the procedure “WITH CONSULT-III”.

Judgement of A/T Interlock

INFOID:000000001282846

When A/T Interlock is judged to be malfunctioning, the vehicle should be fixed in 2nd gear, and should be set in a condition in which it can travel.

When one of the following fastening patterns is detected, the fail-safe function in correspondence with the individual pattern should be performed.

NOTE:

When the vehicle is driven in 2nd gear, a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.

A/T INTERLOCK COUPLING PATTERN TABLE

●: NG, X: OK

Gear position		ATF pressure switch output					Fail-safe function	Clutch pressure output pattern after fail-safe function					
		SW3 (I/C)	SW6 (HLR/C)	SW5 (D/C)	SW1 (FR/B)	SW2 (LC/B)		I/C	HLR/C	D/C	FR/B	LC/B	L/U
A/T interlock coupling pattern	3rd	–	X	X	–	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF
	4th	–	X	X	–	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF
	5th	X	X	–	X	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF

DTC P1730 A/T INTERLOCK

< COMPONENT DIAGNOSIS >

Diagnosis Procedure

INFOID:000000001282847

1.SELF-DIAGNOSIS

Ⓜ With CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Select "SELF-DIAG RESULTS" mode for "TRANSMISSION" with CONSULT-III.

Ⓜ Without CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Perform self-diagnosis. Refer to [TM-42. "Diagnosis Procedure without CONSULT-III"](#).

OK or NG

- OK >> GO TO 2.
NG >> Check low coast brake solenoid valve circuit and function. Refer to [TM-94](#), [TM-96](#).

2.CHECK DTC

Perform "DTC Confirmation Procedure".

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

OK or NG

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

3.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101. "Diagnosis Procedure"](#).

OK or NG

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

4.DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
NG >> Repair or replace damaged parts.

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DTC P1731 A/T 1ST ENGINE BRAKING

< COMPONENT DIAGNOSIS >

DTC P1731 A/T 1ST ENGINE BRAKING

Description

INFOID:000000001282848

Fail-safe function to prevent sudden decrease in speed by engine brake other than at "1" position.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282849

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to TM-10 .	ON
	Low coast brake disengaged. Refer to TM-10 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to TM-10 .	ON
	Low coast brake disengaged. Refer to TM-10 .	OFF

On Board Diagnosis Logic

INFOID:000000001282850

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1731 A/T 1ST E/BRAKING" with CONSULT-III or 13th judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM does not receive the proper voltage signal from the sensor.
 - When TCM monitors each ATF pressure switch and solenoid monitor value, and detects as irregular when engine brake of 1st gear acts other than at "1" position.

Possible Cause

INFOID:000000001282851

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

DTC Confirmation Procedure

INFOID:000000001282852

NOTE:

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

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

④ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
ENGINE SPEED: 1,200 rpm
Selector lever: "1" position
Gear position: 1st gear
5. If DTC is detected, go to [TM-84, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001282853

1. CHECK INPUT SIGNALS

④ With CONSULT-III

1. Start the engine.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Drive vehicle in the "1" position (1st gear), and confirm the ON/OFF actuation of "ATF PRES SW 2" and "ON OFF SOL".

OK or NG

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

DTC P1731 A/T 1ST ENGINE BRAKING

< COMPONENT DIAGNOSIS >

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-84, "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

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DTC P1752 INPUT CLUTCH SOLENOID VALVE

< COMPONENT DIAGNOSIS >

DTC P1752 INPUT CLUTCH SOLENOID VALVE

Description

INFOID:000000001282854

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282855

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to TM-10 .	0.6 - 0.8 A
	Input clutch engaged. Refer to TM-10 .	0 - 0.05 A

On Board Diagnosis Logic

INFOID:000000001282856

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1752 I/C SOLENOID/CIRC" with CONSULT-III or 5th judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
 - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:000000001282857

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

DTC Confirmation Procedure

INFOID:000000001282858

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
 - ACCELE POS: 1.5/8 - 2.0/8**
 - Selector lever: "D" position**
 - Gear position: 3rd ⇒ 4th Gear (I/C ON/OFF)**
 - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
5. If DTC is detected go to [TM-86, "Diagnosis Procedure"](#).

WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282859

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start the engine.
4. Read out the value of "I/C SOLENOID" while driving.

DTC P1752 INPUT CLUTCH SOLENOID VALVE

< COMPONENT DIAGNOSIS >

OK or NG

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

A

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

B

OK or NG

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

C

3.DETECT MALFUNCTIONING ITEM

Check the following.

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

TM

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Repair or replace damaged parts.

E

4.CHECK DTC

F

Perform "DTC Confirmation Procedure".

- Refer to [TM-86, "DTC Confirmation Procedure"](#).

G

OK or NG

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

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DTC P1757 FRONT BRAKE SOLENOID VALVE

< COMPONENT DIAGNOSIS >

DTC P1757 FRONT BRAKE SOLENOID VALVE

Description

INFOID:000000001282866

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282867

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to TM-10 .	0.6 - 0.8 A
	Front brake disengaged. Refer to TM-10 .	0 - 0.05 A

On Board Diagnosis Logic

INFOID:000000001282868

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1757 FR/B SOLENOID/CIRC” with CONSULT-III or 6th judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
 - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:000000001282869

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

DTC Confirmation Procedure

INFOID:000000001282870

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
 - ACCELE POS: 1.5/8 - 2.0/8**
 - Selector lever: “D” position**
 - Gear position: 3rd ⇒ 4th Gear (FR/B ON/OFF)**
 - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
5. If DTC is detected go to [TM-88, "Diagnosis Procedure"](#).

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:000000001282871

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Read out the value of “FR/B SOLENOID” while driving.

DTC P1757 FRONT BRAKE SOLENOID VALVE

< COMPONENT DIAGNOSIS >

OK or NG

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

A

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

B

OK or NG

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

C

3.DETECT MALFUNCTIONING ITEM

Check the following.

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

TM

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Repair or replace damaged parts.

E

4.CHECK DTC

F

Perform "DTC Confirmation Procedure".

- Refer to [TM-88, "DTC Confirmation Procedure"](#).

G

OK or NG

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

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DTC P1762 DIRECT CLUTCH SOLENOID VALVE

< COMPONENT DIAGNOSIS >

DTC P1762 DIRECT CLUTCH SOLENOID VALVE

Description

INFOID:000000001282878

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282879

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to TM-10 .	0.6 - 0.8 A
	Direct clutch engaged. Refer to TM-10 .	0 - 0.05 A

On Board Diagnosis Logic

INFOID:000000001282880

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1762 D/C SOLENOID/CIRC" with CONSULT-III or 2nd judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
 - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:000000001282881

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

DTC Confirmation Procedure

INFOID:000000001282882

NOTE:

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

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

Ⓜ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
ACCELE POS: 1.5/8 - 2.0/8
Selector lever: "D" position
Gear position: 1st ⇒ 2nd Gear (D/C ON/OFF)
Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected, go to [TM-90. "Diagnosis Procedure"](#).

Ⓜ WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282883

1. CHECK INPUT SIGNAL

Ⓜ With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start the engine.
4. Read out the value of "D/C SOLENOID" while driving.

OK or NG

OK >> GO TO 4.

DTC P1762 DIRECT CLUTCH SOLENOID VALVE

< COMPONENT DIAGNOSIS >

NG >> GO TO 2.

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

3.DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-90, "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

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DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

< COMPONENT DIAGNOSIS >

DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

Description

INFOID:000000001282890

High and low reverse clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282891

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to TM-10 .	0.6 - 0.8 A
	High and low reverse clutch engaged. Refer to TM-10 .	0 - 0.05 A

On Board Diagnosis Logic

INFOID:000000001282892

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1767 HLR/C SOL/CIRC” with CONSULT-III or 8th judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
 - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:000000001282893

- Harness or connectors
(The solenoid circuit is open or shorted.)
- High and low reverse clutch solenoid valve

DTC Confirmation Procedure

INFOID:000000001282894

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
 - ACCELE POS: 1.5/8 - 2.0/8**
 - Selector lever: “D” position**
 - Gear position: 2nd ⇒ 3rd Gear (HLR/C ON/OFF)**
 - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
5. If DTC is detected, go to [TM-92, "Diagnosis Procedure"](#).

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:000000001282895

1. CHECK INPUT SIGNAL

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Start the engine.
4. Read out the value of “HLR/C SOLENOID” while driving.

DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

< COMPONENT DIAGNOSIS >

OK or NG

OK >> GO TO 4.

NG >> GO TO 2.

A

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

B

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

C

3.DETECT MALFUNCTIONING ITEM

Check the following.

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

TM

OK or NG

OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

E

NG >> Repair or replace damaged parts.

4.CHECK DTC

F

Perform "DTC Confirmation Procedure".

- Refer to [TM-92, "DTC Confirmation Procedure"](#).

G

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

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DTC P1772 LOW COAST BRAKE SOLENOID VALVE

< COMPONENT DIAGNOSIS >

DTC P1772 LOW COAST BRAKE SOLENOID VALVE

Description

INFOID:000000001282902

Low coast brake solenoid valve is turned "ON" or "OFF" by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282903

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to TM-10 .	ON
	Low coast brake disengaged. Refer to TM-10 .	OFF

On Board Diagnosis Logic

INFOID:000000001282904

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1772 LC/B SOLENOID/CIRC" with CONSULT-III or 7th judgement flicker without CONSULT-III is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

INFOID:000000001282905

- Harness or connectors
(The solenoid circuit is open or shorted.)
- Low coast brake solenoid valve

DTC Confirmation Procedure

INFOID:000000001282906

NOTE:

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

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

Ⓜ WITH CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-III.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
Selector lever: "1" or "2"
Gear position: "1st" or "2nd" gear (LC/B ON/OFF)
5. If DTC is detected, go to [TM-94, "Diagnosis Procedure"](#).

Ⓜ WITH GST

Follow the procedure "WITH CONSULT-III".

Diagnosis Procedure

INFOID:000000001282907

1. CHECK INPUT SIGNAL

Ⓜ With CONSULT-III

1. Turn ignition switch ON.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start the engine.
4. Read out the value of "ON OFF SOL" while driving.

OK or NG

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

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

DTC P1772 LOW COAST BRAKE SOLENOID VALVE

< COMPONENT DIAGNOSIS >

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

3.DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

OK >> Replace the control valve with TCM. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-94. "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

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DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

< COMPONENT DIAGNOSIS >

DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

Description

INFOID:000000001282908

- Low coast brake solenoid valve is turned “ON” or “OFF” by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282909

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to TM-10 .	ON
	Low coast brake disengaged. Refer to TM-10 .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to TM-10 .	ON
	Low coast brake disengaged. Refer to TM-10 .	OFF

On Board Diagnosis Logic

INFOID:000000001282910

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1774 LC/B SOLENOID FNCT” with CONSULT-III or 7th judgement flicker without CONSULT-III is detected under the following conditions.
 - When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of ATF pressure switch 2 is irregular during depressing accelerator pedal. (Other than during shift change)
 - When TCM detects that relation between gear position and condition of ATF pressure switch 2 is irregular during releasing accelerator pedal. (Other than during shift change)

Possible Cause

INFOID:000000001282911

- Harness or connectors
(The solenoid and switch circuits are open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

DTC Confirmation Procedure

INFOID:000000001282912

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

WITH CONSULT-III

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.
Selector lever: “1” or “2” position
Gear position: “1st” or “2nd” gear (LC/B ON/OFF)
3. Perform step “2” again.
4. Turn ignition switch “OFF”, then perform step “1” to “3” again.
5. Check “SELF-DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III. If DTC (P1774) is detected, refer to [TM-97, "Diagnosis Procedure"](#).
If DTC (P1772) is detected, go to [TM-94, "Diagnosis Procedure"](#).

WITH GST

Follow the procedure “WITH CONSULT-III”.

DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

< COMPONENT DIAGNOSIS >

Diagnosis Procedure

INFOID:000000001282913

1. CHECK INPUT SIGNALS

Ⓜ With CONSULT-III

1. Start the engine.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Drive vehicle in the "1" or "2" position (11 or 22" gear), and confirm the ON/OFF actuation of the "ATF PRES SW 2" and "ON OFF SOL".

OK or NG

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

2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

3. DETECT MALFUNCTIONING ITEM

Check the following.

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

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform "DTC Confirmation Procedure".

- Refer to [TM-96, "DTC Confirmation Procedure"](#).

OK or NG

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

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DTC P1815 MANUAL MODE SWITCH

< COMPONENT DIAGNOSIS >

DTC P1815 MANUAL MODE SWITCH

Description

INFOID:000000001724547

Manual mode switch is installed in A/T device. It sends manual mode switch, shift up and shift down switch signals to TCM.

TCM sends the switch signals to combination meter and A/C amp. By CAN communication line. Then manual mode switch position is indicated on the A/T position indicator. For inspection, refer to [TM-126, "A/T Check Indicator Lamp Does Not Come On \(With Manual Mode\)"](#).

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001724548

Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	Selector lever: + side	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever: - side	ON
	Other than the above	OFF

On Board Diagnosis Logic

INFOID:000000001724549

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1815 MANU MODE SW/CIRC" with CONSULT-III is detected when TCM monitors Manual mode, Non manual mode, Up or Down switch signal, and detects as irregular when impossible input pattern occurs 1 second or more.

Possible Cause

INFOID:000000001724550

- Harness or connectors
(These switches circuit is open or shorted.)
- Manual mode select switch (Into control device)
- Manual mode position select switch (Into control device)

DTC Confirmation Procedure

INFOID:000000001724551

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

④ WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Move selector lever to "M" position.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
MANU MODE SW: ON
6. If DTC is detected, go to [TM-98, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001724553

1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

DTC P1815 MANUAL MODE SWITCH

< COMPONENT DIAGNOSIS >

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

- YES >> Check CAN communication line. Refer to [TM-45, "Diagnosis Procedure"](#).
NO >> GO TO 2.

2. CHECK MANUAL MODE SWITCH CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Read out ON/OFF switching action of "MANU MODE SW", "NON M-MODE SW", "UP SW LEVER", "DOWN SW LEVER".

Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	selector lever: +side	ON
	Other than the above	OFF
DOWN SW LEVER	selector lever: -side	ON
	Other than the above	OFF

Without CONSULT-III

Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the "+ (up)" or "- (down)" side (1st ⇔ 5th gear).

OK or NG

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

3. DETECT MALFUNCTIONING ITEM

Check the following.

- Manual mode switch. Refer to [TM-100, "Component Inspection"](#).
- Pin terminals for damage or loose connection with harness connector.
- Open circuit or short to ground or short to power in harness or connector for A/T device (manual mode switch).
- Combination meter. Refer to [MWI-4, "METER SYSTEM : System Description"](#).

OK or NG

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

4. CHECK DTC

Perform [TM-98, "DTC Confirmation Procedure"](#).

OK or NG

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

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101, "Diagnosis Procedure"](#).

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

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

OK or NG

DTC P1815 MANUAL MODE SWITCH

< COMPONENT DIAGNOSIS >

- OK >> Replace control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Repair or replace damaged parts.

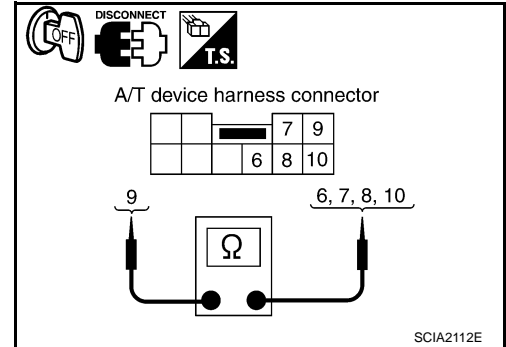
Component Inspection

INFOID:000000001724554

MANUAL MODE SWITCH

Check continuity between terminals.

Item	Position	Terminal	Continuity
Manual mode select switch	Auto	9 – 10	Yes
	Manual	6 – 9	
Manual mode position select switch	UP	8 – 9	
	DOWN	7 – 9	



MAIN POWER SUPPLY AND GROUND CIRCUIT

< COMPONENT DIAGNOSIS >

MAIN POWER SUPPLY AND GROUND CIRCUIT

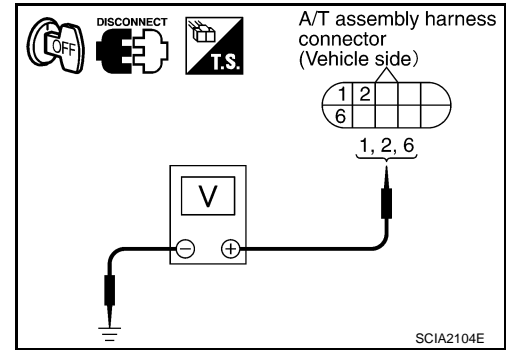
Diagnosis Procedure

INFOID:000000001282939

1. CHECK TCM POWER SOURCE STEP 1

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

Item	Connector	Terminal	Voltage
TCM	F9	1 - Ground	Battery voltage
		2 - Ground	
		6 - Ground	0V



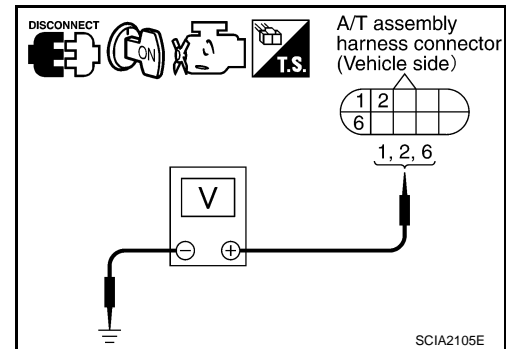
OK or NG

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

2. CHECK TCM POWER SOURCE STEP 2

1. Disconnect A/T assembly harness connector.
2. Turn ignition switch ON. (Do not start engine.)
3. Check voltage between A/T assembly harness connector terminals and ground.

Item	Connector	Terminal	Voltage
TCM	F9	1 - Ground	Battery voltage
		2 - Ground	
		6 - Ground	



OK or NG

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

3. DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between battery and A/T assembly harness connector terminals 1, 2
- Harness for short or open between ignition switch and A/T assembly harness connector terminal 6
- 10A fuse (No. 22, located in the fuse and fusible link block) and 10A fuse (No. 49, located in the IPDM E/R)
- Ignition switch. Refer to [PG-65, "Terminal Arrangement"](#).

OK or NG

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

4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.

MAIN POWER SUPPLY AND GROUND CIRCUIT

< COMPONENT DIAGNOSIS >

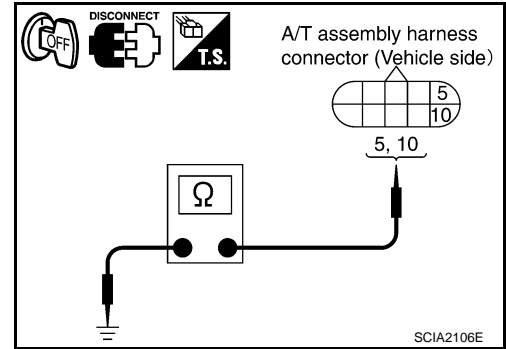
- Check continuity between A/T assembly harness connector terminals and ground.

Item	Connector	Terminal	Continuity
TCM	F9	5, 10 - Ground	Yes

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

OK or NG

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



5. DETECT MALFUNCTIONING ITEM

Check the following.

- The A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

6. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

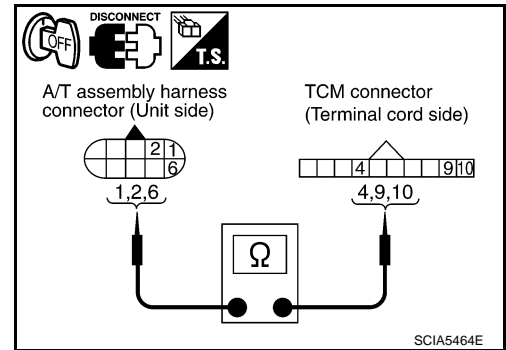
OK or NG

- OK >> **INSPECTION END**
 NG-1 >> Self-diagnosis does not activate: GO TO 7.
 NG-2 >> DTC is displayed: Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

7. CHECK TERMINAL CORD ASSEMBLY

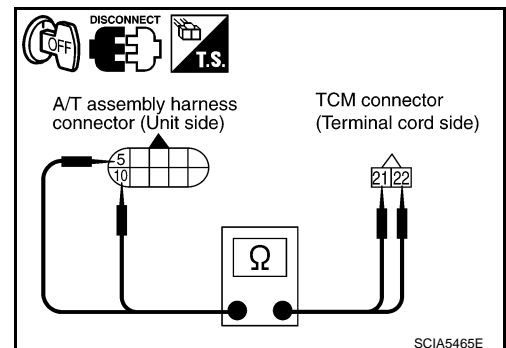
- Remove control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- Disconnect A/T assembly harness connector and TCM connector.
- Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal	Voltage
A/T assembly harness connector	F9	1	Yes
TCM connector	F502	9	
A/T assembly harness connector	F9	2	Yes
TCM connector	F502	10	
A/T assembly harness connector	F9	6	Yes
TCM connector	F502	4	



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

Item	Connector	Terminal	Voltage
A/T assembly harness connector	F9	5	Yes
TCM connector	F504	21	
A/T assembly harness connector	F9	10	Yes
TCM connector	F504	22	



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

OK or NG

- OK >> Replace the control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

MAIN POWER SUPPLY AND GROUND CIRCUIT

< COMPONENT DIAGNOSIS >

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

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CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT

< COMPONENT DIAGNOSIS >

CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282940

Item name	Condition	Display value
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF

Diagnosis Procedure

INFOID:000000001282941

1. CHECK CAN COMMUNICATION LINE

Perform the self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#).

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

- YES >> Check CAN communication line. Refer to [TM-45](#).
NO >> GO TO 2.

2. CHECK THROTTLE POSITION SIGNAL CIRCUIT

With CONSULT-III

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Depress accelerator pedal and read out the value of "CLSD THL POS" and "W/O THL POS".

OK or NG

OK >> **INSPECTION END**

- NG >> Check the following. If NG, repair or replace damaged parts.
- Perform the self-diagnosis for "ENGINE" with CONSULT-III.
 - Open circuit or short to ground or short to power in harness or connectors.
 - Pin terminals for damage or loose connection with harness connector.

BRAKE SIGNAL CIRCUIT

< COMPONENT DIAGNOSIS >

BRAKE SIGNAL CIRCUIT

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282942

Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

Diagnosis Procedure

INFOID:000000001282943

1. CHECK CAN COMMUNICATION LINE

Perform the self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

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

- YES >> Check CAN communication line. Refer to [TM-45](#).
 NO >> GO TO 2.

2. CHECK STOP LAMP SWITCH CIRCUIT

With CONSULT-III

- Turn ignition switch "ON". (Do not start engine.)
- Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
- Read out ON/OFF switching action of the "BRAKE SW".

OK or NG

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

3. CHECK STOP LAMP SWITCH

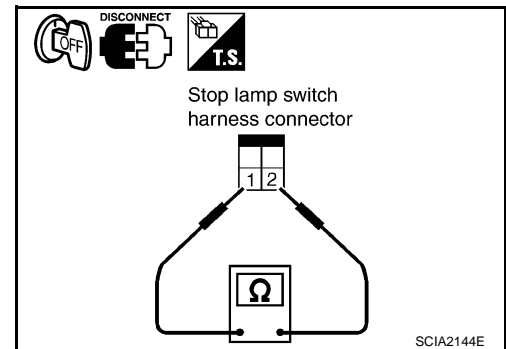
Check continuity between stop lamp switch harness connector terminals 1 and 2.

Item	Condition	Terminal	Continuity
Stop lamp switch harness connector	When brake pedal is depressed	1 - 2	Yes
	When brake pedal is released		No

Check stop lamp switch after adjusting brake pedal — refer to [BR-7, "Brake Pedal Inspection and Adjustment"](#).

OK or NG

- OK >> Check the following. If NG, repair or replace damaged parts.
- Harness for short or open between battery and stop lamp switch.
 - Harness for short or open between stop lamp switch and combination meter.
- NG >> Repair or replace the stop lamp switch.



A/T SHIFT LOCK SYSTEM

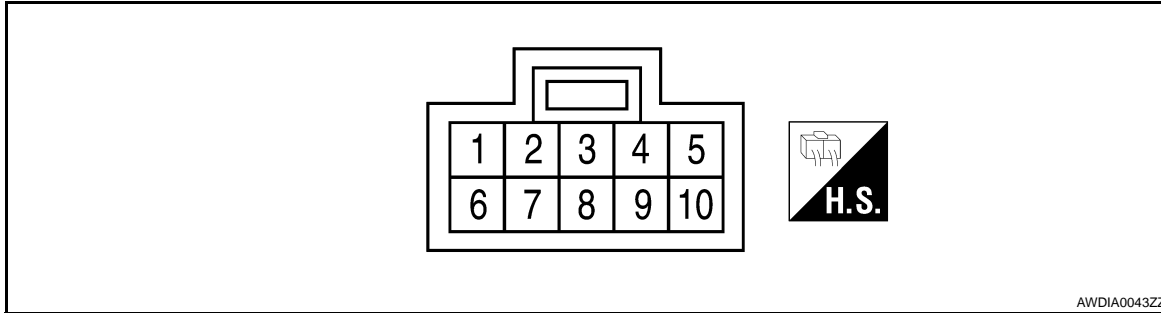
< COMPONENT DIAGNOSIS >

A/T SHIFT LOCK SYSTEM

Terminals And Reference Values

INFOID:000000001712336

SHIFT LOCK HARNESS CONNECTOR TERMINALS LAYOUT



TERMINALS AND REFERENCE VALUES FOR SHIFT LOCK CONTROL UNIT

Data are reference values.

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	VOLTAGE (Approx.)
1	Y/R	Power source	Ignition switch: "ON"	Battery voltage
			Ignition switch: "OFF"	Battery voltage
2	L/R	Detention switch (for key)	When selector lever is not in "P" position with key inserted.	Battery voltage
			Except the above	0V
3	GR	Detention switch (for shift)	When selector lever is not in "P" position	Battery voltage
			Except the above	0V
4	R/G	Stop lamp switch	When brake pedal is depressed	Battery voltage
			When brake pedal is released	0V
5	W/R	Vehicle speed signal	—	—
6	G/R	Ignition signal	Ignition switch: "OFF"	0V
			Ignition switch: "ON"	Battery voltage
7	R/W	Shift lock solenoid	When brake pedal is depressed with ignition switch "ON".	0V
			When brake pedal is depressed.	Battery voltage
8	B	Ground	Always	0V
9	R	Key lock solenoid	When the selector lever is set to a position other than the "P" position, and the key switch is turned from "ON" to "OFF"	Battery voltage for approx. 0.1 sec. (Note)
			Except the above	0V
10	W/G	Key unlock solenoid	When ignition switch is not in "ON" position with key inserted.	Battery voltage for approx. 0.1 sec. (Note)
			Except the above	0V

NOTE:

Confirm that the pointer swings only momentarily because the output time is so short. If the inspection is done with an oscilloscope, it should be observed that the power source voltage lasts for 3.5 to 10 ms.

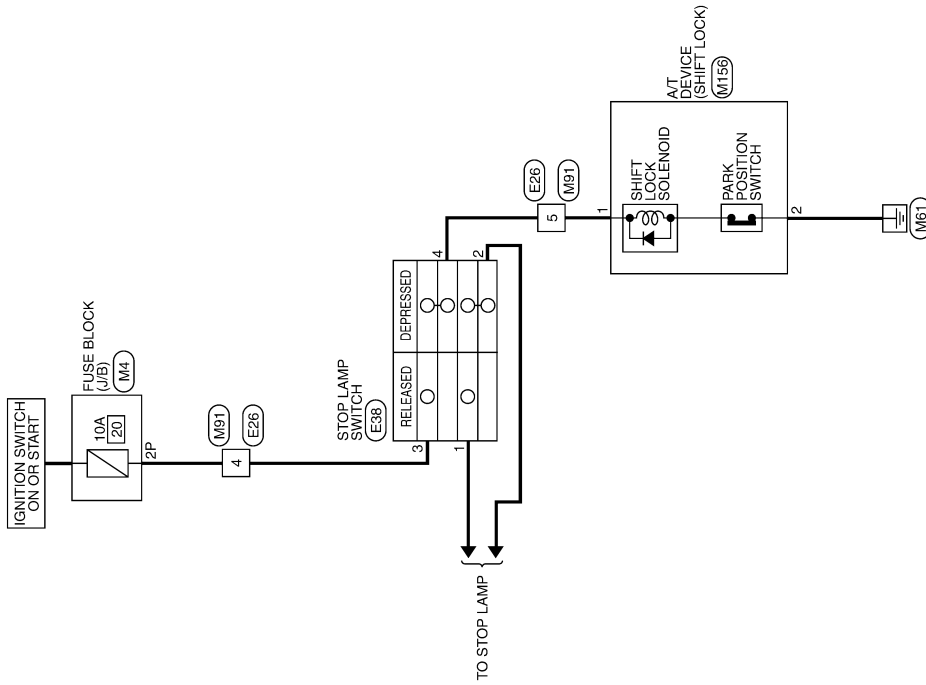
A/T SHIFT LOCK SYSTEM

< COMPONENT DIAGNOSIS >

Wiring Diagram - A/T - SHIFT

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A/T SHIFT LOCK SYSTEM



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A/T SHIFT LOCK SYSTEM

< COMPONENT DIAGNOSIS >

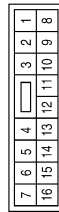
A/T SHIFT LOCK SYSTEM CONNECTORS

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



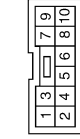
Terminal No.	Color of Wire	Signal Name
2P	W/G	-

Connector No.	M91
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
4	W/G	-
5	R	-

Connector No.	M156
Connector Name	A/T DEVICE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	R	-
2	B	-

Connector No.	E26
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
4	W/G	-
5	R	-

Connector No.	E38
Connector Name	STOP LAMP SWITCH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	R/B	-
2	Y	-
3	W/G	-
4	R	-

Diagnosis Procedure

SYMPTOM 1:

- Selector lever cannot be moved from “P” position with key in ON position and brake pedal applied.
- Selector lever can be moved from “P” position with key in ON position and brake pedal released.
- Selector lever can be moved from “P” position when key is removed from key cylinder.

SYMPTOM 2:

- Ignition key cannot be removed when selector lever is set to “P” position.

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INFOID:000000001712560

A/T SHIFT LOCK SYSTEM

< COMPONENT DIAGNOSIS >

- Ignition key can be removed when selector lever is set to any position except "P".

1. CHECK KEY INTERLOCK CABLE

Check key interlock cable for damage.

OK or NG

OK >> GO TO 2.

NG >> Repair key interlock cable. Refer to [TM-214, "Component"](#).

2. CHECK SELECTOR LEVER POSITION

Check selector lever position for damage. Refer to [TM-196, "Inspection and Adjustment"](#).

OK or NG

OK >> GO TO 3.

NG >> Check selector lever. Refer to [TM-196, "Inspection and Adjustment"](#).

3. CHECK INPUT SIGNAL A/T DEVICE

1. Turn ignition switch "ON".
2. Check voltage between A/T device harness connector M156 terminal 1 and ground.

Voltage

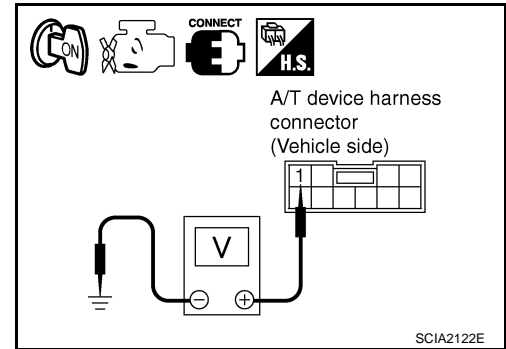
Depressed brake pedal : Battery voltage

Released brake pedal : Approx. 0V

OK or NG

OK >> GO TO 5.

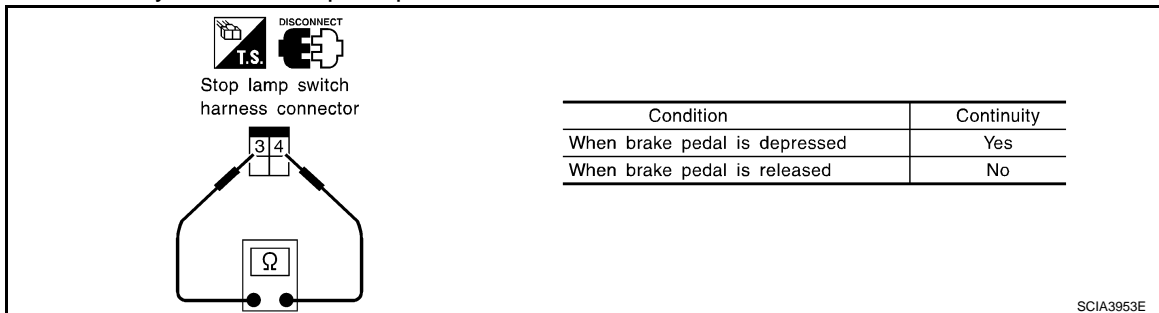
NG >> GO TO 4.



4. DETECT MALFUNCTIONING ITEM

Check the following.

1. Harness for short or open between ignition switch and stop lamp switch harness connector E38 terminal 3.
2. Harness for short or open between stop lamp switch harness connector E38 terminal 4 and A/T device harness connector M156 terminal 1.
3. 10A fuse. [No.12, located in the fuse block (J/B)]
4. Stop lamp switch.
 - Check continuity between stop lamp switch terminals 3 and 4.



Check stop lamp switch after adjusting brake pedal — refer to [BR-7, "Brake Pedal Inspection and Adjustment"](#).

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK GROUND CIRCUIT

1. Turn ignition switch "OFF".
2. Disconnect A/T device harness connector.

A/T SHIFT LOCK SYSTEM

< COMPONENT DIAGNOSIS >

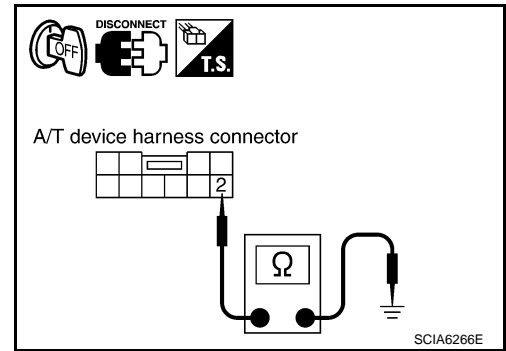
3. Check continuity between A/T device harness connector M156 terminal 2 and ground.

Continuity should exist.

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

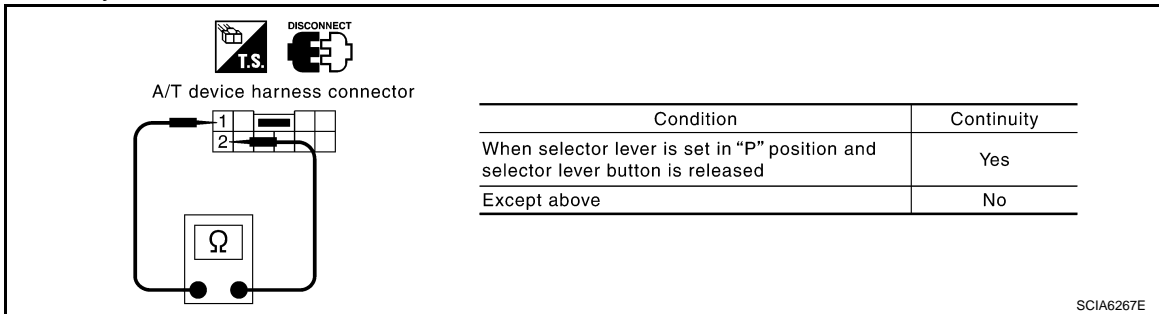
OK or NG

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



6. CHECK PARK POSITION SWITCH AND SHIFT LOCK SOLENOID CIRCUIT

Check continuity between A/T device terminals 1 and 2.



OK or NG

- OK >> **INSPECTION END**
 NG >> • Replace park position switch or shift lock solenoid.
 • Repair open circuit or short to ground or short to power in harness or connectors.

OVERDRIVE CONTROL SWITCH

< COMPONENT DIAGNOSIS >

OVERDRIVE CONTROL SWITCH

CONSULT-III Reference Value in Data Monitor Mode

INFOID:000000001282944

Item name	Condition	Display value
OD CONT SW	Releasing overdrive control switch	OFF
	Holding overdrive control switch	ON

Diagnosis Procedure

INFOID:000000001282945

1. CHECK CAN COMMUNICATION LINE

Perform the self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#).

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

- YES >> Check CAN communication line. Refer to [TM-45](#).
NO >> GO TO 2.

2. CHECK OVERDRIVE CONTROL SWITCH CIRCUIT

With CONSULT-III

- Turn ignition switch "ON".
- Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
- Read out "OD CONT SW".
Check the signal of the overdrive control switch is indicated properly.

Monitor item	Condition	Display value
OD CONT SW	Releasing overdrive control switch	OFF
	Holding overdrive control switch	ON

Without CONSULT-III

- Turn ignition switch "ON". (Do not start engine)
- Check voltage between A/T control device connector terminal and ground.

Item	Connector No.	Terminal No.	Condition	Data (Approx.)
Overdrive control switch	M156	7 - Ground	Releasing overdrive control switch	Battery voltage
			Holding overdrive control switch	0V

OK or NG

- OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK OVERDRIVE CONTROL SWITCH

- Turn ignition switch "OFF".
- Disconnect A/T control device connector.
- Check continuity between A/T control device connector M156 terminals 7 and 8.

Condition	Continuity
Releasing overdrive control switch	No
Holding overdrive control switch	Yes

OK or NG

- OK >> GO TO 4.
NG >> Repair or replace overdrive control switch.

OVERDRIVE CONTROL SWITCH

< COMPONENT DIAGNOSIS >

4. DETECT MALFUNCTIONING ITEM

Check the following. If any items are damaged, repair or replace damaged parts.

- Harness for short or open between combination meter connector terminal 20 and A/T control device connector terminal 7.
- Harness for short or open between A/T control device connector terminal 8 and ground.

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-23, "Diagnosis Description"](#).

OK or NG

OK >> **INSPECTION END**

NO >> Repair or replace damaged parts.

TCM

< ECU DIAGNOSIS >

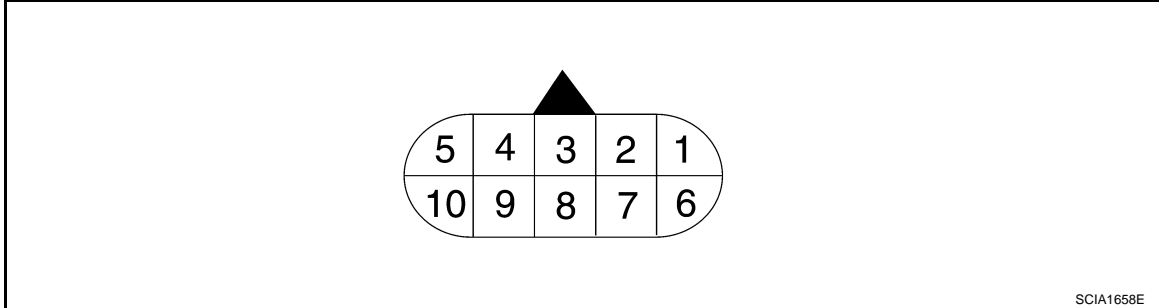
ECU DIAGNOSIS

TCM

TCM Terminals and Reference Values





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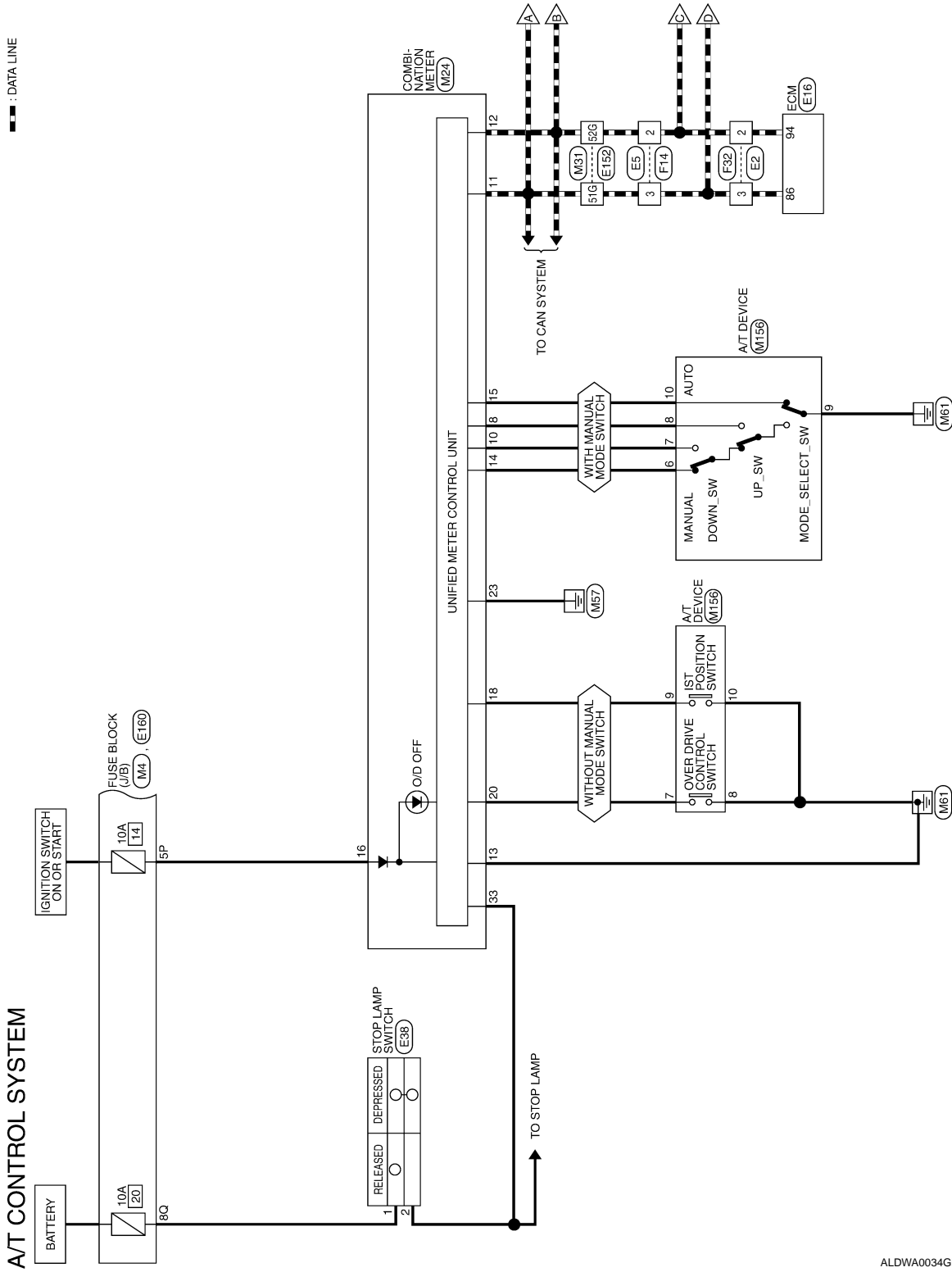
A/T ASSEMBLY HARNESS CONNECTOR TERMINAL LAYOUT



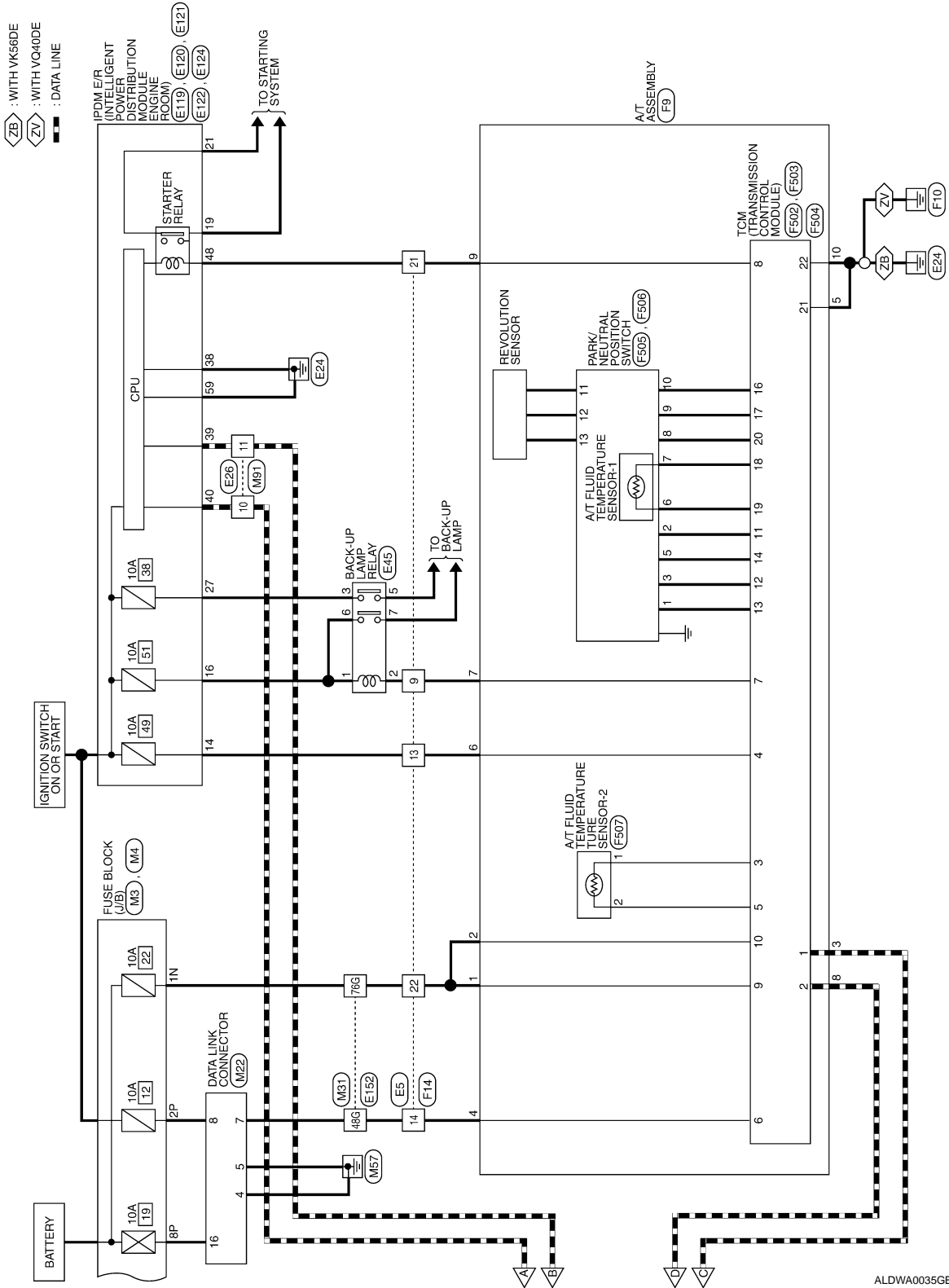
TERMINALS AND REFERENCE VALUES FOR TCM

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

Terminal No.	Wire color	Item	Condition	Data (Approx.)	
1	R/B	Power supply (Memory back-up)	Always	Battery voltage	
2	R/B	Power supply (Memory back-up)	Always	Battery voltage	
3	L	CAN H	-	-	
4	V	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.		
5	B	Ground	Always	0V	
6	W/G	Power supply		-	Battery voltage
				-	0V
7	LG	Back-up lamp relay		Selector lever in "R" position.	0V
				Selector lever in other positions.	Battery voltage
8	P	CAN L	-	-	
9	R	Starter relay		Selector lever in "N", "P" positions.	Battery voltage
				Selector lever in other positions.	0V
10	B	Ground	Always	0V	



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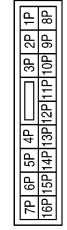
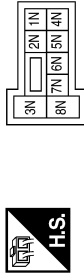


A
B
C
E
F
G
H
I
J
K
L
M
N
O
P

TM

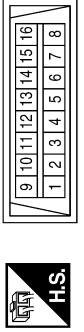
A/T CONTROL SYSTEM CONNECTORS

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Color	WHITE

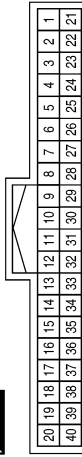


Terminal No.	Color of Wire	Signal Name
1N	R/B	-

Terminal No.	Color of Wire	Signal Name
2P	W/G	-
5P	W/G	-
8P	R/Y	-

Terminal No.	Color of Wire	Signal Name
4	B	-
5	B	-
7	W	-
8	W/G	-
16	R/Y	-

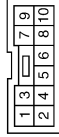
Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
8	SB	-
10	LG	-

Terminal No.	Color of Wire	Signal Name
11	P	-
12	L	-
13	GR	-
14	O	-
15	W	-
16	W/G	-
18	L	-
20	Y	-
23	B	-
33	LG	-

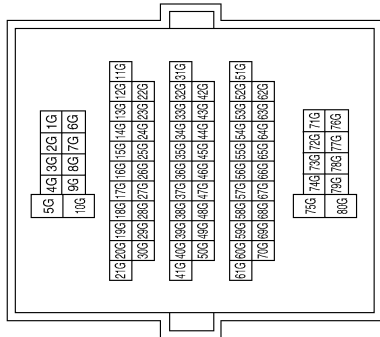
Connector No.	M156
Connector Name	A/T DEVICE (WITH MANUAL MODE SWITCH)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
6	O	MANUAL
7	LG	M-DOWN
8	SB	M-UP
9	B	GND
10	W	AUTO

Terminal No.	Color of Wire	Signal Name
48G	W	-
51G	P	-
52G	L	-
76G	R/B	-

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE

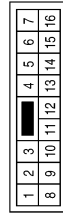


Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Color	WHITE



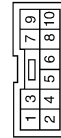
Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
9	LG	-
13	W/G	-
14	V	-
21	R	-
22	R/B	-

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-

Connector No.	M156
Connector Name	A/T DEVICE (WITHOUT MANUAL MODE SWITCH)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
7	Y	-
8	B	-
9	L	-
10	B	-

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Connector No.	E45
Connector Name	BACK-UP LAMP RELAY
Connector Color	BROWN



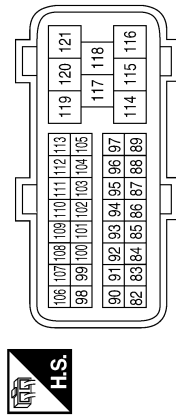
Terminal No.	Color of Wire	Signal Name
1	W/G	-
2	LG	-
3	W	-
5	Y	-
6	W/G	-
7	SB	-

Connector No.	E38
Connector Name	STOP LAMP SWITCH
Connector Color	WHITE



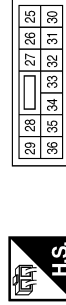
Terminal No.	Color of Wire	Signal Name
1	R/B	-
2	Y	-

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK



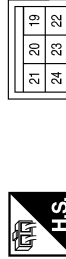
Terminal No.	Color of Wire	Signal Name
86	P	CAN-L
94	L	CAN-H

Connector No.	E121
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN



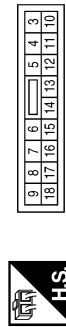
Terminal No.	Color of Wire	Signal Name
27	W	T_TOW_REV_LAMP

Connector No.	E120
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
19	W	STARTER_MOTOR
21	GR	IGN_SW_(ST)

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
14	W/G	A/T_ECU_IGN_SUPPLY
16	W/G	REVERS_LAMP

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Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



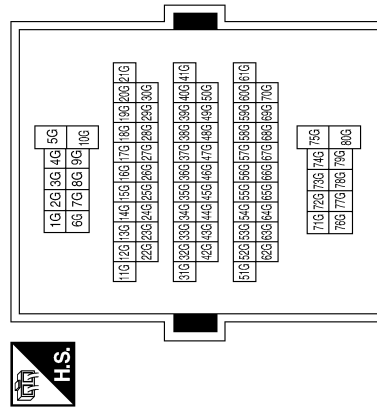
Terminal No.	Color of Wire	Signal Name
38	B	GND SIGNAL
39	L	CAN-H
40	P	CAN-L
48	R	INHIBIT

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



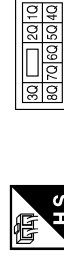
Terminal No.	Color of Wire	Signal Name
59	B	GND (POWER)

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
48G	W	-
51G	P	-
52G	L	-
76G	R/B	-

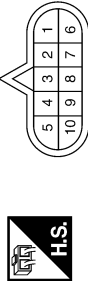
Connector No.	E160
Connector Name	FUSE BLOCK(J/B)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
8Q	R/B	-

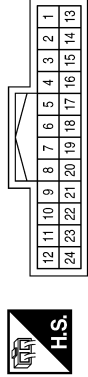
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Connector No.	F9
Connector Name	AT ASSEMBLY
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
1	R/B	-
2	R/B	-
3	L	CAN-H
4	V	-
5	B	-
6	W/G	-
7	LG	-
8	P	CAN-L
9	R	-
10	B	-

Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE



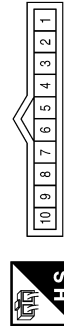
Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
9	LG	-
13	W/G	-
14	V	-
21	R	-
22	R/B	-

Connector No.	F32
Connector Name	WIRE TO WIRE
Connector Color	WHITE



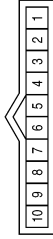
Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-

Connector No.	F502
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	BR	CAN-H
2	L/Y	CAN-L
3	W/Y	ATF SENS2-
4	R	VIGN
5	W/R	ATF SENS2+
6	V	K-LINE
7	O	REV LAMP RLY
8	G	START-RLY
9	W	STAND BY SUPPLY-1
10	GR	STAND BY SUPPLY-2

Connector No.	F505
Connector Name	PARK/NEUTRAL POSITION SWITCH
Connector Color	GRAY



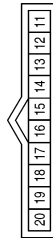
Terminal No.	Color of Wire	Signal Name
1	BR	S1
2	W	S4
3	GR	S2
5	L	S3
6	G	-
7	O	-
8	Y	C1
9	R	C2
10	B	C3

Connector No.	F504
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
21	B	POWER GND-1
22	Y	POWER GND-2

Connector No.	F503
Connector Name	TRANSMISSION CONTROL MODULE
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
11	W	INH-SW4
12	GR	INH-SW2
13	BR	INH-SW1
14	L	INH-SW3
16	B	REV SEN GND
17	R	REV SEN VOUT
18	O	ATF SENS1-
19	G	ATF SENS1+
20	Y	REV SEN VIN

Connector No.	F507
Connector Name	AT TEMPERATURE SENSOR-2
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	W/Y	-
2	W/R	-

Connector No.	F506
Connector Name	PARK/NEUTRAL POSITION SWITCH
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
11	B	C3 (GND)
12	W	C2 (VOUT)
13	R	C1 (VIN)

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Fail-Safe

The TCM has an electrical fail-safe mode. This mode makes it possible to operate even if there is an error in a main electronic control input/output signal circuit. In fail-safe mode the transmission is fixed in 2nd, 4th or 5th (depending on the breakdown position), so the customer should feel “slipping” or “poor acceleration”. Even when the electronic circuits are normal, under special conditions (for example, when slamming on the brake with the wheels spinning drastically and stopping the tire rotation), the transmission can go into fail-safe mode. If this happens, switch “OFF” the ignition switch for 10 seconds, then switch it “ON” again to return to

TCM

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the normal shift pattern. Therefore, the customer's vehicle has returned to normal, so handle according to the "diagnostics flow" (Refer to [TM-7, "Diagnostic Work Sheet"](#)).

FAIL-SAFE FUNCTION

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

Vehicle Speed Sensor

- Signals are input from two systems - from vehicle speed sensor A/T (revolution sensor) installed on the transmission and from combination meter so normal driving is possible even if there is a malfunction in one of the systems. And if vehicle speed sensor A/T (revolution sensor) has unusual cases, 5th gear is prohibited.

Accelerator Pedal Position Sensor

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

Throttle Position Sensor

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

PNP Switch

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

Starter Relay

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

A/T Interlock

- If there is an A/T interlock judgment malfunction, the transmission is fixed in 2nd gear to make driving possible.

NOTE:

When the vehicle is driven fixed in 2nd gear, a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.

- When the coupling pattern below is detected, the fail-safe action corresponding to the pattern is performed.

A/T INTERLOCK COUPLING PATTERN TABLE

●: NG X: OK

Gear position		ATF pressure switch output					Fail-safe function	Clutch pressure output pattern after fail-safe function					
		SW3 (I/C)	SW6 (HLR/C)	SW5 (D/C)	SW1 (FR/B)	SW2 (LC/B)		I/C	HLR/C	D/C	FR/B	LC/B	L/U
A/T interlock coupling pattern	3rd	–	X	X	–	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF
	4th	–	X	X	–	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF
	5th	X	X	–	X	●	Held in 2nd gear	OFF	OFF	ON	OFF	OFF	OFF

A/T 1st Engine Braking

- When there is an A/T first gear engine brake judgment malfunction, the low coast brake solenoid is switched "OFF" to avoid the engine brake operation.

Line Pressure Solenoid

- The solenoid is switched "OFF" and the line pressure is set to the maximum hydraulic pressure to make driving possible.

Torque Converter Clutch Solenoid

- The solenoid is switched "OFF" to release the lock-up.

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Low Coast Brake Solenoid

- When a (electrical or functional) malfunction occurs, in order to make driving possible, the engine brake is not applied in 1st and 2nd gear. A

Input Clutch Solenoid

- If a (electrical or functional) malfunction occurs with the solenoid either “ON” or “OFF”, the transmission is held in 4th gear to make driving possible. B

Direct Clutch Solenoid

- If a (electrical or functional) malfunction occurs with the solenoid either “ON” or “OFF”, the transmission is held in 4th gear to make driving possible. C

Front Brake Solenoid

- If a (electrical or functional) malfunction occurs with the solenoid “ON”, in order to make driving possible, the A/T is held in 5th gear; if the solenoid is OFF, 4th gear. TM

High and Low Reverse Clutch Solenoid

- If a (electrical or functional) malfunction occurs with the solenoid either “ON” or “OFF”, the transmission is held in 4th gear to make driving possible. E

Turbine Revolution Sensor 1 or 2

- The control is the same as if there were no turbine revolution sensors, 5th gear is prohibited. F

DTC Inspection Priority Chart

INFOID:000000001282743

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart. G

NOTE:

If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to [TM-45](#). H

Priority	Detected items (DTC)
1	U1000 CAN communication line
2	Except above

DTC No. Index

INFOID:000000001282718

NOTE:

If DTC U1000 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000. Refer to [TM-45](#). K

DTC		Items (CONSULT- III screen terms)	Reference page
OBD- II	Except OBD- II		
CONSULT- III GST (*1)	CONSULT- III only “A/T”		
—	P0615	STARTER RELAY/CIRC	TM-46
P0700	P0700	TCM	TM-49
P0705	P0705	PNP SW/CIRC	TM-50
P0710	P1710	ATF TEMP SEN/CIRC	TM-77
P0717	P0717	TURBINE REV S/CIRC	TM-52
P0720	P0720	VEH SPD SEN/CIR AT	TM-54
—	P0725	ENGINE SPEED SIG	TM-57
P0731	P0731	A/T 1ST GR FNCTN	TM-69
P0732	P0732	A/T 2ND GR FNCTN	TM-69
P0733	P0733	A/T 3RD GR FNCTN	TM-69
P0734	P0734	A/T 4TH GR FNCTN	TM-69
P0735	P0735	A/T 5TH GR FNCTN	TM-69
P0740	P0740	TCC SOLENOID/CIRC	TM-69

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DTC		Items (CONSULT- III screen terms)	Reference page
OBD- II	Except OBD- II		
CONSULT- III GST (*1)	CONSULT- III only "A/T"		
P0744 (*2)	P0744	A/T TCC S/V FNCTN	TM-71
P0745	P0745	L/PRESS SOL/CIRC	TM-73
—	P1705	TP SEN/CIRC A/T	TM-75
—	P1721	VEH SPD SE/CIR·MTR	TM-80
P1730	P1730	A/T INTERLOCK	TM-82
—	P1731	A/T 1ST E/BRAKING	TM-84
P1752	P1752	I/C SOLENOID/CIRC	TM-86
P1757	P1757	FR/B SOLENOID/CIRC	TM-88
P1762	P1762	D/C SOLENOID/CIRC	TM-90
P1767	P1767	HLR/C SOL/CIRC	TM-92
P1772	P1772	LC/B SOLENOID/CIRC	TM-94
P1774 (*2)	P1774	LC/B SOLENOID FNCT	TM-96
—	P1815	MANU MODE SW/CIR (*3).	TM-80
U1000	U1000	CAN COMM CIRCUIT	TM-45

*1: These numbers are prescribed by SAE J2012.

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

*3: With manual mode.

Alphabetical Index

INFOID:000000001282717

NOTE:

If DTC U1000 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000. Refer to [TM-45](#).

Items (CONSULT- III screen terms)	DTC		Reference page
	OBD- II	Except OBD- II	
	CONSULT- III GST (*1)	CONSULT- III only "A/T"	
A/T 1ST E/BRAKING	—	P1731	TM-84
A/T 1ST GR FNCTN	P0731	P0731	TM-59
A/T 2ND GR FNCTN	P0732	P0732	TM-61
A/T 3RD GR FNCTN	P0733	P0733	TM-63
A/T 4TH GR FNCTN	P0734	P0734	TM-65
A/T 5TH GR FNCTN	P0735	P0735	TM-67
A/T INTERLOCK	P1730	P1730	TM-82
A/T TCC S/V FNCTN	P0744 (*2)	P0744	TM-71
ATF TEMP SEN/CIRC	P0710	P1710	TM-77
CAN COMM CIRCUIT	U1000	U1000	TM-45
D/C SOLENOID/CIRC	P1762	P1762	TM-90
ENGINE SPEED SIG	—	P0725	TM-57
FR/B SOLENOID/CIRC	P1757	P1757	TM-88
HLR/C SOL/CIRC	P1767	P1767	TM-92
I/C SOLENOID/CIRC	P1752	P1752	TM-86
L/PRESS SOL/CIRC	P0745	P0745	TM-73
LC/B SOLENOID/CIRC	P1772	P1772	TM-94

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Items (CONSULT- III screen terms)	DTC		Reference page
	OBD- II	Except OBD- II	
	CONSULT- III GST (*1)	CONSULT- III only "A/T"	
LC/B SOLENOID FNCT	P1774 (*2)	P1774	TM-96
MANU MODE SW/CIR (*3)	—	P1815	TM-94
PNP SW/CIRC	P0705	P0705	TM-50
STARTER RELAY/CIRC	—	P0615	TM-46
TCC SOLENOID/CIRC	P0740	P0740	TM-69
TCM	P0700	P0700	TM-49
TP SEN/CIRC A/T	—	P1705	TM-75
TURBINE REV S/CIRC	P0717	P0717	TM-52
VEH SPD SE/CIR·MTR	—	P1721	TM-80
VEH SPD SEN/CIR AT	P0720	P0720	TM-54

*1: These numbers are prescribed by SAE J2012.

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

*3: With manual mode.

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SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

SYSTEM SYMPTOM

A/T Check Indicator Lamp Does Not Come On (With Manual Mode)

INFOID:000000001714418

SYMPTOM:

AT CHECK indicator lamp does not come on for about 2 seconds when turning ignition switch to "ON".

DIAGNOSTIC PROCEDURE

1.CHECK CAN COMMUNICATION LINE

Perform the self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#).

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

YES >> Check CAN communication line. Refer to [LAN-4, "System Description"](#).

NO >> GO TO 2.

2.CHECK A/T CHECK INDICATOR LAMP CIRCUIT

Check the combination meter. Refer to [MWI-17. "WARNING LAMPS/INDICATOR LAMPS : System Diagram"](#).

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

3.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101. "Diagnosis Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

O/D OFF Indicator Lamp Does Not Come On (Without Manual Mode)

INFOID:000000001282947

SYMPTOM:

O/D OFF indicator lamp does not come on for about 2 seconds when turning ignition switch to "ON".

DIAGNOSTIC PROCEDURE

1.CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#), [TM-42. "Diagnosis Procedure without CONSULT-III"](#).

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

YES >> Check CAN communication line. Refer to [TM-45](#).

NO >> GO TO 2.

2.CHECK O/D OFF INDICATOR LAMP CIRCUIT

Check the combination meter. Refer to [MWI-17. "WARNING LAMPS/INDICATOR LAMPS : System Diagram"](#).

OK or NG

OK >> GO TO 3

NG >> Repair or replace damaged parts.

3.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [TM-101. "Diagnosis Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

Engine Cannot Be Started in "P" or "N" Position

INFOID:000000001282948

SYMPTOM:

- Engine cannot be started with selector lever in "P" or "N" position.
- Engine can be started with selector lever in "D", "3", "2", "1" or "R" position.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#).

Do the self-diagnosis results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to [TM-50](#).

NO >> GO TO 2.

2.CHECK CONTROL CABLE

Check the control cable.

- Refer to [TM-196. "Inspection and Adjustment"](#).

OK or NG

OK >> GO TO 3.

NG >> Adjust control cable. Refer to [TM-196. "Inspection and Adjustment"](#).

3.CHECK STARTING SYSTEM

Check the starting system. Refer to [STR-7. "System Diagram"](#).

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

In "P" Position, Vehicle Moves When Pushed

INFOID:000000001282949

SYMPTOM:

Even though the selector lever is set in the "P" position, the parking mechanism is not actuated, allowing the vehicle to be moved when it is pushed.

DIAGNOSTIC PROCEDURE

1.CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#).

Do the self-diagnosis results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to [TM-50](#).

NO >> GO TO 2.

2.CHECK CONTROL CABLE

Check the control cable.

- Refer to [TM-196. "Inspection and Adjustment"](#).

OK or NG

OK >> GO TO 3.

NG >> Adjust control cable. Refer to [TM-196. "Inspection and Adjustment"](#).

3.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Check A/T fluid condition. Refer to [TM-180. "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 4.

4.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152. "Symptom Chart"](#) (Symptom No.58).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

OK or NG

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

In "N" Position, Vehicle Moves

INFOID:000000001282950

SYMPTOM:

Vehicle moves forward or backward when selecting "N" position.

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Do the self-diagnostic results indicate PNP switch?

- YES >> Check the malfunctioning system. Refer to [TM-50](#).
NO >> GO TO 2.

2. CHECK CONTROL CABLE

Check the control cable.

- Refer to [TM-196, "Inspection and Adjustment"](#).

OK or NG

- OK >> GO TO 3.
NG >> Adjust control cable. Refer to [TM-196, "Inspection and Adjustment"](#).

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 5.
NG >> Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.60).

5. CHECK SYMPTOM

Check again. Refer to [TM-190, "Check at Idle"](#).

OK or NG

- OK >> **INSPECTION END**
NG >> GO TO 6.

6. PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).

2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

Large Shock ("N" to "D" Position)

INFOID:000000001282951

SYMPTOM:

A noticeable shock occurs when the selector lever is shifted from the "N" to "D" position.

DIAGNOSTIC PROCEDURE

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
NO >> GO TO 2.

2. ENGINE IDLE SPEED

Check the engine idle speed. Refer to [EC-24, "Idle Speed and Ignition Timing Check"](#) (VQ40DE) or [EC-496, "Idle Speed and Ignition Timing Check"](#) (VK56DE).

OK or NG

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

3. CHECK CONTROL CABLE

Check the control cable.

- Refer to [TM-196, "Inspection and Adjustment"](#).

OK or NG

- OK >> GO TO 4.
NG >> Adjust control cable. Refer to [TM-196, "Inspection and Adjustment"](#).

4. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 5.
NG >> Refill ATF.

5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "D" position. Refer to [TM-187, "Line Pressure Test"](#).

OK or NG

- OK >> GO TO 8.
NG - 1 >> Line pressure high: GO TO 6.
NG - 2 >> Line pressure low: GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

OK or NG

- OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).
 - Power train system. Refer to [TM-253](#).
 - Transmission case. Refer to [TM-253](#).

OK or NG

- OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

2. Check A/T fluid condition. Refer to [TM-180. "Checking the A/T Fluid \(ATF\)".](#)

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING ITEM

• Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152. "Symptom Chart"](#) (Symptom No.1).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to [TM-190. "Check at Idle".](#)

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113. "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

Vehicle Does Not Creep Backward in "R" Position

INFOID:000000001282952

SYMPTOM:

The vehicle does not creep in the "R" position. Or an extreme lack of acceleration is observed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)".](#)

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)".](#)
NO >> GO TO 2.

2. CHECK CONTROL CABLE

Check the control cable.

• Refer to [TM-196. "Inspection and Adjustment"](#).

OK or NG

OK >> GO TO 3.
NG >> Adjust control cable. Refer to [TM-196. "Inspection and Adjustment"](#).

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180. "Checking the A/T Fluid \(ATF\)".](#)

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK STALL TEST

Check stall revolution with selector lever in "1" and "R" positions.
Refer to [TM-186. "Stall Test"](#).

OK or NG

OK >> GO TO 6.

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

OK in "1" position, NG in "R" position>>GO TO 5.
NG in both "1" and "R" positions>>GO TO 8.

5.DETECT MALFUNCTIONING ITEM

1. Disassemble A/T. Refer to [TM-253](#).
2. Check the following items:
 - Reverse brake. Refer to [TM-253](#).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

6.CHECK LINE PRESSURE

Check the line pressure with the engine idling. Refer to [TM-187, "Line Pressure Test"](#).

OK or NG

OK >> GO TO 9.
NG - 1 >> Line pressure high. GO TO 7.
NG - 2 >> Line pressure low. GO TO 8.

7.DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

8.DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).
 - Power train system. Refer to [TM-253](#).
 - Transmission case. Refer to [TM-253](#).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

OK >> GO TO 10.
NG >> GO TO 13.

10.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

11.CHECK SYMPTOM

Check again. Refer to [TM-190, "Check at Idle"](#).

OK or NG

OK >> **INSPECTION END**

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SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

NG >> GO TO 12.

12.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

13.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

Vehicle Does Not Creep Forward in "D" Position

INFOID:000000001282953

SYMPTOM:

Vehicle does not creep forward when selecting "D" position.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
NO >> GO TO 2.

2.CHECK CONTROL CABLE

Check the control cable.

- Refer to [TM-196, "Inspection and Adjustment"](#).

OK or NG

OK >> GO TO 3.
NG >> Adjust control cable. Refer to [TM-196, "Inspection and Adjustment"](#).

3.CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4.CHECK STALL TEST

Check stall revolution with selector lever in "D" position. Refer to [TM-186, "Stall Test"](#).

OK or NG

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

5.CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "D" position. Refer to [TM-187, "Line Pressure Test"](#).

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high. GO TO 6.
NG - 2 >> Line pressure low. GO TO 7.

6.DETECT MALFUNCTIONING ITEM

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following items:
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

OK or NG

- OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).
 - Power train system. Refer to [TM-253](#).
 - Transmission case. Refer to [TM-253](#).

OK or NG

- OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 9.
NG >> GO TO 12.

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.43).

OK or NG

- OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to [TM-190, "Check at Idle"](#).

OK or NG

- OK >> **INSPECTION END**
NG >> GO TO 11.

11. PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

12. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.43).

OK or NG

- OK >> GO TO 10.
NG >> Repair or replace damaged parts.

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

Vehicle Cannot Be Started from D1

INFOID:000000001282954

SYMPTOM:

Vehicle cannot be started from D1 on cruise test - Part 1 and cruise test - Part 2.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps in "R" position.

OK or NG

OK >> GO TO 2.

NG >> Refer to [TM-130, "Vehicle Does Not Creep Backward in "R" Position"](#).

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

NO >> GO TO 3.

3. CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR

Check accelerator pedal position (APP) sensor. Refer to [TM-75](#).

OK or NG

OK >> GO TO 4.

NG >> Repair or replace accelerator pedal position (APP) sensor.

4. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

OK >> GO TO 5.

NG >> Refill ATF.

5. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [TM-187, "Line Pressure Test"](#).

OK or NG

OK >> GO TO 8.

NG - 1 >> Line pressure high. GO TO 6.

NG - 2 >> Line pressure low. GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Disassemble A/T. Refer to [TM-253](#).

3. Check the following.

- Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Disassemble A/T. Refer to [TM-253](#).

3. Check the following.

- Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

- Power train system. Refer to [TM-253](#).

- Transmission case. Refer to [TM-253](#).

OK or NG

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

- OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 9.
NG >> GO TO 12.

9.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.23).

OK or NG

- OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10.CHECK SYMPTOM

Check again. Refer to [TM-191, "Cruise Test - Part 1"](#), [TM-193, "Cruise Test - Part 2"](#).

OK or NG

- OK >> **INSPECTION END**
NG >> GO TO 11.

11.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

12.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.23).

OK or NG

- OK >> GO TO 10.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: D1→D2

INFOID:000000001282955

SYMPTOM:

The vehicle does not shift-up from the D1 to D2 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1.CONFIRM THE SYMPTOM

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

OK or NG

- OK >> GO TO 2.
NG >> Refer to [TM-132, "Vehicle Does Not Creep Forward in "D" Position"](#), [TM-134, "Vehicle Cannot Be Started from D1"](#).

2.CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
NO >> GO TO 3.

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)".](#)

OK or NG

- OK >> GO TO 4.
- NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [TM-187, "Line Pressure Test".](#)

OK or NG

- OK >> GO TO 7.
- NG - 1 >> Line pressure high. GO TO 5.
- NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".](#)
2. Disassemble A/T. Refer to [TM-253.](#)
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View".](#)

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".](#)
2. Disassemble A/T. Refer to [TM-253.](#)
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View".](#)
 - Power train system. Refer to [TM-253.](#)
 - Transmission case. Refer to [TM-253.](#)

OK or NG

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

7. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".](#)
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)".](#)

OK or NG

- OK >> GO TO 8.
- NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.10).

OK or NG

- OK >> GO TO 9.
- NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to [TM-191, "Cruise Test - Part 1"](#), [TM-193, "Cruise Test - Part 2"](#).

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 10.

10. PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values".](#)

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

11.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.10).

OK or NG

- OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: D2→ D3

INFOID:000000001282956

SYMPTOM:

The vehicle does not shift-up from D2 to D3 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1.CONFIRM THE SYMPTOM

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

OK or NG

- OK >> GO TO 2.
NG >> Refer to [TM-132, "Vehicle Does Not Creep Forward in "D" Position"](#), [TM-134, "Vehicle Cannot Be Started from D1"](#).

2.CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
NO >> GO TO 3.

3.CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 4.
NG >> Refill ATF.

4.CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [TM-187, "Line Pressure Test"](#).

OK or NG

- OK >> GO TO 7.
NG - 1 >> Line pressure high. GO TO 5.
NG - 2 >> Line pressure low. GO TO 6.

5.DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

OK or NG

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

6.DETECT MALFUNCTIONING ITEM

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).
 - Power train system. Refer to [TM-253](#).
 - Transmission case. Refer to [TM-253](#).

OK or NG

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

7.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 8.
NG >> GO TO 11.

8.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.11).

OK or NG

- OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9.CHECK SYMPTOM

Check again. Refer to [TM-191, "Cruise Test - Part 1"](#), [TM-193, "Cruise Test - Part 2"](#).

OK or NG

- OK >> **INSPECTION END**
NG >> GO TO 10.

10.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

11.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.11).

OK or NG

- OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: D3→ D4

INFOID:000000001282957

SYMPTOM:

- **The vehicle does not shift-up from the D3 to D4 gear at the specified speed.**

DIAGNOSTIC PROCEDURE

1.CONFIRM THE SYMPTOM

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

OK or NG

- OK >> GO TO 2.

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

NG >> Refer to [TM-132, "Vehicle Does Not Creep Forward in "D" Position"](#), [TM-134, "Vehicle Cannot Be Started from D1"](#).

2.CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

NO >> GO TO 3.

3.CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

4.CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [TM-187, "Line Pressure Test"](#).

OK or NG

OK >> GO TO 7.

NG - 1 >> Line pressure high. GO TO 5.

NG - 2 >> Line pressure low. GO TO 6.

5.DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Disassemble A/T. Refer to [TM-253](#).

3. Check the following.

- Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

6.DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Disassemble A/T. Refer to [TM-253](#).

3. Check the following.

- Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

- Power train system. Refer to [TM-253](#).

- Transmission case. Refer to [TM-253](#).

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

OK >> GO TO 8.

NG >> GO TO 11.

8.DETECT MALFUNCTIONING ITEM

• Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.12).

OK or NG

OK >> GO TO 9.

NG >> Repair or replace damaged parts.

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

9. CHECK SYMPTOM

Check again. Refer to [TM-191, "Cruise Test - Part 1"](#), [TM-193, "Cruise Test - Part 2"](#).

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 10.

10. PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

11. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.12).

OK or NG

- OK >> GO TO 9.
- NG >> Repair or replace damaged parts.

A/T Does Not Shift: D4→ D5

INFOID:000000001282958

SYMPTOM:

- The vehicle does not shift-up from the D4 to D5 gear at the specified speed.
- The vehicle does not shift-up from the D4 to D5 gear unless A/T is warmed up.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

OK or NG

- OK >> GO TO 2.
- NG >> Refer to [TM-132, "Vehicle Does Not Creep Forward in "D" Position"](#), [TM-134, "Vehicle Cannot Be Started from D1"](#).

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
- NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 4.
- NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [TM-187, "Line Pressure Test"](#).

OK or NG

- OK >> GO TO 7.
- NG - 1 >> Line pressure high. GO TO 5.
- NG - 2 >> Line pressure low. GO TO 6.

5. DETECT MALFUNCTIONING ITEM

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

OK or NG

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

6.DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).
 - Power train system. Refer to [TM-253](#).
 - Transmission case. Refer to [TM-253](#).

OK or NG

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

7.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 8.
NG >> GO TO 11.

8.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.13).

OK or NG

- OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9.CHECK SYMPTOM

Check again. Refer to [TM-191, "Cruise Test - Part 1"](#).

OK or NG

- OK >> **INSPECTION END**
NG >> GO TO 10.

10.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

11.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.13).

OK or NG

- OK >> GO TO 9.
NG >> Repair or replace damaged parts.

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

A/T Does Not Perform Lock-up

INFOID:000000001282959

SYMPTOM:

A/T does not perform lock-up at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
- NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 3.
- NG >> Refill ATF.

3. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [TM-187, "Line Pressure Test"](#).

OK or NG

- OK >> GO TO 6.
- NG - 1 >> Line pressure high. GO TO 4.
- NG - 2 >> Line pressure low. GO TO 5.

4. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).

OK or NG

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

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disassemble A/T. Refer to [TM-253](#).
3. Check the following.
 - Oil pump assembly. Refer to [TM-271, "Exploded View"](#).
 - Power train system. Refer to [TM-253](#).
 - Transmission case. Refer to [TM-253](#).

OK or NG

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

6. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 7.
- NG >> GO TO 10.

7. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.24).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

OK or NG

- OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8.CHECK SYMPTOM

Check again. Refer to [TM-191, "Cruise Test - Part 1"](#).

OK or NG

- OK >> **INSPECTION END**
NG >> GO TO 9.

9.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

10.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.24).

OK or NG

- OK >> GO TO 8.
NG >> Repair or replace damaged parts.

A/T Does Not Hold Lock-up Condition

INFOID:000000001282960

SYMPTOM:

The lock-up condition cannot be maintained for more than 30 seconds.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
NO >> GO TO 2.

2.CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 3.
NG >> Refill ATF.

3.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 4.
NG >> GO TO 7.

4.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.25).

OK or NG

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

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

5.CHECK SYMPTOM

Check again. Refer to [TM-191, "Cruise Test - Part 1"](#).

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 6.

6.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

7.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.25).

OK or NG

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

Lock-up Is Not Released

INFOID:000000001282961

SYMPTOM:

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
- NO >> GO TO 2.

2.CHECK SYMPTOM

Check again. Refer to [TM-191, "Cruise Test - Part 1"](#).

OK or NG

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

3.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

Engine Speed Does Not Return to Idle

INFOID:000000001282962

SYMPTOM:

When a shift-down is performed, the engine speed does not smoothly return to the idling speed.

DIAGNOSTIC PROCEDURE

1.CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

OK or NG

- OK >> GO TO 2.
- NG >> Refill ATF.

2.CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)".](#)

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)".](#)
- NO >> GO TO 3.

3.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2".](#)
2. Check A/T fluid condition. Refer to [TM-180. "Checking the A/T Fluid \(ATF\)".](#)

OK or NG

- OK >> GO TO 4.
- NG >> GO TO 7.

4.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152. "Symptom Chart"](#) (Symptom No.65).

OK or NG

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

5.CHECK SYMPTOM

Check again. Refer to [TM-191. "Cruise Test - Part 1".](#)

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 6.

6.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113. "TCM Terminals and Reference Values".](#)
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

7.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152. "Symptom Chart"](#) (Symptom No.65).

OK or NG

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

A/T Does Not Shift: 5th gear → 4th gear

INFOID:000000001282963

SYMPTOM:

When shifted from D5 to D4 position, does not downshift from 5th to 4th gears.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)".](#)

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)".](#)
- NO >> GO TO 2.

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

2.CHECK OVERDRIVE CONTROL SWITCH CIRCUIT

Check overdrive control switch. Refer to [TM-111](#).

OK or NG

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

3.CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 4.
- NG >> Refill ATF.

4.CHECK CONTROL CABLE

Check the control cable.

- Refer to [TM-196, "Inspection and Adjustment"](#).

OK or NG

- OK >> GO TO 5.
- NG >> Adjust control cable. Refer to [TM-196, "Inspection and Adjustment"](#).

5.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 6.
- NG >> GO TO 9.

6.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.14).

OK or NG

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

7.CHECK SYMPTOM

Check again. Refer to [TM-194, "Cruise Test - Part 3"](#).

OK or NG

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

8.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

9.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.14).

OK or NG

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

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

A/T Does Not Shift: 4th gear → 3rd gear

INFOID:000000001282964

SYMPTOM:

When shifted from D4 to 33 position, does not downshift from 4th to 3rd gears.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
- NO >> GO TO 2.

2.CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 3.
- NG >> Refill ATF.

3.CHECK CONTROL CABLE

Check the control cable.

- Refer to [TM-196, "Inspection and Adjustment"](#).

OK or NG

- OK >> GO TO 4.
- NG >> Adjust control cable. Refer to [TM-196, "Inspection and Adjustment"](#).

4.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

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

5.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.15).

OK or NG

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

6.CHECK SYMPTOM

Check again. Refer to [TM-194, "Cruise Test - Part 3"](#).

OK or NG

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

7.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

8.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.15).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

OK or NG

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

A/T Does Not Shift: 3rd gear → 2nd gear

INFOID:000000001282965

SYMPTOM:

When shifted from 33 to 22 position, does not downshift from 3rd to 2nd gears.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK CONTROL CABLE

Check the control cable.

- Refer to [TM-196, "Inspection and Adjustment"](#).

OK or NG

- OK >> GO TO 4.
NG >> Adjust control cable. Refer to [TM-196, "Inspection and Adjustment"](#).

4. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

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

5. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.16).

OK or NG

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

6. CHECK SYMPTOM

Check again. Refer to [TM-194, "Cruise Test - Part 3"](#).

OK or NG

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

7. PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

8. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.16).

OK or NG

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

A/T Does Not Shift: 2nd gear → 1st gear

INFOID:000000001282966

SYMPTOM:

When shifted from 22 to 11 position, does not downshift from 2nd to 1st gears.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
- NO >> GO TO 2.

2. CHECK 1ST POSITION SWITCH CIRCUIT

With CONSULT-III

1. Turn ignition switch "ON".
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Read out "1 POSITION SW" switch moving selector lever to each position.

Monitor item	Condition	Display value
1 POSITION SW	When setting the selector lever to "1" position.	ON
	When setting selector lever to other positions.	OFF

Without CONSULT-III

1. Turn ignition switch "ON". (Do not start engine)
2. Check voltage between A/T device harness connector terminal and ground.

Item	Connector No.	Terminal No.	Condition	Data (Approx.)
1st position switch	M156	9 - Ground	When setting the selector lever to "1" position.	0V
			When setting selector lever to other positions.	Battery voltage

OK or NG

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

3. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

- OK >> GO TO 4.
- NG >> Refill ATF.

4. CHECK CONTROL CABLE

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

Check the control cable.

- Refer to [TM-196, "Inspection and Adjustment"](#).

OK or NG

OK >> GO TO 5.

NG >> Adjust control cable. Refer to [TM-196, "Inspection and Adjustment"](#).

5.CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

2. Check A/T fluid condition. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

OK or NG

OK >> GO TO 6.

NG >> GO TO 9.

6.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.17).

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7.CHECK SYMPTOM

Check again. Refer to [TM-194, "Cruise Test - Part 3"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 8.

8.PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).

2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

9.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.17).

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

Vehicle Does Not Decelerate By Engine Brake

INFOID:000000001282967

SYMPTOM:

No engine brake is applied when the gear is shifted from the 22 to 11.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).

NO >> GO TO 2.

2.CHECK 1ST POSITION SWITCH CIRCUIT

With CONSULT-III

1. Turn ignition switch "ON".

2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

3. Read out "1 POSITION SW" moving switch selector lever to each position.

Monitor item	Condition	Display value
1 POSITION SW	When setting the selector lever to "1" position.	ON
	When setting selector lever to other positions.	OFF

⊗ Without CONSULT-III

- Turn ignition switch "ON". (Do not start engine)
- Check voltage between A/T device harness connector terminal and ground.

Item	Connector No.	Terminal No.	Condition	Data (Approx.)
1st position switch	M156	9 - Ground	When setting the selector lever to "1" position.	0V
			When setting selector lever to other positions.	Battery voltage

OK or NG

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

3.CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [TM-180. "Checking the A/T Fluid \(ATF\)".](#)

OK or NG

- OK >> GO TO 4.
 NG >> Refill ATF.

4.CHECK CONTROL CABLE

Check the control cable.

- Refer to [TM-196. "Inspection and Adjustment".](#)

OK or NG

- OK >> GO TO 5.
 NG >> Adjust control cable. Refer to [TM-196. "Inspection and Adjustment".](#)

5.CHECK A/T FLUID CONDITION

- Remove oil pan. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2".](#)
- Check A/T fluid condition. Refer to [TM-180. "Checking the A/T Fluid \(ATF\)".](#)

OK or NG

- OK >> GO TO 6.
 NG >> GO TO 9.

6.DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152. "Symptom Chart"](#) (Symptom No.53).

OK or NG

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

7.CHECK SYMPTOM

Check again. Refer to [TM-194. "Cruise Test - Part 3".](#)

OK or NG

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

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

8. PERFORM TCM INSPECTION

1. Perform TCM input/output signals inspection. Refer to [TM-113, "TCM Terminals and Reference Values"](#).
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

9. DETECT MALFUNCTIONING ITEM

- Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [TM-152, "Symptom Chart"](#) (Symptom No.53).

OK or NG

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

Cannot Be Changed to Manual Mode

INFOID:000000001724600

SYMPTOM:

Does not change to manual mode when manual shift gate is used.

DIAGNOSTIC PROCEDURE

1. CHECK MANUAL MODE SWITCH

Check manual mode switch. Refer to [TM-98, "Diagnosis Procedure"](#).

OK or NG

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

2. CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#), [TM-42, "Diagnosis Procedure without CONSULT-III"](#).

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
- NO >> **INSPECTION END**

Symptom Chart

INFOID:000000001282756

- The diagnostics item numbers show the sequence for inspection. Inspect in order from item 1.
- Overhaul and inspect inside the A/T only if A/T fluid condition is NG. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
1		Large shock. ("N"→"D" position) Refer to TM-128 . "Large Shock ("N" to "D" Position)" .	ON vehicle	1. Engine idle speed	EC-24 (VQ), EC-496 (VK)
				2. Engine speed signal	TM-57
				3. Accelerator pedal position sensor	TM-75
				4. Control cable adjustment	TM-196
				5. ATF temperature sensor	TM-77
				6. Front brake solenoid valve	TM-88
				7. CAN communication line	TM-45
				8. Fluid level and state	TM-180
				9. Line pressure test	TM-187
				10. Control valve with TCM	TM-199
			OFF vehicle	11. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
2	Shift Shock	Shock is too large when changing D1→D2.	ON vehicle	1. Accelerator pedal position sensor	TM-75
				2. Control cable adjustment	TM-196
				3. Direct clutch solenoid valve	TM-90
				4. CAN communication line	TM-45
				5. Engine speed signal	TM-57
				6. Turbine revolution sensor	TM-52
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				8. Fluid level and state	TM-180
				9. Control valve with TCM	TM-199
			OFF vehicle	10. Direct clutch	TM-289
3		Shock is too large when changing D2→D3.	ON vehicle	1. Accelerator pedal position sensor	TM-75
				2. Control cable adjustment	TM-196
				3. High and low reverse clutch solenoid valve	TM-92
				4. CAN communication line	TM-45
				5. Engine speed signal	TM-57
				6. Turbine revolution sensor	TM-52
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				8. Fluid level and state	TM-180
				9. Control valve with TCM	TM-199
			OFF vehicle	10. High and low reverse clutch	TM-287

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
4		Shock is too large when changing D3→D4.	ON vehicle	1. Accelerator pedal position sensor	TM-75
				2. Control cable adjustment	TM-196
				3. Input clutch solenoid valve	TM-86
				4. CAN communication line	TM-45
				5. Engine speed signal	TM-57
				6. Turbine revolution sensor	TM-52
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				8. Fluid level and state	TM-180
				9. Control valve with TCM	TM-199
			OFF vehicle	10. Input clutch	TM-276
5	Shift Shock	Shock is too large when changing D4→D5.	ON vehicle	1. Accelerator pedal position sensor	TM-75
				2. Control cable adjustment	TM-196
				3. Front brake solenoid valve	TM-88
				4. CAN communication line	TM-45
				5. Engine speed signal	TM-57
				6. Turbine revolution sensor	TM-52
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				8. Fluid level and state	TM-180
				9. Control valve with TCM	TM-199
			OFF vehicle	10. Front brake (brake band)	TM-232
				11. Input clutch	TM-276
6		Shock is too large for downshift when accelerator pedal is pressed.	ON vehicle	1. Accelerator pedal position sensor	TM-75
				2. Control cable adjustment	TM-196
				3. CAN communication line	TM-45
				4. Engine speed signal	TM-57
				5. Turbine revolution sensor	TM-52
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				7. Fluid level and state	TM-180
				8. Control valve with TCM	TM-199
			OFF vehicle	9. Front brake (brake band)	TM-232
				10. Input clutch	TM-276
				11. High and low reverse clutch	TM-287
				12. Direct clutch	TM-289

SYSTEM SYMPTOM

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
7		Shock is too large for upshift when accelerator pedal is released.	ON vehicle	1. Accelerator pedal position sensor	TM-75
				2. Control cable adjustment	TM-196
				3. Engine speed signal	TM-57
				4. CAN communication line	TM-45
				5. Turbine revolution sensor	TM-52
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				7. Fluid level and state	TM-180
				8. Control valve with TCM	TM-199
			OFF vehicle	9. Front brake (brake band)	TM-232
				10. Input clutch	TM-276
				11. High and low reverse clutch	TM-287
				12. Direct clutch	TM-289
8	Shift Shock	Shock is too large for lock-up.	ON vehicle	1. Accelerator pedal position sensor	TM-75
				2. Control cable adjustment	TM-196
				3. Engine speed signal	TM-57
				4. CAN communication line	TM-45
				5. Turbine revolution sensor	TM-52
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				7. Torque converter clutch solenoid valve	TM-69
				8. Fluid level and state	TM-180
				9. Control valve with TCM	TM-199
			OFF vehicle	10. Torque converter	TM-253
9		Shock is too large during engine brake.	ON vehicle	1. Accelerator pedal position sensor	TM-75
				2. Control cable adjustment	TM-196
				3. CAN communication line	TM-45
				4. Fluid level and state	TM-180
				5. Control valve with TCM	TM-199
			OFF vehicle	6. Front brake (brake band)	TM-232
				7. Input clutch	TM-276
				8. High and low reverse clutch	TM-287
				9. Direct clutch	TM-289

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SYSTEM SYMPTOM

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
10		Gear does not change from D1 → D2. Refer to TM-135, "A/T Does Not Shift: D1→D2" .	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				3. Direct clutch solenoid valve	TM-90
				4. Line pressure test	TM-187
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Direct clutch	TM-289
11		Gear does not change from D2 → D3. Refer to TM-137, "A/T Does Not Shift: D2→D3" .	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				3. High and low reverse clutch solenoid valve	TM-92
				4. Line pressure test	TM-187
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. High and low reverse clutch	TM-287
12	No Up Shift	Gear does not change from D3 → D4. Refer to TM-138, "A/T Does Not Shift: D3→D4" .	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				3. Input clutch solenoid valve	TM-86
				4. Front brake solenoid valve	TM-88
				5. Line pressure test	TM-187
				6. CAN communication line	TM-45
				7. Control valve with TCM	TM-199
OFF vehicle	8. Input clutch	TM-276			
13		Gear does not change from D4 → D5. Refer to TM-140, "A/T Does Not Shift: D4→D5" .	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				3. Front brake solenoid valve	TM-88
				4. Direct clutch solenoid valve	TM-90
				5. Turbine revolution sensor	TM-52
				6. Line pressure test	TM-187
				7. CAN communication line	TM-45
				8. Control valve with TCM	TM-199
			OFF vehicle	9. Front brake (brake band)	TM-253
			10. Input clutch	TM-276	

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
14	No Down Shift	In "D" range, does not downshift to 4th gear. Refer to TM-145 , " A/T Does Not Shift: 5th gear → 4th gear ".	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Front brake solenoid valve	TM-88
				4. Direct clutch solenoid valve	TM-90
				5. CAN communication line	TM-45
				6. Line pressure test	TM-187
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Front brake (brake band)	TM-253
				9. Input clutch	TM-276
15	No Down Shift	In "D", "3" or "M" range, does not downshift to 3rd gear. Refer to TM-147 , " A/T Does Not Shift: 4th gear → 3rd gear ".	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Input clutch solenoid valve	TM-86
				4. Front brake solenoid valve	TM-88
				5. CAN communication line	TM-45
				6. Line pressure test	TM-187
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Input clutch	TM-276
16	No Down Shift	In "D", "2" or "M" range, does not downshift to 2nd gear. Refer to TM-148 , " A/T Does Not Shift: 3rd gear → 2nd gear ".	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. High and low reverse clutch solenoid valve	TM-92
				4. CAN communication line	TM-45
				5. Line pressure test	TM-187
				6. Control valve with TCM	TM-199
			OFF vehicle	7. High and low reverse clutch	TM-287
17	No Down Shift	In "D", "1" or "M" range, does not downshift to 1st gear. Refer to TM-149 , " A/T Does Not Shift: 2nd gear → 1st gear ".	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Direct clutch solenoid valve	TM-90
				4. CAN communication line	TM-45
				5. Line pressure test	TM-187
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Direct clutch	TM-289

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
18	Slips/Will Not engage	When "D" or "M" position, remains in 1st gear.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Direct clutch solenoid valve	TM-90
				4. Line pressure test	TM-187
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. 3rd one-way clutch	TM-274
				8. 1st one-way clutch	TM-232
				9. Gear system	TM-232
				10. Reverse brake	TM-253
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
19		When "D" or "M" position, remains in 2nd gear.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Low coast brake solenoid valve	TM-94
				4. Line pressure test	TM-187
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. 3rd one-way clutch	TM-274
				8. Gear system	TM-232
				9. Direct clutch	TM-289
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253

SYSTEM SYMPTOM

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
20		When "D" or "M" position, remains in 3rd gear.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Line pressure test	TM-187
				4. CAN communication line	TM-45
				5. Control valve with TCM	TM-199
			OFF vehicle	6. 3rd one-way clutch	TM-274
				7. Gear system	TM-232
				8. High and low reverse clutch	TM-287
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
21	Slips/Will Not engage	When "D" or "M" position, remains in 4th gear.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Input clutch solenoid valve	TM-86
				4. Direct clutch solenoid valve	TM-90
				5. High and low reverse clutch solenoid valve	TM-92
				6. Low coast brake solenoid valve	TM-94
				7. Front brake solenoid valve	TM-88
				8. Line pressure test	TM-187
				9. CAN communication line	TM-45
				10. Control valve with TCM	TM-199
			OFF vehicle	11. Input clutch	TM-276
				12. Gear system	TM-232
				13. High and low reverse clutch	TM-287
				14. Direct clutch	TM-289

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
22		When "D" or "M" position, remains in 5th gear.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Front brake solenoid valve	TM-88
				4. Line pressure test	TM-187
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Front brake (brake band)	TM-253
				8. Input clutch	TM-276
				9. Gear system	TM-232
				10. High and low reverse clutch	TM-287
23	Slips/Will Not Engage	Vehicle cannot be started from D1. Refer to TM-134 , " Vehicle Cannot Be Started from D1 ".	ON vehicle	1. Fluid level and state	TM-180
				2. Accelerator pedal position sensor	TM-75
				3. Line pressure test	TM-187
				4. CAN communication line	TM-45
				5. Control valve with TCM	TM-199
			OFF vehicle	6. Torque converter	TM-253
				7. Oil pump assembly	TM-271
				8. 3rd one-way clutch	TM-274
				9. 1st one-way clutch	TM-232
				10. Gear system	TM-232
				11. Reverse brake	TM-253
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
24		Does not lock-up. Refer to TM-142 , " A/T Does Not Perform Lock-up ".	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Engine speed signal	TM-57
				4. Turbine revolution sensor	TM-52
				5. Torque converter clutch solenoid valve	TM-69
				6. CAN communication line	TM-45
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Torque converter	TM-253
				9. Oil pump assembly	TM-271

SYSTEM SYMPTOM

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page	
25	Slips/Will Not engage	Does not hold lock-up condition. Refer to TM-143 , " A/T Does Not Hold Lock-up Condition ".	ON vehicle	1. Fluid level and state	TM-180	
				2. Line pressure test	TM-187	
				3. Engine speed signal	TM-57	
				4. Turbine revolution sensor	TM-52	
				5. Torque converter clutch solenoid valve	TM-69	
				6. CAN communication line	TM-45	
				7. Control valve with TCM	TM-199	
			OFF vehicle	8. Torque converter	TM-253	
				9. Oil pump assembly	TM-271	
26		Slips/Will Not engage	Lock-up is not released. Refer to TM-144 , " Lock-up Is Not Released ".	ON vehicle	1. Fluid level and state	TM-180
					2. Line pressure test	TM-187
					3. Engine speed signal	TM-57
					4. Turbine revolution sensor	TM-52
					5. Torque converter clutch solenoid valve	TM-69
					6. CAN communication line	TM-45
					7. Control valve with TCM	TM-199
				OFF vehicle	8. Torque converter	TM-253
					9. Oil pump assembly	TM-271
27	Slips/Will Not engage		No shock at all or the clutch slips when vehicle changes speed D1 → D2, 11 → 22 or M → M	ON vehicle	1. Fluid level and state	TM-180
					2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
					3. Direct clutch solenoid valve	TM-90
					4. CAN communication line	TM-45
					5. Line pressure test	TM-187
					6. Control valve with TCM	TM-199
				OFF vehicle	7. Torque converter	TM-253
					8. Oil pump assembly	TM-271
					9. 3rd one-way clutch	TM-274
		10. Gear system			TM-232	
		11. Direct clutch			TM-289	
		12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)			TM-253	

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
28	Slips/Will Not engage	No shock at all or the clutch slips when vehicle changes speed D2 → D3, 22 → 33 or M2 → M3.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. High and low reverse clutch solenoid valve	TM-92
				4. CAN communication line	TM-45
				5. Line pressure test	TM-187
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Torque converter	TM-253
				8. Oil pump assembly	TM-271
				9. 3rd one-way clutch	TM-274
				10. Gear system	TM-232
				11. High and low reverse clutch	TM-287
				12. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
29		No shock at all or the clutch slips when vehicle changes speed D3 → D4, 33 → D4 or M3 → M4.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Input clutch solenoid valve	TM-86
				4. Front brake solenoid valve	TM-88
				5. CAN communication line	TM-45
				6. Line pressure test	TM-187
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Torque converter	TM-253
				9. Oil pump assembly	TM-271
				10. Input clutch	TM-276
				11. Gear system	TM-232
				12. High and low reverse clutch	TM-287
				13. Direct clutch	TM-289

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
30	Slips/Will Not engage	No shock at all or the clutch slips when vehicle changes speed D4 → D5, or M4 → M5.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Front brake solenoid valve	TM-88
				4. Direct clutch solenoid valve	TM-90
				5. CAN communication line	TM-45
				6. Line pressure test	TM-187
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Torque converter	TM-253
				9. Oil pump assembly	TM-271
				10. Front brake (brake band)	TM-253
				11. Input clutch	TM-276
				12. Gear system	TM-232
				13. High and low reverse clutch	TM-287
31	Slips/Will Not engage	When you press the accelerator pedal and shift speed D5 → D4, or M5 → M4. the engine idles or the transmission slips.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Front brake solenoid valve	TM-88
				4. Direct clutch solenoid valve	TM-90
				5. CAN communication line	TM-45
				6. Line pressure test	TM-187
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Torque converter	TM-253
				9. Oil pump assembly	TM-271
				10. Input clutch	TM-276
				11. Gear system	TM-232
				12. High and low reverse clutch	TM-287
				13. Direct clutch	TM-289

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
32	Slips/Will Not engage	When you press the accelerator pedal and shift speed D4→ D3, D4→ 33 OR M4 → M3 the engine idles or the transmission slips.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Input clutch solenoid valve	TM-86
				4. Front brake solenoid valve	TM-88
				5. CAN communication line	TM-45
				6. Line pressure test	TM-187
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Torque converter	TM-253
				9. Oil pump assembly	TM-271
				10. 3rd one-way clutch	TM-274
				11. Gear system	TM-232
				12. High and low reverse clutch	TM-287
				13. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
33		When you press the accelerator pedal and shift speed D3→ D2, 33→ 22 OR M3 → M2 the engine idles or the transmission slips.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. High and low reverse clutch solenoid valve	TM-92
				4. Direct clutch solenoid valve	TM-90
				5. CAN communication line	TM-45
				6. Line pressure test	TM-187
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Torque converter	TM-253
				9. Oil pump assembly	TM-271
				10. 3rd one-way clutch	TM-274
				11. Gear system	TM-232
				12. Direct clutch	TM-289
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
34	Slips/Will Not Engage	When you press the accelerator pedal and shift speed D2→ D1, 22→ 11 OR M2 → M1 the engine idles or the transmission slips.	ON vehicle	1. Fluid level and state	TM-180
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				3. Direct clutch solenoid valve	TM-90
				4. CAN communication line	TM-45
				5. Line pressure test	TM-187
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Torque converter	TM-253
				8. Oil pump assembly	TM-271
				9. 3rd one-way clutch	TM-274
				10. 1st one-way clutch	TM-232
				11. Gear system	TM-232
				12. Reverse brake	TM-253
				13. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
35		With selector lever in "D" position, acceleration is extremely poor.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Accelerator pedal position sensor	TM-75
				4. CAN communication line	TM-45
				5. PNP switch	TM-50
				6. Control cable adjustment	TM-196
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Torque converter	TM-253
				9. Oil pump assembly	TM-271
				10. 1st one-way clutch	TM-232
				11. Gear system	TM-232
				12. Reverse brake	TM-253
				13. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
36		With selector lever in "R" position, acceleration is extremely poor.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Accelerator pedal position sensor	TM-75
				4. High and low reverse clutch solenoid valve	TM-92
				5. CAN communication line	TM-45
				6. PNP switch	TM-50
				7. Control cable adjustment	TM-196
				8. Control valve with TCM	TM-199
			OFF vehicle	9. Gear system	TM-232
				10. Output shaft	TM-253
				11. Reverse brake	TM-253
37	Slips/Will Not Engage	While starting off by accelerating in 1st, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Accelerator pedal position sensor	TM-75
				4. CAN communication line	TM-45
				5. Control valve with TCM	TM-199
			OFF vehicle	6. Torque converter	TM-253
				7. Oil pump assembly	TM-271
				8. 3rd one-way clutch	TM-274
				9. 1st one-way clutch	TM-232
				10. Gear system	TM-232
				11. Reverse brake	TM-253
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
38		While accelerating in 2nd, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Accelerator pedal position sensor	TM-75
				4. CAN communication line	TM-45
				5. Direct clutch solenoid valve	TM-90
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Torque converter	TM-253
				8. Oil pump assembly	TM-271
				9. 3rd one-way clutch	TM-274
				10. Gear system	TM-232
				11. Direct clutch	TM-289
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
39	Slips/Will Not Engage	While accelerating in 3rd, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Accelerator pedal position sensor	TM-75
				4. CAN communication line	TM-45
				5. High and low reverse clutch solenoid valve	TM-92
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Torque converter	TM-253
				8. Oil pump assembly	TM-271
				9. 3rd one-way clutch	TM-274
				10. Gear system	TM-232
				11. High and low reverse clutch	TM-287
				12. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
40		While accelerating in 4th, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Accelerator pedal position sensor	TM-75
				4. CAN communication line	TM-45
				5. Input clutch solenoid valve	TM-86
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Torque converter	TM-253
				8. Oil pump assembly	TM-271
				9. Input clutch	TM-276
				10. Gear system	TM-232
				11. High and low reverse clutch	TM-287
				12. Direct clutch	TM-289

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
41		While accelerating in 5th, engine races or slippage occurs.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Accelerator pedal position sensor	TM-75
				4. CAN communication line	TM-45
				5. Front brake solenoid valve	TM-88
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Torque converter	TM-253
				8. Oil pump assembly	TM-271
				9. Front brake (brake band)	TM-253
				10. Input clutch	TM-276
				11. Gear system	TM-232
				12. High and low reverse clutch	TM-287
42	Slips/Will Not Engage	Slips at lock-up.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Engine speed signal	TM-57
				4. Turbine revolution sensor	TM-52
				5. Torque converter clutch solenoid valve	TM-69
				6. CAN communication line	TM-45
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Torque converter	TM-253
				9. Oil pump assembly	TM-271
43		No creep at all. Refer to TM-130 . " Vehicle Does Not Creep Backward in "R" Position ", TM-132 . " Vehicle Does Not Creep Forward in "D" Position "	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Accelerator pedal position sensor	TM-75
				4. Direct clutch solenoid valve	TM-90
				5. PNP switch	TM-50
				6. CAN communication line	TM-45
				7. Control cable adjustment	TM-196
				8. Control valve with TCM	TM-199
			OFF vehicle	9. Torque converter	TM-253
				10. Oil pump assembly	TM-271
				11. 1st one-way clutch	TM-232
				12. Gear system	TM-232
				13. Reverse brake	TM-253
				14. Direct clutch	TM-289
				15. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
				16. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
44		Vehicle cannot run in all positions.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. PNP switch	TM-50
				4. Control cable adjustment	TM-196
				5. Control valve with TCM	TM-199
			OFF vehicle	6. Oil pump assembly	TM-271
				7. Gear system	TM-232
				8. Output shaft	TM-253
45	Slips/Will Not Engage	With selector lever in "D" position, driving is not possible.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. PNP switch	TM-50
				4. Control cable adjustment	TM-196
				5. Control valve with TCM	TM-199
			OFF vehicle	6. Torque converter	TM-253
				7. Oil pump assembly	TM-271
				8. 1st one-way clutch	TM-232
				9. Gear system	TM-232
				10. Reverse brake	TM-253
				11. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
46		With selector lever in "R" position, driving is not possible.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. PNP switch	TM-50
				4. Control cable adjustment	TM-196
				5. Control valve with TCM	TM-199
			OFF vehicle	6. Gear system	TM-232
				7. Output shaft	TM-253
				8. Reverse brake	TM-253
47	Does not change	Does not change M5 → M4 Refer to TM-145 . "A/T Does Not Shift: 5th gear → 4th gear".	ON vehicle	1. PNP switch	TM-50
				2. Fluid level and state	TM-180
				3. A/T position	TM-196
				4. Manual mode switch	TM-98
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Front brake (brake band)	TM-253

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
48		Does not change M4 → M3. Refer to TM-147 . "A/T Does Not Shift: 4th gear → 3rd gear".	ON vehicle	1. PNP switch	TM-50
				2. Fluid level and state	TM-180
				3. Control cable adjustment	TM-196
				4. Manual mode switch	TM-98
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Front brake (brake band)	TM-253
				8. Input clutch	TM-276
49	Does not change	Does not change M3 → M2. Refer to TM-148 . "A/T Does Not Shift: 3rd gear → 2nd gear".	ON vehicle	1. PNP switch	TM-50
				2. Fluid level and state	TM-180
				3. Control cable adjustment	TM-196
				4. Manual mode switch	TM-98
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Front brake (brake band)	TM-253
				8. Input clutch	TM-276
50		Does not change M2 → M1. Refer to TM-149 . "A/T Does Not Shift: 2nd gear → 1st gear".	ON vehicle	1. PNP switch	TM-50
				2. Fluid level and state	TM-180
				3. Control cable adjustment	TM-196
				4. Manual mode switch	TM-98
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Input clutch	TM-276
				8. High and low reverse clutch	TM-287
				9. Direct clutch	TM-289
51		Cannot be changed to manual mode. Refer to TM-98 . "Diagnosis Procedure".	ON vehicle	1. Manual mode switch	TM-98
				2. Turbine revolution sensor	TM-52
				3. CAN communication line	TM-45
52	Others	Shift point is high in "D" position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				2. Accelerator pedal position sensor	TM-75
				3. CAN communication line	TM-45
				4. ATF temperature sensor	TM-77
				5. Control valve with TCM	TM-199

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
53		Shift point is low in "D" position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
				2. Accelerator pedal position sensor	TM-75
				3. CAN communication line	TM-45
				4. Control valve with TCM	TM-199
54		Judder occurs during lock-up.	ON vehicle	1. Fluid level and state	TM-180
				2. Engine speed signal	TM-57
				3. Turbine revolution sensor	TM-52
				4. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54 , TM-80
			OFF vehicle	5. Accelerator pedal position sensor	TM-75
				6. CAN communication line	TM-45
				7. Torque converter clutch solenoid valve	TM-69
				8. Control valve with TCM	TM-199
55	Others	Strange noise in "R" position.	ON vehicle	1. Fluid level and state	TM-180
				2. Engine speed signal	TM-57
				3. CAN communication line	TM-45
				4. Control valve with TCM	TM-199
			OFF vehicle	5. Torque converter	TM-253
				6. Oil pump assembly	TM-271
				7. Gear system	TM-232
				8. High and low reverse clutch	TM-287
				9. Reverse brake	TM-253
56		Strange noise in "N" position.	ON vehicle	1. Fluid level and state	TM-180
				2. Engine speed signal	TM-57
				3. CAN communication line	TM-45
				4. Control valve with TCM	TM-199
			OFF vehicle	5. Torque converter	TM-253
				6. Oil pump assembly	TM-271
				7. Gear system	TM-232
57		Strange noise in "D" position.	ON vehicle	1. Fluid level and state	TM-180
				2. Engine speed signal	TM-57
				3. CAN communication line	TM-45
				4. Control valve with TCM	TM-199
			OFF vehicle	5. Torque converter	TM-253
				6. Oil pump assembly	TM-271
				7. Gear system	TM-232
				8. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page				
58		Vehicle does not decelerate by engine brake. Refer to TM-150, "Vehicle Does Not Decelerate By Engine Brake" .	ON vehicle	1. PNP switch	TM-50				
				2. Fluid level and state	TM-180				
				3. Control cable adjustment	TM-196				
				4. 1st position switch	TM-150				
				6. CAN communication line	TM-45				
			OFF vehicle	7. Control valve with TCM	TM-199				
				8. Input clutch	TM-276				
				9. High and low reverse clutch	TM-287				
				10. Direct clutch	TM-289				
				59	Others	Engine brake does not operate in "2" position.	ON vehicle	1. PNP switch	TM-50
2. Fluid level and state	TM-180								
3. Control cable adjustment	TM-196								
6. CAN communication line	TM-45								
7. Control valve with TCM	TM-199								
OFF vehicle	8. Front brake (brake band)	TM-253							
	9. Input clutch	TM-276							
	10. High and low reverse clutch	TM-287							
	60	Others	Engine brake does not operate in "1" position.				ON vehicle	1. PNP switch	TM-50
								2. Fluid level and state	TM-180
3. Control cable adjustment				TM-196					
4. 1st position switch				TM-150					
6. CAN communication line				TM-45					
OFF vehicle				7. Control valve with TCM	TM-199				
				8. Input clutch	TM-276				
				9. High and low reverse clutch	TM-287				
				10. Direct clutch	TM-289				
				61	Others	Engine brake does not work M5 → M4.	ON vehicle	1. PNP switch	TM-50
2. Fluid level and state	TM-180								
3. Control cable adjustment	TM-196								
4. Manual mode switch	TM-98								
5. CAN communication line	TM-45								
6. Control valve with TCM	TM-199								
OFF vehicle	7. Front brake (brake band)	TM-253							
	8. Input clutch	TM-276							

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page	
62	Others	Engine brake does not work M4 → M3.	ON vehicle	1. PNP switch	TM-50	
				2. Fluid level and state	TM-180	
				3. Control cable adjustment	TM-196	
				4. Manual mode switch	TM-98	
				5. CAN communication line	TM-45	
				6. Control valve with TCM	TM-199	
			OFF vehicle	7. Front brake (brake band)	TM-253	
				8. Input clutch	TM-276	
63		Others	Engine brake does not work M3 → M2.	ON vehicle	1. PNP switch	TM-50
					2. Fluid level and state	TM-180
					3. Control cable adjustment	TM-196
					4. Manual mode switch	TM-98
					5. CAN communication line	TM-45
					6. Control valve with TCM	TM-199
				OFF vehicle	7. Front brake (brake band)	TM-253
					8. Input clutch	TM-276
	9. High and low reverse clutch				TM-287	
64	Others		Engine brake does not work M2 → M1.	ON vehicle	1. PNP switch	TM-50
					2. Fluid level and state	TM-180
					3. Control cable adjustment	TM-196
					4. Manual mode switch	TM-98
					5. CAN communication line	TM-45
					6. Control valve with TCM	TM-199
				OFF vehicle	7. Input clutch	TM-276
					8. High and low reverse clutch	TM-287
					9. Direct clutch	TM-289

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65		Maximum speed low.	ON vehicle	1. Fluid level and state	TM-180
				2. Line pressure test	TM-187
				3. Accelerator pedal position sensor	TM-75
				4. CAN communication line	TM-45
				5. Direct clutch solenoid valve	TM-90
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Torque converter	TM-253
				8. Oil pump assembly	TM-271
				9. Input clutch	TM-276
				10. Gear system	TM-232
				11. High and low reverse clutch	TM-287
				12. Direct clutch	TM-289
				13. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
				14 Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9 .)	TM-253
66	Others	Extremely large creep.	ON vehicle	1. Engine idle speed	EC-24 (VQ), EC-496 (VK)
				2. CAN communication line	TM-45
			OFF vehicle	3. Torque converter	TM-253
			67		With selector lever in "P" position, vehicle does not enter parking condition or, with selector lever in another position, parking condition is not cancelled. Refer to TM-127 , " In "P" Position, Vehicle Moves When Pushed ".
2. Control cable adjustment	TM-196				
OFF vehicle	3. Parking pawl components	TM-232			
68		Vehicle runs with transmission in "P" position.			
			2. Fluid level and state	TM-180	
			3. Control cable adjustment	TM-196	
			4. Control valve with TCM	TM-199	
			5. Parking pawl components	TM-232	
			OFF vehicle	6. Gear system	TM-232

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
69		Vehicle runs with transmission in "N" position. Refer to TM-128, "In "N" Position, Vehicle Moves" .	ON vehicle	1. PNP switch	TM-50
				2. Fluid level and state	TM-180
				3. Control cable adjustment	TM-196
				4. Control valve with TCM	TM-199
			OFF vehicle	5. Input clutch	TM-276
				6. Gear system	TM-232
				7. Direct clutch	TM-289
				8. Reverse brake	TM-253
				9. Forward one- way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to TM-9.)	TM-253
70		Engine does not start in "N" or "P" position. Refer to TM-127, "Engine Cannot Be Started in "P" or "N" Position" .	ON vehicle	1. Ignition switch and starter	PG-7, STR-7
				2. Control cable adjustment	TM-196
				3. PNP switch	TM-50
71	Others	Engine starts in positions other than "N" or "P".	ON vehicle	1. Ignition switch and starter	PG-7, STR-7
				2. Control cable adjustment	TM-196
				3. PNP switch	TM-50
72		Engine stall.	ON vehicle	1. Fluid level and state	TM-180
				2. Engine speed signal	TM-57
				3. Turbine revolution sensor	TM-52
				4. Torque converter clutch solenoid valve	TM-69
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Torque converter	TM-253
73		Engine stalls when select lever shifted "N" → "D", "R".	ON vehicle	1. Fluid level and state	TM-180
				2. Engine speed signal	TM-57
				3. Turbine revolution sensor	TM-52
				4. Torque converter clutch solenoid valve	TM-69
				5. CAN communication line	TM-45
				6. Control valve with TCM	TM-199
			OFF vehicle	7. Torque converter	TM-253
74	Others	Engine speed does not return to idle. Refer to TM-144, "Engine Speed Does Not Return to Idle" .	ON vehicle	1. Fluid level and state	TM-180
				2. Direct clutch solenoid valve	TM-90
				3. Front brake solenoid valve	TM-88
				4. Accelerator pedal position sensor	TM-75
				5. Vehicle speed sensor A/T and vehicle speed sensor MTR	TM-54, TM-80
				6. CAN communication line	TM-45
				7. Control valve with TCM	TM-199
			OFF vehicle	8. Front brake (brake band)	TM-253
				9. Direct clutch	TM-289

PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000001282719

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

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

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

INFOID:000000001282720

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

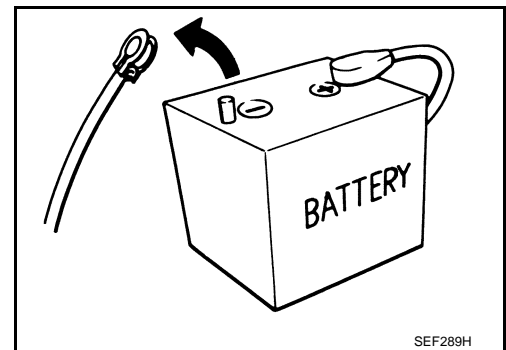
CAUTION:

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

Precaution

INFOID:000000001282721

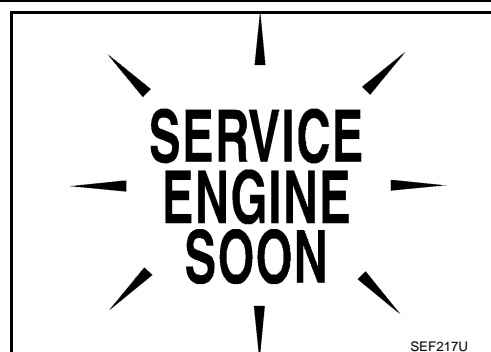
- Before connecting or disconnecting the A/T assembly harness connector, turn ignition switch "OFF" and disconnect negative battery cable. Because battery voltage is applied to TCM even if ignition switch is turned "OFF".



PRECAUTIONS

< PRECAUTION >

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



- Always use the specified brand of ATF. Refer to [MA-10. "Fluids and Lubricants"](#).
- Use lint-free paper not cloth rags during work.
- After replacing the ATF, dispose of the waste oil using the methods prescribed by law, ordinance, etc.
- Before proceeding with disassembly, thoroughly clean the outside of the transmission. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free paper or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transmission.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the transmission is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Clean or replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to [TM-177. "Service Notice or Precaution"](#).
- After overhaul, refill the transmission with new ATF.
- When the A/T drain plug is removed, only some of the fluid is drained. Old A/T fluid will remain in torque converter and ATF cooling system.
Always follow the procedures under “Changing A/T Fluid” in the AT section when changing A/T fluid. Refer to [TM-182. "Changing the A/T Fluid \(ATF\)"](#), [TM-180. "Checking the A/T Fluid \(ATF\)"](#).

Service Notice or Precaution

INFOID:000000001282722

ATF COOLER SERVICE

If A/T fluid contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T 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-183. "A/T Fluid Cooler Cleaning"](#). For radiator replacement, refer to [CO-16. "Removal and Installation"](#) (VQ40DE), [CO-43. "Removal and Installation"](#) (VK56DE).

OBD-II SELF-DIAGNOSIS

- A/T self-diagnosis is performed by the TCM in combination with the ECM. Refer to the table on [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#) for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MIL are automatically stored in both the ECM and TCM memories.

Always perform the procedure on [TM-33. "OBD-II Diagnostic Trouble Code \(DTC\)"](#) to complete the repair and avoid unnecessary blinking of the MIL.

For details of OBD-II, refer to [EC-53. "Introduction"](#) (VQ40DE), [EC-521. "Introduction"](#) (VK56DE).

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

PREPARATION

< PREPARATION >

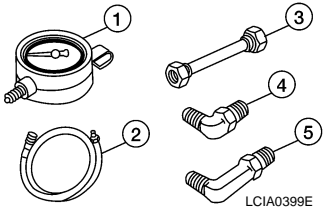
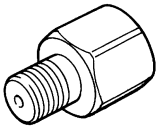
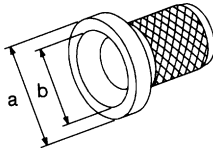
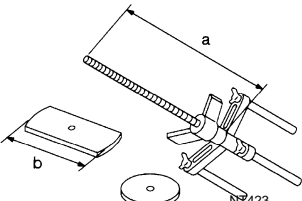
PREPARATION

PREPARATION

Special Service Tool

INFOID:000000001282723

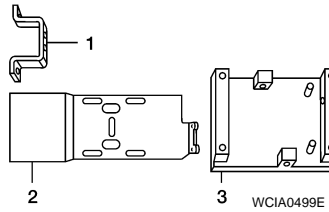
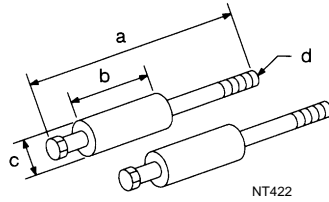
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST2505S001 (J-34301-C) Oil pressure gauge set 1 ST25051001 (—) Oil pressure gauge 2 ST25052000 (—) Hose 3 ST25053000 (—) Joint pipe 4 ST25054000 (—) Adapter 5 ST25055000 (—) Adapter	Measuring line pressure 
KV31103600 (J-45674) Joint pipe adapter (With ST25054000)	Measuring line pressure 
ST33400001 (J-26082) Drift	<ul style="list-style-type: none"> • Installing rear oil seal (2WD models) • Installing oil pump housing oil seal a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia. 
KV31102400 (J-34285 and J-34285-87) Clutch spring compressor	Installing reverse brake return spring retainer a: 320 mm (12.60 in) b: 174 mm (6.85 in) 

PREPARATION

< PREPARATION >

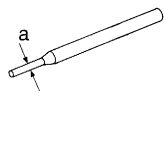
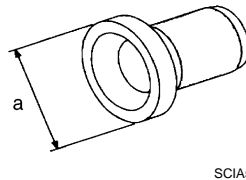
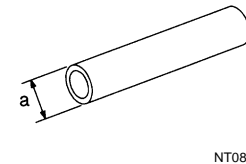
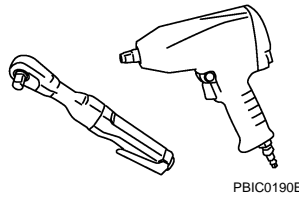
Tool number (Kent-Moore No.) Tool name	Description
ST25850000 (J-25721-A) Sliding hammer	Remove oil pump assembly a: 179 mm (7.05 in) b: 70 mm (2.76 in) c: 40 mm (1.57 in) d: M12X1.75P
— (J-47002) Transmission jack adapter kit 1. — (J-47002-1) Center bracket 2. — (J-47002-3) Adapter plate 3. — (J-47002-4) Adapter block	Assist in removal of transmission and transfer case as one assembly using only one transmission jack.



Commercial Service Tool

INFOID:000000001282724

Tool name	Description
Power tool	Loosening bolts and nuts
Drift	Installing manual shaft seals a: 22 mm (0.87 in) dia.
Drift	Installing rear oil seal (4WD models) a: 64 mm (2.52 in) dia.
Pin punch	<ul style="list-style-type: none"> • Removing retaining pin • Installing retaining pin a: 4 mm (0.16 in) dia.



A/T FLUID

< ON-VEHICLE MAINTENANCE >

ON-VEHICLE MAINTENANCE

A/T FLUID

Checking the A/T Fluid (ATF)

INFOID:000000001282725

CAUTION:

If using the vehicle for towing, the A/T fluid must be replaced as specified. Refer to [MA-6, "Introduction of Periodic Maintenance"](#).

1. Before driving, the A/T fluid level can be checked at A/T fluid temperatures of 30° to 50° C (86° to 122° F) using the "COLD" range on the A/T fluid level gauge as follows:
 - a. Park the vehicle on a level surface and set the parking brake.
 - b. Start the engine and move the selector lever through each gear position. Shift the selector lever into the "P" position.
 - c. Check the A/T fluid level with the engine idling.
 - d. Remove the A/T fluid level gauge and wipe it clean with a lint-free paper.

CAUTION:

When wiping the A/T fluid from the A/T fluid level gauge, always use a lint-free paper, not a cloth.

- e. Re-insert the A/T fluid level gauge into the A/T fluid charging pipe until the cap contacts the top of the A/T fluid charging pipe as shown.

CAUTION:

To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the top of the A/T fluid charging pipe, with the gauge reversed from the normal inserted position.

- f. Remove the A/T fluid level gauge and note the A/T fluid level. If the A/T fluid level is at low side of range, add A/T fluid to the transmission through the A/T fluid charging pipe.

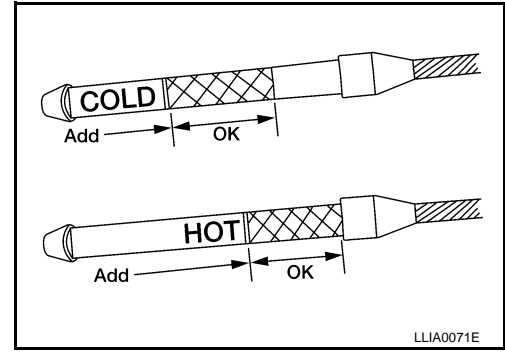
CAUTION:

Do not overfill the transmission with A/T fluid.

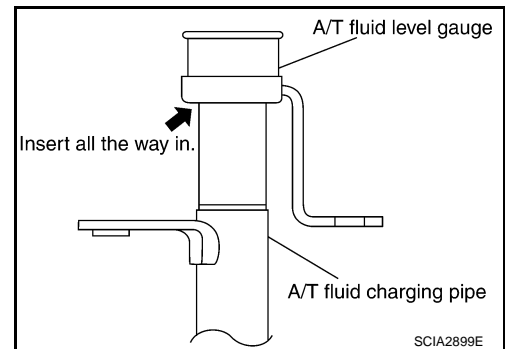
- g. Install the A/T fluid level gauge and the A/T fluid level gauge bolt.

A/T fluid level gauge bolt : Refer to [TM-224, "2WD : Exploded View"](#) (2WD) or [TM-228, "4WD : Exploded View"](#) (4WD).

2. Warm up the engine and transmission.
3. Check for any A/T fluid leaks.
4. Drive the vehicle to increase the A/T fluid temperature to 80° C (176° F).



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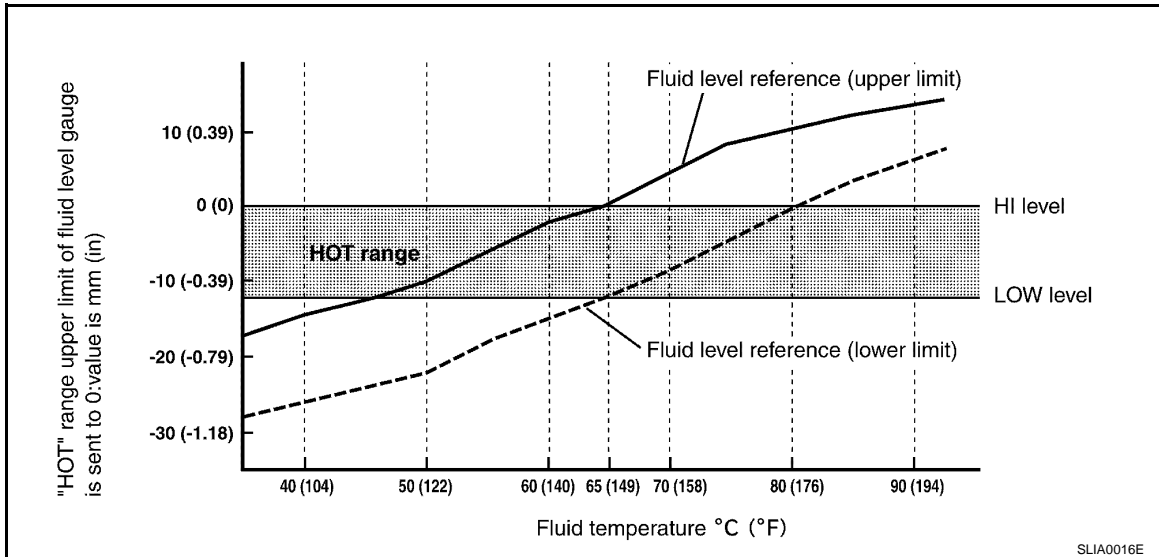


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A/T FLUID

< ON-VEHICLE MAINTENANCE >

- Allow the A/T fluid temperature to fall to approximately 65°C (149°F). Use the CONSULT-II to monitor the A/T fluid temperature as follows:



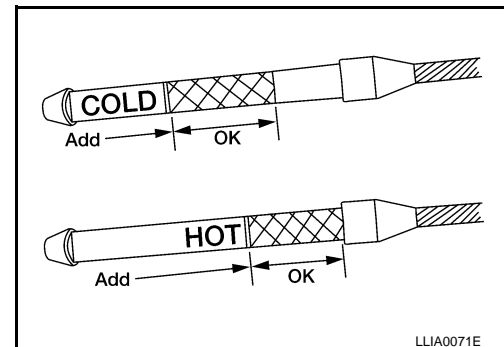
NOTE:

The A/T fluid level will be significantly affected by the A/T fluid temperature as shown. Therefore monitor the A/T fluid temperature data using the CONSULT-II.

- Connect CONSULT-II to data link connector.
 - Select "MAIN SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
 - Read out the value of "ATF TEMP 1".
- Re-check the A/T fluid level at A/T fluid temperatures of approximately 65°C (149°F) using the "HOT" range on the A/T fluid level gauge as shown. The HOT range is between 50° - 80° C (122° - 176° F).

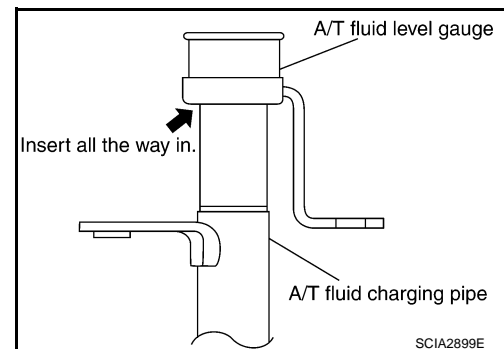
CAUTION:

- When wiping the A/T fluid from the A/T fluid level gauge, always use lint-free paper, not a cloth.



- To check the A/T fluid level, insert the A/T fluid level gauge until the cap contacts the top of the A/T fluid charging pipe, with the gauge reversed from the normal inserted position as shown.

- Check the A/T fluid condition.
 - If the A/T fluid is very dark or has some burned smell, there may be an internal problem with the transmission. Refer to [TM-114](#). Flush the transmission cooling system after repairing the transmission.
 - If the A/T fluid contains frictional material (clutches, bands, etc.), replace the radiator and flush the transmission cooler lines using cleaning solvent and compressed air after repairing the transmission.
- Install the A/T fluid level gauge in the A/T fluid charging pipe.
- Tighten the A/T fluid level gauge bolt to specification.



A/T fluid level gauge bolt : Refer to [TM-224, "2WD : Exploded View" \(2WD\)](#) or [TM-228, "4WD : Exploded View" \(4WD\)](#).

A/T FLUID

< ON-VEHICLE MAINTENANCE >

Changing the A/T Fluid (ATF)

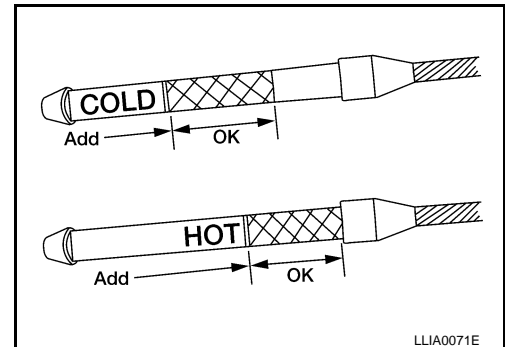
INFOID:000000001282726

CAUTION:

If using the vehicle for towing, the A/T fluid must be replaced as specified. Refer to [MA-6, "Introduction of Periodic Maintenance"](#).

1. Drive the vehicle to warm up the A/T fluid to approximately 80° C (176° F).
2. Stop the engine.
3. Remove the A/T fluid level gauge.
4. Drain the A/T fluid from the drain plug hole, then install the drain plug with a new gasket. Refill the transmission with new A/T fluid. Always refill with the same volume as the drained A/T fluid. Use the A/T fluid level gauge to check the A/T fluid level as shown. Add A/T fluid as necessary.

Drain plug : Refer to [TM-197, "Removal and Installation"](#).



- To flush out the old A/T fluid from the transmission oil coolers, pour new A/T fluid into the A/T fluid charging pipe with the engine idling and at the same time drain the old A/T fluid from the auxiliary transmission oil cooler hose return line.
- When the color of the A/T fluid coming out of the auxiliary transmission oil cooler hose return line is about the same as the color of the new A/T fluid, flushing out the old A/T fluid is complete. The amount of new A/T fluid used for flushing should be 30% to 50% of the specified capacity.

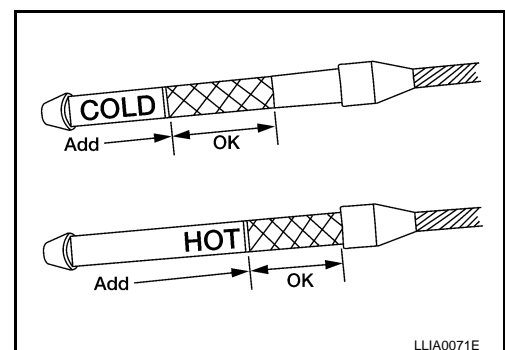
A/T fluid grade and capacity : Refer to [MA-10, "Fluids and Lubricants"](#).

CAUTION:

- Use only Genuine NISSAN Matic J ATF and do not mix with other fluids.
 - Using A/T fluid other than Genuine NISSAN Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the warranty.
 - When filling the transmission with A/T fluid, do not spill the A/T fluid on any heat generating parts such as the exhaust manifold.
 - Do not reuse the drain plug gasket.
5. Install the A/T fluid level gauge and tighten the A/T fluid level gauge bolt to specification.

A/T fluid level gauge bolt : Refer to [TM-224, "2WD : Exploded View" \(2WD\)](#) or [TM-228, "4WD : Exploded View" \(4WD\)](#).

6. Drive the vehicle to warm up the A/T fluid to approximately 80° C (176° F).
7. Check the fluid level and condition. If the A/T fluid is still dirty, repeat steps 2 through 6.



8. Install the A/T fluid level gauge in the A/T fluid charging pipe and install the A/T fluid level gauge bolt.
9. Tighten the A/T fluid level gauge bolt to specification.

A/T fluid level gauge bolt : Refer to [TM-224, "2WD : Exploded View" \(2WD\)](#) or [TM-228, "4WD : Exploded View" \(4WD\)](#).

A/T Fluid Cooler Cleaning

INFOID:000000001282727

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

Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of A/T fluid. In either case, malfunction of the newly serviced A/T may result.

Debris, if present, may build up as A/T fluid enters the cooler inlet. It will be necessary to back flush the cooler through the cooler outlet in order to flush out any built up debris.

A/T FLUID COOLER CLEANING PROCEDURE

1. Position a drain pan under the A/T inlet and outlet fluid cooler tube to cooler hose connection.
2. Put a different color matching mark on each cooler tube to cooler hose connection to aid in assembly.

CAUTION:

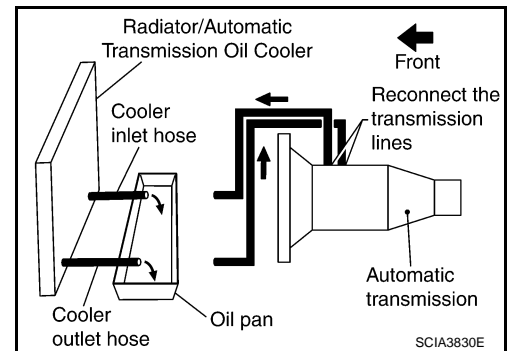
Use paint to make the matching mark. Do not damage the tubes or hose.

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

NOTE:

Replace the cooler hoses if rubber material from the hose remains on the tube fitting.

4. Drain any A/T fluid from the cooler hose.

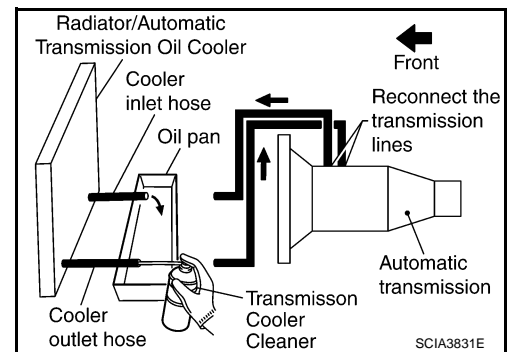


5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

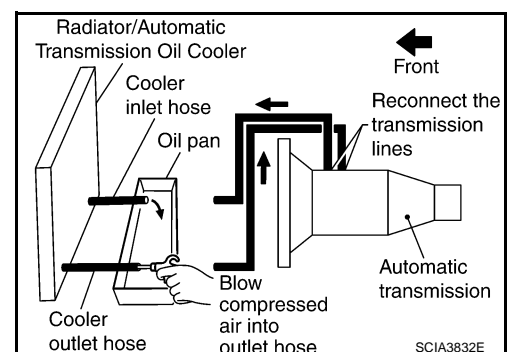
CAUTION:

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

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



7. Insert the tip of an air gun into the end of the cooler outlet hose.
8. Wrap a shop rag around the tip of the air gun and the cooler outlet hose.



9. Blow compressed air regulated to 5 - 9 kg/cm² (70 - 130 psi) through the cooler outlet hose for 10 seconds to force out any remaining fluid.

A/T FLUID

< ON-VEHICLE MAINTENANCE >

- Repeat steps 5 through 9 three additional times.
- Position an oil pan under the banjo bolts that connect the fluid cooler tubes to the A/T.
- Remove the banjo bolts.
- 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.
- Blow compressed air regulated to 5 - 9 kg/cm² (70 - 130 psi) through each steel line from the cooler side back toward the A/T for 10 seconds to force out any remaining fluid.
- Ensure all debris is removed from the steel cooler lines.
- Ensure all debris is removed from the banjo bolts and fittings.
- Perform "A/T FLUID COOLER DIAGNOSIS PROCEDURE".

A/T FLUID COOLER DIAGNOSIS PROCEDURE

NOTE:

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

- Position a drain pan under the A/T inlet and outlet fluid cooler tube to cooler hose connection.
- Clean the exterior and tip of the cooler inlet hose.
- Put a different color matching mark on each cooler tube to cooler hose connection to aid in assembly.

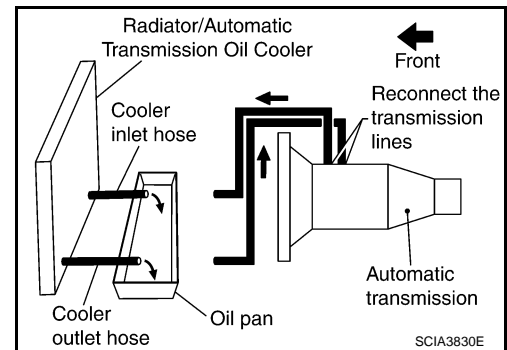
CAUTION:

Use paint to make the matching mark. Do not damage the tubes or hose.

- Disconnect the fluid cooler inlet and outlet rubber hoses from the steel cooler tubes.

NOTE:

Replace the cooler hoses if rubber material from the hose remains on the tube fitting.

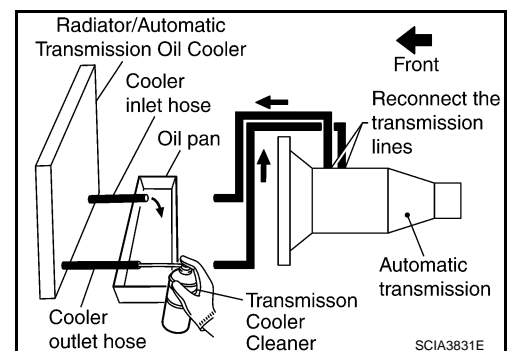


- Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

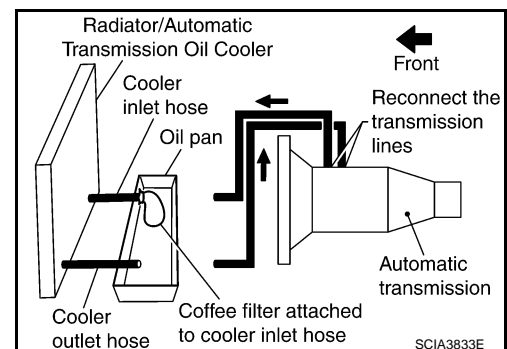
CAUTION:

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

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



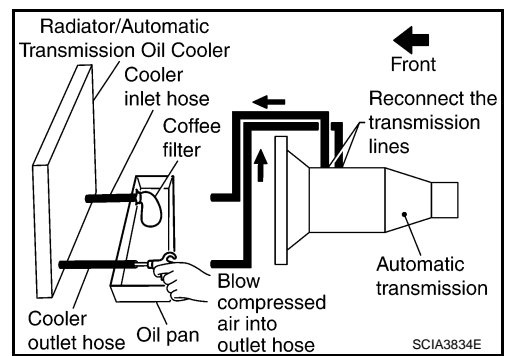
- Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.



A/T FLUID

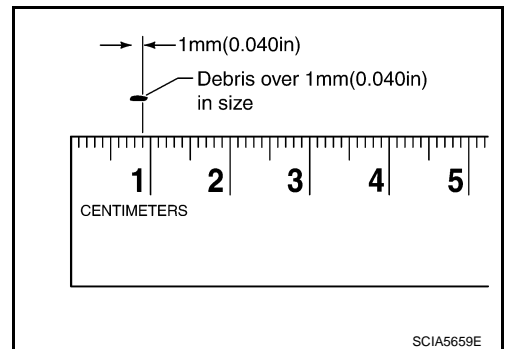
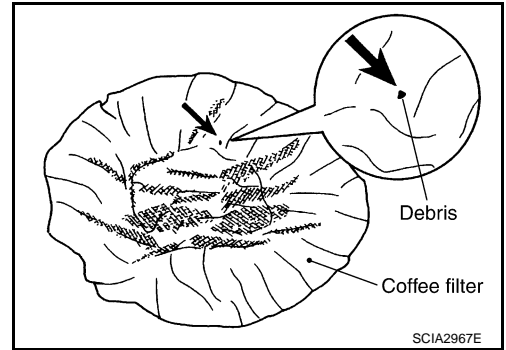
< ON-VEHICLE MAINTENANCE >

8. Insert the tip of an air gun into the end of the cooler outlet hose.
9. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
10. Blow compressed air regulated to 5 - 9 kg/cm² (70 - 130 psi) through the cooler outlet hose to force any remaining A/T fluid into the coffee filter.
11. Remove the coffee filter from the end of the cooler inlet hose.
12. Perform A/T fluid cooler inspection. Refer to [TM-180. "Checking the A/T Fluid \(ATF\)".](#)



A/T FLUID COOLER INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.
 - a. If small metal debris less than 1mm (0.040 in) in size or metal powder is found in the coffee filter, this is normal. If normal debris is found, the A/T fluid cooler/radiator can be re-used and the procedure is ended.
 - b. If one or more pieces of debris are found that are over 1mm (0.040 in) in size and/or peeled clutch facing material is found in the coffee filter, the fluid cooler is not serviceable. The A/T fluid cooler/radiator must be replaced and the inspection procedure is ended. Refer to [CO-16. "Removal and Installation"](#) for (VQ40DE) [CO-43. "Removal and Installation"](#) for (VK56DE).



A/T FLUID COOLER FINAL INSPECTION

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

INSPECTIONS BEFORE TROUBLE DIAGNOSIS

< ON-VEHICLE MAINTENANCE >

INSPECTIONS BEFORE TROUBLE DIAGNOSIS

Fluid Condition Check

INFOID:000000001713131

A/T FLUID CHECK

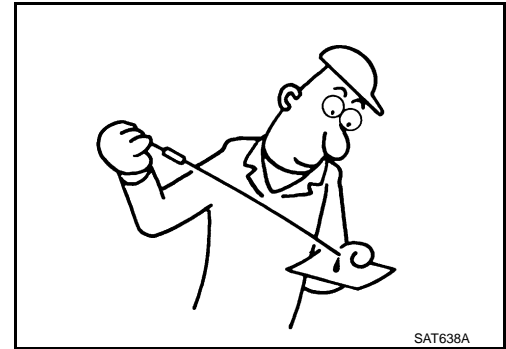
Fluid Leakage and Fluid Level Check

- Inspect for fluid leakage and check the fluid level. Refer to [TM-182. "Changing the A/T Fluid \(ATF\)".](#)

Fluid Condition Check

Inspect the fluid condition.

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



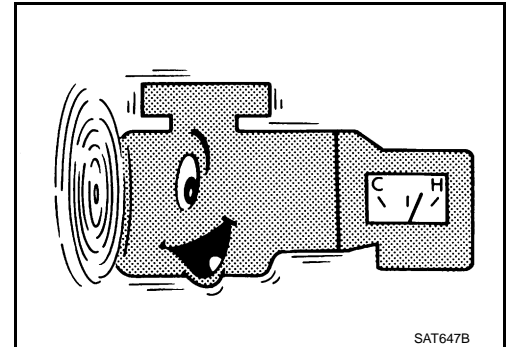
Stall Test

INFOID:000000001713133

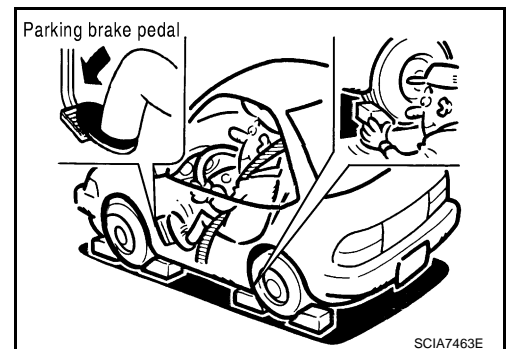
STALL TEST

Stall Test Procedure

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



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



INSPECTIONS BEFORE TROUBLE DIAGNOSIS

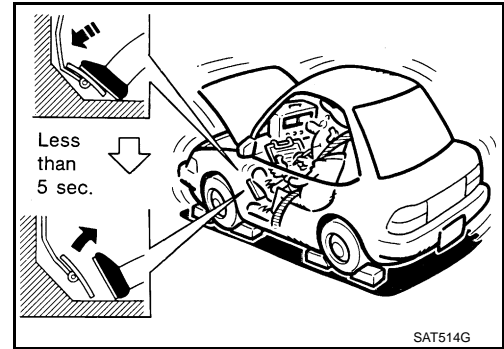
< ON-VEHICLE MAINTENANCE >

4. Engine start, apply foot brake, and place selector lever in "D" position.
5. While holding down the foot brake, gradually press down the accelerator pedal.
6. Quickly read off the stall speed, then quickly remove your foot from the accelerator pedal.

CAUTION:

Do not hold down the accelerator pedal for more than 5 seconds during this test.

Stall speed: 2,200 - 2,500 rpm



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

Judgement of Stall Test

	Selector lever position		Expected problem location
	D	R	
Stall rotation	H	O	<ul style="list-style-type: none"> • Forward brake • Forward one-way clutch • 1st one-way clutch • 3rd one-way clutch
	O	H	<ul style="list-style-type: none"> • Reverse brake
	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

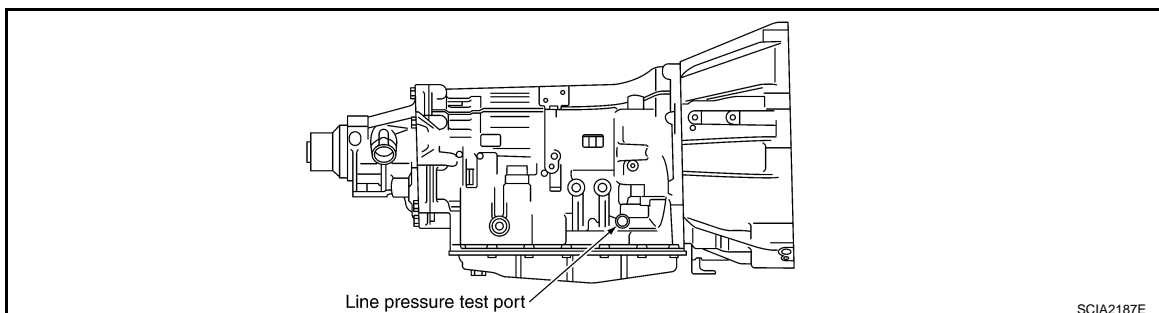
Does not shift-up D position 1 → 2	Slipping in 2nd, 3rd, 4th gears	Direct clutch slippage
Does not shift-up D position 2 → 3	Slipping in 3rd, 4th, 5th gears	High and low reverse clutch slippage
Does not shift-up D position 3 → 4	Slipping in 4th, 5th gears	Input clutch slippage
Does not shift-up D position 4 → 5	Slipping in 5th gear	Front brake slippage

Line Pressure Test

INFOID:000000001713134

LINE PRESSURE TEST

Line Pressure Test Port



Line Pressure Test Procedure

1. Inspect the amount of engine oil and replenish if necessary.

INSPECTIONS BEFORE TROUBLE DIAGNOSIS

< ON-VEHICLE MAINTENANCE >

- Drive the car for about 10 minutes to warm it up so that the ATF reaches in range of 50 to 80°C (122 to 176°F), then inspect the amount of ATF and replenish if necessary.

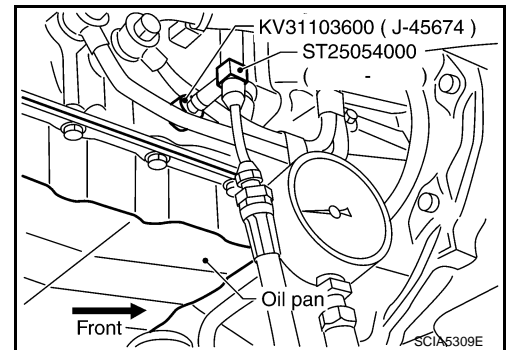
NOTE:

The automatic fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.

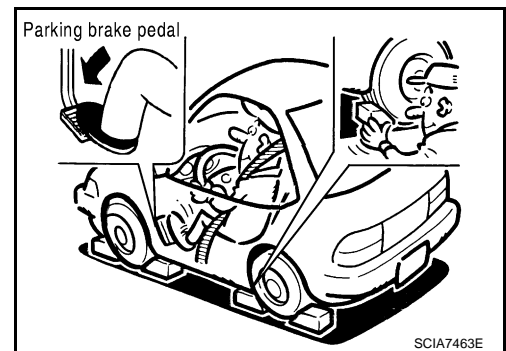
- After warming up remove the oil pressure detection plug and install the oil pressure gauge [ST2505S001(J-34301-C)].

CAUTION:

When using the oil pressure gauge, be sure to use the O-ring attached to the oil pressure detection plug.



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



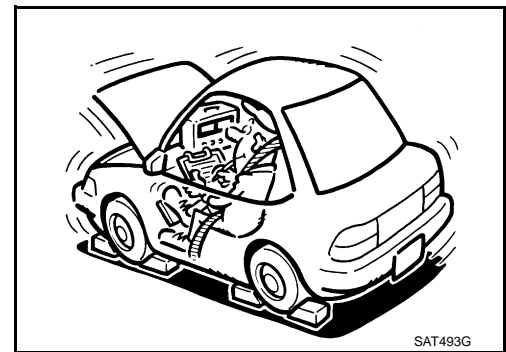
- Start the engine, then measure the line pressure at both idle and the stall speed.

CAUTION:

- Keep the brake pedal pressed all the way down during measurement.
- When measuring the line pressure at the stall speed, refer to "STALL TEST".

- After the measurements are complete, install the oil pressure detection plug and tighten to the regulation torque below.

:7.3 N·m (0.74 kg·m, 65 in·lb)



CAUTION:

- Do not reuse the O-ring.
- Apply ATF to O-ring.

Line Pressure

Engine speed	Line pressure [kPa (kg/cm ² , psi)]	
	"R" position	"D" position
At idle speed	425-465 (4.3 - 4.7, 62 - 67)	379 - 428 (3.9 - 4.4, 55 - 62)
At stall speed	1,605 - 1,905 (16.4 - 19.9, 233 - 283)	1,310 - 1,500 (13.4 - 15.3, 190 - 218)

Judgement of Line Pressure Test

INSPECTIONS BEFORE TROUBLE DIAGNOSIS

< ON-VEHICLE MAINTENANCE >

	Judgement	Possible cause	
Idle speed	Low for all positions (P, R, N, D)	Possible causes include malfunctions in the pressure supply system and low oil pump output. For example <ul style="list-style-type: none"> • Oil pump wear • Pressure regulator valve or plug sticking or spring fatigue • Oil strainer ⇒ oil pump ⇒ pressure regulator valve passage oil leak • Engine idle speed too low 	A B
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.	C
	High	Possible causes include a sensor malfunction or malfunction in the line pressure adjustment function. For example <ul style="list-style-type: none"> • Accelerator pedal position signal malfunction • ATF temperature sensor malfunction • Line pressure solenoid malfunction (sticking in "OFF" state, filter clog, cut line) • Pressure regulator valve or plug sticking 	TM E
Stall speed	Oil pressure does not rise higher than the oil pressure for idle.	Possible causes include a sensor malfunction or malfunction in the pressure adjustment function. For example <ul style="list-style-type: none"> • Accelerator pedal position signal malfunction • TCM breakdown • Line pressure solenoid malfunction (shorting, sticking in "ON" state) • Pressure regulator valve or plug sticking • Pilot valve sticking or pilot filter clogged 	F G
	The pressure rises, but does not enter the standard position.	Possible causes include malfunctions in the pressure supply system and malfunction in the pressure adjustment function. For example <ul style="list-style-type: none"> • Accelerator pedal position signal malfunction • Line pressure solenoid malfunction (sticking, filter clog) • Pressure regulator valve or plug sticking • Pilot valve sticking or pilot filter clogged 	H I
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.	J

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ROAD TEST

< ON-VEHICLE MAINTENANCE >

ROAD TEST

Check Before Engine Is Started

INFOID:000000001282749

1. CHECK O/D OFF INDICATOR LAMP

1. Park vehicle on level surface.
2. Move selector lever to "P" position.
3. Turn ignition switch to "OFF" position and wait at least 10 seconds.
4. Turn ignition switch to "ON" position. (Do not start engine.)

Does O/D OFF indicator lamp light up for about 2 seconds?

- YES >> 1. Turn ignition switch "OFF".
2. Perform self-diagnostics and record all NG items on the [TM-7, "Diagnostic Work Sheet"](#). Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#), [TM-42, "Diagnosis Procedure without CONSULT-III"](#).
3. Go to [TM-190, "Check at Idle"](#).
- NO >> Stop the test and go to [TM-126, "O/D OFF Indicator Lamp Does Not Come On \(Without Manual Mode\)"](#).

Check at Idle

INFOID:000000001282750

1. CHECK STARTING THE ENGINE

1. Park vehicle on level surface.
2. Move selector lever to "P" or "N" position.
3. Turn ignition switch to "OFF" position.
4. Turn ignition switch to "START" position.

Does the engine start?

- YES >> GO TO 2.
- NO >> Stop the road test and go to [TM-127, "Engine Cannot Be Started in "P" or "N" Position"](#).

2. CHECK VEHICLE EQUIPMENT

Is vehicle equipped with manual mode shifter?

YES or NO?

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

3. CHECK STARTING THE ENGINE

1. Turn ignition switch to "ON" position.
2. Move selector lever in "D", "M" and "R" position.
3. Turn ignition switch to "START" position.

Does the engine start in either position?

- YES >> Stop the road test and go to [TM-127, "Engine Cannot Be Started in "P" or "N" Position"](#).
- NO >> GO TO 5.

4. CHECK STARTING THE ENGINE

1. Turn ignition switch to "ON" position.
2. Move selector lever in "D", "3", "2", "1" or "R" position.
3. Turn ignition switch to "START" position.

Does the engine start in either position?

- YES >> Stop the road test and go to [TM-127, "Engine Cannot Be Started in "P" or "N" Position"](#).
- NO >> GO TO 5.

5. CHECK "P" POSITION FUNCTIONS

Without manual mode

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

ROAD TEST

< ON-VEHICLE MAINTENANCE >

5. Engage the parking brake.

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

- YES >> Record the malfunction, then continue the road test.
NO >> GO TO 6.

6.CHECK "N" POSITION FUNCTIONS

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

Does vehicle move forward or backward?

- YES >> Record the malfunction, then continue the road test.
NO >> GO TO 7.

7.CHECK SHIFT SHOCK

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

When the transmission is shifted from "N" to "D", is there an excessive shock?

- YES >> Record the malfunction, then continue the road test.
NO >> GO TO 8.

8.CHECK "R" POSITION FUNCTIONS

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

Does the vehicle creep backward?

- YES >> GO TO 9.
NO >> Record the malfunction, then continue the road test.

9.CHECK "D" POSITION FUNCTIONS

Inspect whether the vehicle creep forward when the transmission is put into the "D" position.

Does the vehicle creep forward in the "D" positions?

- YES >> Go to [TM-191. "Cruise Test - Part 1"](#), [TM-193. "Cruise Test - Part 2"](#) and [TM-194. "Cruise Test - Part 3"](#).
NO >> Record the malfunction, then continue the road test.

Cruise Test - Part 1

INFOID:000000001282751

1.CHECK STARTING OUT FROM D1

1. Drive the vehicle for about 10 minutes to warm up the engine oil and ATF.
Appropriate temperature for the ATF: 50 - 80°C (122 - 176°F)
2. Park the vehicle on a level surface.
3. Move selector lever to "P" position.
4. Start the engine.
5. Set overdrive control switch to ON position (without manual mode).
6. Move selector lever to "D" position.
7. Press the accelerator pedal about half way down to accelerate the vehicle.

With CONSULT-III

Read off the gear positions.

Starts from D1?

- YES >> GO TO 2.
NO >> Record the malfunction, then continue the road test.

2.CHECK SHIFT-UP D1 → D2

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D1 → D2) at the appropriate speed.

- Refer to [TM-314. "Vehicle Speed at Which Gear Shifting Occurs"](#).

With CONSULT-III

ROAD TEST

< ON-VEHICLE MAINTENANCE >

Read the gear position, throttle degree of opening, and vehicle speed.

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

YES >> GO TO 3.

NO >> Record the malfunction, "" then continue the road test"→"e road test.

3.CHECK SHIFT-UP D2 → D3

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D2 → D3) at the appropriate speed.

• Refer to [TM-314, "Vehicle Speed at Which Gear Shifting Occurs"](#).

With CONSULT-III

Read the gear position, throttle degree of opening, and vehicle speed.

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

YES >> GO TO 4.

NO >> Record the malfunction, then continue the road test.

4.CHECK SHIFT-UP D3 → D4

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D3 → D4) at the appropriate speed.

• Refer to [TM-314, "Vehicle Speed at Which Gear Shifting Occurs"](#).

With CONSULT-III

Read the gear position, throttle degree of opening, and vehicle speed.

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

YES >> GO TO 5.

NO >> Record the malfunction, then continue the road test.

5.CHECK SHIFT-UP D4 → D5

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D4 → D5) at the appropriate speed.

• Refer to [TM-314, "Vehicle Speed at Which Gear Shifting Occurs"](#).

With CONSULT-III

Read the gear position, throttle degree of opening, and vehicle speed.

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

YES >> GO TO 6.

NO >> Record the malfunction, then continue the road test.

6.CHECK LOCK-UP

When releasing accelerator pedal from D5 (closed throttle position signal: OFF), check lock-up from D5 to L/U.

• Refer to [TM-314, "Vehicle Speed at Which Gear Shifting Occurs"](#).

With CONSULT-III

Select "TCC SOLENOID" with the "MAIN SIGNAL" mode for A/T.

Does it lock-up?

YES >> GO TO 7.

NO >> Record the malfunction, then continue the road test.

7.CHECK LOCK-UP HOLD

Check hold lock-up.

With CONSULT-III

Select "TCC SOLENOID" with the "MAIN SIGNAL" mode for A/T.

Does it maintain lock-up status?

YES >> GO TO 8.

NO >> Record the malfunction, then continue the road test.

8.CHECK LOCK-UP RELEASE

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

With CONSULT-III

Select "TCC SOLENOID" with the "MAIN SIGNAL" mode for A/T.

ROAD TEST

< ON-VEHICLE MAINTENANCE >

Does lock-up cancel?

YES >> GO TO 9.

NO >> Enter a check mark at "Lock-up Is Not Released" on the diagnostics worksheet, then continue the road test.

9.CHECK SHIFT-DOWN D5 → D4

Decelerate by pressing lightly on the brake pedal.

With CONSULT-III

Read the gear position and engine speed.

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

YES >> 1. Stop the vehicle.

2. Go to Cruise test - Part 2 (Refer to [TM-193](#)).

NO >> Record the malfunction, then continue the road test. Go To Cruise test - Part 2 (Refer to [TM-193](#)).

Cruise Test - Part 2

INFOID:000000001282752

1.CHECK VEHICLE EQUIPMENT

Is vehicle equipped with manual mode shifter?

YES or NO?

YES >> GO TO 2.

NO >> GO TO 4.

2.MANUAL MODE FUNCTION

Move selector lever to manual mode from "D" position.

Does it switch to manual mode?

YES >> GO TO 3.

NO >> Record the malfunction, "then continue the road test.

3.CHECK SHIFT - DOWN

During manual mode driving, move gear selector from M5 → M4 → M3 → M2 → M1.

With CONSULT-III

Read the gear position, throttle position and vehicle speed.

Is downshifting correctly performed?

YES >> GO TO 6.

NO >> Record the malfunction, "then continue the road test.

4.CHECK STARTING FROM D1

1. Move selector lever to "D" position.

2. Accelerate at half throttle.

With CONSULT-III

Read the gear position.

Does it start from D1?

YES >> GO TO 5.

NO >> Record the malfunction, "then continue the road test.

5.CHECK SHIFT - DOWN

During D4 driving, move gear selector from D → 3 → 2 →.

With CONSULT-III

Read the gear position.

Is downshifting correctly performed→?

YES >> GO TO 6.

NO >> Record the malfunction, "then continue the road test.

6.CHECK ENGINE BRAKE

ROAD TEST

< ON-VEHICLE MAINTENANCE >

Does engine braking effectively reduce speed in M1 position (with manual mode) or 11 position (without manual mode)?

- YES >> 1. Stop the vehicle.
2. Carry out the self-diagnostics. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
NO >> Record the malfunction, "then continue the trouble diagnosis.

Cruise Test - Part 3

INFOID:000000001282753

1.CHECK SHIFT-DOWN

1. Confirm overdrive control switch is ON position.
2. Confirm gear selector lever is in "D" position.
3. Accelerate vehicle using half-throttle to D5.
4. Release accelerator pedal.
5. Set overdrive control switch to OFF position while driving in D5.

Ⓟ **With CONSULT-II**

Read the gear position.

Does A/T shift from D5 to D4 (O/D OFF)?

- YES >> GO TO 2.
NO >> Record the malfunction, then continue the road test.

2.CHECK SHIFT-DOWN

During D4 driving, move gear selector from D → 3 → 2 → 1.

Ⓟ **With CONSULT-II**

Read the gear position.

Is downshifting correctly performed?

- YES >> GO TO 3.
NO >> Record the malfunction, then continue the road test.

3.CHECK ENGINE BRAKE

Does engine braking effectively reduce speed in 11 position?

- YES >> 1. Stop the vehicle.
2. Carry out the self-diagnostics. Refer to [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#).
NO >> Record the malfunction, then continue the trouble diagnosis.

SHIFT CONTROL SYSTEM

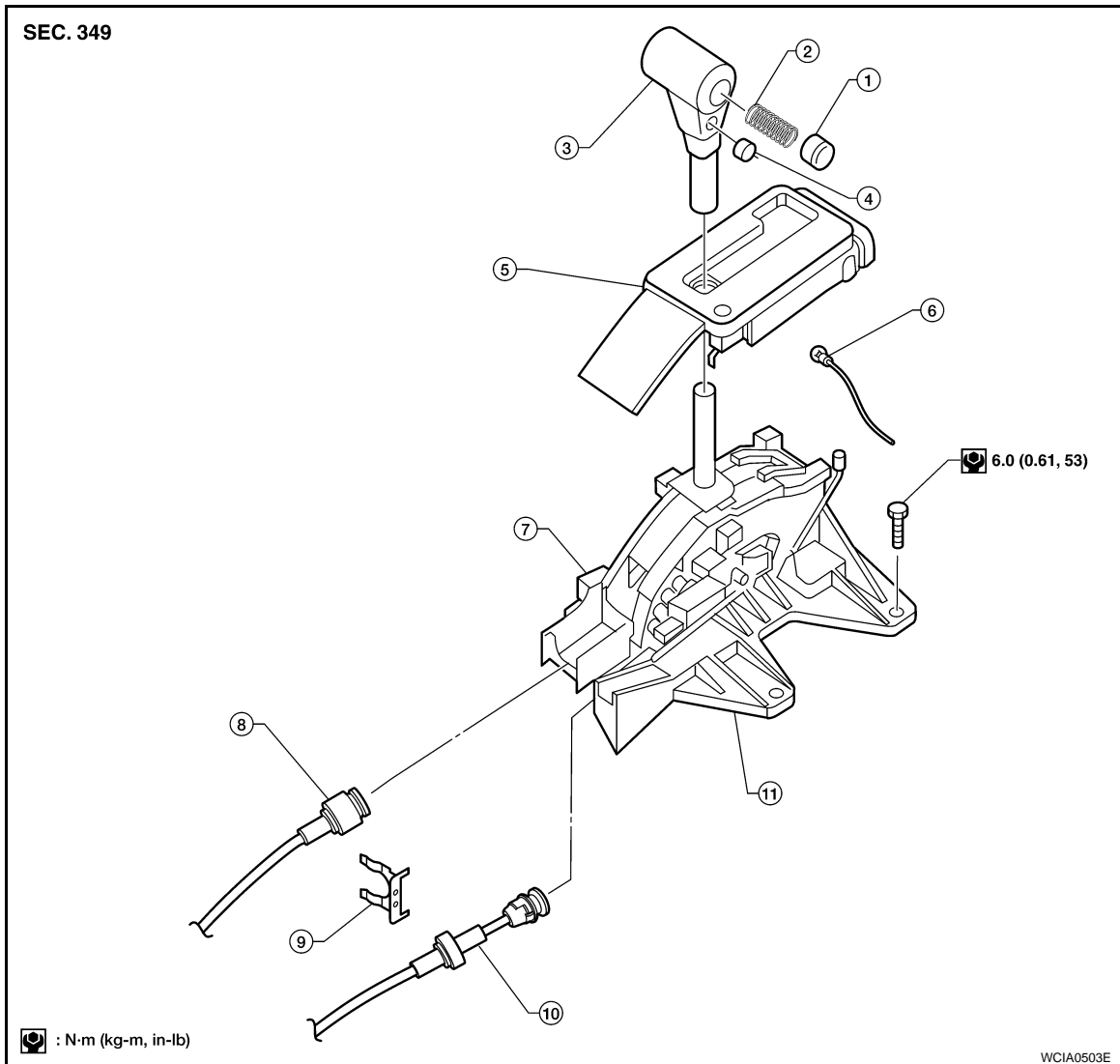
< ON-VEHICLE REPAIR >

ON-VEHICLE REPAIR

SHIFT CONTROL SYSTEM

Exploded view

INFOID:000000001724657



- | | | |
|---------------------------------|---------------------------------|-------------------|
| 1. Selector button | 2. Selector spring | 3. Selector lever |
| 4. Overdrive control switch | 5. Position indicator | 6. Position lamp |
| 7. A/T device harness connector | 8. A/T selector control cable | 9. Lock plate |
| 10. A/T key interlock cable | 11. A/T control device assembly | |

Removal and Installation

INFOID:000000001724659

REMOVAL

1. Remove the A/T finisher. Refer to [IP-15, "Exploded View"](#).
2. Disconnect the following from the A/T control device assembly.
 - A/T selector control cable
 - A/T key interlock cable
 - A/T device connector
3. Remove the A/T control device assembly.

INSTALLATION

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SHIFT CONTROL SYSTEM

< ON-VEHICLE REPAIR >

Installation is in the reverse order of removal.

Inspection and Adjustment

INFOID:000000001724660

INSPECTION

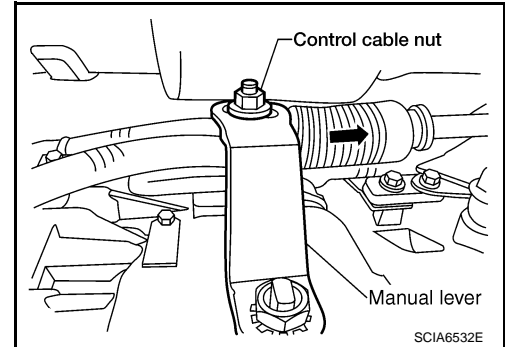
With the selector lever in the "P" position, turn the ignition switch to the ON position with the engine OFF. Confirm that the following conditions apply.

- The selector lever can be shifted from the "P" position only when the brake pedal is depressed.
- The selector lever stops at each position with the feel of engagement when it is moved through all the positions.
- There is no excessive effort, sticking, noise or rattle.
- The actual position of the selector lever matches the position shown by the shift position indicator and the A/T body.
- The back-up lamps illuminate only when the selector lever is placed in the "R" position.
- The back-up lamps do not illuminate when the selector lever is pushed against the "R" position when in the "P" or "N" position.
- The engine can only be started with the selector lever in the "P" and "N" positions.
- The A/T is locked completely when in the "P" position.

ADJUSTMENT

1. Loosen nut of control cable.
2. Place the manual lever and selector lever in "P" position.
3. Push the control cable in the direction shown with a force of 9.8 N (1kg, 2.2 lb), and release it. This is in the natural state, tighten control cable nut to specifications.

Control cable nut : 14.5 N·m (1.5 kg-m, 11 ft-lb)



OIL PAN

< ON-VEHICLE REPAIR >

OIL PAN

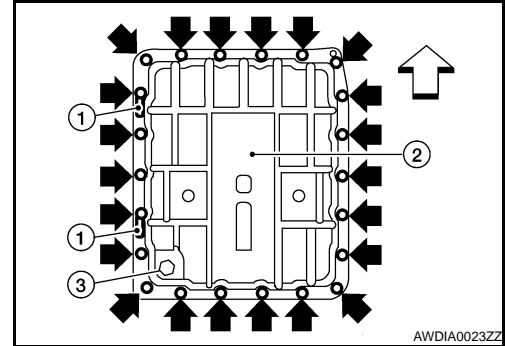
Removal and Installation

INFOID:000000001724690

REMOVAL AND INSTALLATION

Removal

1. Drain A/T fluid. Refer to [TM-182, "Changing the A/T Fluid \(ATF\)"](#).
2. Remove oil pan clips (1).
3. Remove oil pan (2).
4. Remove oil pan gasket.
 - ⇨ Vehicle front
 - ➡ Oil pan bolts
 - Drain plug (3)

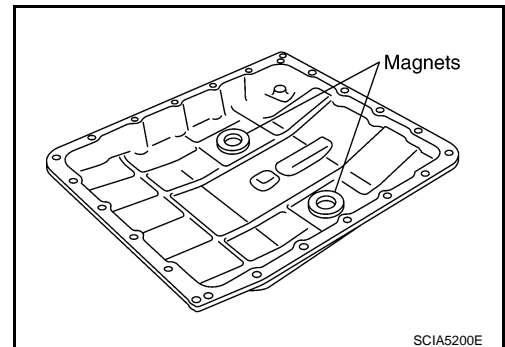


5. Check for foreign materials in oil pan to help determine cause of malfunction. If the A/T fluid is very dark, has some burned smell, or contains foreign particles then friction material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.

CAUTION:

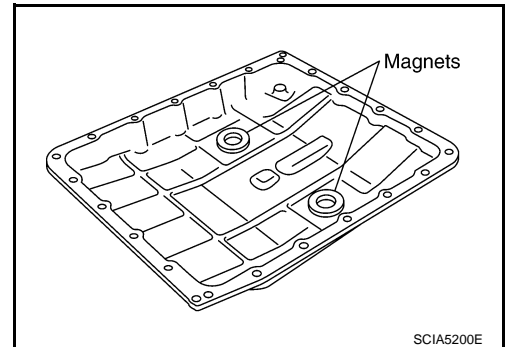
If friction material is detected, flush the transmission cooler after repair. Refer to [TM-183, "A/T Fluid Cooler Cleaning"](#).

6. Remove magnets from oil pan.



Installation

1. Install the oil pan magnets as shown.



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OIL PAN

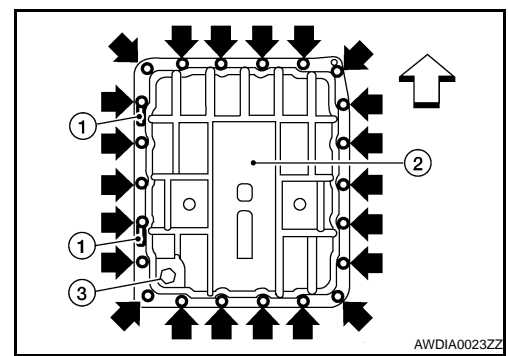
< ON-VEHICLE REPAIR >

2. Install the oil pan (2) with new oil pan gasket with the bolts and clips (1) finger tight to secure in place as shown.

- ⇨ : Vehicle Front
- ➡ : Oil pan bolts

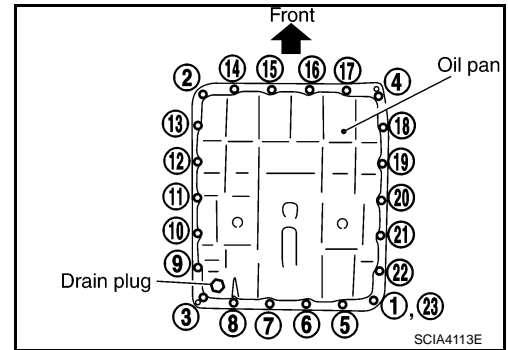
CAUTION:

- Be sure the oil drain plug is located to the rear of the transmission assembly.
- Before installing oil pan bolts, remove any traces of old sealant from the sealing surfaces and threaded holes.
- Do not reuse old gasket, replace with a new one.
- Always replace the oil pan bolts as they are self-sealing.
- Partially install the oil pan bolts in a criss-cross pattern to prevent dislocation of the gasket.



3. Tighten oil pan bolts in numerical order as shown.

Oil pan bolts : 7.9 N-m (0.81 kg-m, 70 in-lb)



4. Refill the A/T with fluid and check for fluid leakage. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).

CONTROL VALVE WITH TCM

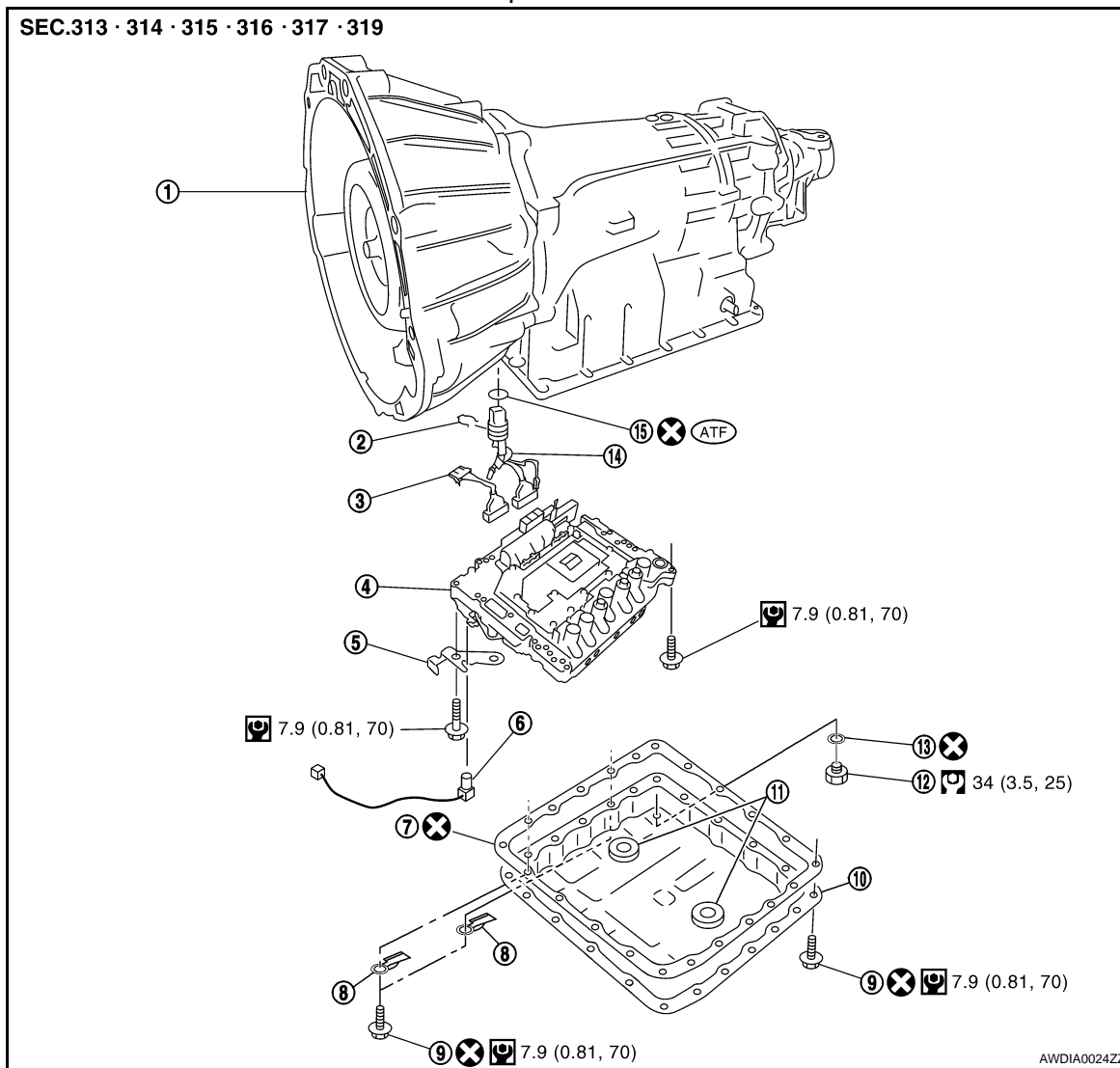
< ON-VEHICLE REPAIR >

CONTROL VALVE WITH TCM

Control Valve with TCM and A/T Fluid Temperature Sensor 2

INFOID:000000001282978

Exploded view



- | | | |
|---------------------------|----------------------------|-----------------------------------|
| 1. Transmission | 2. Snap ring | 3. Sub-harness |
| 4. Control valve with TCM | 5. Bracket | 6. A/T fluid temperature sensor 2 |
| 7. Oil pan gasket | 8. Clips | 9. Oil pan bolt |
| 10. Oil pan | 11. Magnet | 12. Drain plug |
| 13. Drain plug gasket | 14. Terminal cord assembly | 15. O-ring |

CONTROL VALVE WITH TCM AND A/T FLUID TEMPRATURE SENSOR 2

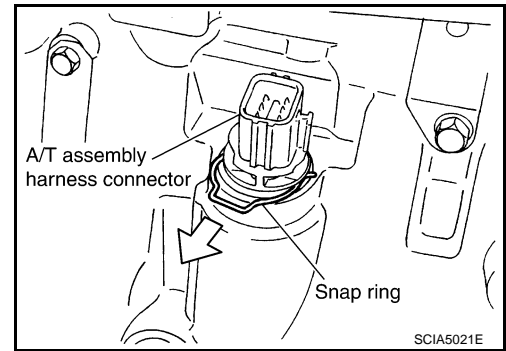
Removal

1. Disconnect negative battery terminal.
2. Drain A/T fluid. Refer to [TM-180](#).
3. Disconnect A/T assembly harness connector.

CONTROL VALVE WITH TCM

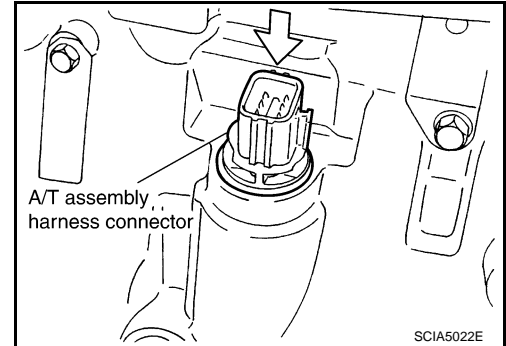
< ON-VEHICLE REPAIR >

4. Remove snap ring from A/T assembly harness connector.



5. Push A/T assembly harness connector.

CAUTION:
Do not damage connector.

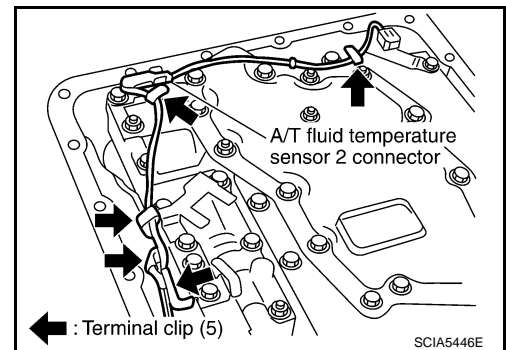


6. Remove oil pan and oil pan gasket. Refer to [TM-197, "Removal and Installation"](#).

7. Straighten the terminal clip to free the terminal cord assembly for A/T fluid temperature sensor 2 harness.

8. Disconnect A/T fluid temperature sensor 2 connector.

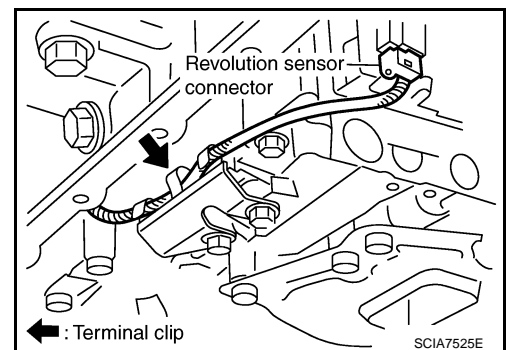
CAUTION:
Do not damage connector.



9. Straighten terminal clip to free the revolution sensor harness.

10. Disconnect revolution sensor connector.

CAUTION:
Do not damage connector.

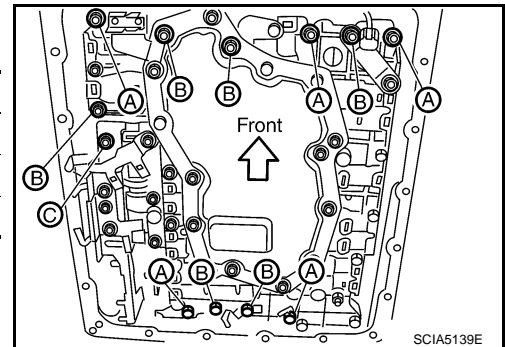


CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

11. Remove bolts (A), (B) and (C) from control valve with TCM.

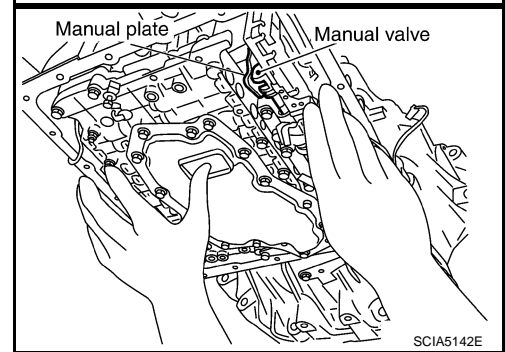
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



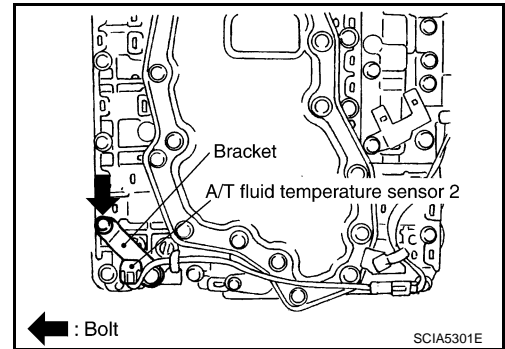
12. Remove control valve with TCM from transmission case.

CAUTION:

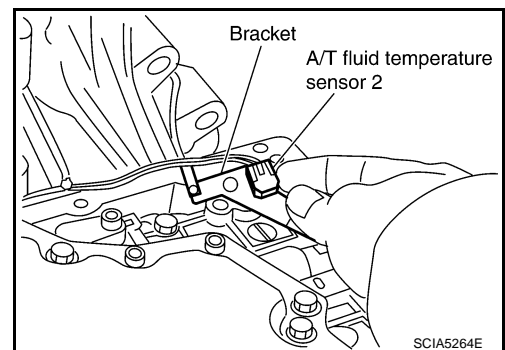
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



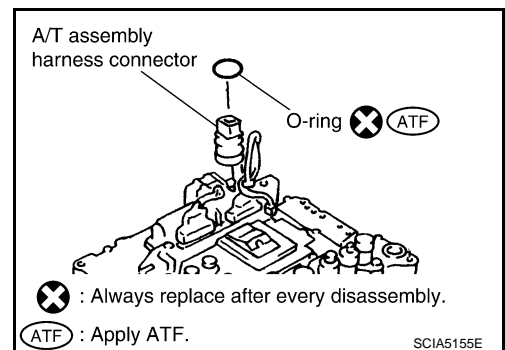
13. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



14. Remove bracket from A/T fluid temperature sensor 2.



15. Remove O-ring from A/T assembly harness connector.



⊗ : Always replace after every disassembly.

⊙ ATF : Apply ATF.

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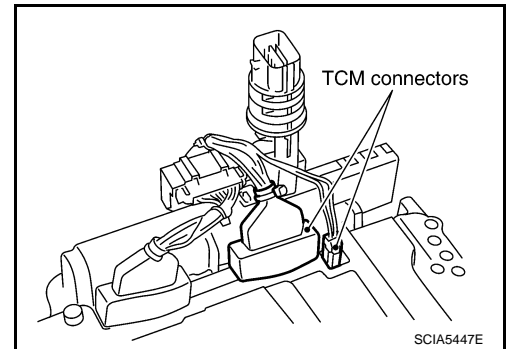
CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

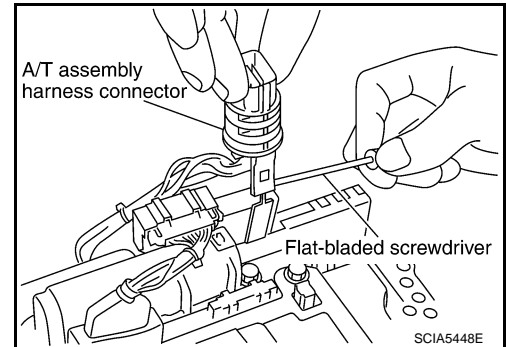
16. Disconnect TCM connectors.

CAUTION:

Do not damage connectors.



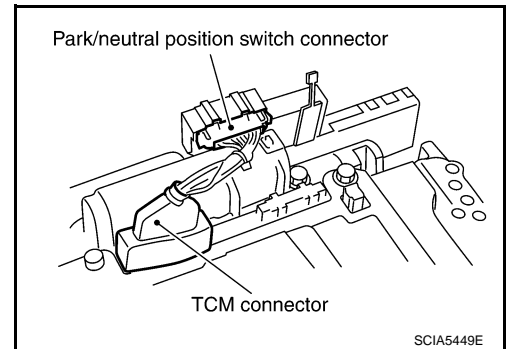
17. Remove A/T assembly harness connector from control valve with TCM using suitable tool.



18. Disconnect TCM connector and park/neutral position switch connector

CAUTION:

Do not damage connectors.

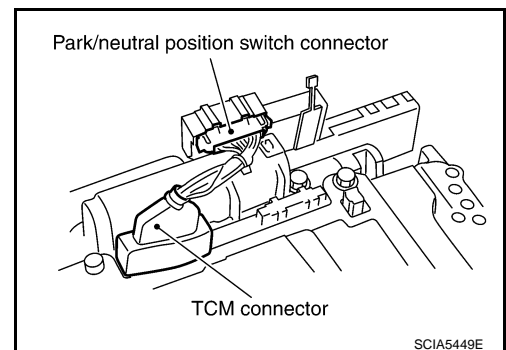


Installation

CAUTION:

After completing installation, check A/T fluid leakage and fluid level. Refer to [TM-180](#).

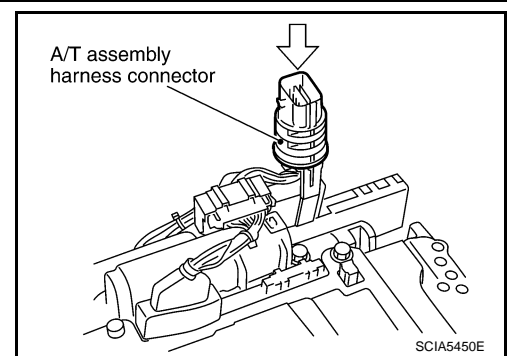
1. Connect TCM connector and park/neutral position switch connector.



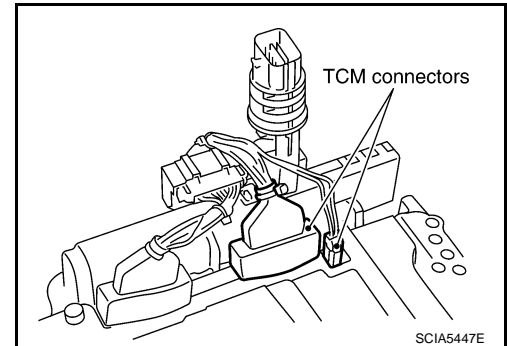
CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

2. Install A/T assembly harness connector to control valve with TCM.



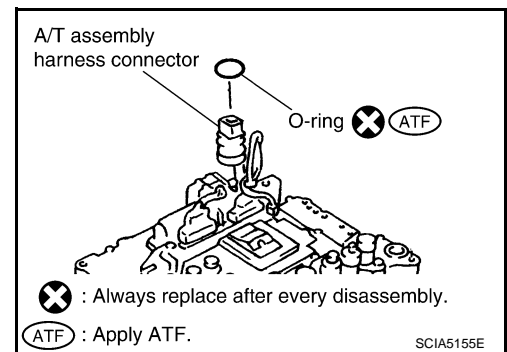
3. Connect TCM connector.



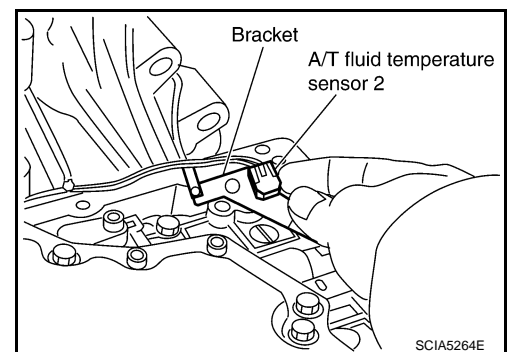
4. Install new O-ring in A/T assembly harness connector.

CAUTION:

- Do not reuse O-ring.
- Apply ATF to O-ring.



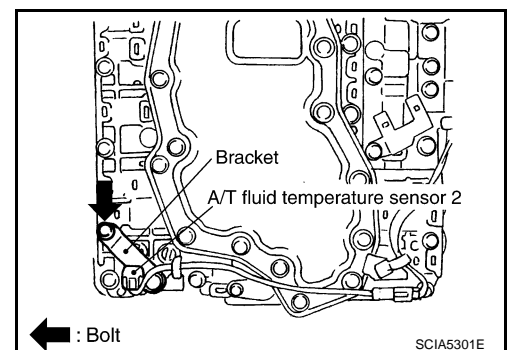
5. Install A/T fluid temperature sensor 2 to bracket.



6. Install A/T fluid temperature sensor 2 (with bracket) to control valve with TCM. Tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

CAUTION:

Adjust bolt hole of bracket to bolt hole of control valve with TCM.



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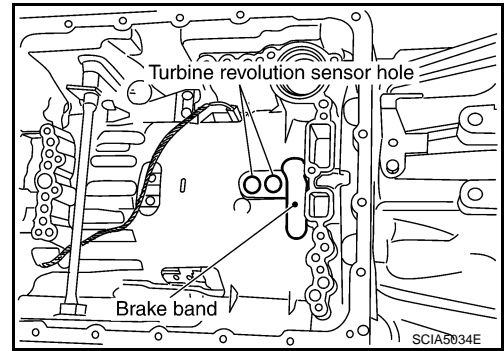
CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

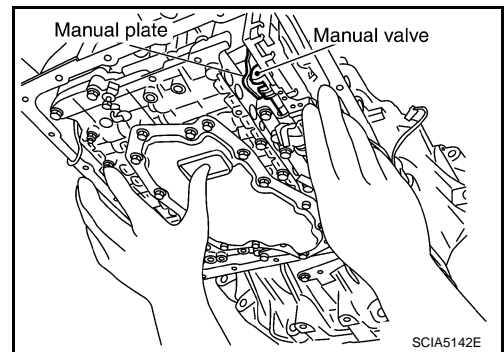
7. Install control valve with TCM in transmission case.

CAUTION:

- Make sure that turbine revolution sensor is securely installed into turbine revolution sensor hole.
- Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.
- Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.

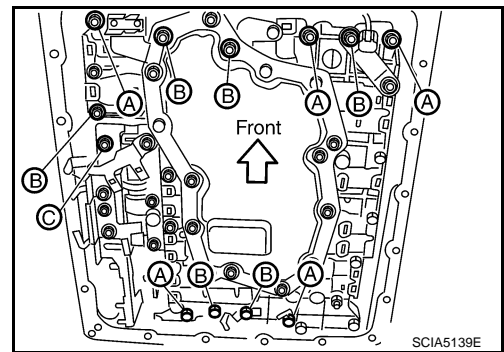


- Assemble it so that manual valve cutout is engaged with manual plate projection.



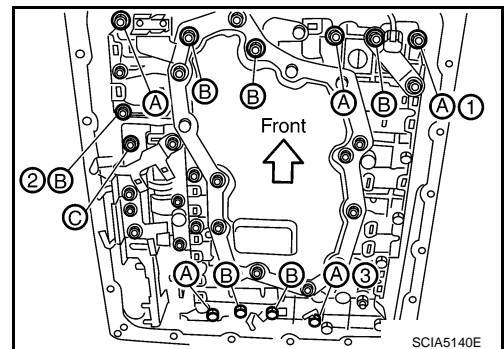
8. Install bolts (A), (B) and (C) in control valve with TCM.

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



9. Tighten bolt (1), (2) and (3) temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3). Then tighten other bolts.

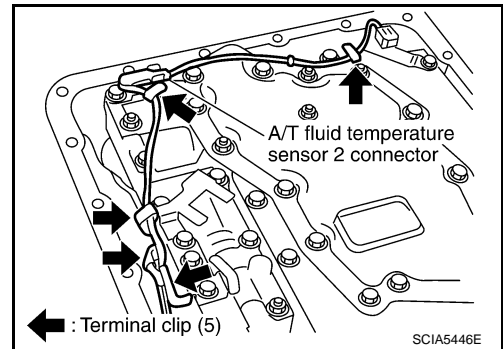
10. Tighten control valve with TCM bolts to the specified torque. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).



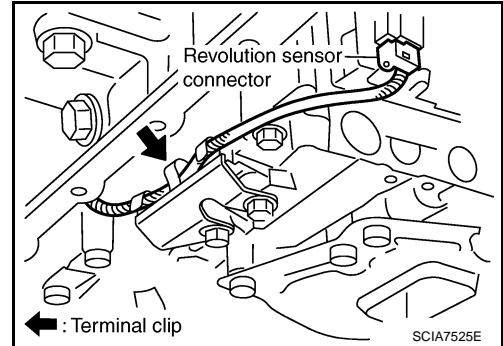
CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

11. Connect A/T fluid temperature sensor 2 connector.
12. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips.

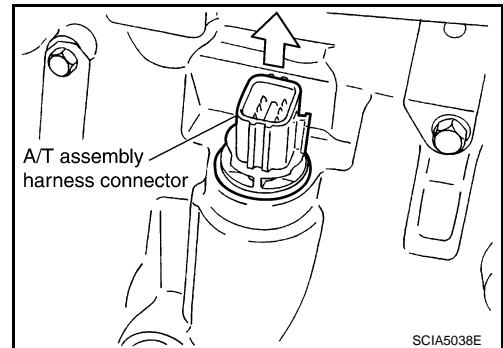


13. Connect revolution sensor connector.
14. Securely fasten revolution sensor harness with terminal clip.

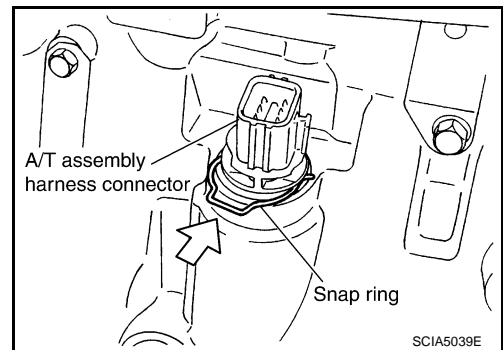


15. Install oil pan to transmission case. Refer to [TM-197, "Removal and Installation"](#).
16. Pull up A/T assembly harness connector.

CAUTION:
Do not damage connector.



17. Install snap ring to A/T assembly harness connector.
18. Connect A/T assembly harness connector.
19. Connect the negative battery terminal.
20. Refill the A/T with fluid and check the fluid level and for fluid leakage. Refer to [TM-180](#).

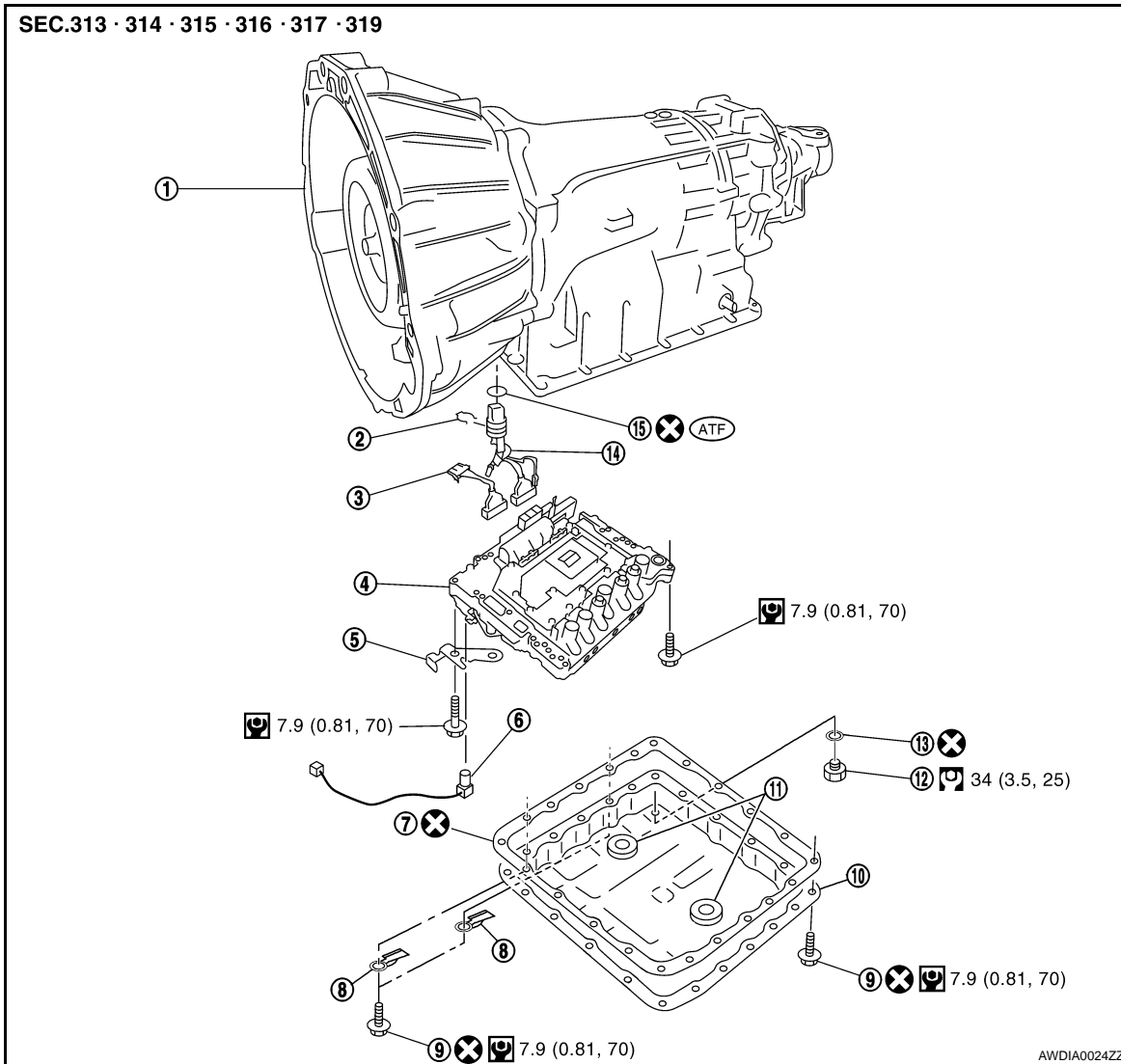


CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

Exploded view

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- | | | |
|---------------------------|----------------------------|-----------------------------------|
| 1. Transmission | 2. Snap ring | 3. Sub-harness |
| 4. Control valve with TCM | 5. Bracket | 6. A/T fluid temperature sensor 2 |
| 7. Oil pan gasket | 8. Clips | 9. Oil pan bolt |
| 10. Oil pan | 11. Magnet | 12. Drain plug |
| 13. Drain plug gasket | 14. Terminal cord assembly | 15. O-ring |

Removal and Installation

INFOID:000000001724673

CONTROL VALVE WITH TCM REMOVAL AND INSTALLATION

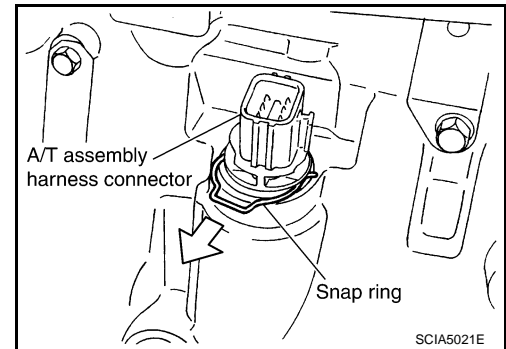
Removal

1. Disconnect negative battery terminal.
2. Drain A/T fluid. Refer to [TM-180](#).
3. Disconnect A/T assembly harness connector.

CONTROL VALVE WITH TCM

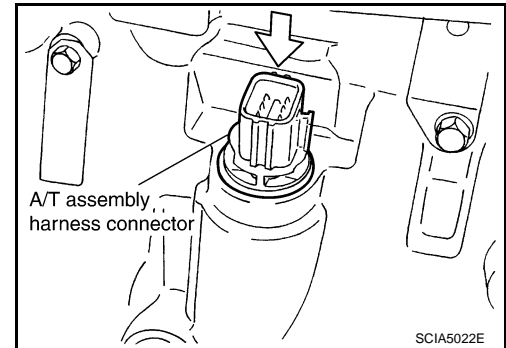
< ON-VEHICLE REPAIR >

4. Remove snap ring from A/T assembly harness connector.



5. Push A/T assembly harness connector.

CAUTION:
Do not damage connector.

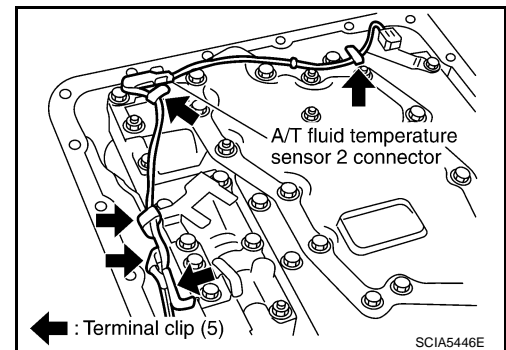


6. Remove oil pan and oil pan gasket. Refer to [TM-197, "Removal and Installation"](#).

7. Straighten the terminal clip to free the terminal cord assembly for A/T fluid temperature sensor 2 harness.

8. Disconnect A/T fluid temperature sensor 2 connector.

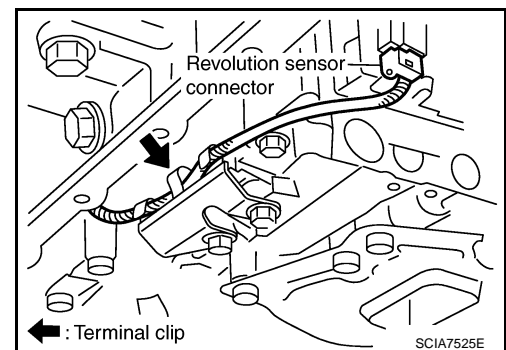
CAUTION:
Do not damage connector.



9. Straighten terminal clip to free the revolution sensor harness.

10. Disconnect revolution sensor connector.

CAUTION:
Do not damage connector.



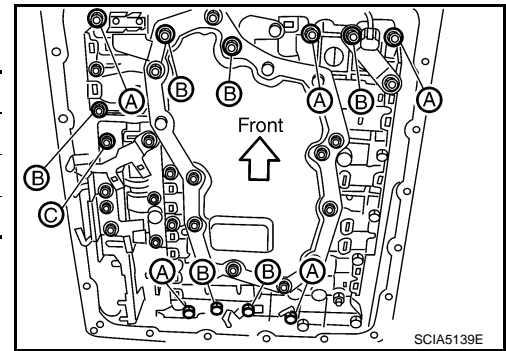
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CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

11. Remove bolts (A), (B) and (C) from control valve with TCM.

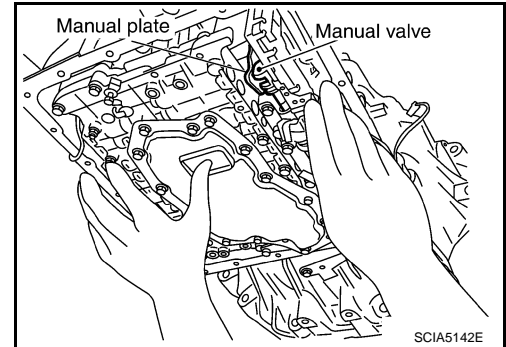
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



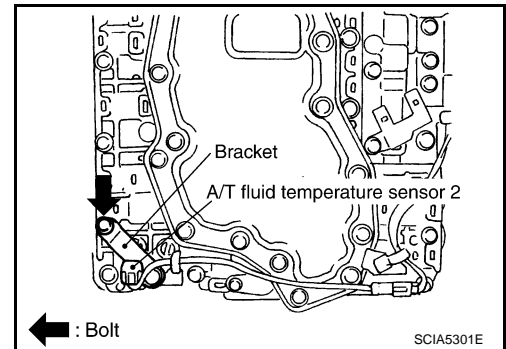
12. Remove control valve with TCM from transmission case.

CAUTION:

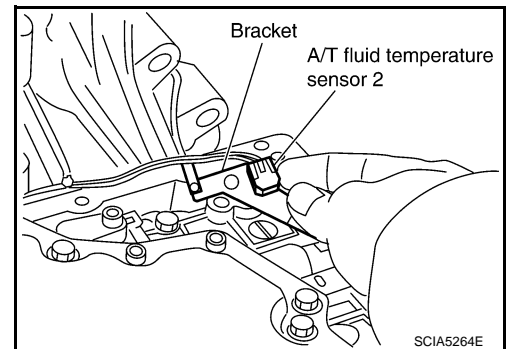
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



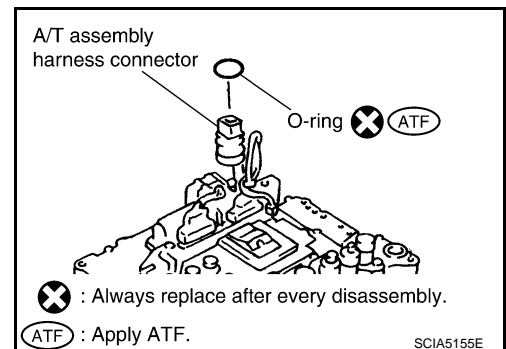
13. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



14. Remove bracket from A/T fluid temperature sensor 2.



15. Remove O-ring from A/T assembly harness connector.



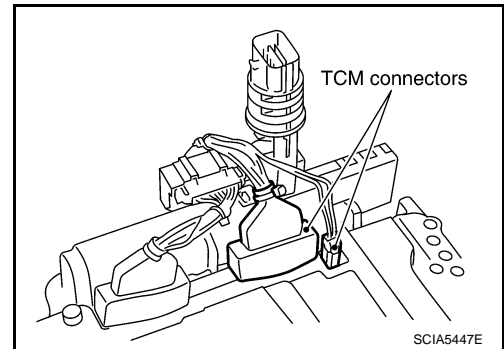
CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

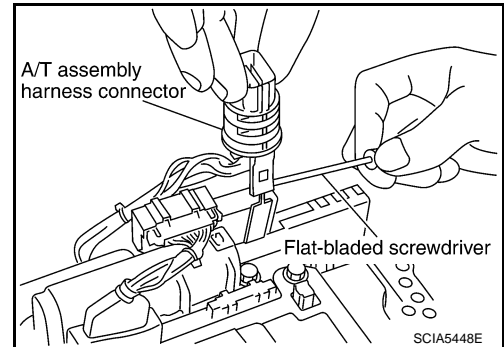
16. Disconnect TCM connectors.

CAUTION:

Do not damage connectors.



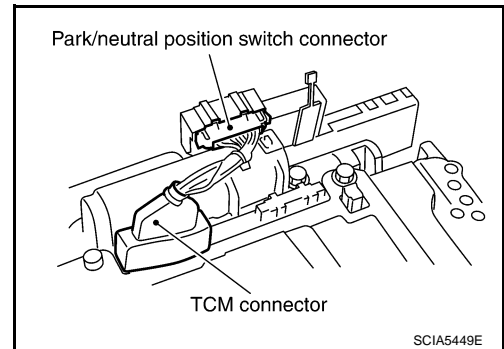
17. Remove A/T assembly harness connector from control valve with TCM using suitable tool.



18. Disconnect TCM connector and park/neutral position switch connector

CAUTION:

Do not damage connectors.

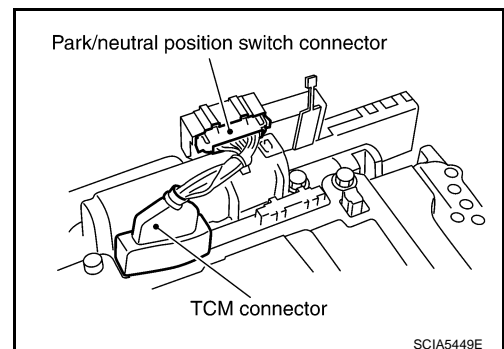


Installation

CAUTION:

After completing installation, check A/T fluid leakage and fluid level. Refer to [TM-180](#).

1. Connect TCM connector and park/neutral position switch connector.

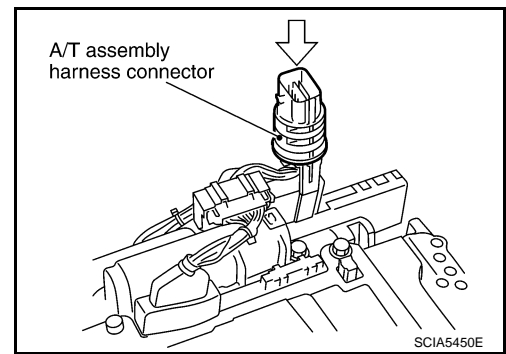


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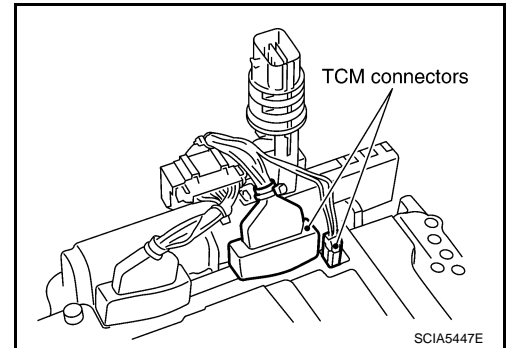
CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

2. Install A/T assembly harness connector to control valve with TCM.



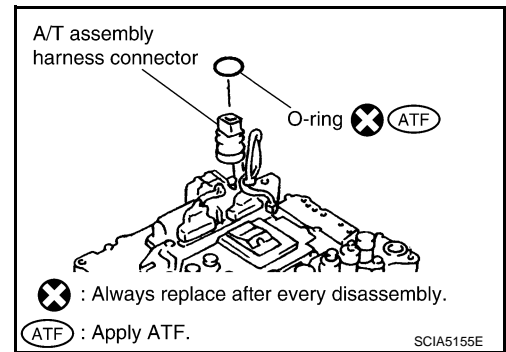
3. Connect TCM connector.



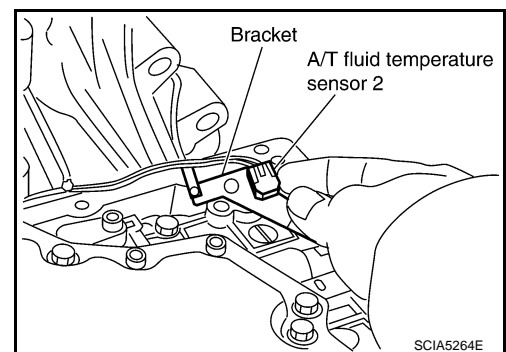
4. Install new O-ring in A/T assembly harness connector.

CAUTION:

- Do not reuse O-ring.
- Apply ATF to O-ring.



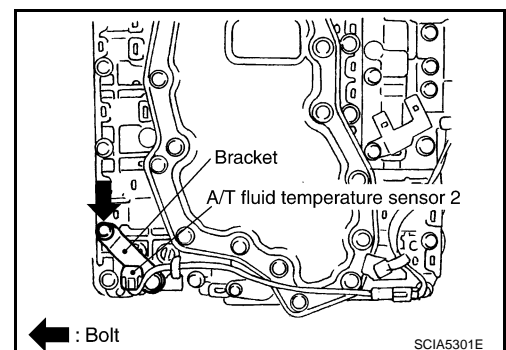
5. Install A/T fluid temperature sensor 2 to bracket.



6. Install A/T fluid temperature sensor 2 (with bracket) to control valve with TCM. Tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to [TM-199, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

CAUTION:

Adjust bolt hole of bracket to bolt hole of control valve with TCM.



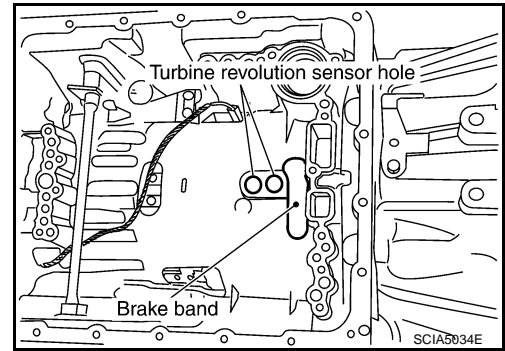
CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

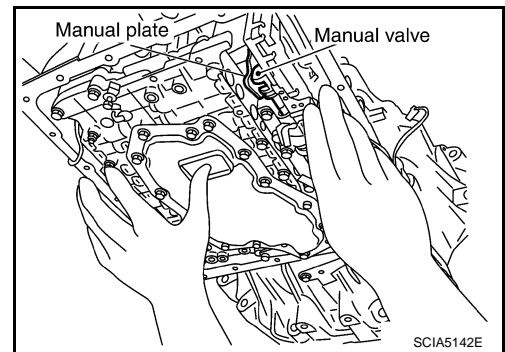
7. Install control valve with TCM in transmission case.

CAUTION:

- Make sure that turbine revolution sensor is securely installed into turbine revolution sensor hole.
- Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.
- Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.

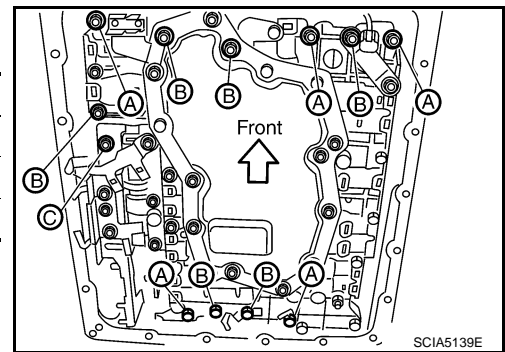


- Assemble it so that manual valve cutout is engaged with manual plate projection.



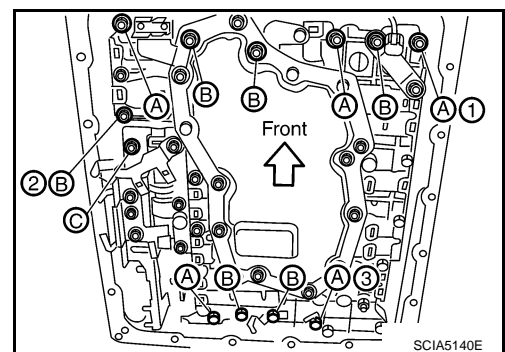
8. Install bolts (A), (B) and (C) in control valve with TCM.

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



9. Tighten bolt (1), (2) and (3) temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3). Then tighten other bolts.

10. Tighten control valve with TCM bolts to the specified torque. Refer to [TM-199. "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

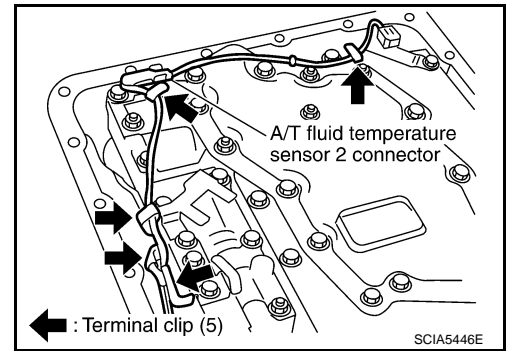


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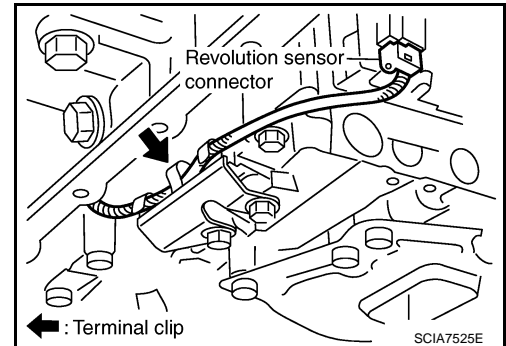
CONTROL VALVE WITH TCM

< ON-VEHICLE REPAIR >

11. Connect A/T fluid temperature sensor 2 connector.
12. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips.

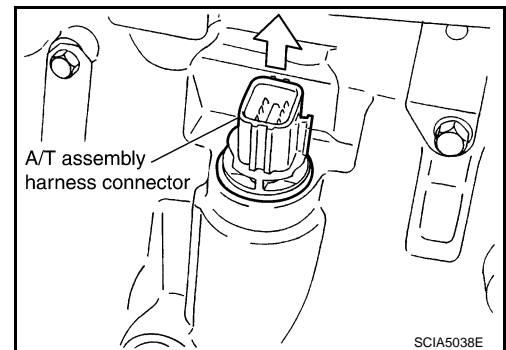


13. Connect revolution sensor connector.
14. Securely fasten revolution sensor harness with terminal clip.

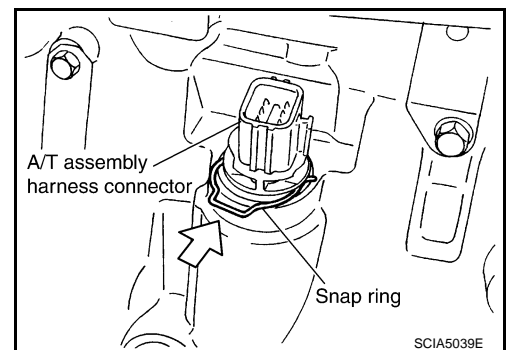


15. Install oil pan to transmission case. Refer to [TM-197, "Removal and Installation"](#).
16. Pull up A/T assembly harness connector.

CAUTION:
Do not damage connector.



17. Install snap ring to A/T assembly harness connector.
18. Connect A/T assembly harness connector.
19. Connect the negative battery terminal.
20. Refill the A/T with fluid and check the fluid level and for fluid leakage. Refer to [TM-180](#).



REAR OIL SEAL

< ON-VEHICLE REPAIR >

REAR OIL SEAL

Removal and Installation

INFOID:000000001724682

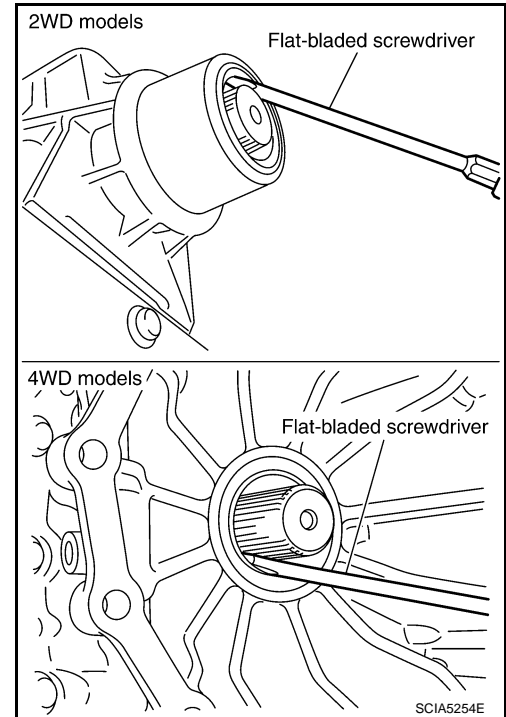
REMOVAL

1. Remove rear propeller shaft. Refer to [DLN-316, "Removal and Installation"](#).
2. Remove transfer from transmission (4WD models). Refer to [DLN-148, "Removal and Installation"](#) (ATX14B), [DLN-287, "Removal and Installation"](#) (TX15B).

3. Remove rear oil seal using flat bladed screwdriver.

CAUTION:

Do not scratch rear extension assembly (2WD models) or adapter case assembly (4WD models).



INSTALLATION

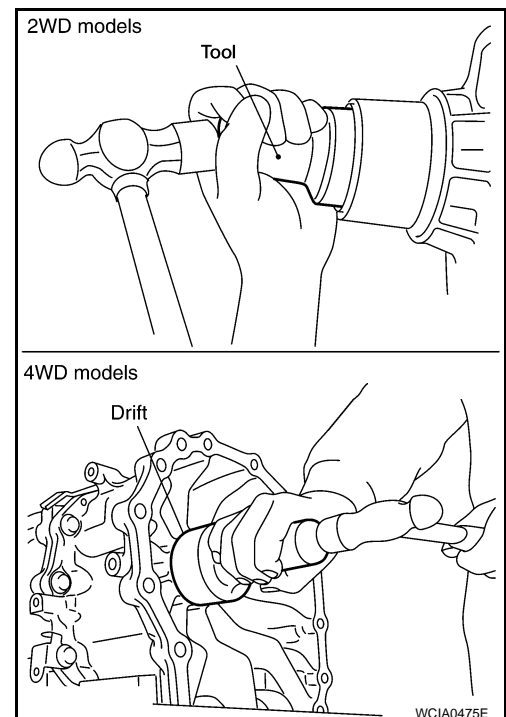
1. Install new rear oil seal until it is flush into the rear extension case (2WD models) using Tool or adapter case (4WD models) using suitable tool.

Tool number : ST33400001 (J-26082)

CAUTION:

- Apply ATF to rear oil seal.
- Do not reuse rear oil seal.

2. Install transfer to transmission (4WD models). Refer to [DLN-148, "Removal and Installation"](#) (ATX14B), [DLN-287, "Removal and Installation"](#) (TX15B).
3. Install rear propeller shaft. Refer to [DLN-316, "Removal and Installation"](#).
4. Check the A/T fluid level and for fluid leakage. Refer to [TM-180](#).



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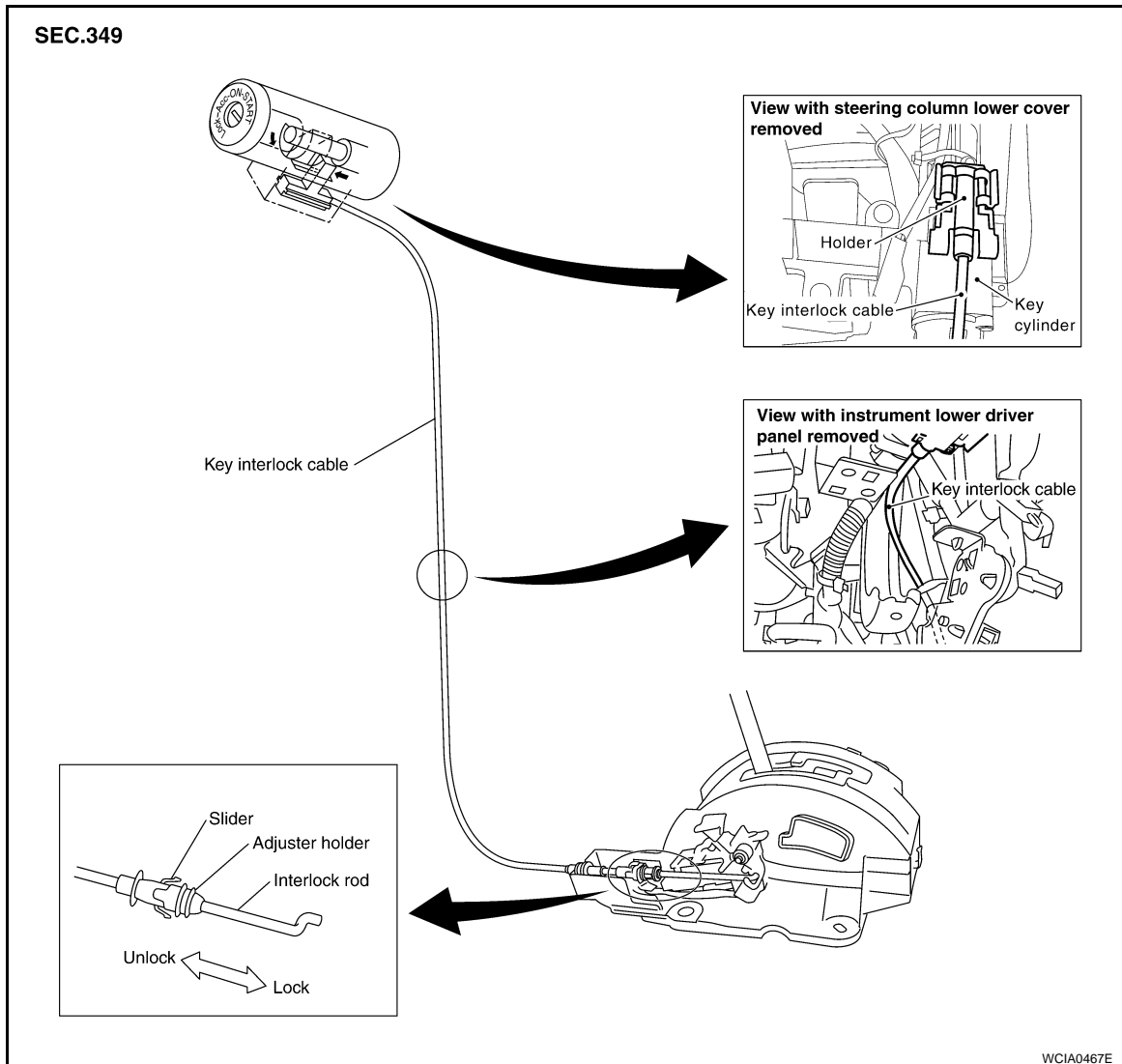
KEY INTERLOCK CABLE

< ON-VEHICLE REPAIR >

KEY INTERLOCK CABLE

Component

INFOID:000000001282975



CAUTION:

- Install key interlock cable in such a way that it will not be damaged by sharp bends, twists or interference with adjacent parts.
- After installing key interlock cable to control device, make sure that casing cap and bracket are firmly secured in their positions. If casing cap can be removed with an external load of less than 39 N (4.0 kg, 8.8 lb), replace key interlock cable with new one.

Removal and Installation

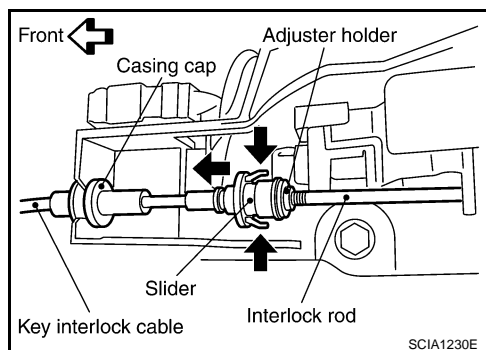
INFOID:000000001282976

REMOVAL

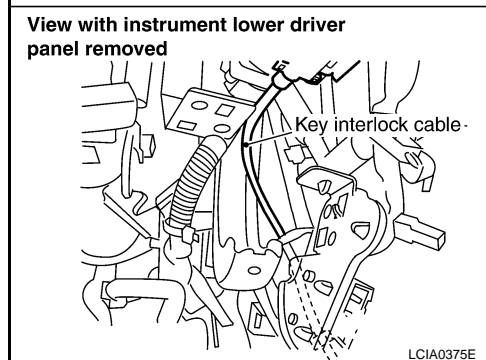
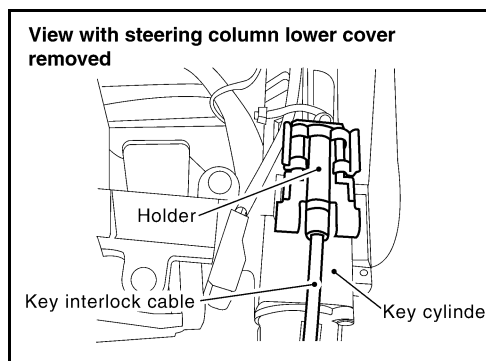
KEY INTERLOCK CABLE

< ON-VEHICLE REPAIR >

1. Unlock slider from adjuster holder by squeezing lock tabs.
2. Remove casing cap from bracket of control device assembly and remove interlock rod from adjuster holder.

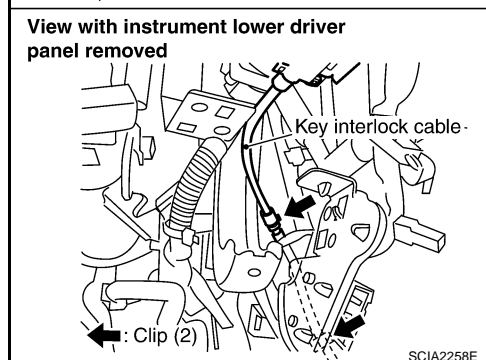
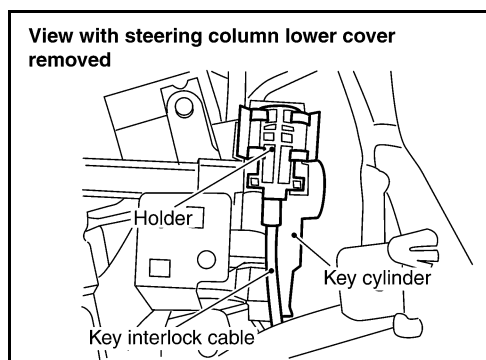


3. Remove holder from key cylinder and remove key interlock cable.



INSTALLATION

1. Set key interlock cable to key cylinder and install holder.
2. Turn ignition key to "LOCK" position.
3. Set selector lever to "P" position.

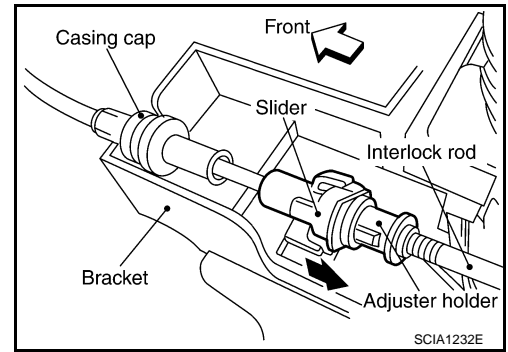


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KEY INTERLOCK CABLE

< ON-VEHICLE REPAIR >

4. Insert interlock rod into adjuster holder.
5. Install casing cap to bracket.
6. Move slider in order to secure adjuster holder to interlock rod.



AIR BREATHER HOSE

< ON-VEHICLE REPAIR >

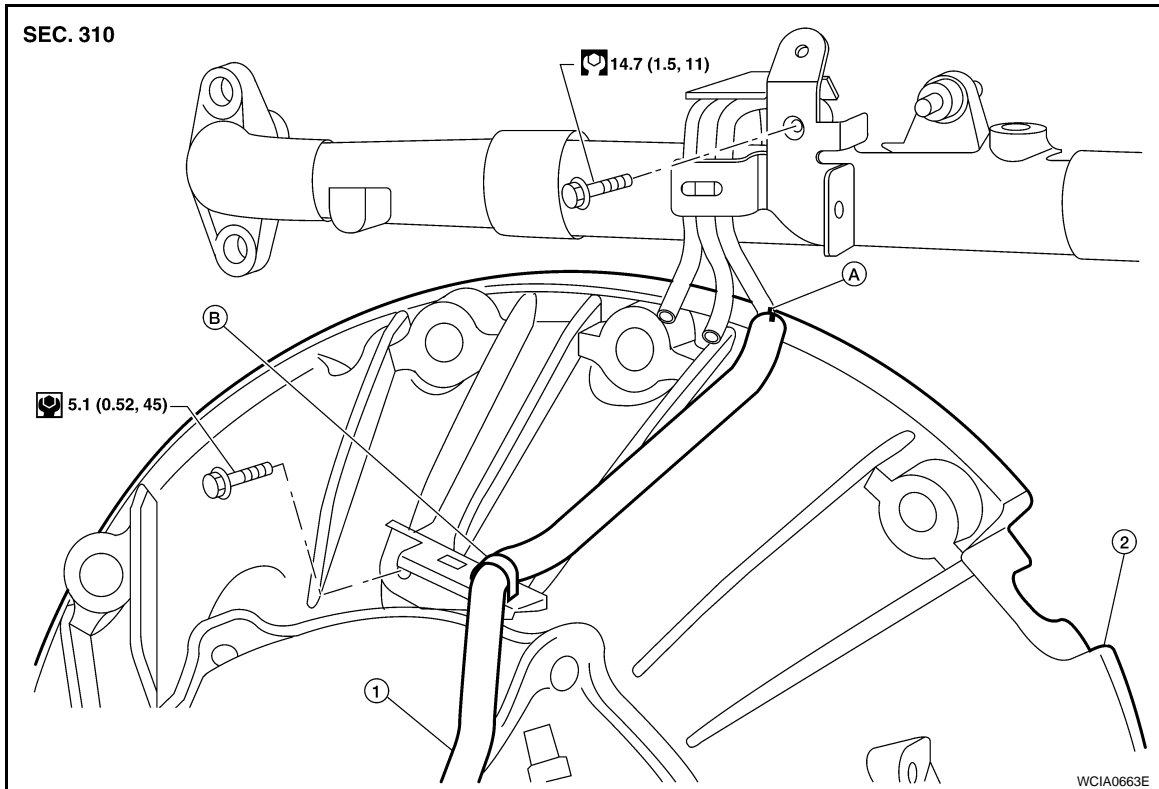
AIR BREATHER HOSE

2WD

2WD : Removal and Installation

INFOID:000000001282980

VQ40DE Models for 2WD



1. Air breather hose

2. Transmission assembly

A. Paint mark

B. Clip

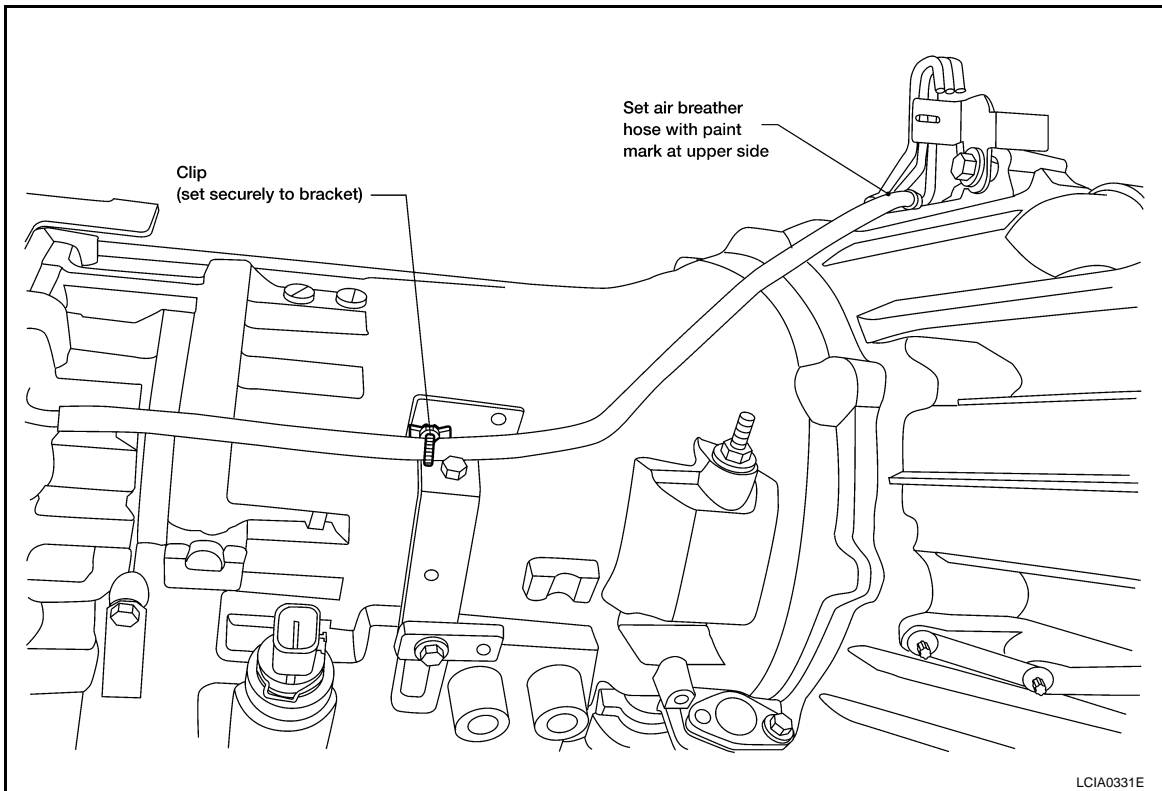
CAUTION:

- Install air breather hose with paint mark at upper side.
- When installing the air breather hose, do not crush or block by folding or bending the hose.
- When inserting the hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend portion.
- Make sure clip is securely installed to bracket.

VK56DE Models 2WD

AIR BREATHER HOSE

< ON-VEHICLE REPAIR >



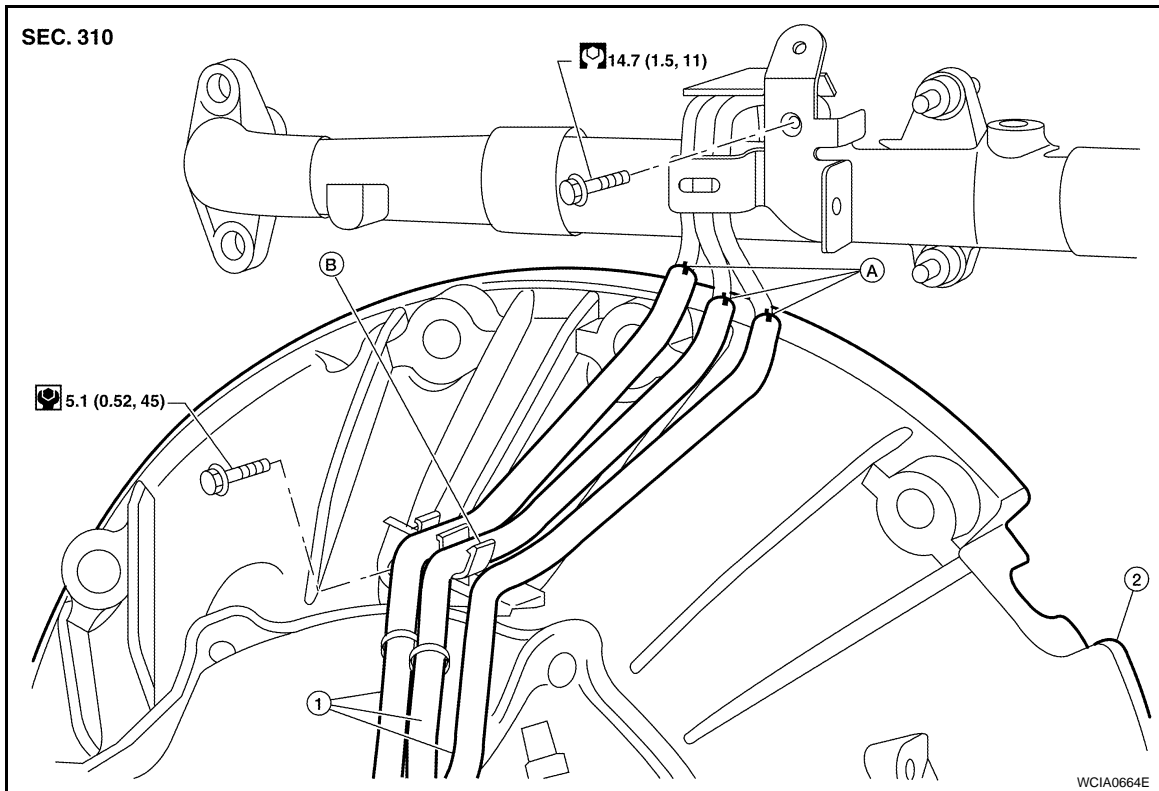
CAUTION:

- Install air breather hose with paint mark at upper side.
- When installing the air breather hose, do not crush or block by folding or bending the hose.
- When inserting the hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend portion.
- Make sure clip is securely installed to bracket.

VQ40DE Models 4WD

AIR BREATHER HOSE

< ON-VEHICLE REPAIR >



1. Air breather hose

2. Transmission assembly

A. Paint mark

B. Clip

CAUTION:

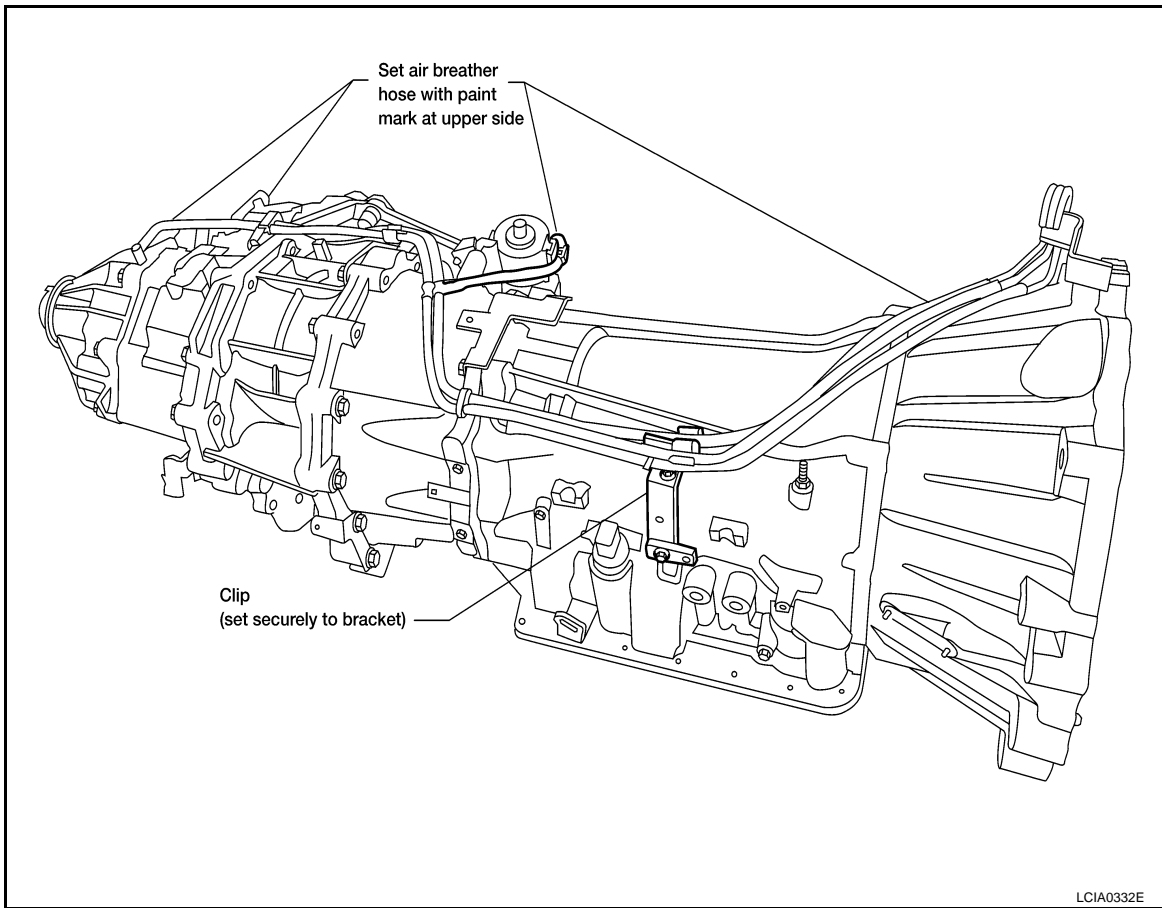
- Install air breather hose with paint mark at upper side.
- When installing the air breather hose, do not crush or block by folding or bending the hose.
- When inserting the hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend portion.
- Make sure clip is securely installed to bracket.

VK56DE Models 4WD

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AIR BREATHER HOSE

< ON-VEHICLE REPAIR >



CAUTION:

- Install air breather hose with paint mark at upper side.
- When installing the air breather hose, do not crush or block by folding or bending the hose.
- When inserting the hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend portion.
- Make sure clip is securely installed to bracket.

4WD

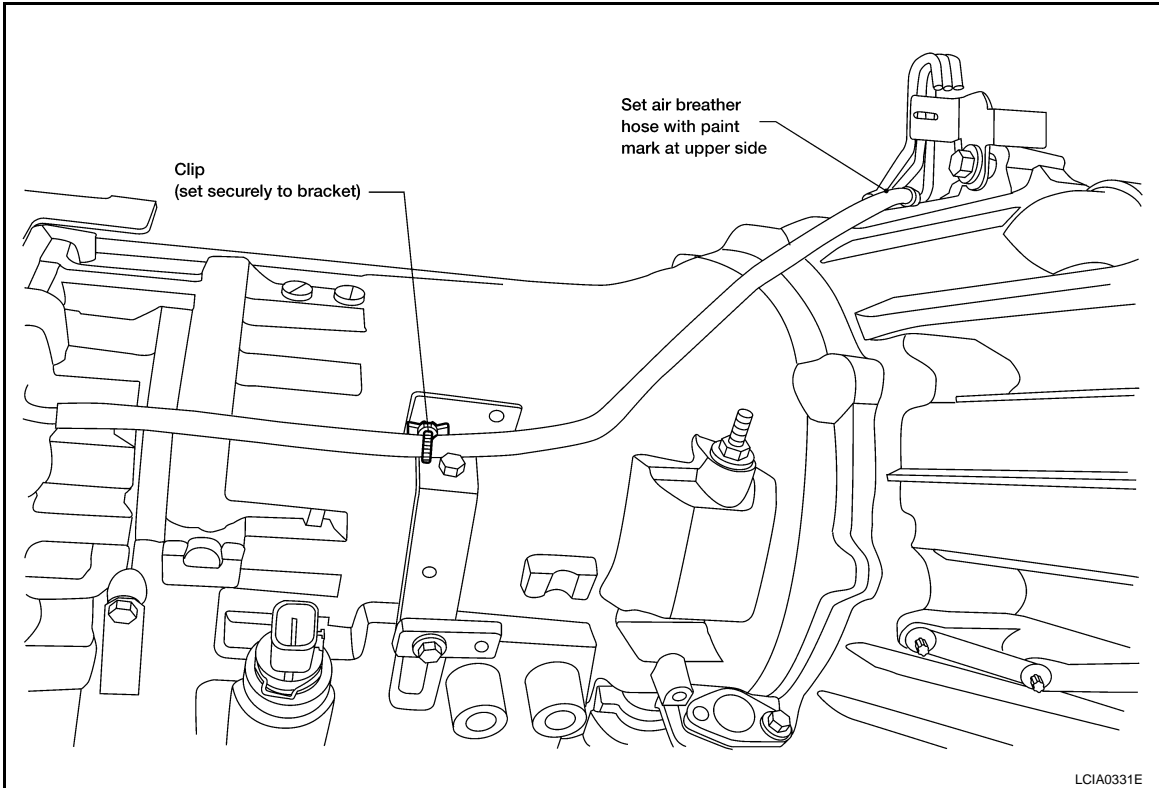
4WD : Removal and Installation

INFOID:000000001365455

2WD

AIR BREATHER HOSE

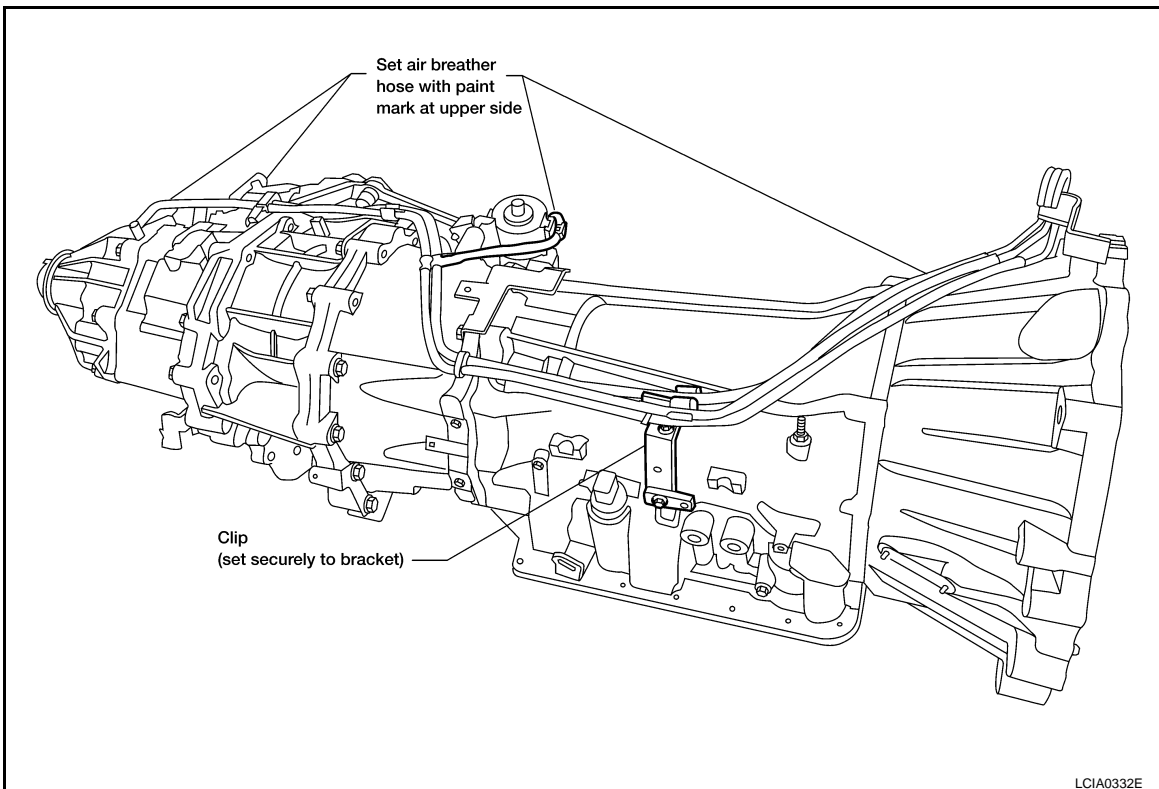
< ON-VEHICLE REPAIR >



CAUTION:

- When installing an air breather hose, do not crush or block by folding or bending the hose.
- When inserting a hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend portion.

4WD



CAUTION:

- When installing an air breather hose, do not crush or block by folding or bending the hose.

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AIR BREATHER HOSE

< ON-VEHICLE REPAIR >

- When inserting a hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend portion.

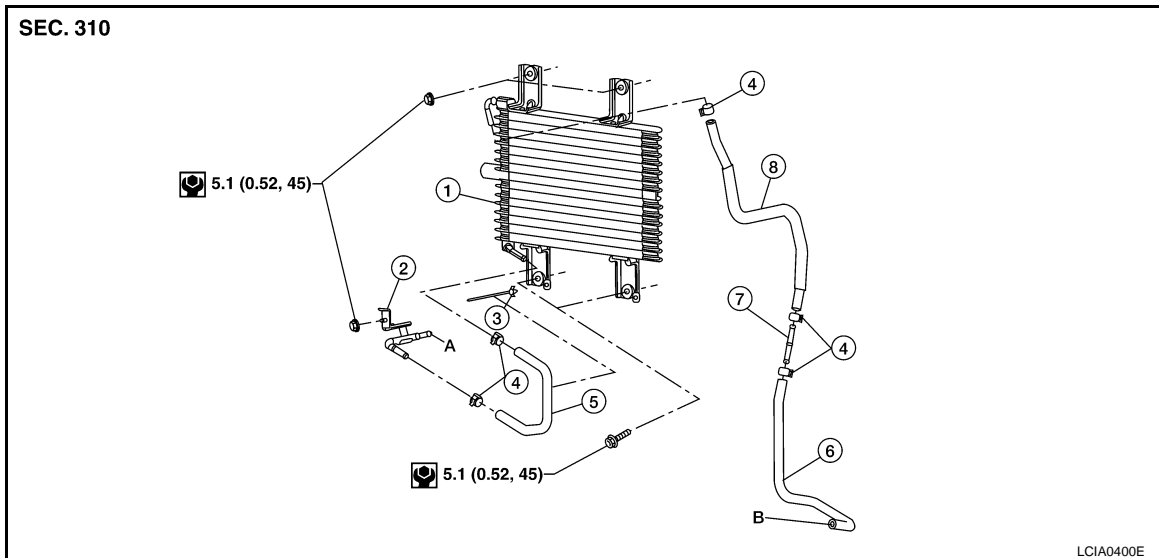
A/T FLUID COOLER

< ON-VEHICLE REPAIR >

A/T FLUID COOLER

Removal and Installation

INFOID:000000001282981



- | | | |
|---------------------|------------------------|--------------------|
| 1. A/T fluid cooler | 2. Fluid cooler tube | 3. Clip |
| 4. Hose clamp | 5. Cooler hose (lower) | 6. Cooler hose |
| 7. Tube joint | 8. Cooler hose (upper) | A. To transmission |
| B. From radiator | | |

- After completing installation, check fluid level and check for fluid leakage. Refer to [TM-180. "Checking the A/T Fluid \(ATF\)".](#)

TRANSMISSION ASSEMBLY

< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

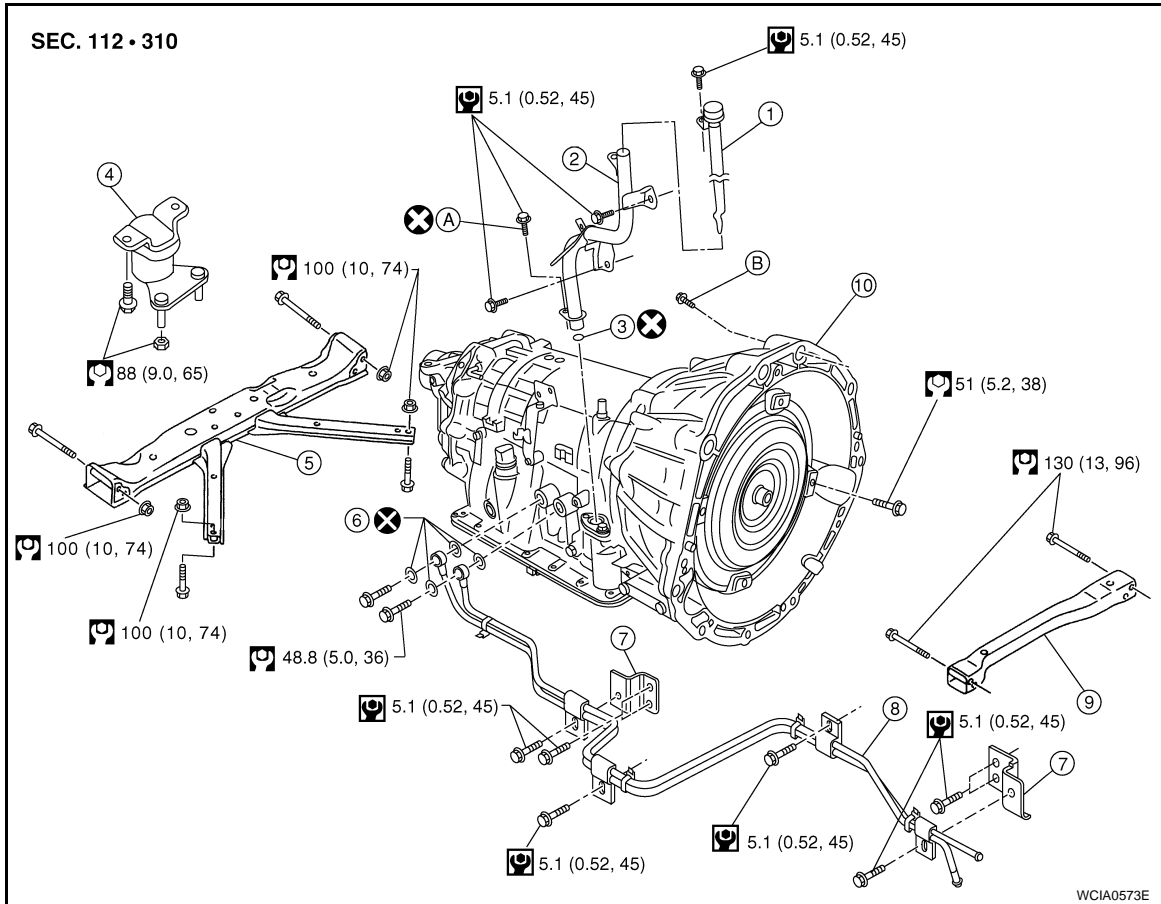
TRANSMISSION ASSEMBLY

2WD

2WD : Exploded View

INFOID:000000001714441

VQ40DE



- 1. A/T fluid level gauge
- 4. Insulator
- 7. Bracket
- 10. Transmission assembly

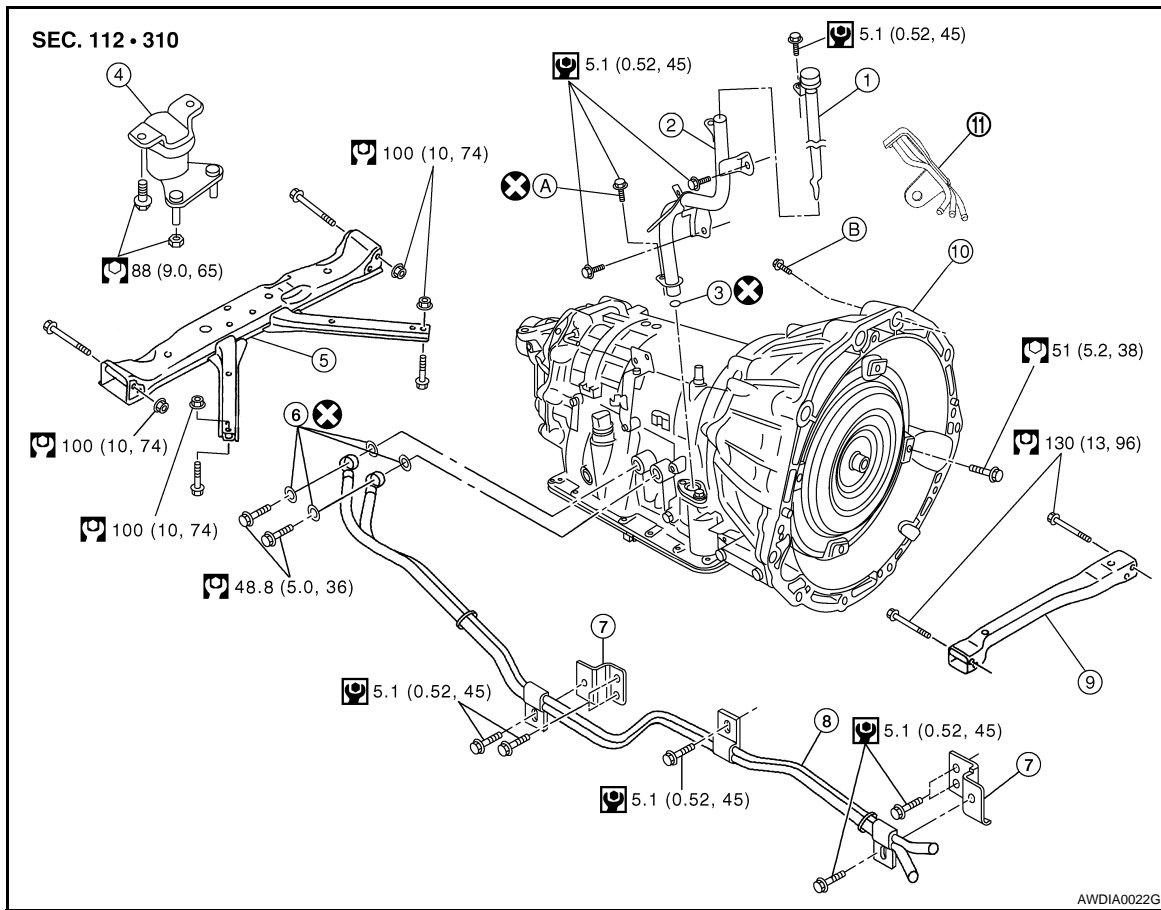
- 2. A/T fluid charging pipe
- 5. A/T crossmember
- 8. A/T fluid cooler tube
- A. Self-sealing bolt

- 3. O-ring
- 6. Copper washer
- 9. Front crossmember
- B. Refer to installation.

TRANSMISSION ASSEMBLY

< REMOVAL AND INSTALLATION >

VK56DE



- | | | |
|---------------------------|----------------------------|---------------------------|
| 1. A/T fluid level gauge | 2. A/T fluid charging pipe | 3. O-ring |
| 4. Insulator | 5. A/T crossmember | 6. Copper washer |
| 7. Bracket | 8. A/T fluid cooler tube | 9. Front crossmember |
| 10. Transmission assembly | A. Self-sealing bolt | B. Refer to installation. |

2WD : Removal and Installation

INFOID:000000001714440

REMOVAL

CAUTION:

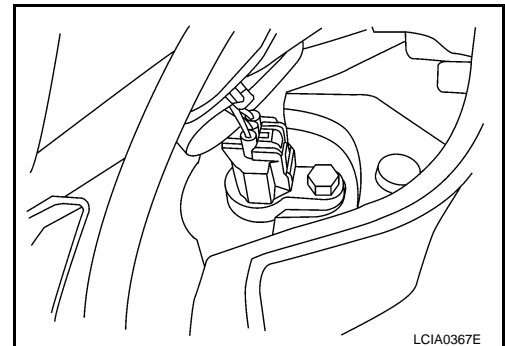
When removing the A/T assembly from engine, first remove the crankshaft position sensor (POS) from the A/T assembly.

1. Disconnect the negative battery terminal.
2. Remove the A/T fluid level gauge.
3. Remove the LH fender protector.
4. Remove the crankshaft position sensor (POS) from the A/T assembly.

CAUTION:

- Do not subject it to impact by dropping or hitting it.
- Do not disassemble.
- Do not allow metal filings or foreign material to get on the sensor front edge magnetic area.
- Do not place in an area affected by magnetism.

5. Remove the undercovers using power tool.
6. Partially drain the A/T fluid. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#).
7. Remove the front crossmember using power tool.
8. Remove the starter motor.

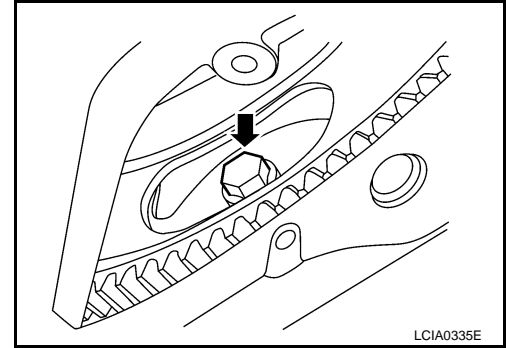


LCIA0367E

TRANSMISSION ASSEMBLY

< REMOVAL AND INSTALLATION >

9. Remove the rear propeller shaft. Refer to [DLN-316. "Removal and Installation"](#) (VQ40DE) or [DLN-325. "Removal and Installation"](#) (VK56DE).
10. Remove the left and right front exhaust tubes. Refer to [EX-5. "Removal and Installation"](#).
11. Remove the A/T selector control cable and bracket from the A/T.
12. Disconnect the A/T fluid cooler tubes from the A/T assembly.
13. Remove the dust cover from the converter housing.
14. Turn the crankshaft to access and remove the four bolts for the drive plate to torque converter.
CAUTION:
When turning the crankshaft, turn it clockwise as viewed from the front of the engine.
15. Support the A/T assembly using a transmission jack.
CAUTION:
When setting the transmission jack, be careful not to allow it to collide against the drain plug.
16. Remove the nuts securing the insulator to the crossmember.
17. Remove the crossmember using power tool.
18. Tilt the transmission slightly to gain clearance between the body and the transmission, then disconnect the air breather hose.
19. Disconnect the A/T assembly harness connector.
20. Remove the wiring harness from the retainers.
21. Remove the A/T fluid charging pipe.
22. Plug any openings such as the A/T fluid charging pipe hole.
23. Remove the A/T assembly to engine bolts using power tool.
24. Remove A/T assembly from the vehicle using Tool.



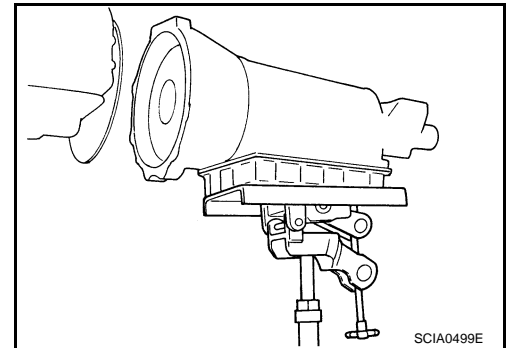
Tool number : — (J-47002)

CAUTION:

- Secure the torque converter to prevent it from dropping.
- Secure the A/T assembly the transmission jack.

NOTE:

The actual special service Tool may differ from Tool shown.



INSPECTION

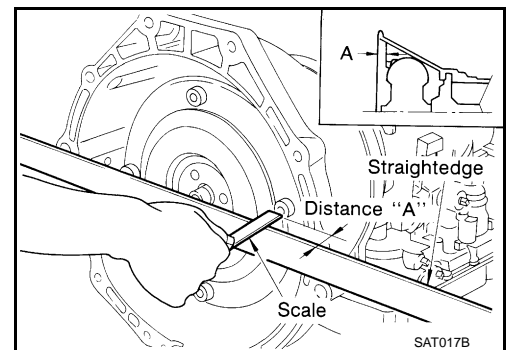
Installation and Inspection of Torque Converter

- After inserting the torque converter to the transmission, check dimension "A" to ensure it is within the reference value limit.

Dimension "A"

VQ40DE Models : 25.0 mm (0.98 in) or more

VK56DE Models : 24.0 mm (0.94 in) or more



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- When replacing an engine or transmission you must make sure the dowels are installed correctly during re-assembly.
- Improper alignment caused by missing dowels may cause vibration, oil leaks or breakage of drivetrain components.

TRANSMISSION ASSEMBLY

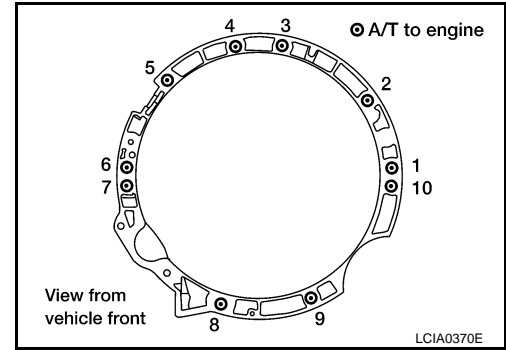
< REMOVAL AND INSTALLATION >

- Do not reuse O-rings and copper washers. Refer to [TM-224, "2WD : Exploded View"](#).
- When turning crankshaft, turn it clockwise as viewed from the front of the engine.
- After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.
- When tightening the bolts for the torque converter while securing the crankshaft pulley bolt, be sure to confirm the tightening torque of the crankshaft pulley bolt. Refer to [EM-61, "Removal and Installation" \(VQ40DE\)](#) or [EM-185, "Removal and Installation" \(VK56DE\)](#).

When installing transmission to the engine, tighten the bolts to the specified torque as shown.

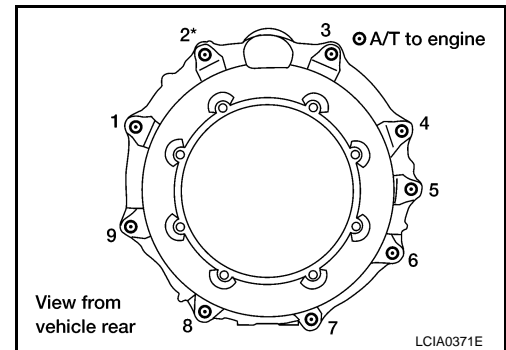
- For VQ40DE

Transmission bolts : 74 N·m (7.5 kg·m, 55 ft·lb)

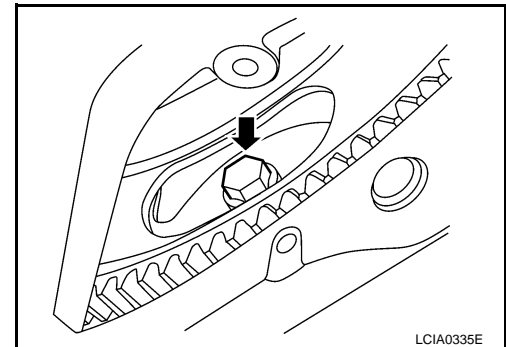


- For VK56DE

Transmission bolts : 113 N·m (12 kg·m, 83 ft·lb)



- When installing the drive plate to torque converter bolts, align the positions of bolts for drive plate with those of the torque converter and temporarily tighten the bolts. Then tighten the bolts with the specified torque.
- After completing installation, fill A/T with fluid and check fluid leakage, fluid level, and the positions of A/T. Refer to [TM-180, "Checking the A/T Fluid \(ATF\)"](#), [TM-196, "Inspection and Adjustment"](#).



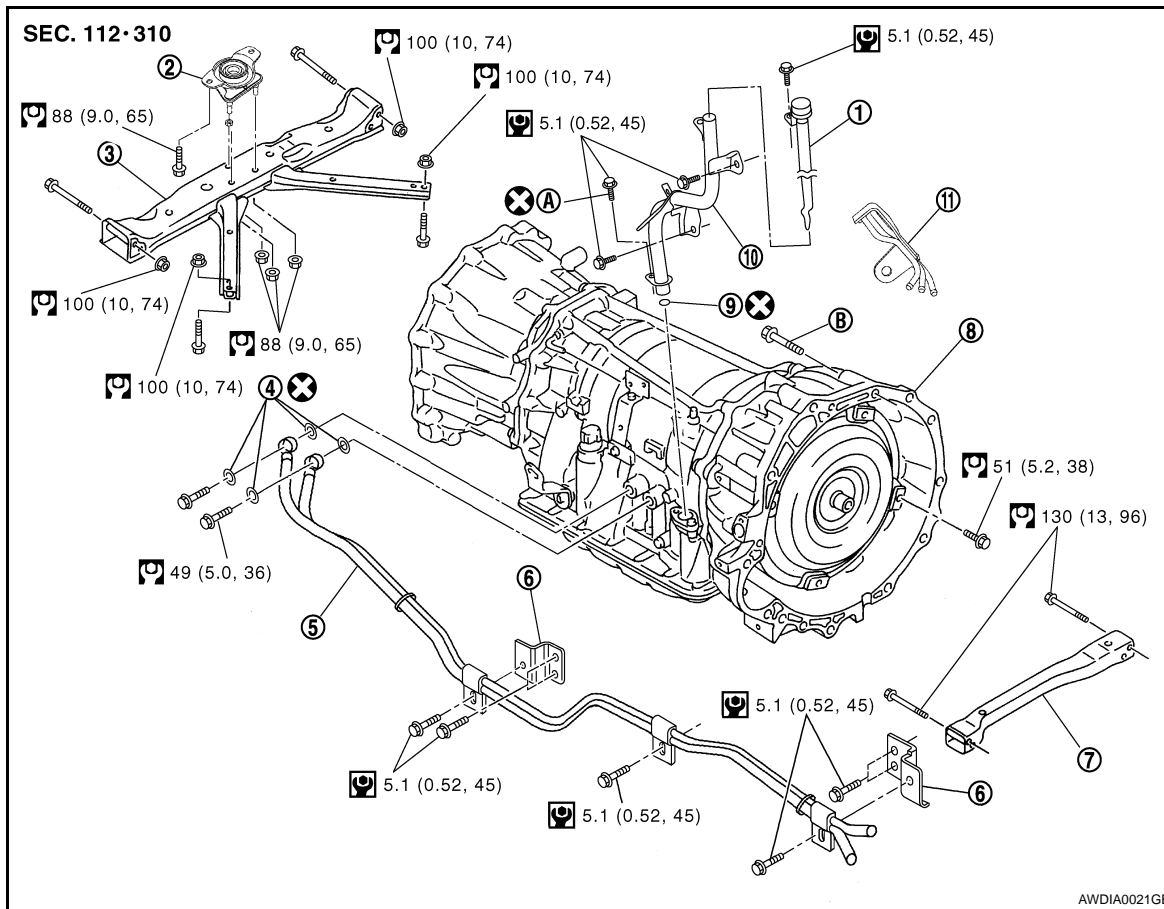
4WD

TRANSMISSION ASSEMBLY

< REMOVAL AND INSTALLATION >

4WD : Exploded View

INFOID:000000001714445



- | | | |
|-----------------------------|--------------------------|----------------------|
| 1. A/T fluid level gauge | 2. Insulator | 3. A/T crossmember |
| 4. Copper washers | 5. A/T fluid cooler tube | 6. Bracket |
| 7. Front crossmember | 8. Transmission assembly | 9. O-ring |
| 10. A/T fluid charging pipe | 11. Air breather vent | A. Self-sealing bolt |
| B. Refer to installation | | |

4WD : Removal and Installation

INFOID:000000001716874

REMOVAL

CAUTION:

When removing the A/T assembly from engine, first remove the crankshaft position sensor (POS) from the A/T assembly.

1. Disconnect the negative battery terminal.
2. Remove the A/T fluid level gauge.
3. Remove the LH fender protector.

TRANSMISSION ASSEMBLY

< REMOVAL AND INSTALLATION >

4. Remove the crankshaft position sensor (POS) from the A/T assembly.

CAUTION:

- Do not subject it to impact by dropping or hitting it.
- Do not disassemble.
- Do not allow metal filings or foreign material to get on the sensor's front edge magnetic area.
- Do not place in an area affected by magnetism.

5. Remove the undercovers using power tool.
6. Partially drain the A/T fluid. Refer to [TM-182, "Changing the A/T Fluid \(ATF\)"](#).

7. Remove the front crossmember using power tool.

8. Remove the starter motor.

9. Remove the front and rear propeller shafts. Refer to [DLN-308, "Removal and Installation"](#) for front and [DLN-316, "Removal and Installation"](#) (VQ40DE) or [DLN-325, "Removal and Installation"](#) (VK56DE) for rear.

10. Remove the left and right front exhaust tubes. Refer to [EX-5, "Removal and Installation"](#).

11. Remove the A/T selector control cable and bracket from the A/T.

12. Disconnect the fluid cooler tubes from the A/T assembly.

13. Remove the dust cover from the converter housing.

14. Turn the crankshaft to access and remove the four bolts for the drive plate and torque converter.

CAUTION:

When turning the crankshaft, turn it clockwise as viewed from the front of the engine.

15. Support the A/T assembly using a transmission jack.

CAUTION:

When setting the transmission jack, be careful not to allow it to collide against the drain plug.

16. Remove the nuts securing the insulator to the crossmember.

17. Remove the crossmember using power tool.

18. Tilt the transmission slightly to gain clearance between the body and the transmission, then disconnect the air breather hose.

19. Disconnect the following:

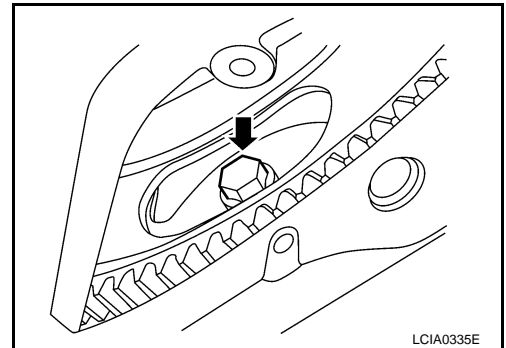
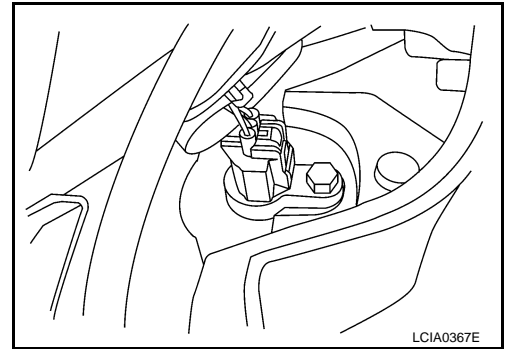
- A/T assembly harness connector
- Neutral-4LO switch connector (ATX14B only)
- 4LO switch connector (TX15B only)
- Wait detection switch connector
- ATP switch connector
- Transfer motor connector (ATX14B only)
- Control valve assembly connector (ATX14B only)
- Transfer control device connector

20. Remove the wiring harness from the retainers.

21. Remove the A/T fluid charging pipe.

22. Plug any openings such as the fluid charging pipe hole.

23. Remove the A/T assembly to engine bolts using power tool.



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TRANSMISSION ASSEMBLY

< REMOVAL AND INSTALLATION >

24. Remove A/T assembly with transfer from the vehicle using Tool.

Tool number : — (J-47002)

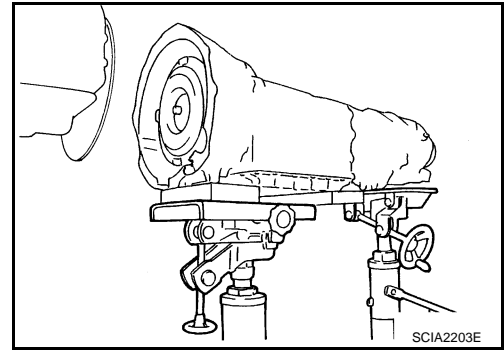
CAUTION:

- Secure the torque converter to prevent it from dropping.
- Secure the A/T assembly to the transmission jack.

NOTE:

The actual special service Tool may differ from Tool shown.

25. Remove the transfer from the A/T assembly. Refer to [DLN-148, "Removal and Installation"](#) (ATX14B) or [DLN-287, "Removal and Installation"](#) (TX15B).



INSPECTION

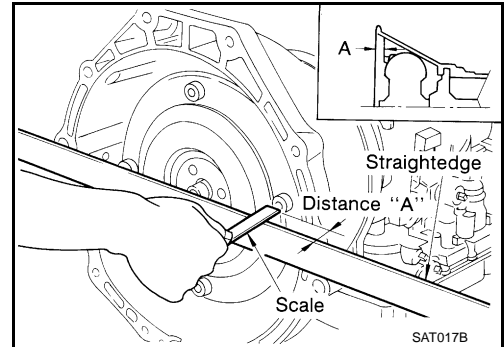
Installation and Inspection of Torque Converter

- After inserting the torque converter to the transmission, be sure to check dimension "A" to ensure it is within the reference value limit.

Dimension "A"

VQ40DE Models : 25.0 mm (0.98 in) or more

VK56DE Models : 24.0 mm (0.94 in) or more



INSTALLATION

Installation is in the reverse order of removal.

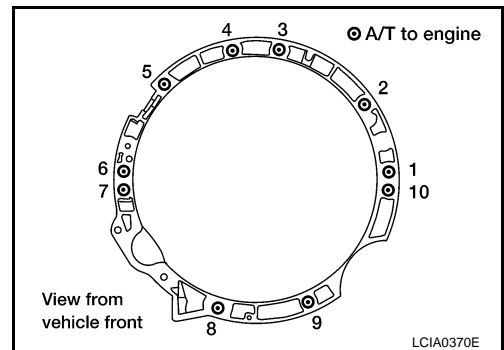
CAUTION:

- When replacing an engine or transmission you must make sure the dowels are installed correctly during re-assembly.
- Improper alignment caused by missing dowels may cause vibration, oil leaks or breakage of drivetrain components.
- Do not reuse O-rings and copper washers. Refer to [TM-228, "4WD : Exploded View"](#).
- When turning crankshaft, turn it clockwise as viewed from the front of the engine.
- After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.
- When tightening the bolts for the torque converter while securing the crankshaft pulley bolt, be sure to confirm the tightening torque of the crankshaft pulley bolt. Refer to [EM-61, "Removal and Installation"](#) (VQ40DE) or [EM-185, "Removal and Installation"](#) (VK56DE).

When installing transmission to the engine, tighten the bolts to the specified torque as shown.

- For VQ40DE

Transmission bolts : 74 N·m (7.5 kg·m, 55 ft·lb)

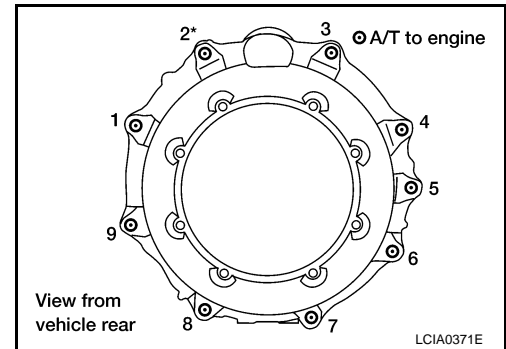


TRANSMISSION ASSEMBLY

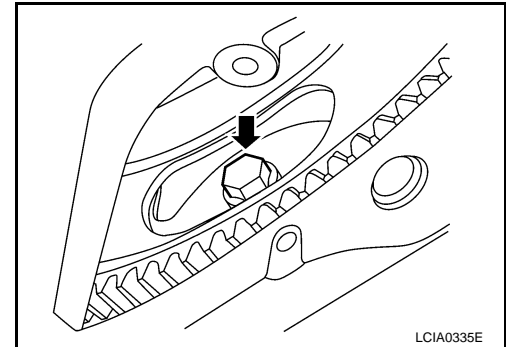
< REMOVAL AND INSTALLATION >

- For VK56DE

Transmission bolts : 113 N·m (12 kg-m, 83 ft-lb)



- When installing the drive plate to torque converter bolts, align the positions of bolts for drive plate with those of the torque converter and temporarily tighten the bolts. Then tighten the bolts with the specified torque.
- After completing installation, fill A/T with fluid and check fluid leakage, fluid level, and the positions of A/T. Refer to [TM-180. "Checking the A/T Fluid \(ATF\)"](#), [TM-196. "Inspection and Adjustment"](#).



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OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

DISASSEMBLY AND ASSEMBLY

OVERHAUL

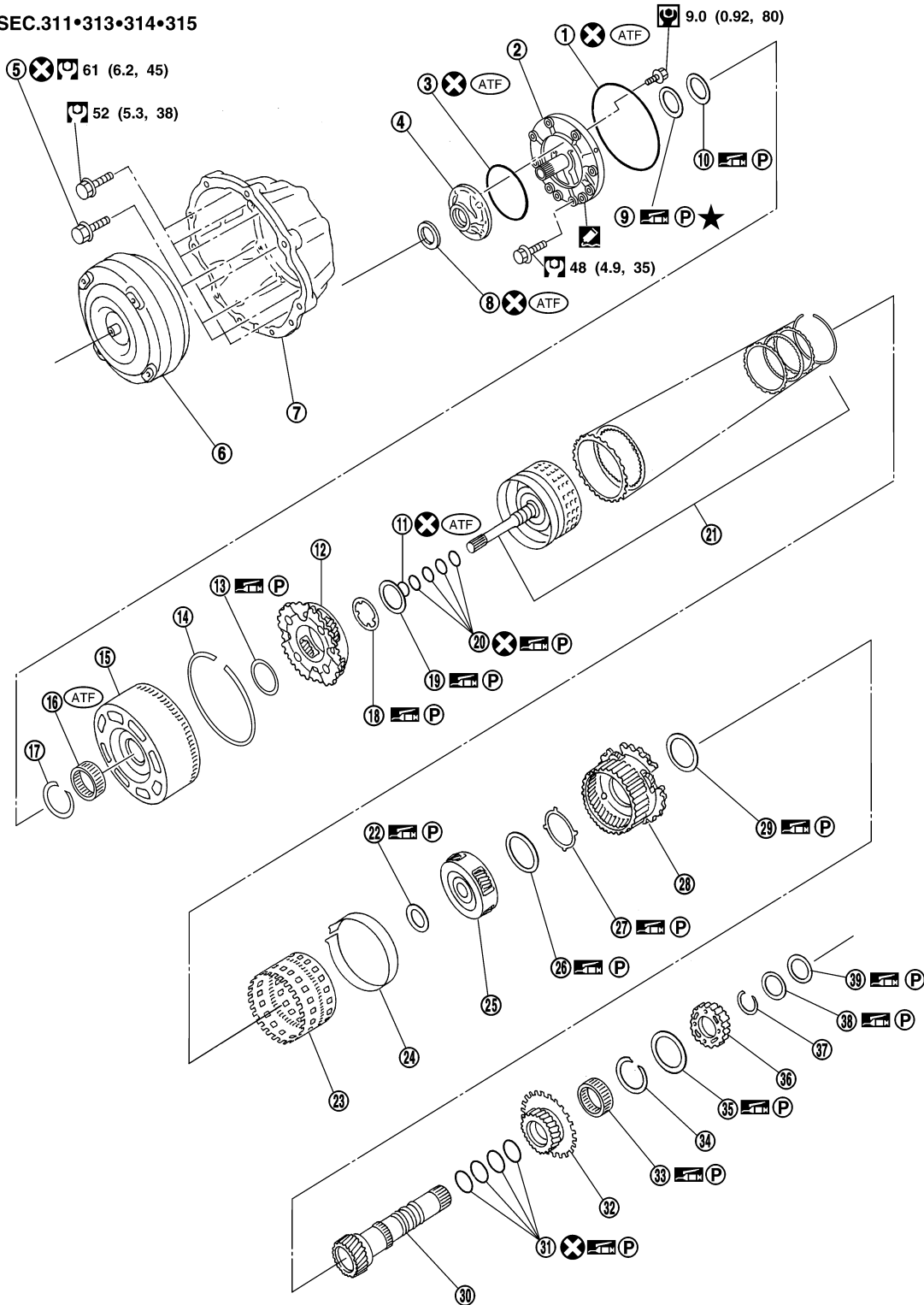
Exploded View

INFOID:000000001726694

VQ40DE models

Bell Housing Components

SEC.311•313•314•315



WCIA0661E

OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

1. O-ring	2. Oil pump cover	3. O-ring	A
4. Oil pump housing	5. Self-sealing bolts	6. Torque converter	
7. Converter housing	8. Oil pump housing oil seal	9. Bearing race	
10. Needle bearing	11. O-ring	12. Front carrier assembly	B
13. Needle bearing	14. Snap ring	15. Front sun gear	
16. 3rd one-way clutch	17. Snap ring	18. Bearing race	
19. Needle bearing	20. Seal ring	21. Input clutch assembly	C
22. Needle bearing	23. Rear internal gear	24. Brake band	
25. Mid carrier assembly	26. Needle bearing	27. Bearing race	
28. Rear carrier assembly	29. Needle bearing	30. Mid sun gear	TM
31. Seal ring	32. Rear sun gear	33. 1st one-way clutch	
34. Snap ring	35. Needle bearing	36. High and low reverse clutch hub	
37. Snap ring	38. Bearing race	39. Needle bearing	E

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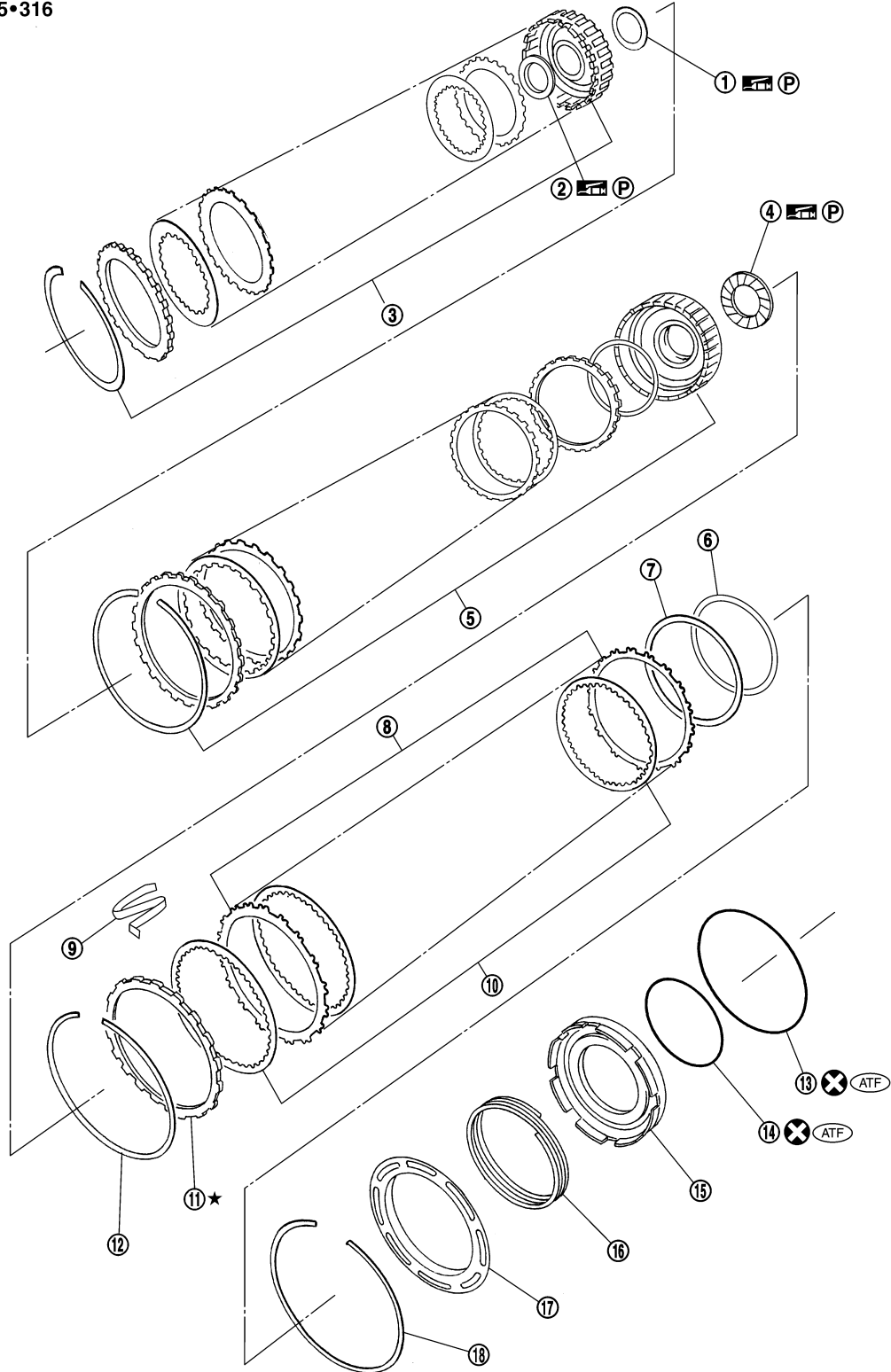
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OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

Clutch Pack Components

SEC.315•316



- | | | |
|-------------------------------|-----------------------------------|---|
| 1. Needle bearing | 2. Bearing race | 3. High and low reverse clutch assembly |
| 4. Needle bearing | 5. Direct clutch assembly | 6. Reverse brake dish plate |
| 7. Reverse brake dish plate | 8. Reverse brake driven plate | 9. N-spring |
| 10. Reverse brake drive plate | 11. Reverse brake retaining plate | 12. Snap ring |

SCIA7001E

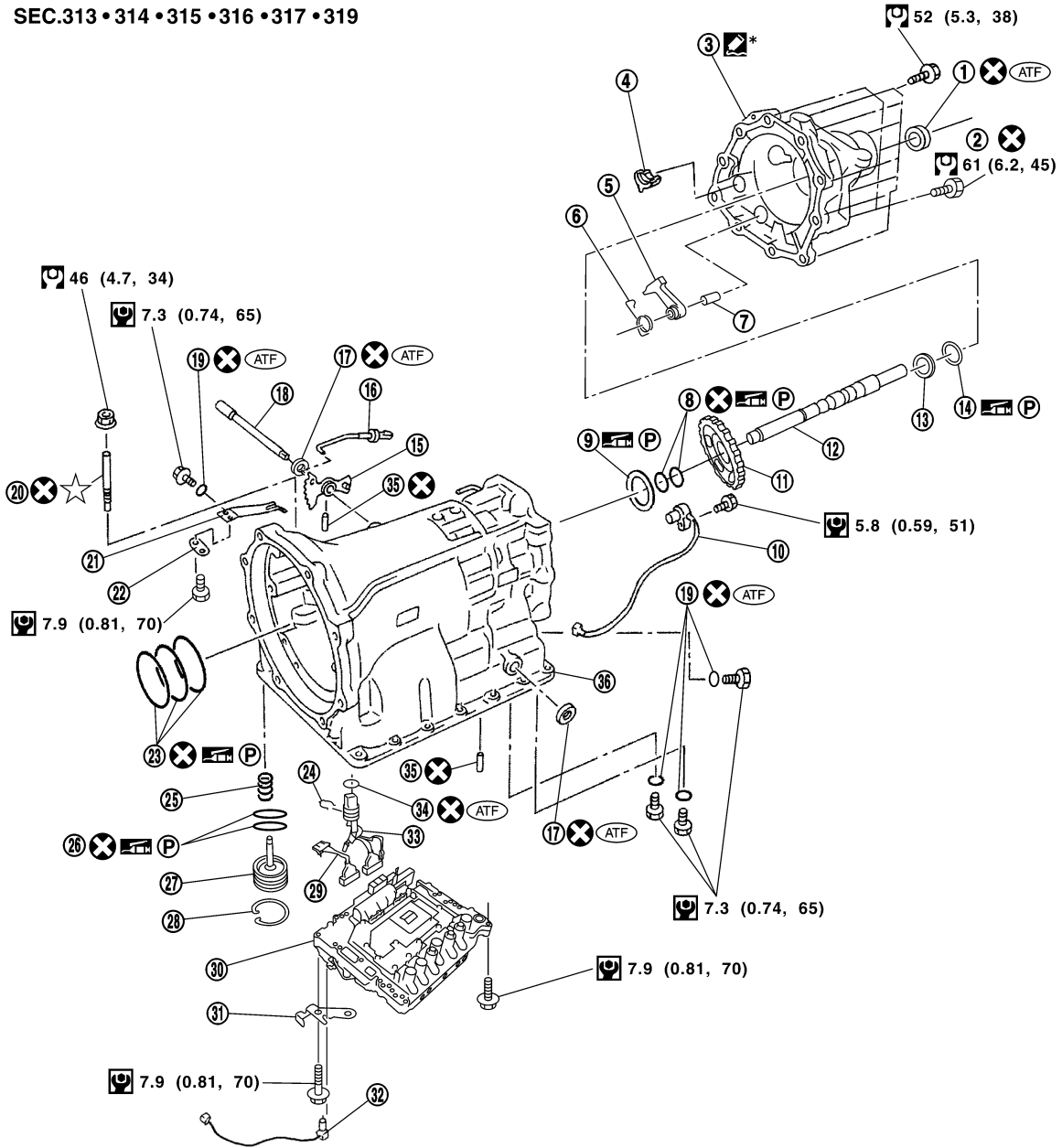
OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

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|-------------------|---------------------|--------------------------|
| 13. D-ring | 14. D-ring | 15. Reverse brake piston |
| 16. Return spring | 17. Spring retainer | 18. Snap ring |

Transmission Case Components for 2WD

SEC.313 • 314 • 315 • 316 • 317 • 319



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

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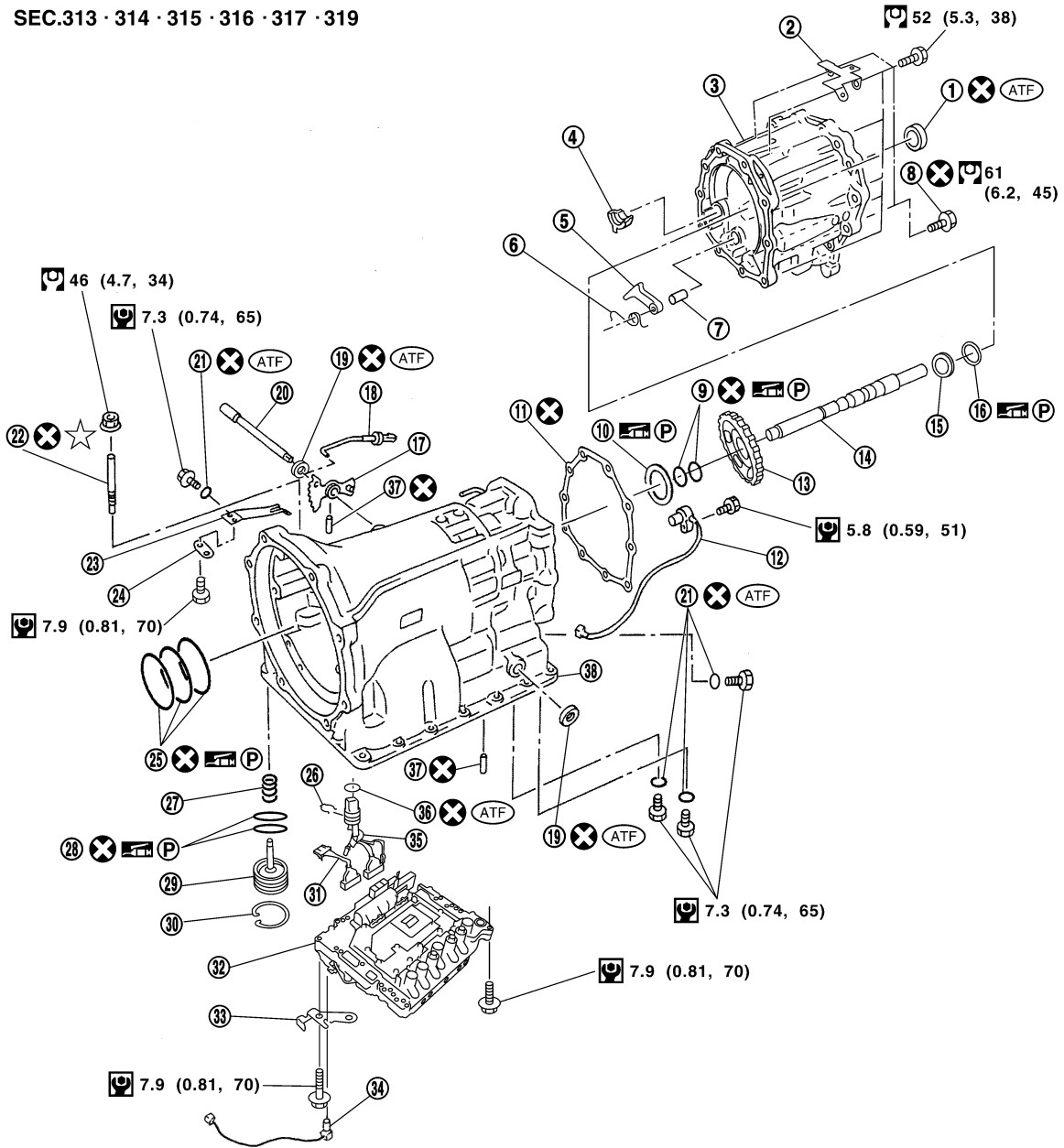
- | | | |
|-------------------|------------------------------------|----------------------------|
| 13. Bearing race | 14. Needle bearing | 15. Manual plate |
| 16. Parking rod | 17. Manual shaft oil seal | 18. Manual shaft |
| 19. O-ring | 20. Band servo anchor end pin | 21. Detent spring |
| 22. Spacer | 23. Seal ring | 24. Snap ring |
| 25. Return spring | 26. O-ring | 27. Servo assembly |
| 28. Snap ring | 29. Sub-harness | 30. Control valve with TCM |
| 31. Bracket | 32. A/T fluid temperature sensor 2 | 33. Terminal cord assembly |
| 34. O-ring | 35. Retaining pin | 36. Transmission case |

OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

Transmission Case Components for 4WD

SEC.313 · 314 · 315 · 316 · 317 · 319



- | | | |
|-----------------------------|----------------------|-----------------------|
| 1. Rear oil seal | 2. Bracket | 3. Adapter case |
| 4. Parking actuator support | 5. Parking pawl | 6. Return spring |
| 7. Pawl shaft | 8. Self-sealing bolt | 9. Seal ring |
| 10. Needle bearing | 11. Gasket | 12. Revolution sensor |
| 13. Parking gear | 14. Output shaft | 15. Bearing race |
| 16. Needle bearing | 17. Manual plate | 18. Parking rod |

AWDIA0026GB

OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

- | | | |
|------------------------------------|----------------------------|-------------------|
| 19. Manual shaft oil seal | 20. Manual shaft | 21. O-ring |
| 22. Band servo anchor end pin | 23. Detent spring | 24. Spacer |
| 25. Seal ring | 26. Snap ring | 27. Return spring |
| 28. O-ring | 29. Servo assembly | 30. Snap ring |
| 31. Sub-harness | 32. Control valve with TCM | 33. Bracket |
| 34. A/T fluid temperature sensor 2 | 35. Terminal cord assembly | 36. O-ring |
| 37. Retaining pin | 38. Transmission case | |

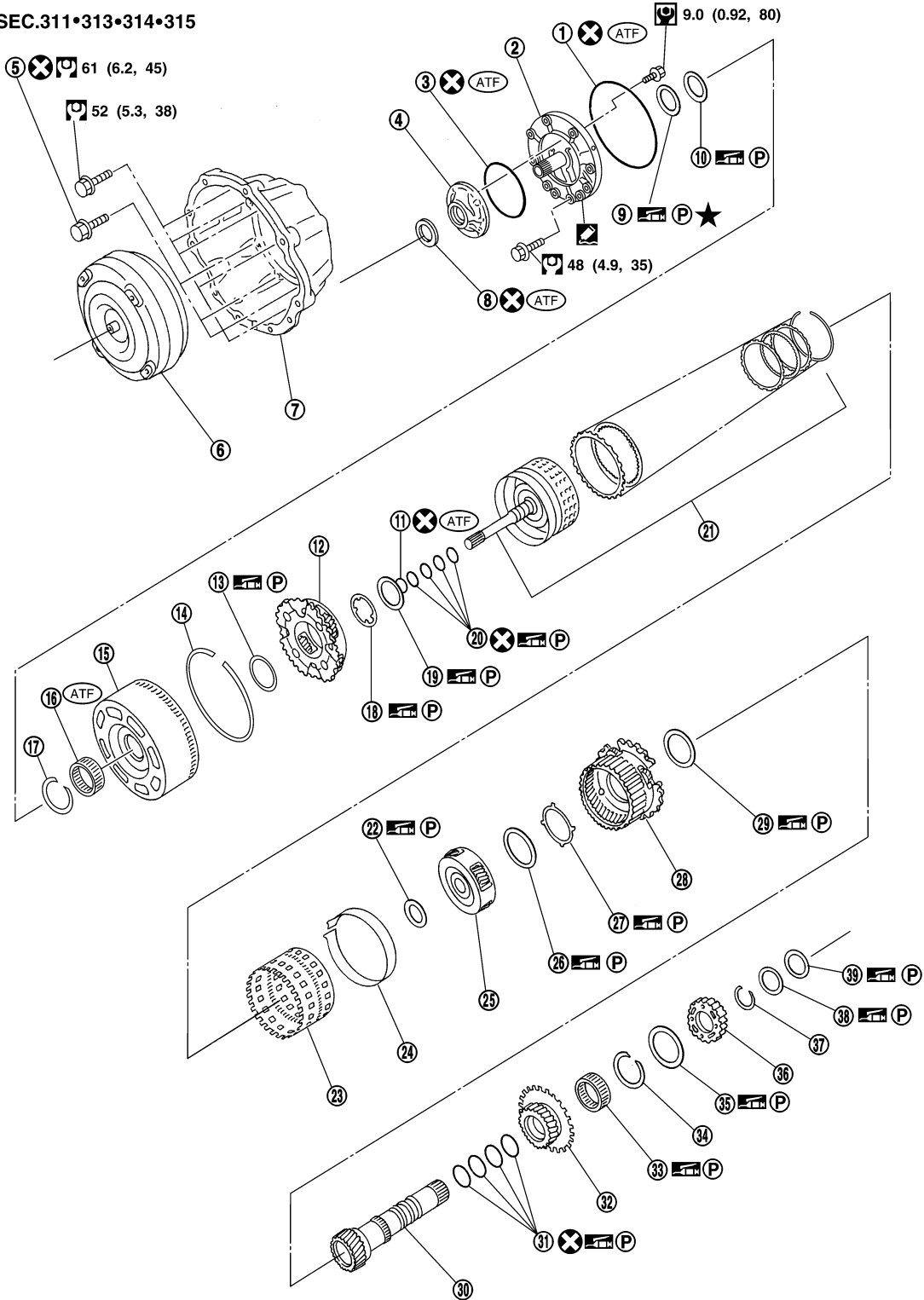
VK56DE models

OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

Bell Housing Components

SEC.311•313•314•315



- | | | |
|------------------------|------------------------------|----------------------------|
| 1. O-ring | 2. Oil pump cover | 3. O-ring |
| 4. Oil pump housing | 5. Self-sealing bolts | 6. Torque converter |
| 7. Converter housing | 8. Oil pump housing oil seal | 9. Bearing race |
| 10. Needle bearing | 11. O-ring | 12. Front carrier assembly |
| 13. Needle bearing | 14. Snap ring | 15. Front sun gear |
| 16. 3rd one-way clutch | 17. Snap ring | 18. Bearing race |

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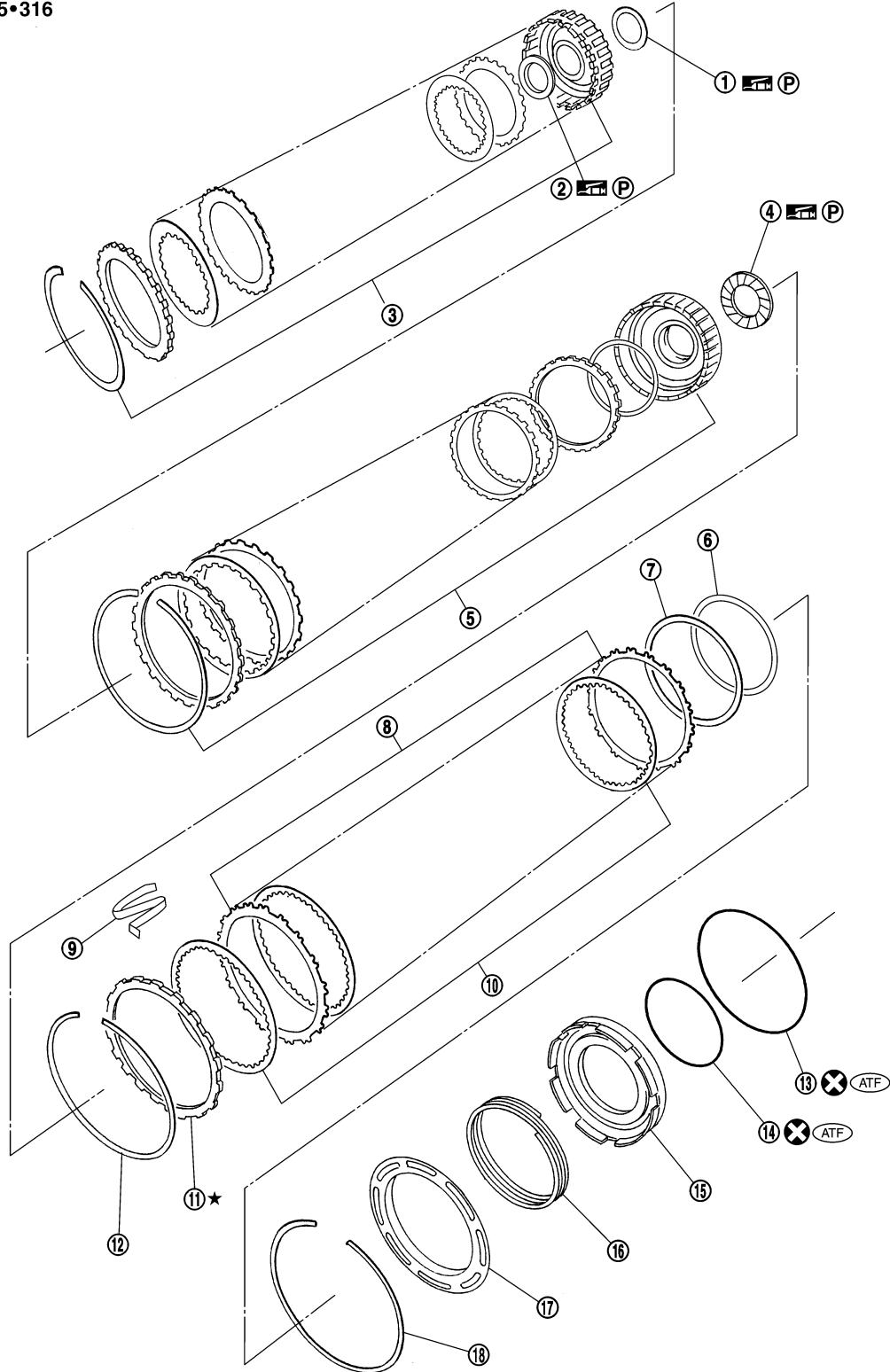
- | | | |
|---------------------------|------------------------|-------------------------------------|
| 19. Needle bearing | 20. Seal ring | 21. Input clutch assembly |
| 22. Needle bearing | 23. Rear internal gear | 24. Brake band |
| 25. Mid carrier assembly | 26. Needle bearing | 27. Bearing race |
| 28. Rear carrier assembly | 29. Needle bearing | 30. Mid sun gear |
| 31. Seal ring | 32. Rear sun gear | 33. 1st one-way clutch |
| 34. Snap ring | 35. Needle bearing | 36. High and low reverse clutch hub |
| 37. Snap ring | 38. Bearing race | 39. Needle bearing |

OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

Clutch Pack Components

SEC.315•316



- | | | |
|-------------------------------|-----------------------------------|---|
| 1. Needle bearing | 2. Bearing race | 3. High and low reverse clutch assembly |
| 4. Needle bearing | 5. Direct clutch assembly | 6. Reverse brake dish plate |
| 7. Reverse brake dish plate | 8. Reverse brake driven plate | 9. N-spring |
| 10. Reverse brake drive plate | 11. Reverse brake retaining plate | 12. Snap ring |

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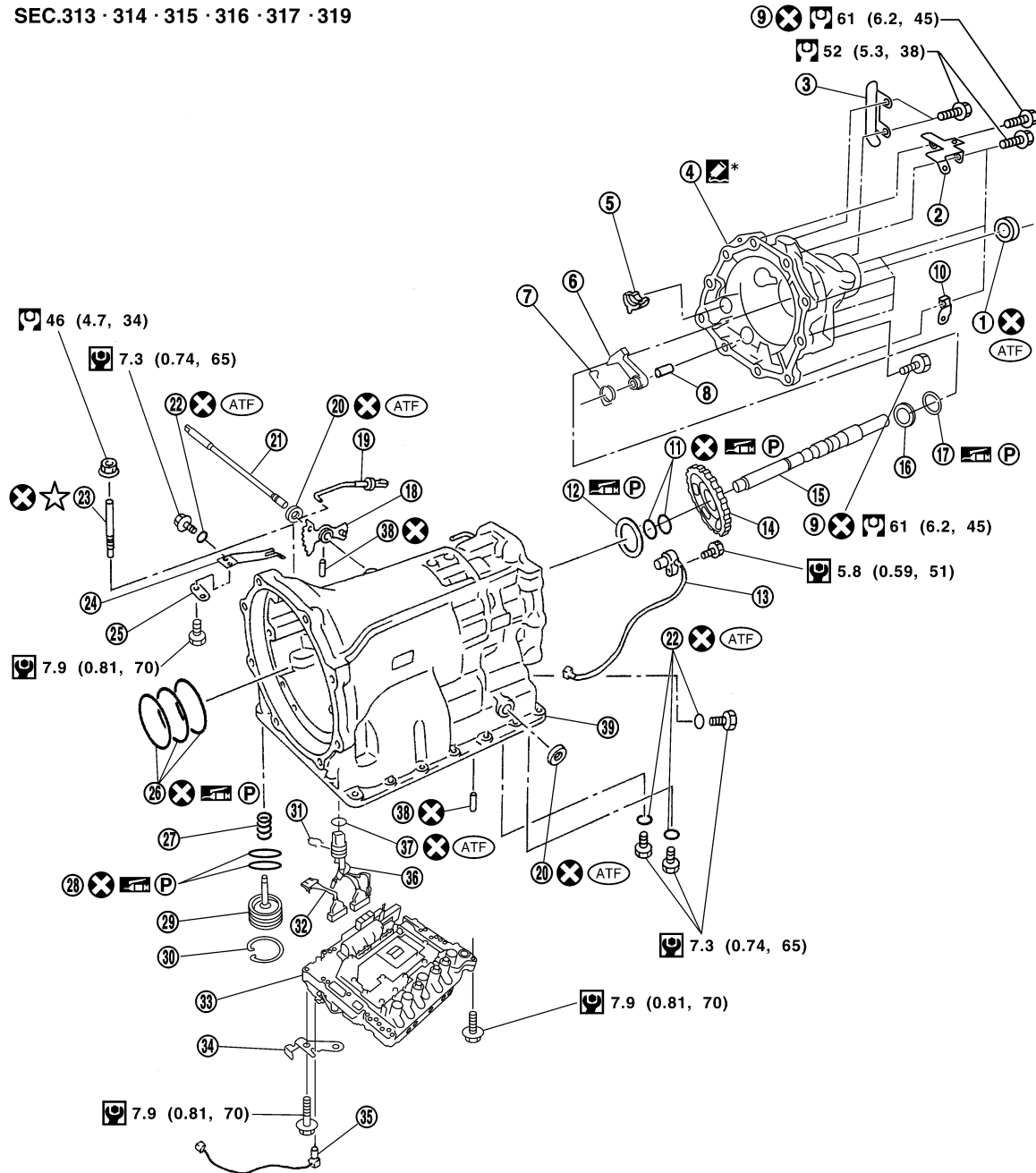
OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

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|-------------------|---------------------|--------------------------|
| 13. D-ring | 14. D-ring | 15. Reverse brake piston |
| 16. Return spring | 17. Spring retainer | 18. Snap ring |

Transmission Case Components for 2WD

SEC.313 · 314 · 315 · 316 · 317 · 319



- | | | |
|------------------|-----------------------------|----------------------|
| 1. Rear oil seal | 2. Bracket | 3. Bracket |
| 4. Adapter case | 5. Parking actuator support | 6. Parking pawl |
| 7. Return spring | 8. Pawl shaft | 9. Self-sealing bolt |
| 10. Seal ring | 11. Needle bearing | 12. Gasket |

AWDIA0027GB

OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

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|-----------------------|------------------------------------|----------------------------|
| 13. Revolution sensor | 14. Parking gear | 15. Output shaft |
| 16. Bearing race | 17. Needle bearing | 18. Manual plate |
| 19. Parking rod | 20. Manual shaft oil seal | 21. Manual shaft |
| 22. O-ring | 23. Band servo anchor end pin | 24. Detent spring |
| 25. Spacer | 26. Seal ring | 27. Snap ring |
| 28. Return spring | 29. O-ring | 30. Servo assembly |
| 31. Snap ring | 32. Sub-harness | 33. Control valve with TCM |
| 34. Bracket | 35. A/T fluid temperature sensor 2 | 36. Terminal cord assembly |
| 37. O-ring | 38. Retaining pin | 39. Transmission case |

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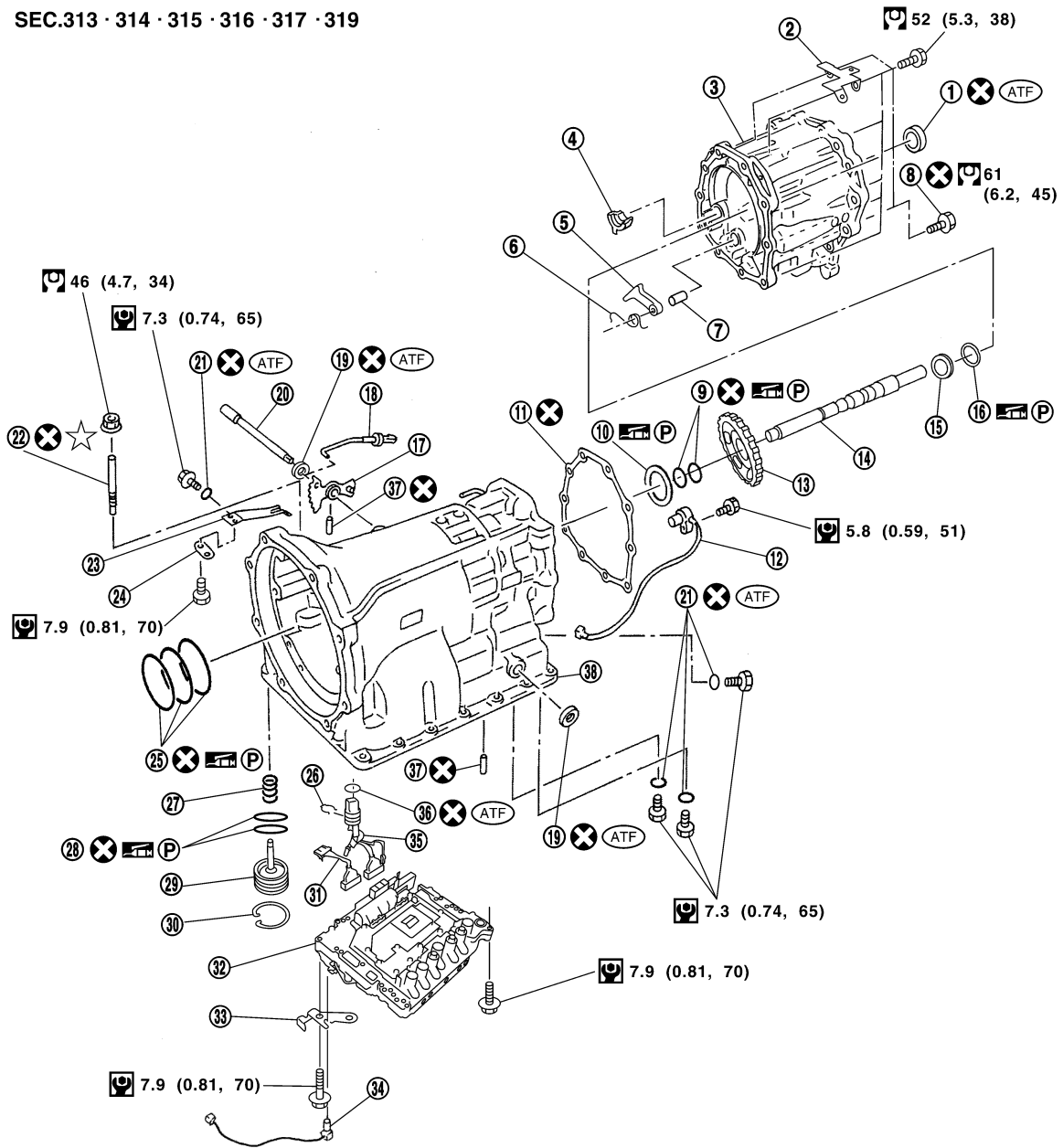
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OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

Transmission Case Components for 4WD

SEC.313 · 314 · 315 · 316 · 317 · 319



AWDIA0026GB

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|-----------------------------|----------------------|-----------------------|
| 1. Rear oil seal | 2. Bracket | 3. Adapter case |
| 4. Parking actuator support | 5. Parking pawl | 6. Return spring |
| 7. Pawl shaft | 8. Self-sealing bolt | 9. Seal ring |
| 10. Needle bearing | 11. Gasket | 12. Revolution sensor |
| 13. Parking gear | 14. Output shaft | 15. Bearing race |
| 16. Needle bearing | 17. Manual plate | 18. Parking rod |

OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

- | | | |
|------------------------------------|----------------------------|-------------------|
| 19. Manual shaft oil seal | 20. Manual shaft | 21. O-ring |
| 22. Band servo anchor end pin | 23. Detent spring | 24. Spacer |
| 25. Seal ring | 26. Snap ring | 27. Return spring |
| 28. O-ring | 29. Servo assembly | 30. Snap ring |
| 31. Sub-harness | 32. Control valve with TCM | 33. Bracket |
| 34. A/T fluid temperature sensor 2 | 35. Terminal cord assembly | 36. O-ring |
| 37. Retaining pin | 38. Transmission case | |

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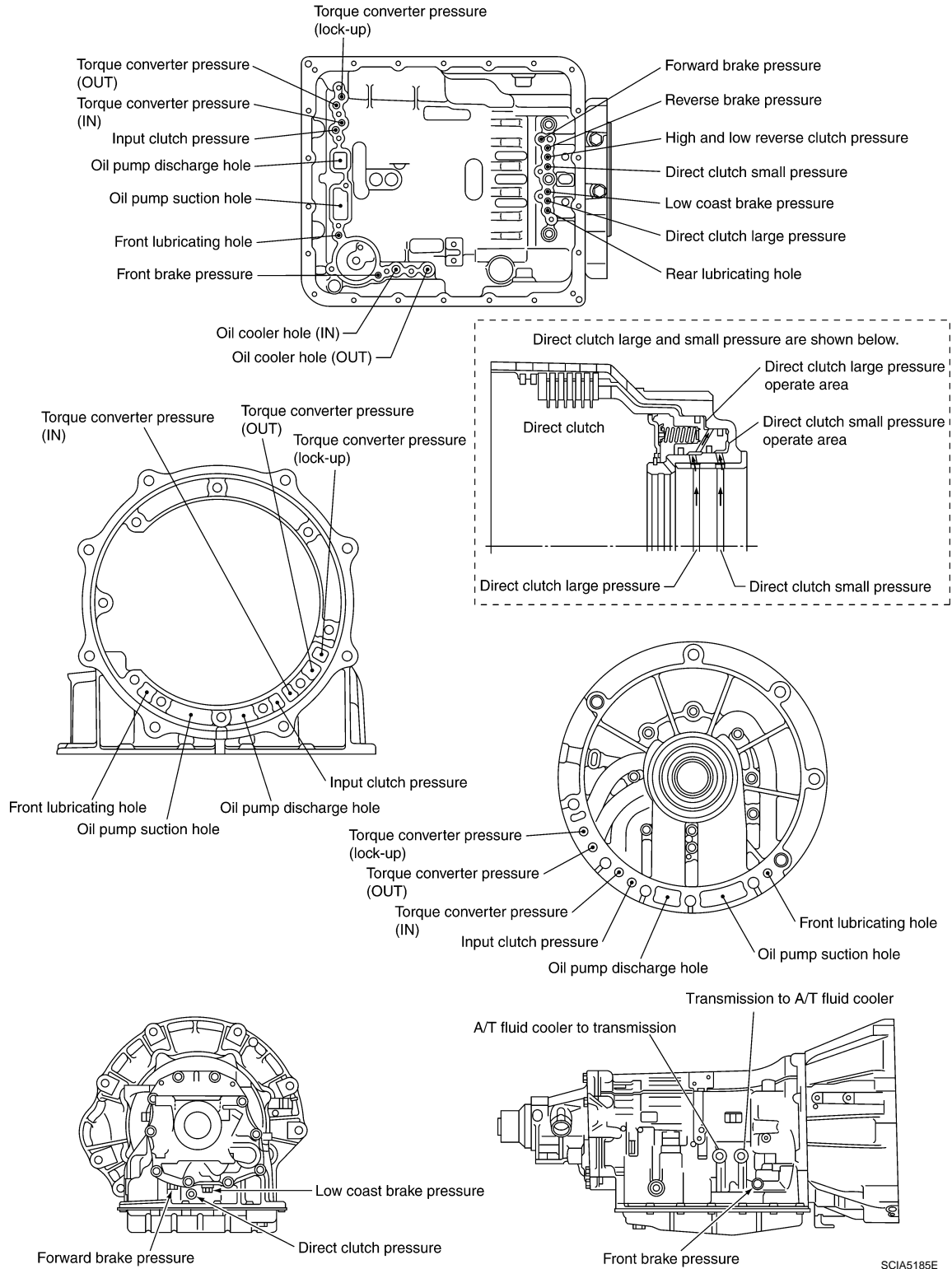
OVERHAUL

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Oil Channel

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2WD models

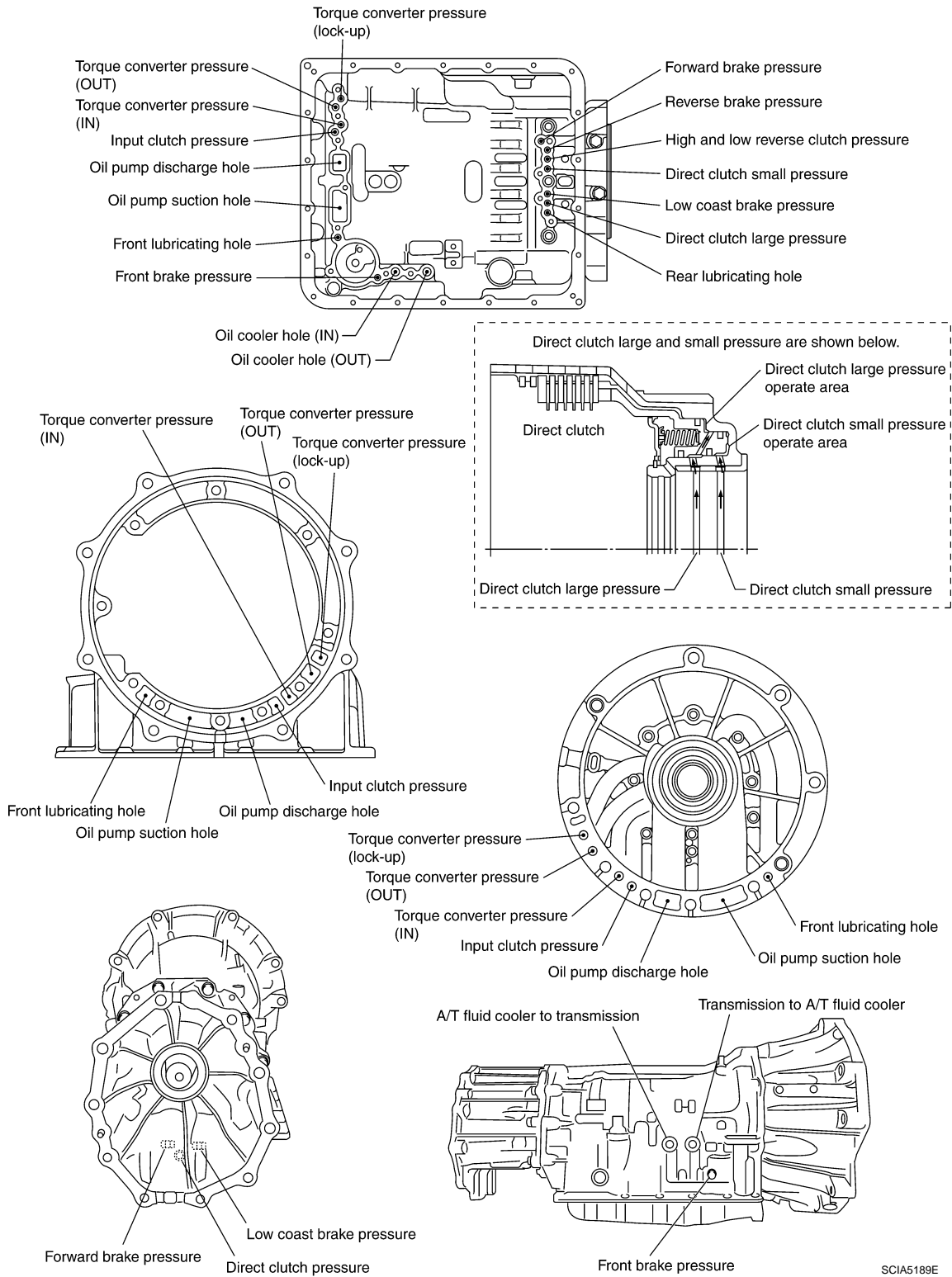


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OVERHAUL

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4WD models



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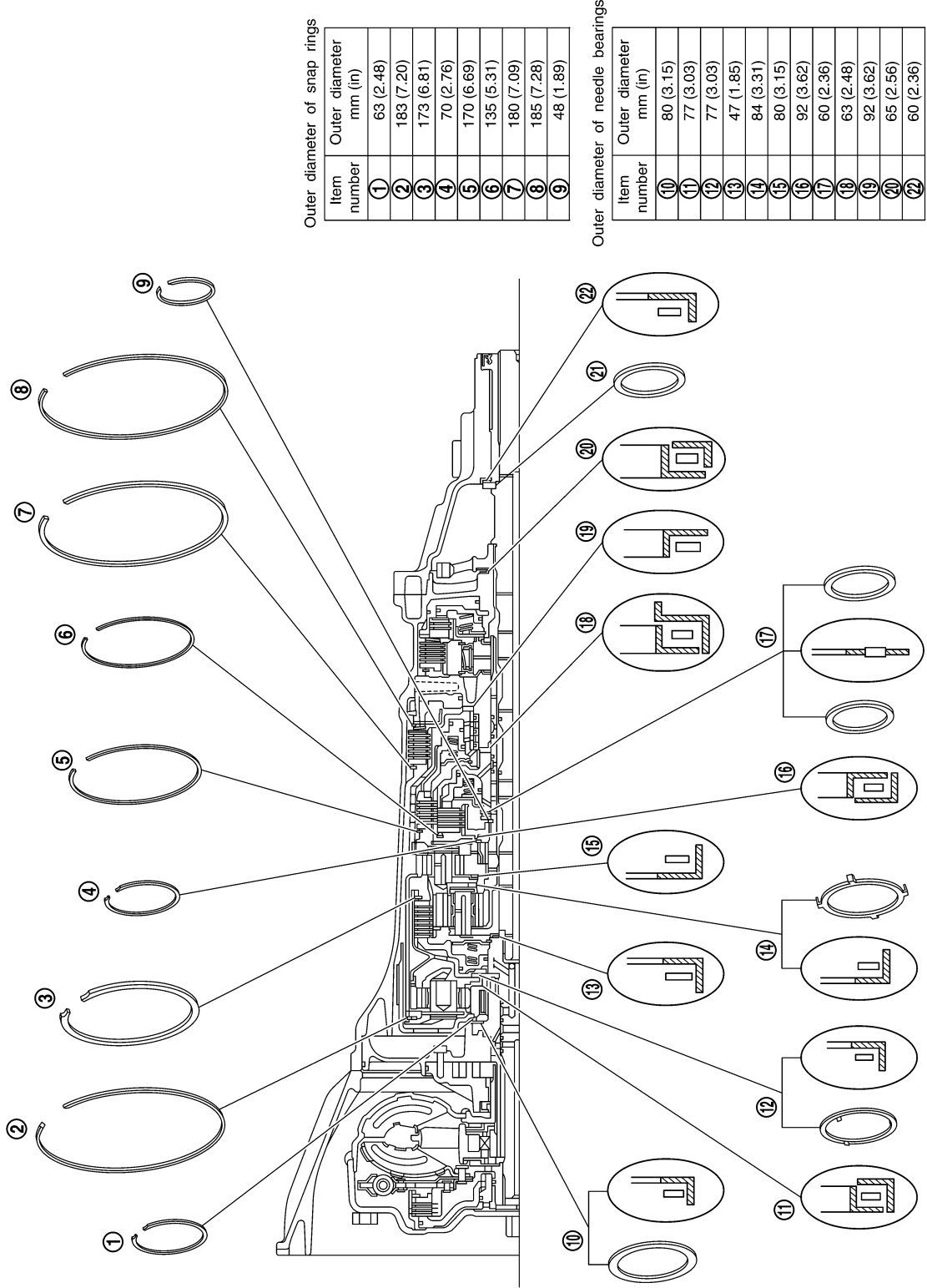
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Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

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VQ40 DE models 2WD



Outer diameter of snap rings

Item number	Outer diameter mm (in)
1	63 (2.48)
2	183 (7.20)
3	173 (6.81)
4	70 (2.76)
5	170 (6.69)
6	135 (5.31)
7	180 (7.09)
8	185 (7.28)
9	48 (1.89)

Outer diameter of needle bearings

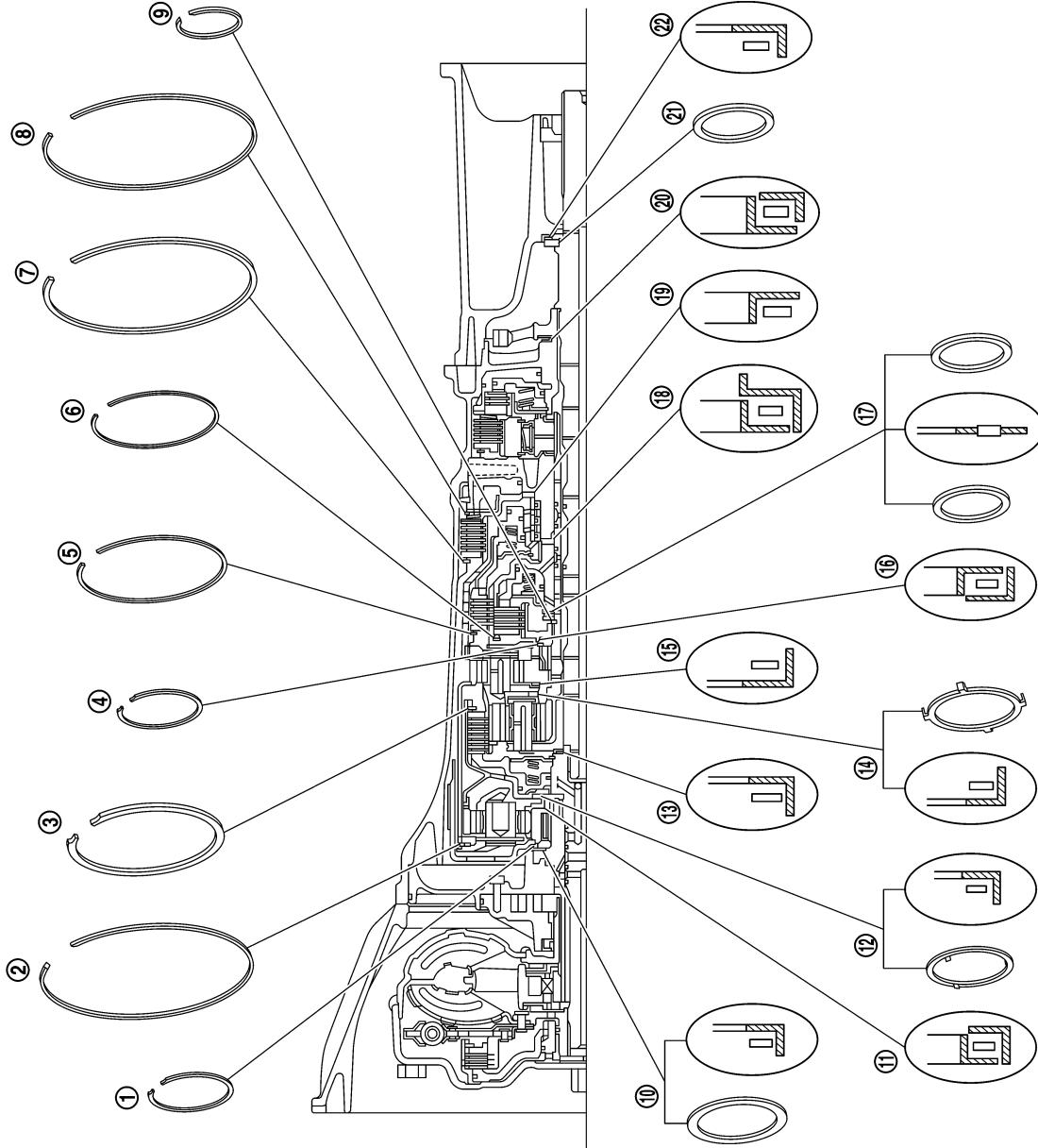
Item number	Outer diameter mm (in)
10	80 (3.15)
11	77 (3.03)
12	77 (3.03)
13	47 (1.85)
14	84 (3.31)
15	80 (3.15)
16	92 (3.62)
17	60 (2.36)
18	63 (2.48)
19	92 (3.62)
20	65 (2.56)
22	60 (2.36)

SCIA7019E

OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

VQ40DE models 4WD



Outer diameter of snap rings

Item number	Outer diameter mm (in)
①	63 (2.48)
②	183 (7.20)
③	173 (6.81)
④	70 (2.76)
⑤	170 (6.69)
⑥	135 (5.31)
⑦	180 (7.09)
⑧	185 (7.28)
⑨	48 (1.89)

Outer diameter of needle bearings

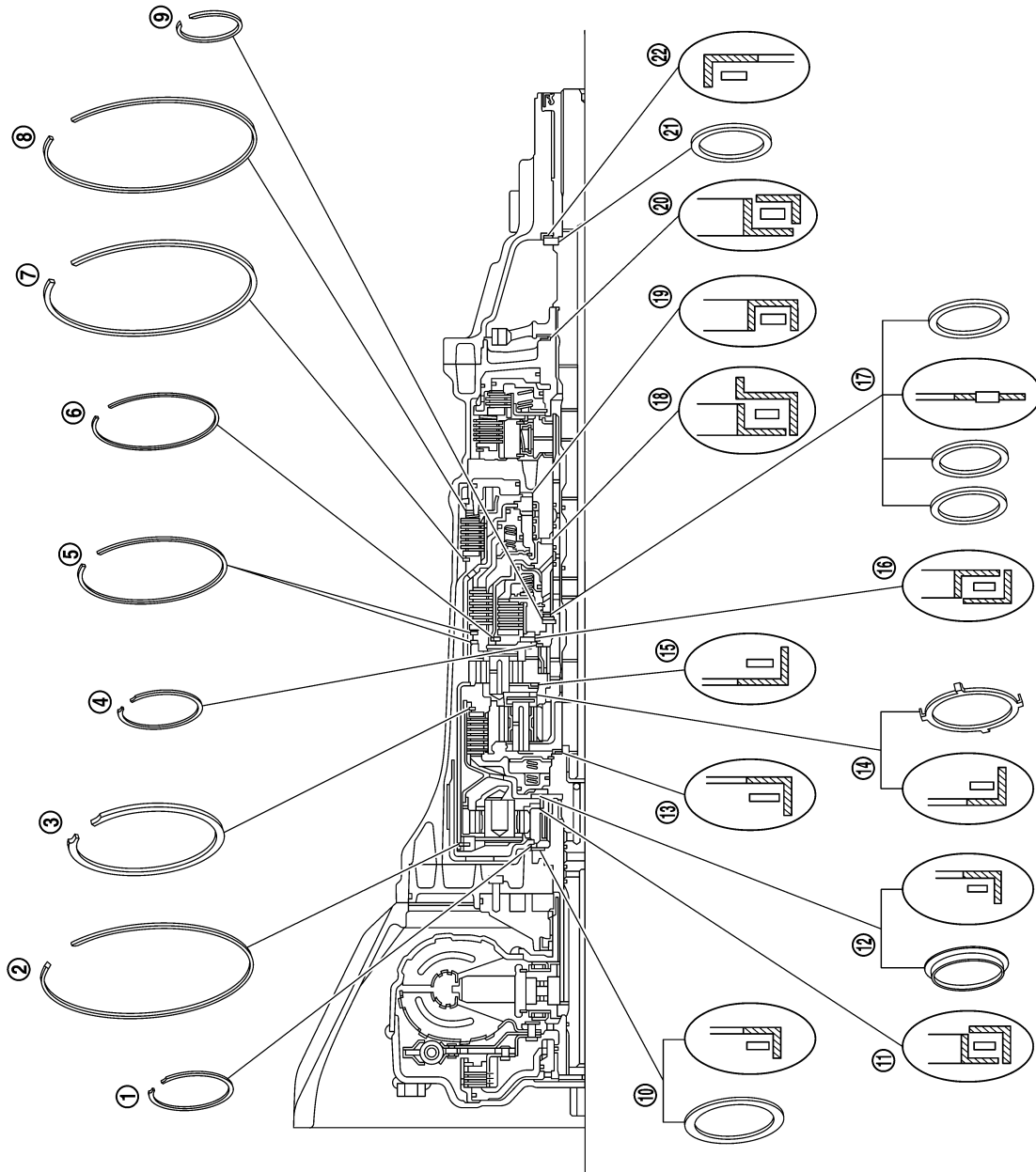
Item number	Outer diameter mm (in)
⑩	80 (3.15)
⑪	77 (3.03)
⑫	77 (3.03)
⑬	47 (1.85)
⑭	84 (3.31)
⑮	80 (3.15)
⑯	92 (3.62)
⑰	60 (2.36)
⑱	63 (2.48)
⑲	92 (3.62)
⑳	65 (2.56)
㉑	60 (2.36)

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VK56DE models 2WD



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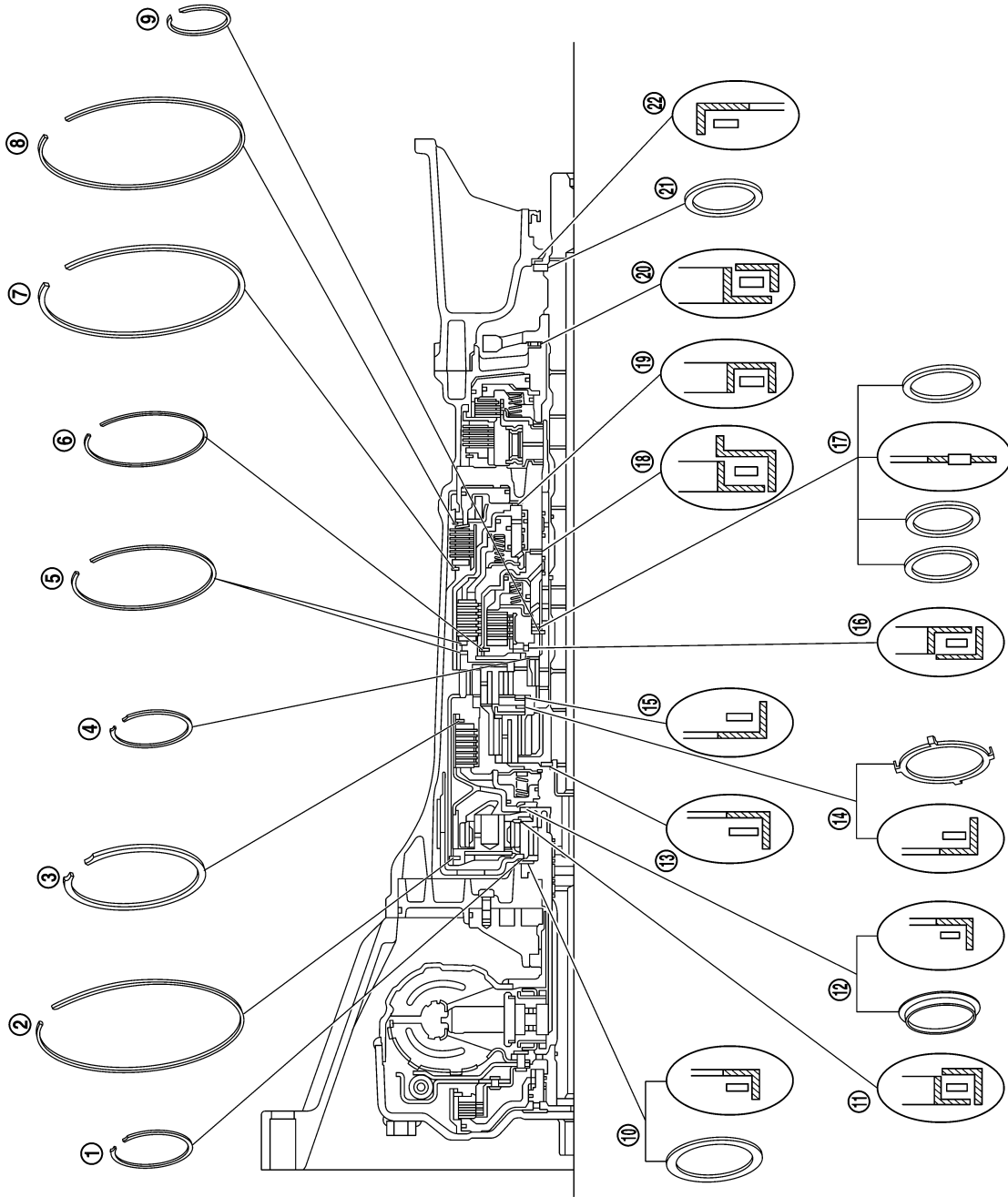
- | | | |
|------------------------------------|------------------------------------|------------------------------------|
| 1. Outer diameter 68 mm (2.68 in) | 2. Outer diameter 182 mm (7.17 in) | 3. Outer diameter 172 mm (6.77 in) |
| 4. Outer diameter 71 mm (2.80 in) | 5. Outer diameter 169 mm (6.65 in) | 6. Outer diameter 134 mm (5.28 in) |
| 7. Outer diameter 181 mm (7.13 in) | 8. Outer diameter 181 mm (7.13 in) | 9. Outer diameter 48 mm (1.89 in) |
| 10. Outer diameter 80 mm (3.15 in) | 11. Outer diameter 77 mm (3.03 in) | 12. Outer diameter 77 mm (3.03 in) |
| 13. Outer diameter 47 mm (1.85 in) | 14. Outer diameter 84 mm (3.31 in) | 15. Outer diameter 84 mm (3.31 in) |
| 16. Outer diameter 92 mm (3.62 in) | 17. Outer diameter 60 mm (2.36 in) | 18. Outer diameter 63 mm (2.48 in) |

OVERHAUL

< DISASSEMBLY AND ASSEMBLY >

19. Outer diameter 92 mm (3.62 in) 20. Outer diameter 65 mm (2.56 in) 21. Bearing race
 22. Outer diameter 60 mm (2.36 in)

VK56DE models 4WD



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WCIA0561E

1. Outer diameter 68 mm (2.68 in) 2. Outer diameter 182 mm (7.17 in) 3. Outer diameter 172 mm (6.77 in)
 4. Outer diameter 71 mm (2.80 in) 5. Outer diameter 169 mm (6.65 in) 6. Outer diameter 134 mm (5.28 in)
 7. Outer diameter 181 mm (7.13 in) 8. Outer diameter 181 mm (7.13 in) 9. Outer diameter 48 mm (1.89 in)
 10. Outer diameter 80 mm (3.15 in) 11. Outer diameter 77 mm (3.03 in) 12. Outer diameter 77 mm (3.03 in)

OVERHAUL

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- | | | |
|------------------------------------|------------------------------------|------------------------------------|
| 13. Outer diameter 47 mm (1.85 in) | 14. Outer diameter 84 mm (3.31 in) | 15. Outer diameter 84 mm (3.31 in) |
| 16. Outer diameter 92 mm (3.62 in) | 17. Outer diameter 60 mm (2.36 in) | 18. Outer diameter 63 mm (2.48 in) |
| 19. Outer diameter 92 mm (3.62 in) | 20. Outer diameter 65 mm (2.56 in) | 21. Bearing race |
| 22. Outer diameter 60 mm (2.36 in) | | |

DISASSEMBLY

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DISASSEMBLY

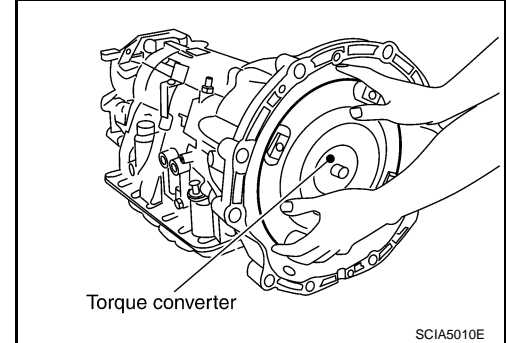
Disassembly

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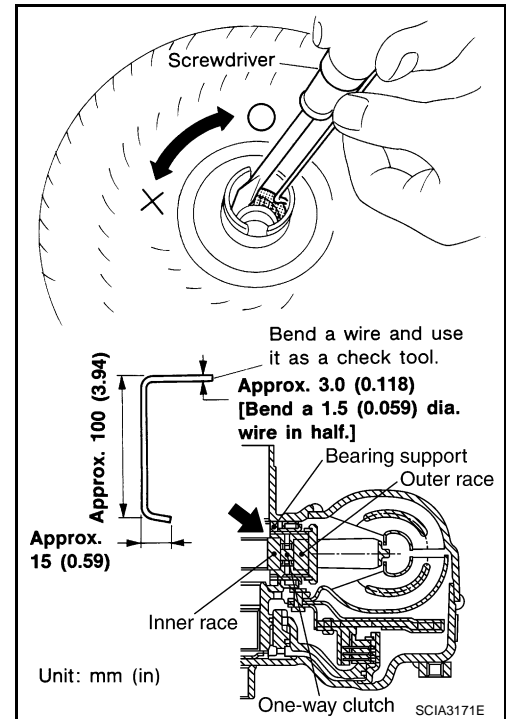
CAUTION:

Do not disassemble parts behind Drum Support. Refer to [TM-9, "Cross-Sectional View"](#).

1. Drain A/T fluid through drain plug.
2. Remove torque converter by holding it firmly and turing while pulling straight out.



3. Check torque converter one-way clutch using a check tool as shown.
 - a. Insert a check tool into the groove of bearing support built into one-way clutch outer race.
 - b. While holding bearing support with a check tool, rotate one-way clutch spline using suitable tool.
 - c. Make sure that inner race rotates clockwise only. If not, replace torque converter assembly.

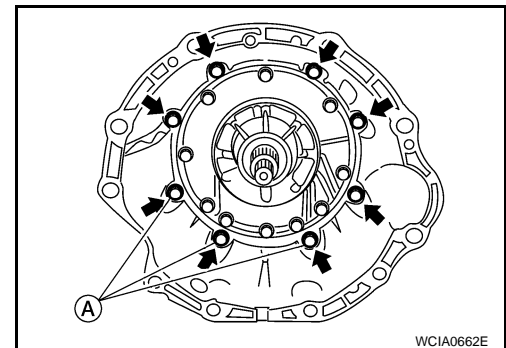


4. Remove bolts and converter housing from transmission case.

CAUTION:

Do not scratch converter housing.

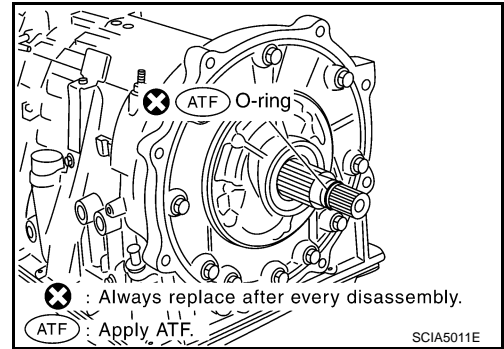
- Self-sealing bolt (A)



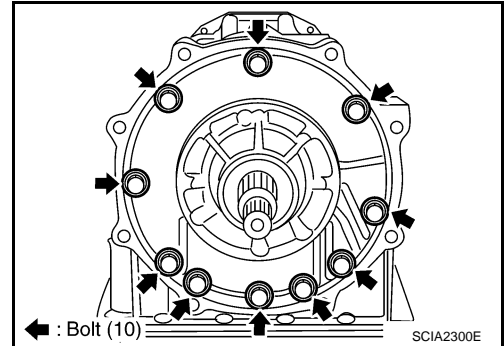
DISASSEMBLY

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5. Remove O-ring from input clutch assembly.



6. Remove oil pump assembly to transmission case bolts.

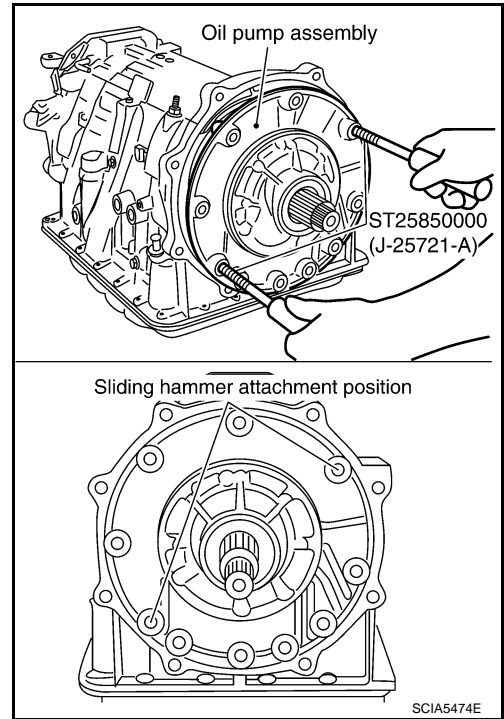


7. Remove the oil pump assembly evenly from the transmission case using Tools.

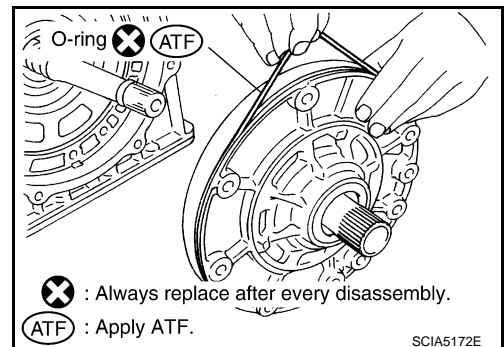
Tool number : ST25850000 (J-25721-A)

CAUTION:

- Fully tighten the sliding hammer screws.
- Make sure that bearing race is installed to the oil pump assembly edge surface.



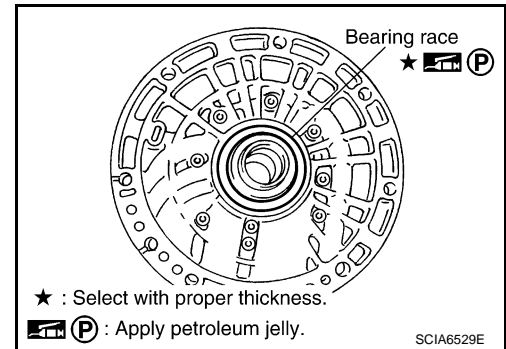
8. Remove O-ring from oil pump assembly.



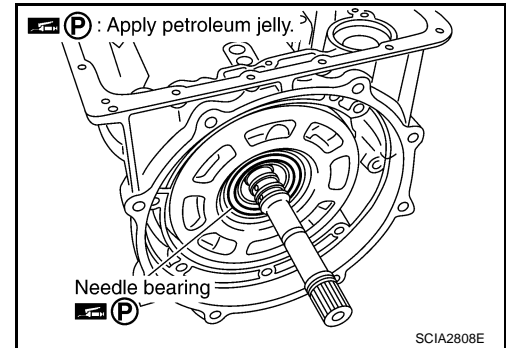
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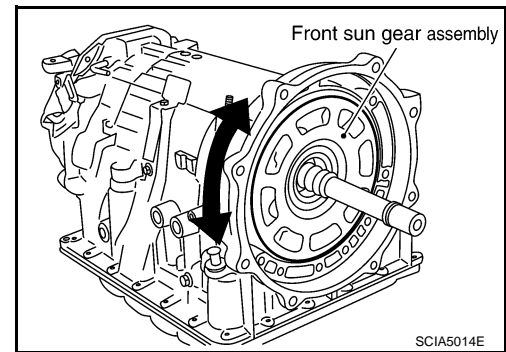
9. Remove bearing race from oil pump assembly.



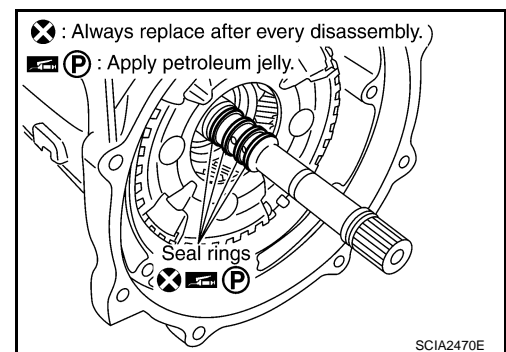
10. Remove needle bearing from front sun gear.



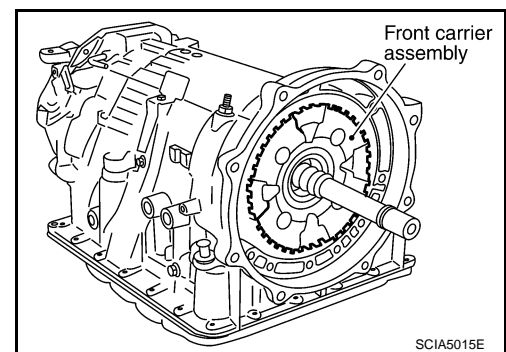
11. Remove front sun gear assembly from front carrier assembly.
NOTE:
Remove front sun gear by rotating it left and right.



12. Remove seal rings from input clutch assembly.



13. Remove front carrier assembly (with input clutch assembly and rear internal gear) from rear carrier assembly.
CAUTION:
Do not remove it with needle bearing.

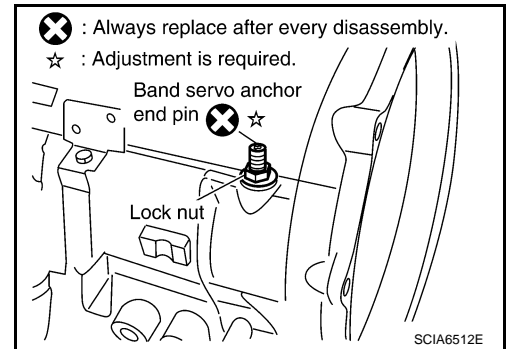


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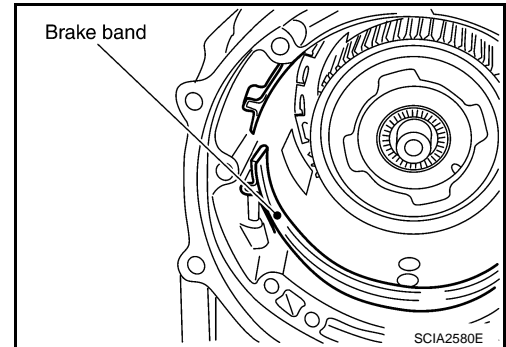
DISASSEMBLY

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14. Loosen lock nut and remove band servo anchor end pin from transmission case.

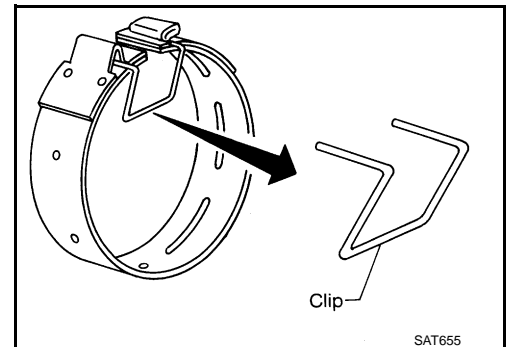


15. Remove brake band from transmission case.

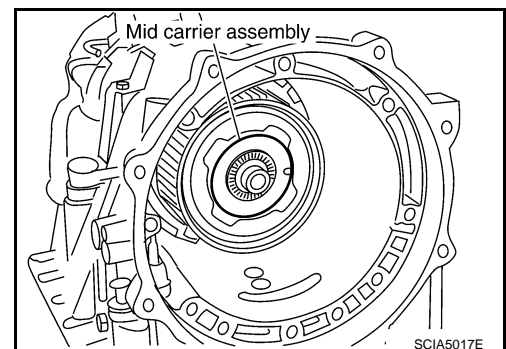


CAUTION:

- To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown.
- Check brake band facing for damage, cracks, wear or burns.



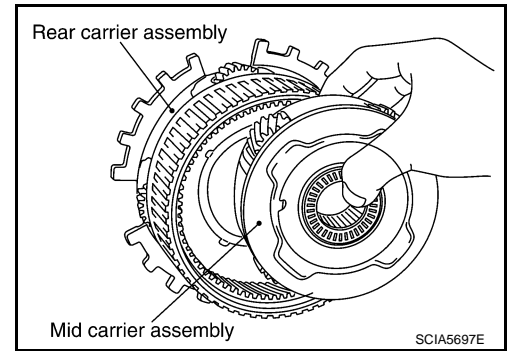
16. Remove mid carrier assembly and rear carrier assembly as a unit.



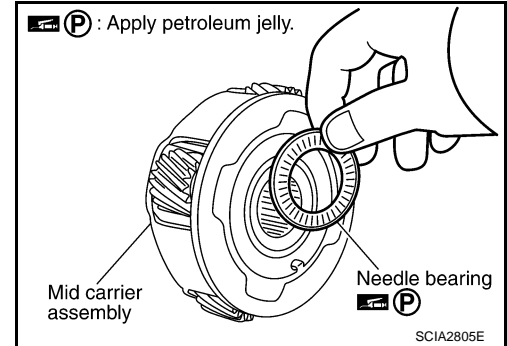
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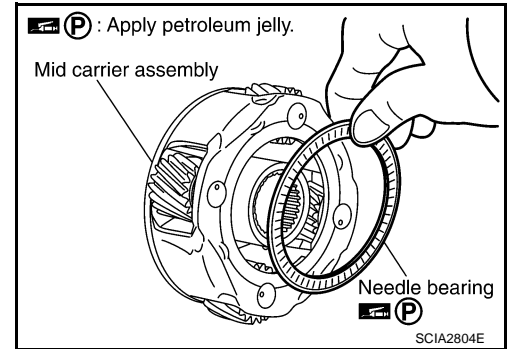
17. Remove mid carrier assembly from rear carrier assembly.



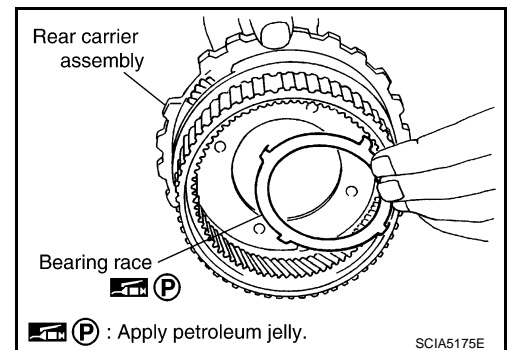
18. Remove needle bearing (front side) from mid carrier assembly.



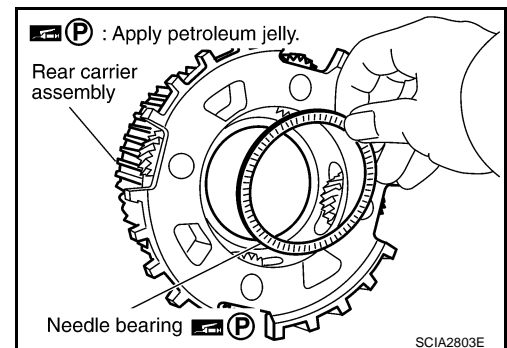
19. Remove needle bearing (rear side) from mid carrier assembly.



20. Remove bearing race from rear carrier assembly.



21. Remove needle bearing from rear carrier assembly.



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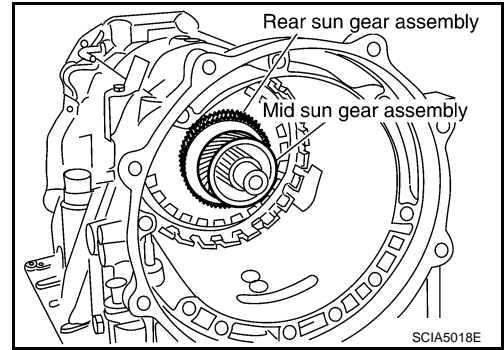
DISASSEMBLY

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22. Remove mid sun gear assembly, rear sun gear assembly and high and low reverse clutch hub as a unit.

CAUTION:

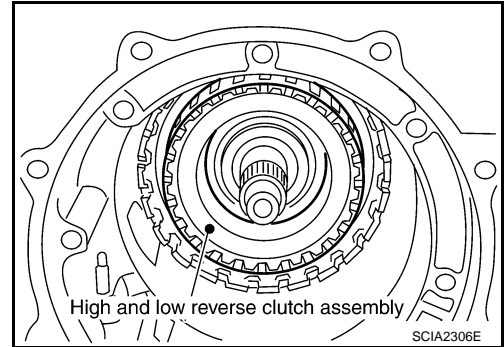
Remove them with bearing race and needle bearing.



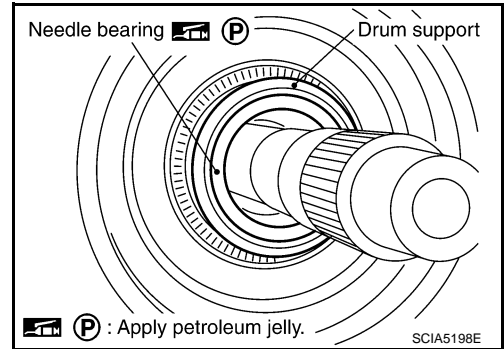
23. Remove high and low reverse clutch assembly from direct clutch assembly.

CAUTION:

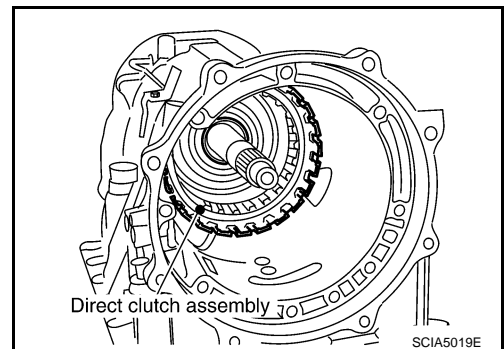
Make sure that needle bearing is installed to the high and low reverse clutch assembly edge surface.



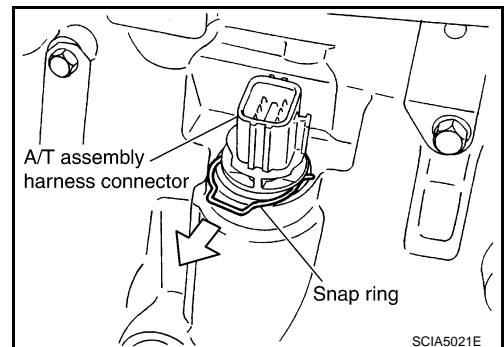
24. Remove needle bearing from drum support.



25. Remove direct clutch assembly from reverse brake.



26. Remove snap ring from A/T assembly harness connector.



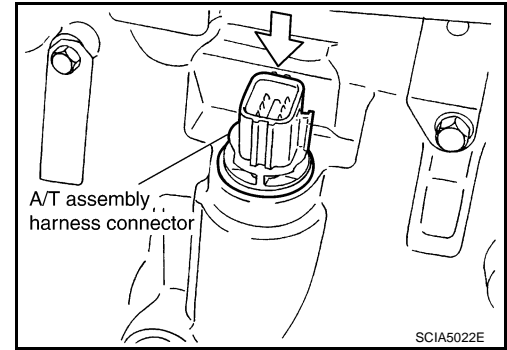
DISASSEMBLY

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27. Push A/T assembly harness connector.

CAUTION:

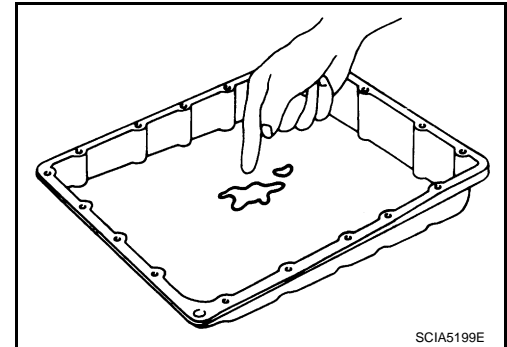
Do not damage connector.



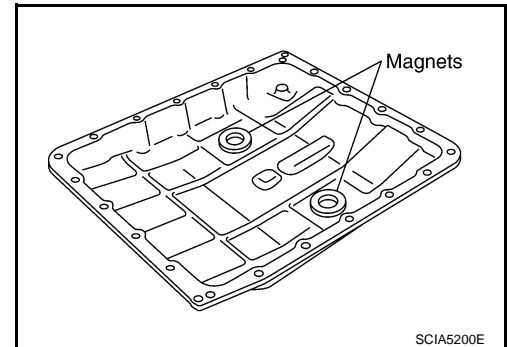
28. Remove oil pan and oil pan gasket. Refer to [TM-197, "Removal and Installation"](#).

29. Check foreign materials in oil pan to help determine causes of malfunction. If the A/T fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.

• **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to [TM-183, "A/T Fluid Cooler Cleaning"](#).**



30. Remove magnets from oil pan.

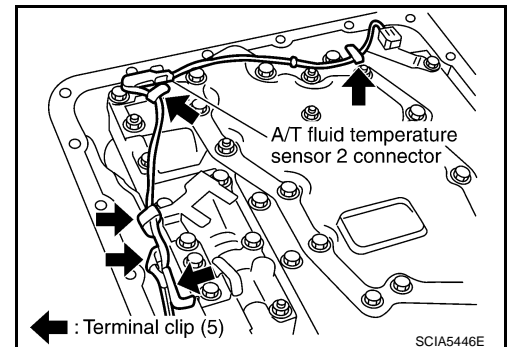


31. Straighten terminal clips to free terminal cord assembly and A/T fluid temperature sensor 2 harness.

32. Disconnect A/T fluid temperature sensor 2 connector.

CAUTION:

Do not damage connector.



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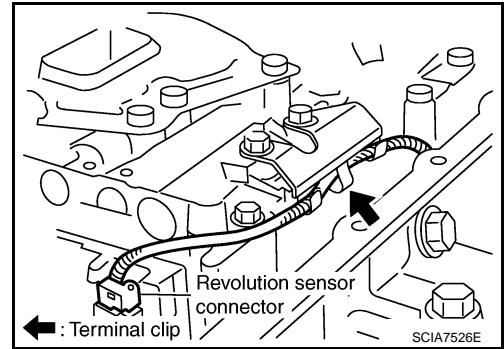
DISASSEMBLY

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33. Straighten terminal clip to free revolution sensor harness.
34. Disconnect revolution sensor connector.

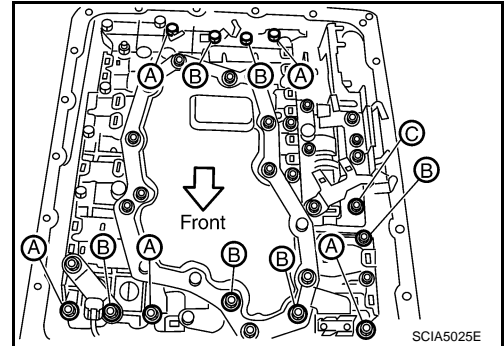
CAUTION:

Do not damage connector.



35. Remove bolts (A), (B) and (C) from control valve with TCM.

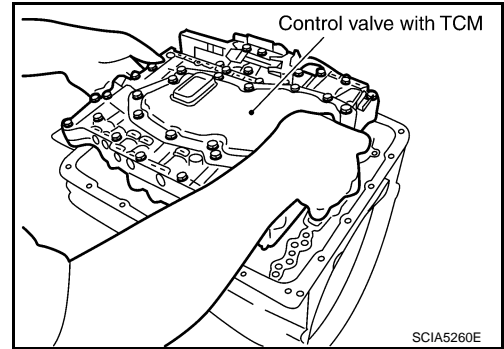
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



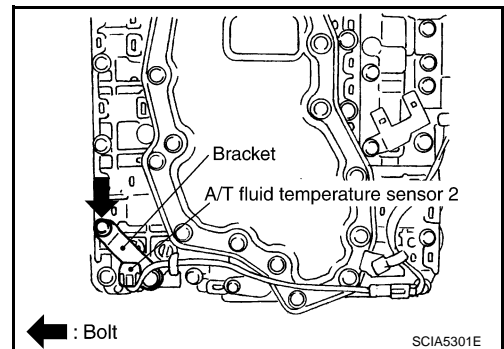
36. Remove control valve with TCM from transmission case.

CAUTION:

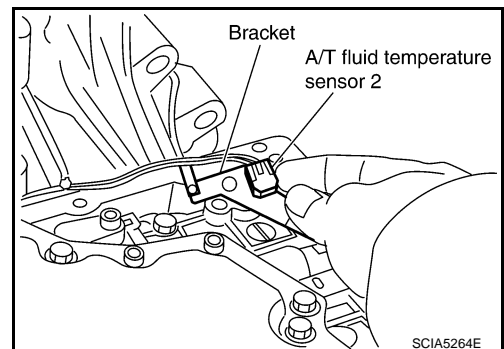
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



37. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



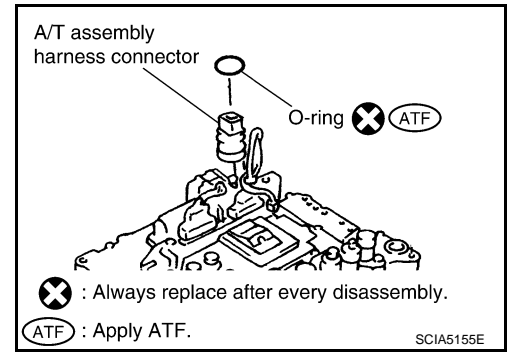
38. Remove bracket from A/T fluid temperature sensor 2.



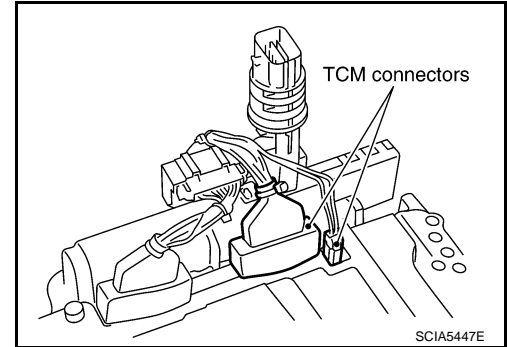
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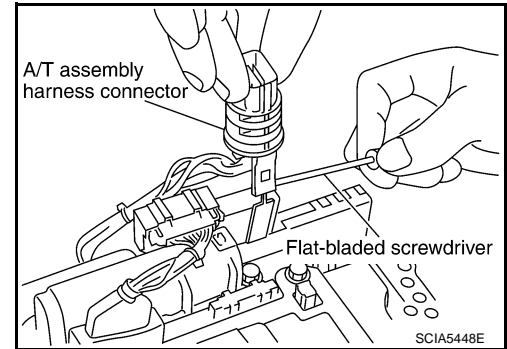
39. Remove O-ring from A/T assembly harness connector.



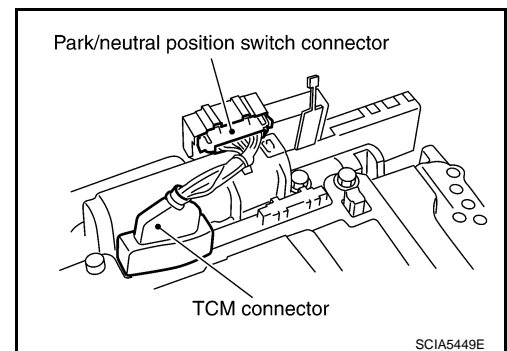
40. Disconnect TCM connectors.
CAUTION:
Do not damage connectors.



41. Remove A/T assembly harness connector from control valve with TCM using suitable tool.



42. Disconnect TCM connector and park/neutral position switch connector.
CAUTION:
Do not damage connectors.



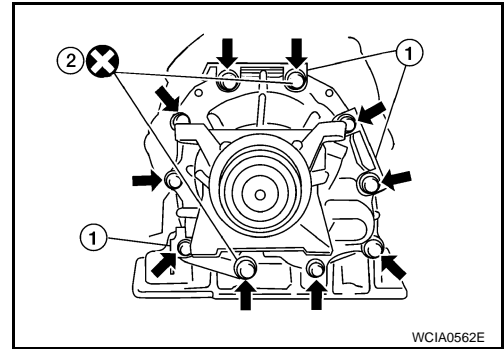
43. Remove rear extension assembly (2WD models) or adapter case assembly (4WD models) according to the following procedures.

DISASSEMBLY

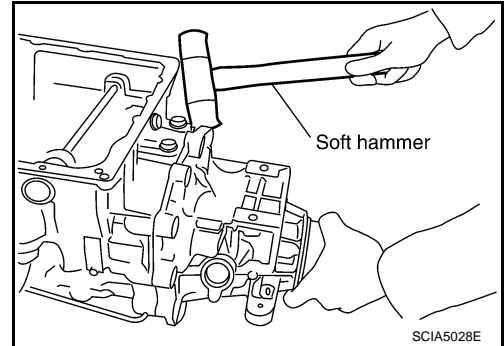
< DISASSEMBLY AND ASSEMBLY >

a. 2WD models

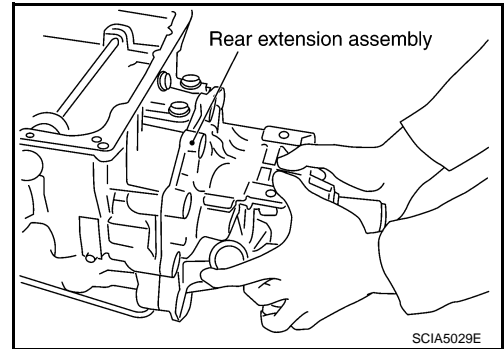
- i. Remove bolts for rear extension assembly and transmission case.
 - Self-sealing bolts (2)
- ii. Remove brackets (1) (VK56DE models only).



- iii. Tap rear extension assembly with soft hammer.

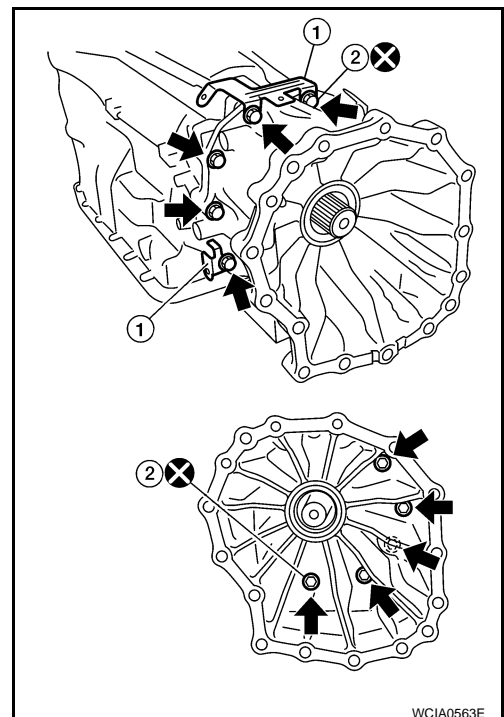


- iv. Remove rear extension assembly (with needle bearing) from transmission case.



b. 4WD models

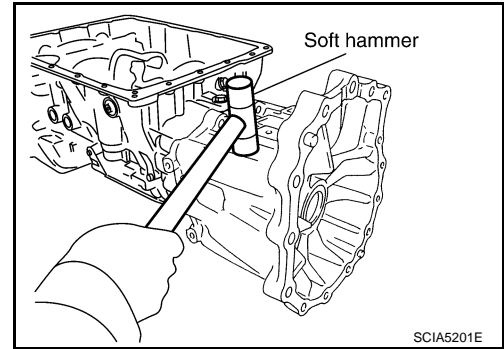
- i. Remove adapter case to transmission case bolts and terminal bracket (2).
 - Self-sealing bolt (2)
- ii. Remove brackets (1) (VK56DE models only).



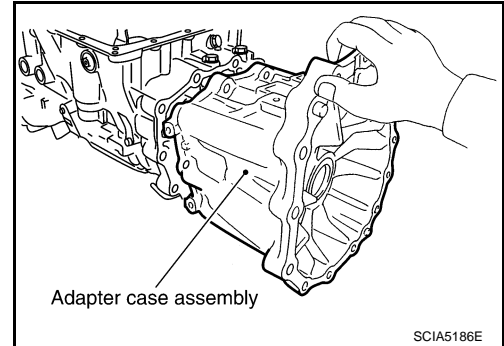
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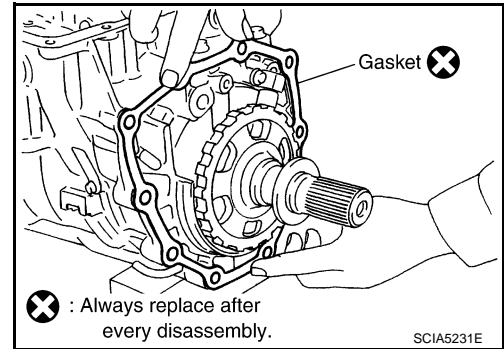
iii. Tap adapter case assembly using suitable tool.



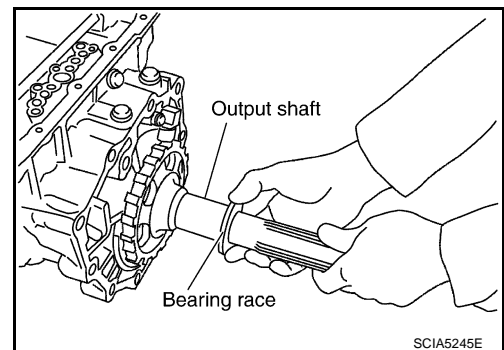
iv. Remove adapter case assembly (with needle bearing) from transmission case.



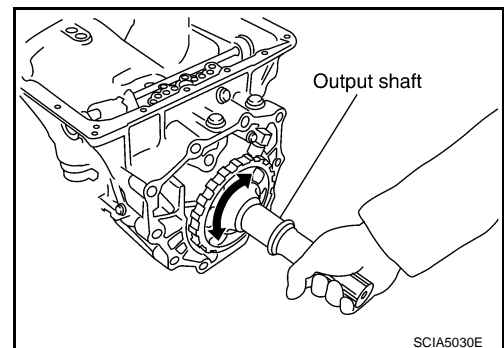
v. Remove gasket from transmission case.



44. Remove bearing race from output shaft.



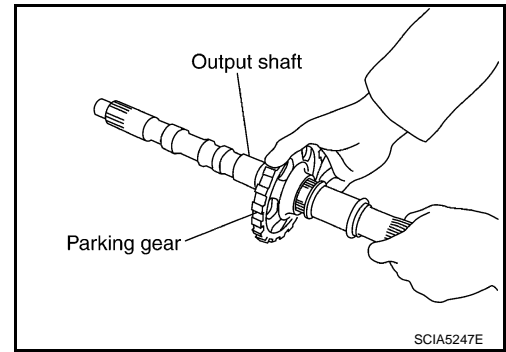
45. Remove output shaft from transmission case by rotating left and right.



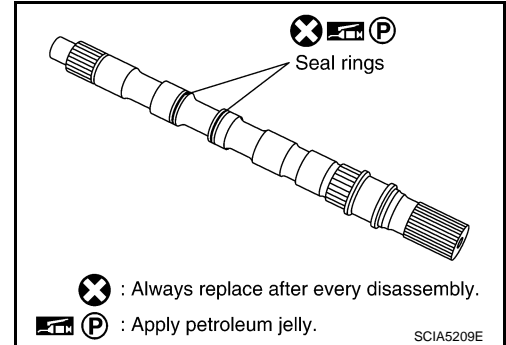
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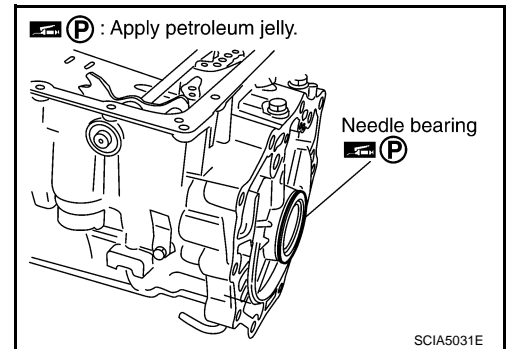
46. Remove parking gear from output shaft.



47. Remove seal rings from output shaft.



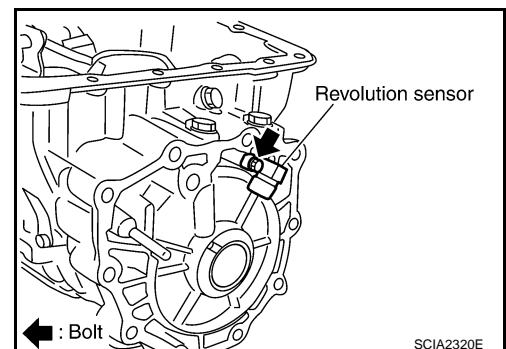
48. Remove needle bearing from transmission case.



49. Remove revolution sensor from transmission case.

CAUTION:

- Do not subject it to impact by dropping or hitting it.
- Do not disassemble.
- Do not allow metal filings or any foreign material to get on the sensor's front edge magnetic area.
- Do not place in an area affected by magnetism.



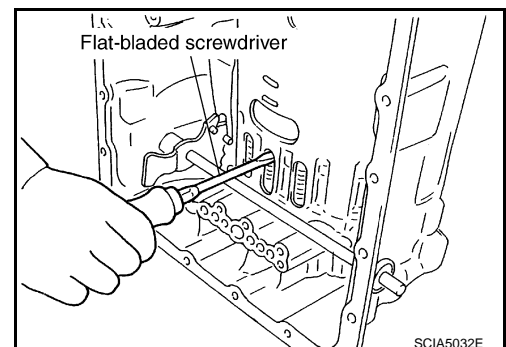
50. Remove reverse brake snap ring using two flat-bladed screwdrivers.

NOTE:

Press out snap ring from the transmission case oil pan side gap using a flat-bladed screwdriver, and remove it using a another screwdriver.

51. Remove reverse brake retaining plate from transmission case.

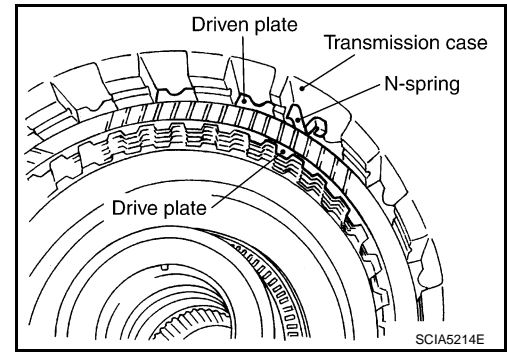
- Check facing for burns, cracks or damage. If necessary, replace the plate.



DISASSEMBLY

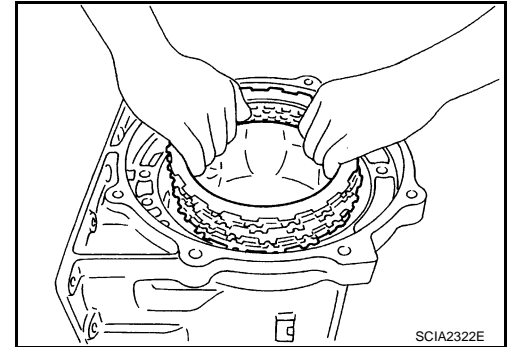
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52. Remove N-spring from transmission case.

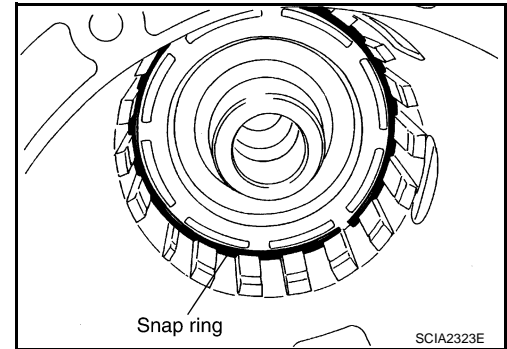


53. Remove reverse brake drive plates, driven plates and dish plate from transmission case.

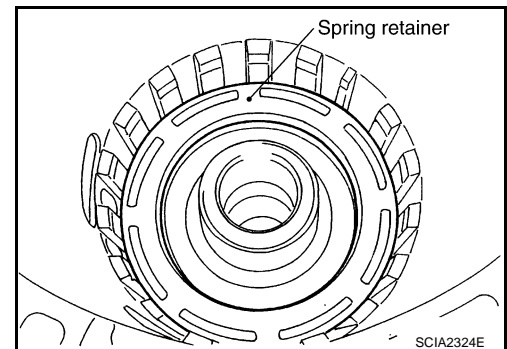
- Check facing for burns, cracks or damage. If necessary, replace the plate.



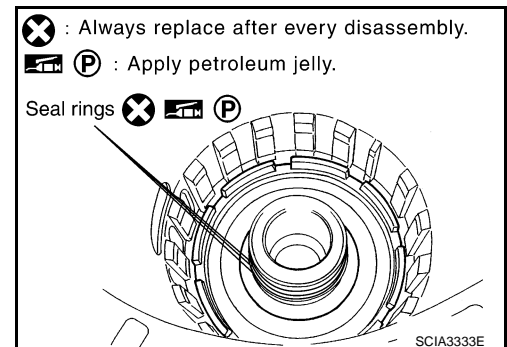
54. Remove snap ring using suitable tool.



55. Remove spring retainer and return spring from transmission case.



56. Remove seal rings from drum support.

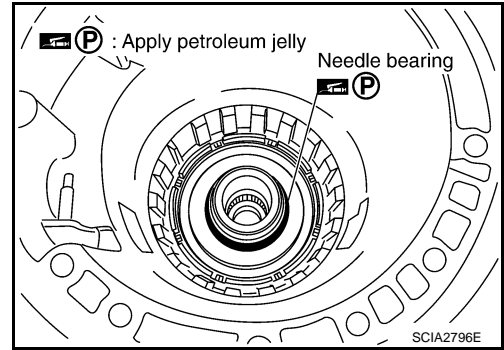


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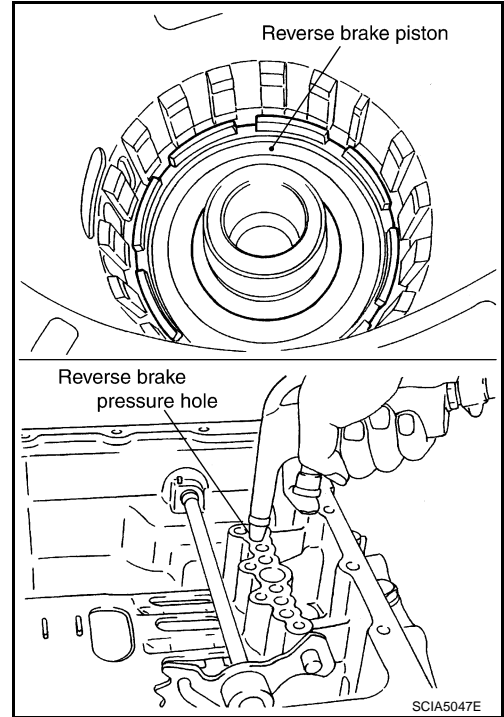
57. Remove needle bearing from drum support edge surface.



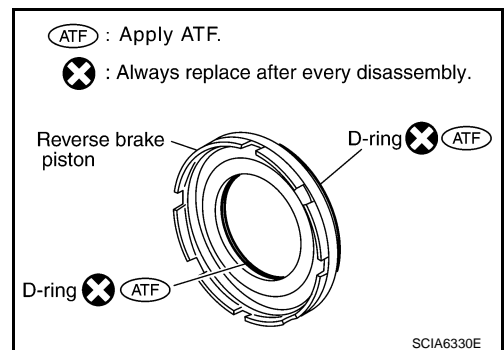
58. Remove reverse brake piston from transmission case using compressed air. Refer to [TM-246, "Oil Channel"](#).

CAUTION:

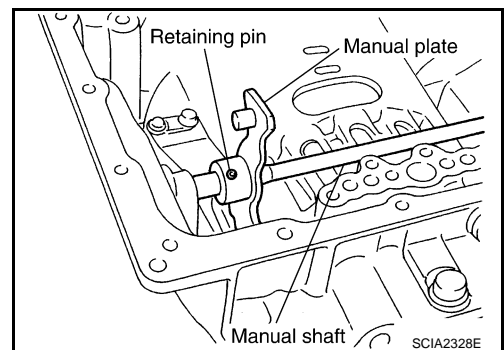
Care should be taken not to abruptly blow air. It makes the piston incline, and as a result, it becomes hard to disassemble the pistons.



59. Remove D-rings from reverse brake piston.



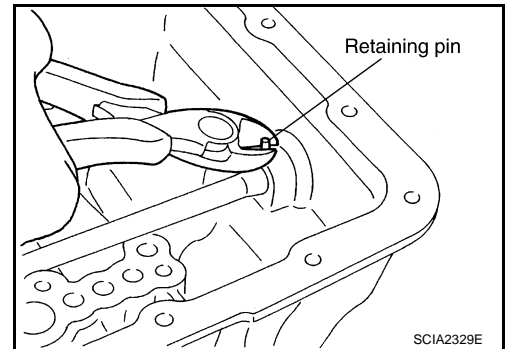
60. Knock out retaining pin using suitable tool.



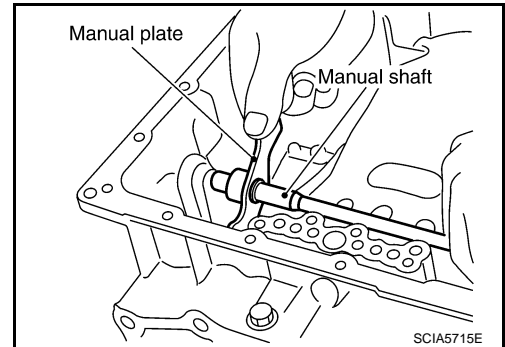
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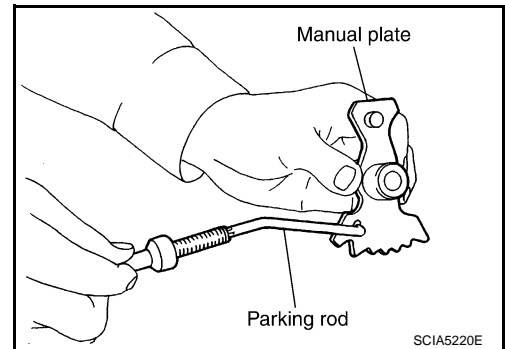
61. Remove manual shaft retaining pin using suitable tool.



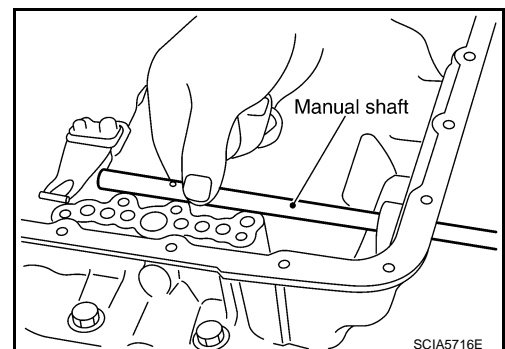
62. Remove manual plate (with parking rod) from manual shaft.



63. Remove parking rod from manual plate.



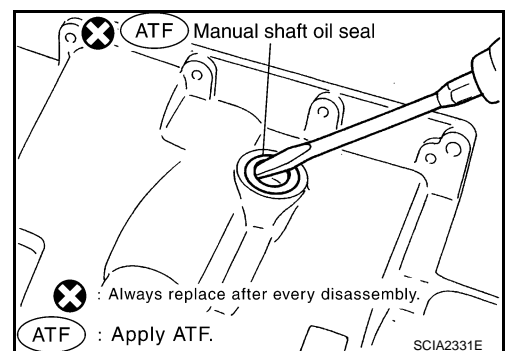
64. Remove manual shaft from transmission case.



65. Remove manual shaft oil seals using suitable tool.

CAUTION:

Do not scratch transmission case.

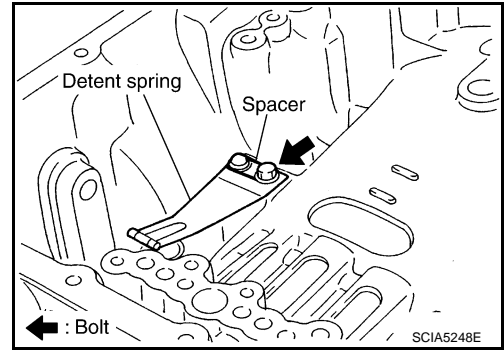


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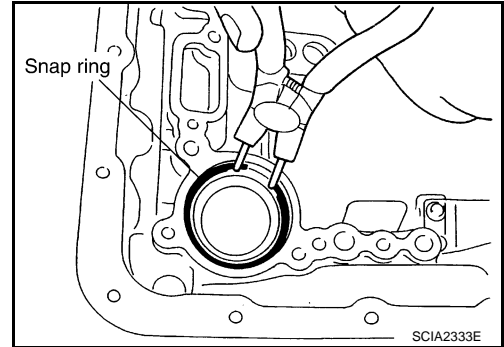
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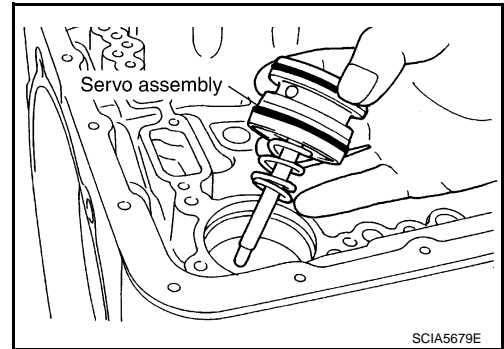
66. Remove detent spring and spacer from transmission case.



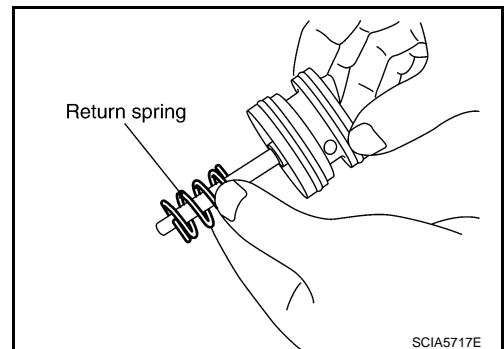
67. Remove snap ring from transmission case using suitable tool.



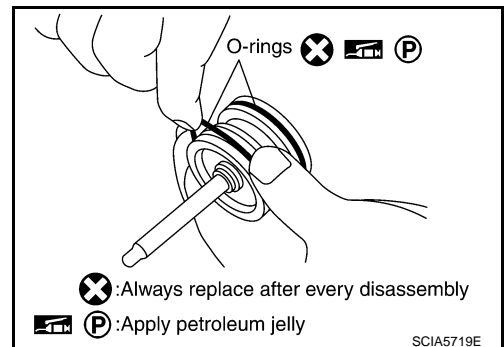
68. Remove servo assembly (with return spring) from transmission case.



69. Remove return spring from servo assembly.



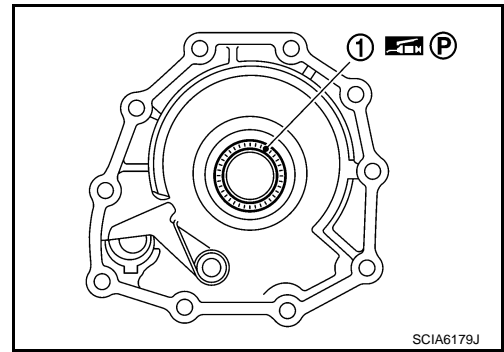
70. Remove O-rings from servo assembly.



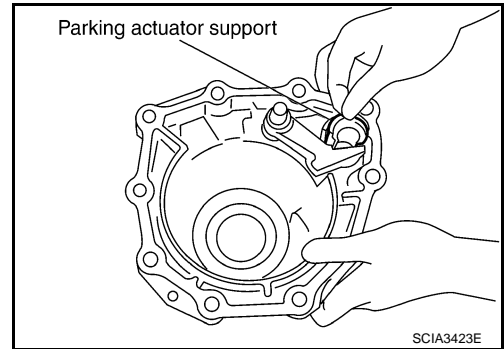
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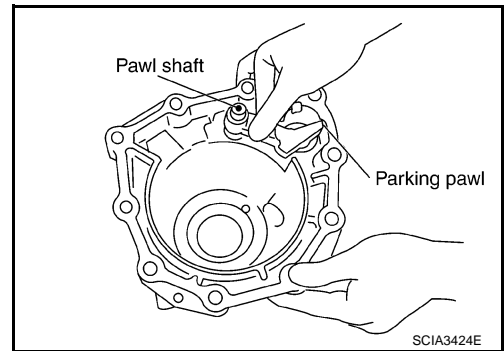
71. Remove needle bearing (1) from rear extension (2WD models) or adapter case (4WD models).



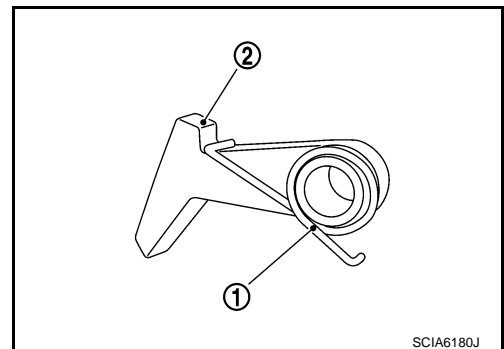
72. Remove parking actuator support from rear extension (2WD models) or adapter case (4WD models).



73. Remove parking pawl (with return spring) and pawl shaft from rear extension (2WD models) or adapter case (4WD models).



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



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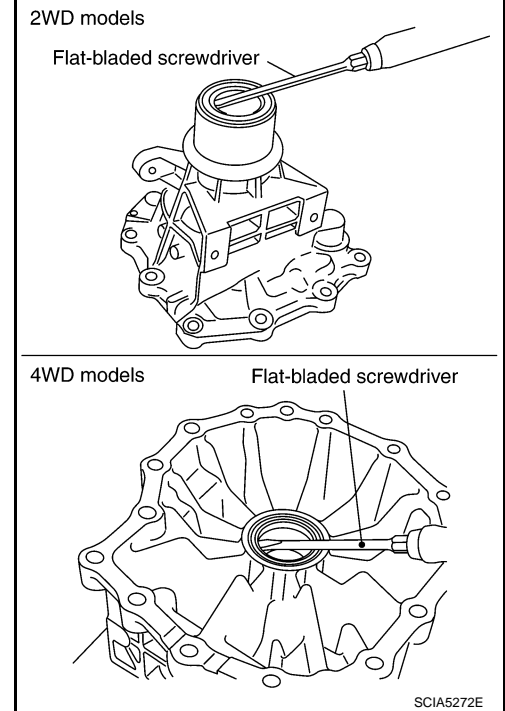
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< DISASSEMBLY AND ASSEMBLY >

75. Remove rear oil seal from rear extension (2WD models) or adapter case (4WD models) using suitable tool.

CAUTION:

Do not scratch rear extension (2WD models) or adapter case (4WD models).



OIL PUMP

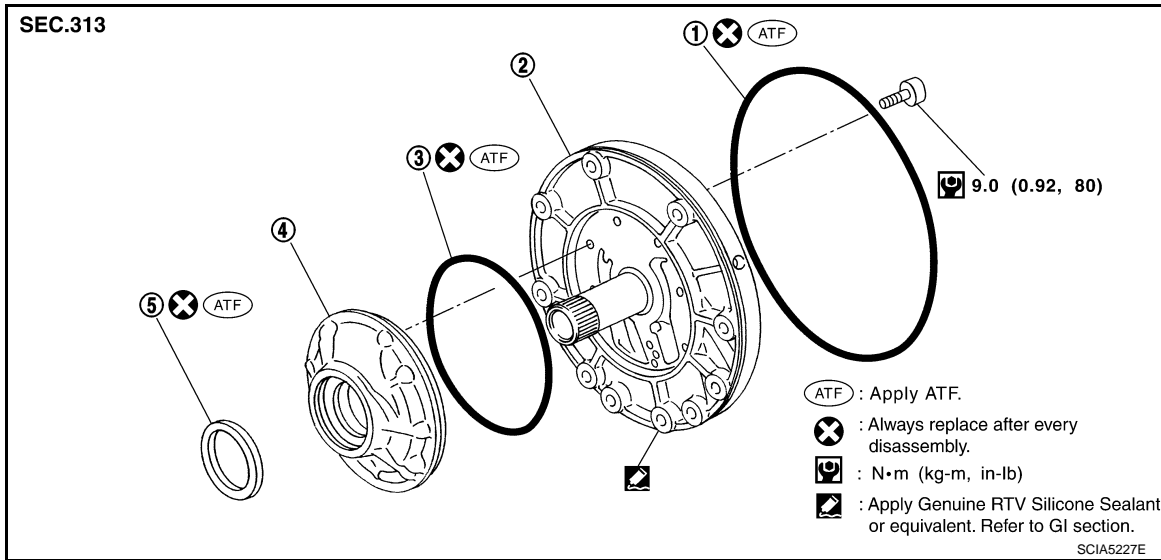
< DISASSEMBLY AND ASSEMBLY >

OIL PUMP

Exploded View

INFOID:000000001726725

Oil Pump



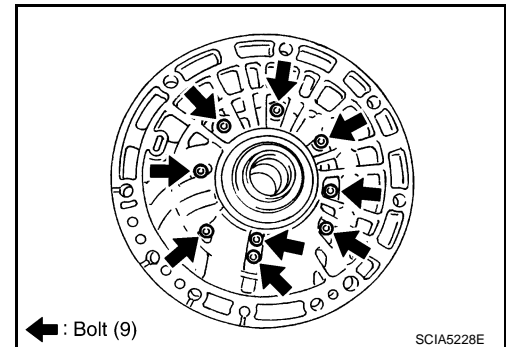
1. O-ring
2. Oil pump cover
3. O-ring
4. Oil pump housing
5. Oil pump housing oil seal

Disassembly and Assembly

INFOID:000000001726731

DISASSEMBLY

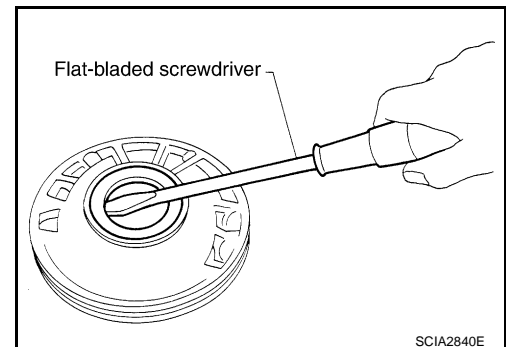
1. Remove oil pump housing from oil pump cover.



2. Remove oil pump housing oil seal using suitable tool.

CAUTION:

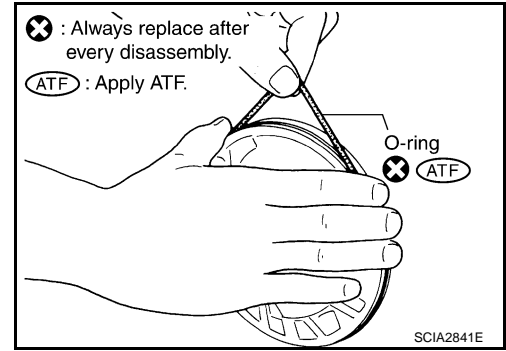
Do not scratch oil pump housing.



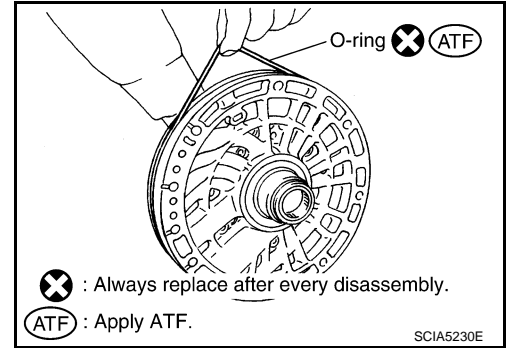
OIL PUMP

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3. Remove O-ring from oil pump housing.



4. Remove O-ring from oil pump cover.

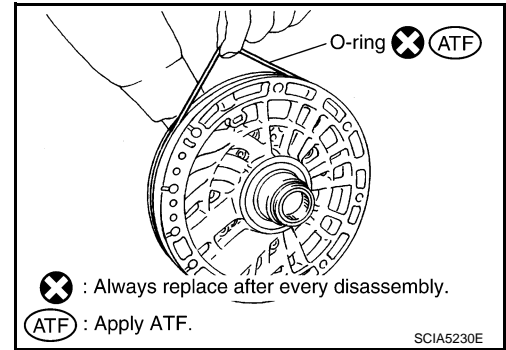


ASSEMBLY

1. Install O-ring to oil pump cover.

CAUTION:

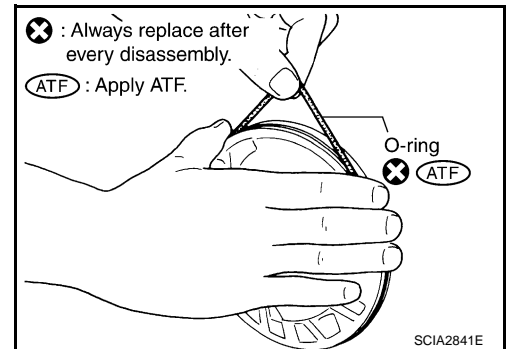
- Do not reuse O-ring.
- Apply ATF to O-ring.



2. Install O-ring to oil pump housing.

CAUTION:

- Do not reuse O-ring.
- Apply ATF to O-ring.



OIL PUMP

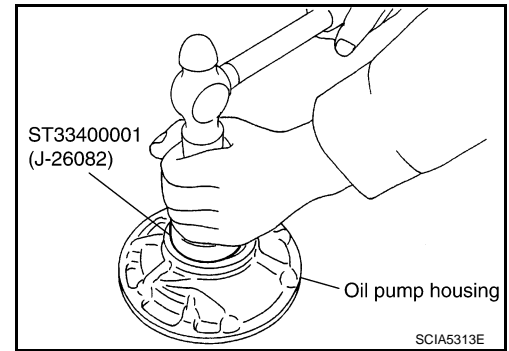
< DISASSEMBLY AND ASSEMBLY >

3. Install oil pump housing oil seal to the oil pump housing until it is flush using Tool.

Tool number : ST33400001 (J-26082)

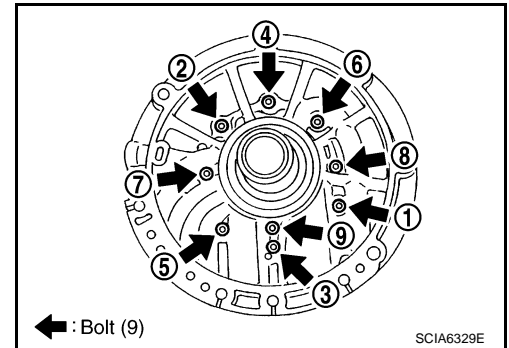
CAUTION:

- Do not reuse oil seal.
- Apply ATF to oil seal.



4. After temporarily tightening the bolts for the oil pump housing to the oil pump cover, tighten them to the specified torque in the sequence shown.

Oil pump housing bolts : 9.0 N-m (0.92 kg-m, 80 in-lb.)



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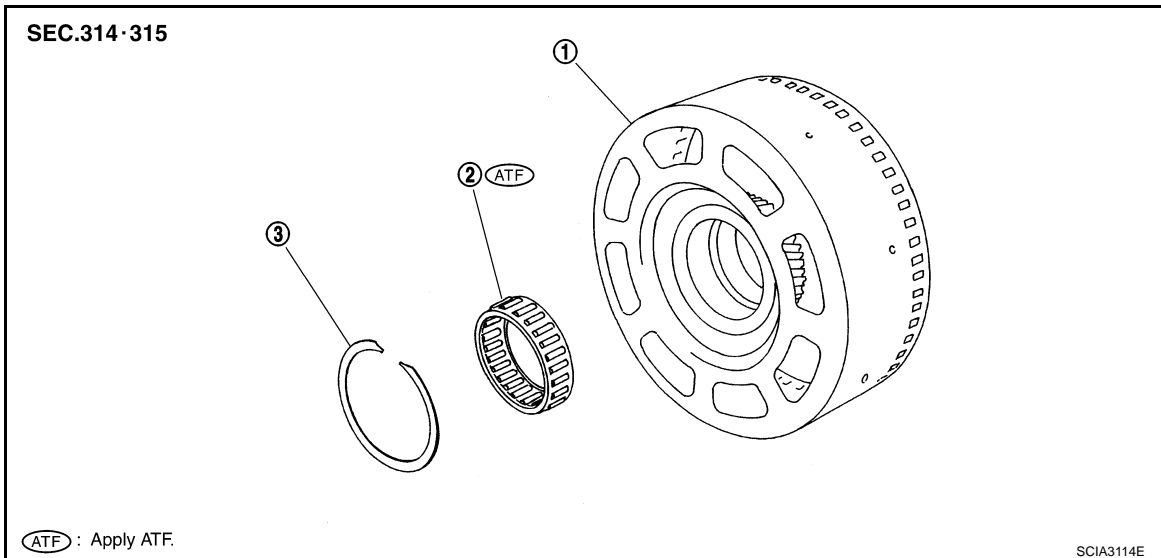
FRONT SUN GEAR, 3RD ONE-WAY CLUTCH

< DISASSEMBLY AND ASSEMBLY >

FRONT SUN GEAR, 3RD ONE-WAY CLUTCH

Exploded View

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1. Front sun gear

2. 3rd one-way clutch

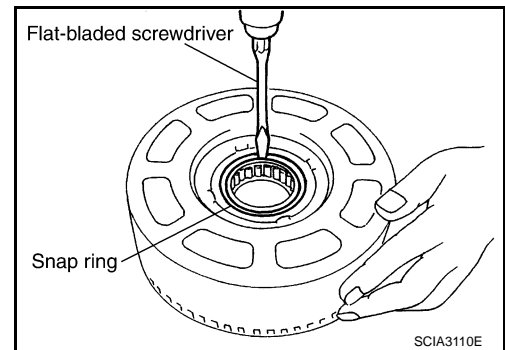
3. Snap ring

Disassembly and Assembly

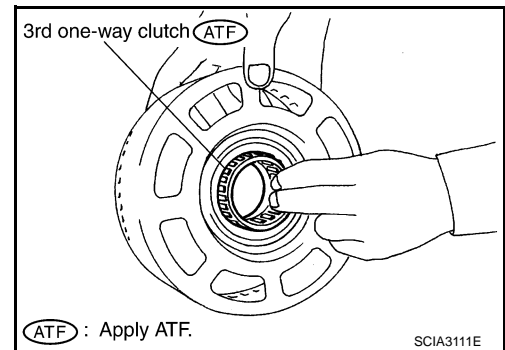
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DISASSEMBLY

1. Remove snap ring from front sun gear using suitable tool.



2. Remove 3rd one-way clutch from front sun gear.



INSPECTION

3rd One-way Clutch

- Check frictional surface for wear or damage.

CAUTION:

If necessary, replace the 3rd one-way clutch.

FRONT SUN GEAR, 3RD ONE-WAY CLUTCH

< DISASSEMBLY AND ASSEMBLY >

Front Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:

If necessary, replace the snap ring.

Front Sun Gear

- Check for deformation, fatigue or damage.

CAUTION:

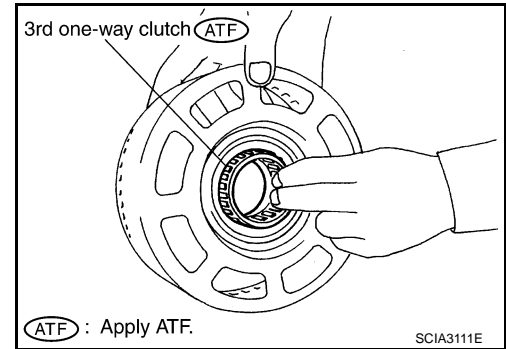
If necessary, replace the front sun gear.

ASSEMBLY

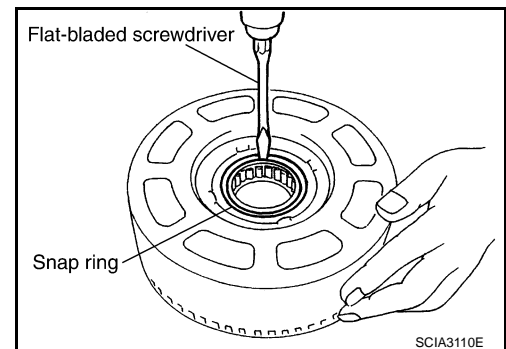
1. Install 3rd one-way clutch in front sun gear.

CAUTION:

Apply ATF to 3rd one-way clutch.



2. Install snap ring in front sun gear using suitable tool.



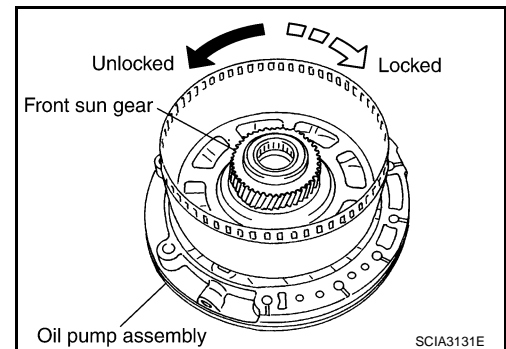
3. Check operation of 3rd one-way clutch.

- a. Hold oil pump assembly and turn front sun gear.

- b. Check 3rd one-way clutch for correct locking and unlocking directions.

CAUTION:

If not as shown, check installation direction of 3rd one-way clutch.



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FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

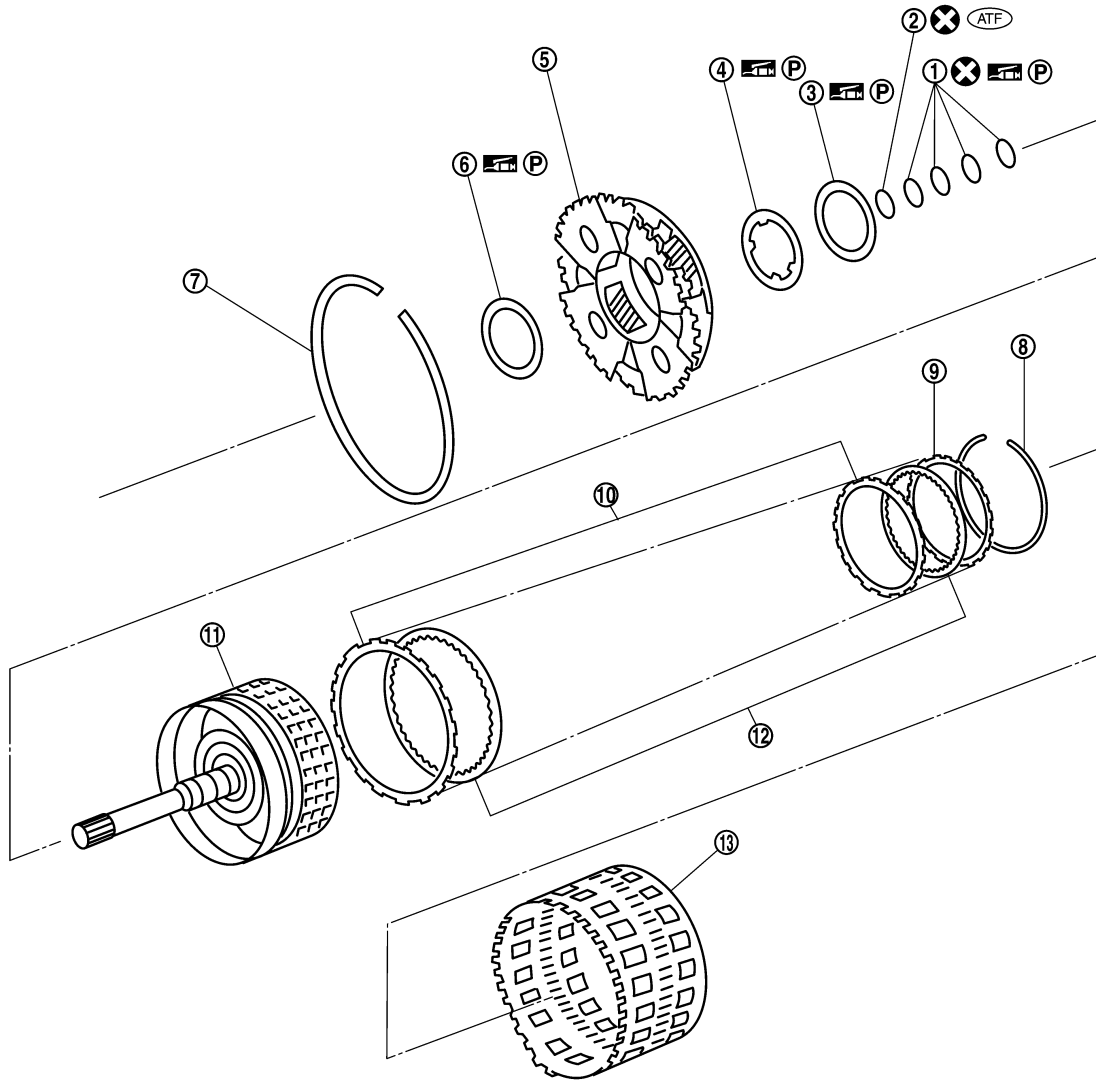
< DISASSEMBLY AND ASSEMBLY >

FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

Exploded View

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|------------------------|---------------------------|--------------------|
| 1. Seal ring | 2. O-ring | 3. Needle bearing |
| 4. Bearing race | 5. Front carrier assembly | 6. Needle bearing |
| 7. Snap ring | 8. Snap ring | 9. Retaining plate |
| 10. Driven plate | 11. Input clutch drum | 12. Drive plate |
| 13. Rear internal gear | | |

Disassembly and Assembly

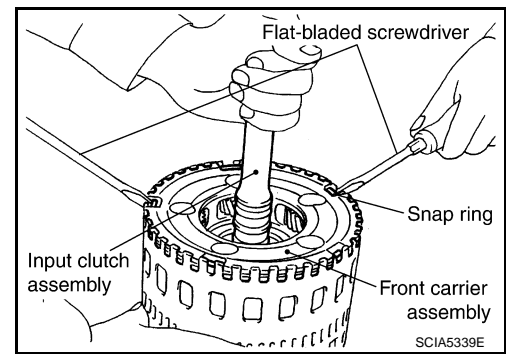
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DISASSEMBLY

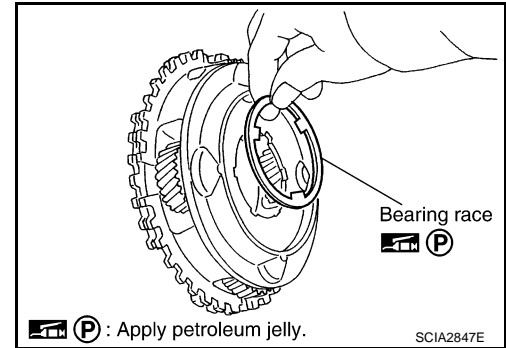
FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

< DISASSEMBLY AND ASSEMBLY >

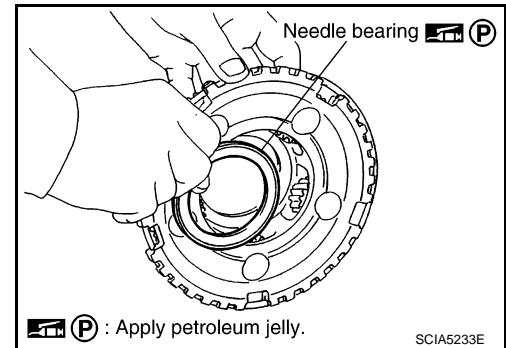
1. Compress snap ring using 2 flat-bladed screwdrivers.
2. Remove front carrier assembly and input clutch assembly from rear internal gear.
3. Remove front carrier assembly from input clutch assembly.



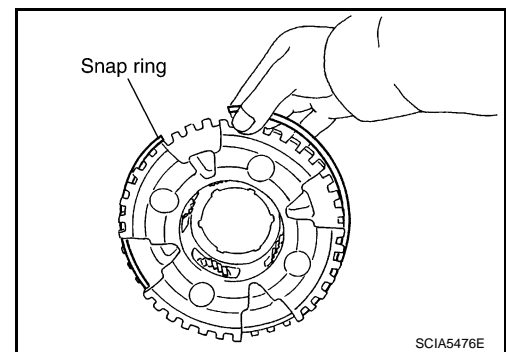
- a. Remove bearing race from front carrier assembly.



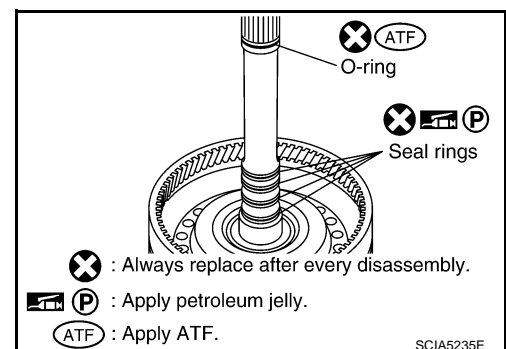
- b. Remove needle bearing from front carrier assembly.



- c. Remove snap ring from front carrier assembly.
CAUTION:
Do not excessively expand snap ring.



4. Disassemble input clutch assembly.
- a. Remove O-ring and seal rings from input clutch assembly.

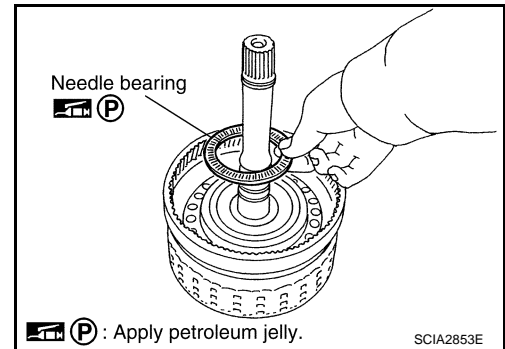


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FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

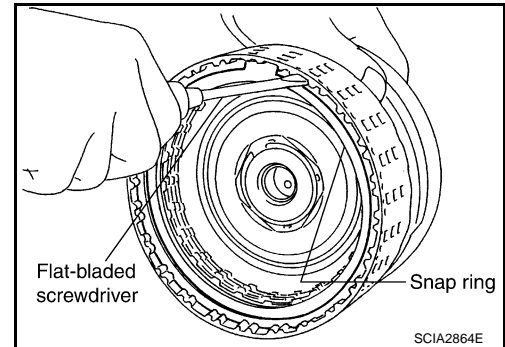
< DISASSEMBLY AND ASSEMBLY >

b. Remove needle bearing from input clutch assembly.



c. Remove snap ring from input clutch drum using suitable tool.

d. Remove drive plates, driven plates and retaining plate from input clutch drum.



INSPECTION

Front Carrier Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:

If necessary, replace the snap ring.

Input Clutch Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:

If necessary, replace the input clutch assembly.

Input Clutch Drum

- Check for deformation, fatigue or damage or burns.

CAUTION:

If necessary, replace the input clutch assembly.

Input Clutch Drive Plates

- Check facing for burns, cracks or damage.

CAUTION:

If necessary, replace the input clutch assembly.

Input Clutch Retaining Plate and Driven Plates

- Check facing for burns, cracks or damage.

CAUTION:

If necessary, replace the input clutch assembly.

Front Carrier

- Check for deformation, fatigue or damage.

CAUTION:

If necessary, replace the front carrier assembly.

Rear Internal Gear

- Check for deformation, fatigue or damage.

CAUTION:

If necessary, replace the rear internal gear assembly.

ASSEMBLY

1. Install input clutch.

FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

< DISASSEMBLY AND ASSEMBLY >

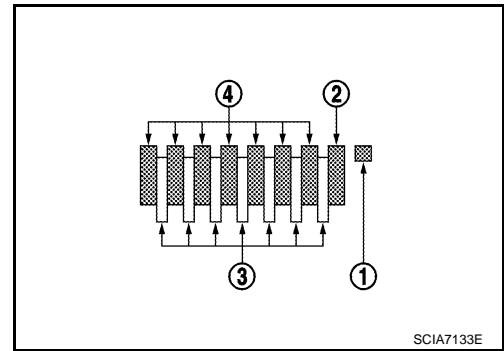
- a. Install drive plates (3), driven plates (4) and retaining plate (2) in input clutch drum.
- Snap ring (1)

CAUTION:

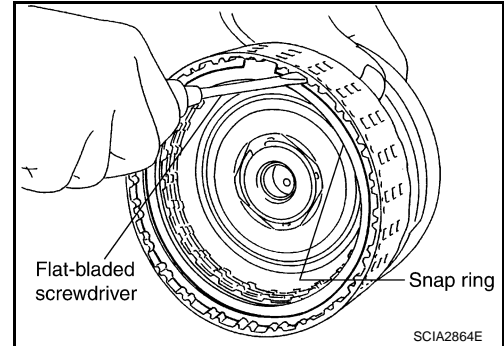
Take care with order of plates.

NOTE:

There are 7 drive plates and 7 driven plates.



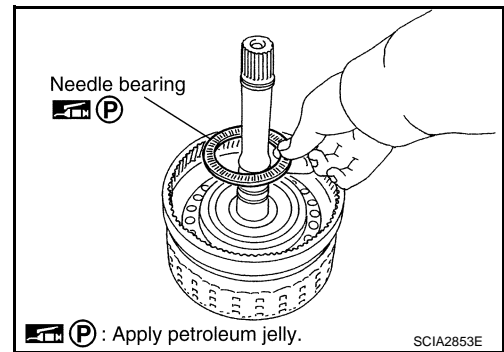
- b. Install snap ring in input clutch drum using suitable tool.



- c. Install needle bearing in input clutch assembly.

CAUTION:

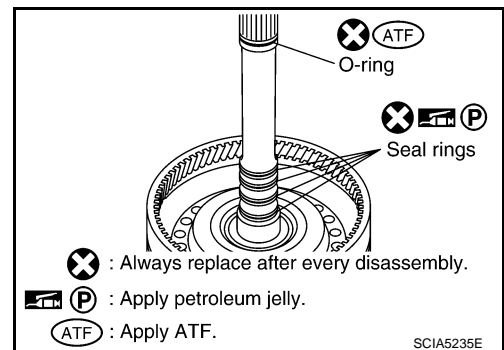
Apply petroleum jelly to needle bearing.



- d. Install O-ring and seal rings in input clutch assembly.

CAUTION:

- Do not reuse O-ring and seal rings.
- Apply ATF to O-ring.
- Apply petroleum jelly to seal rings.

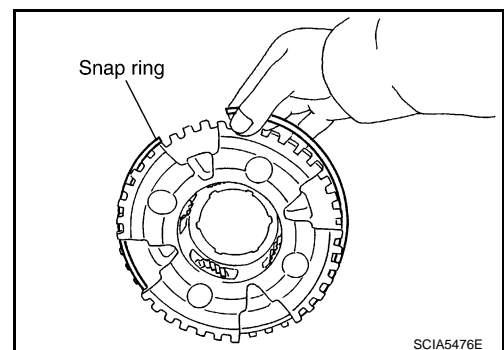


2. Install front carrier assembly.

- a. Install snap ring to front carrier assembly.

CAUTION:

Do not excessively expand snap ring.



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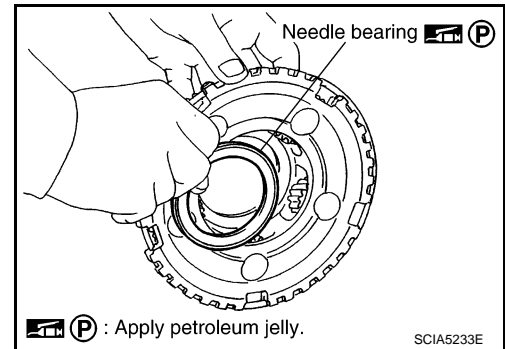
FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

< DISASSEMBLY AND ASSEMBLY >

- b. Install needle bearing in front carrier assembly.

CAUTION:

- Take care with the direction of needle bearing. Refer to [TM-248, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#).
- Apply petroleum jelly to bearing race.

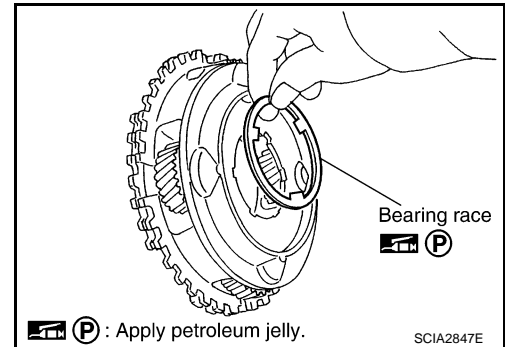


- c. Install bearing race in front carrier assembly.

CAUTION:

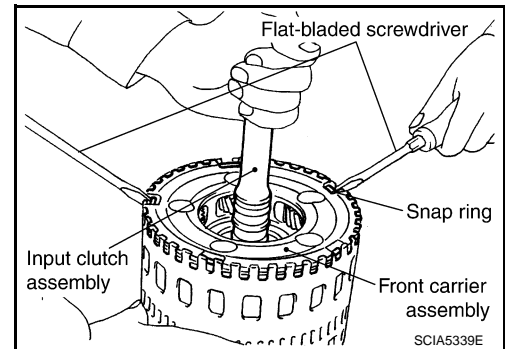
Apply petroleum jelly to bearing race.

- d. Install front carrier assembly to input clutch assembly.



3. Compress snap ring using 2 flat-bladed screwdrivers.

4. Install front carrier assembly and input clutch assembly to rear internal gear.



MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

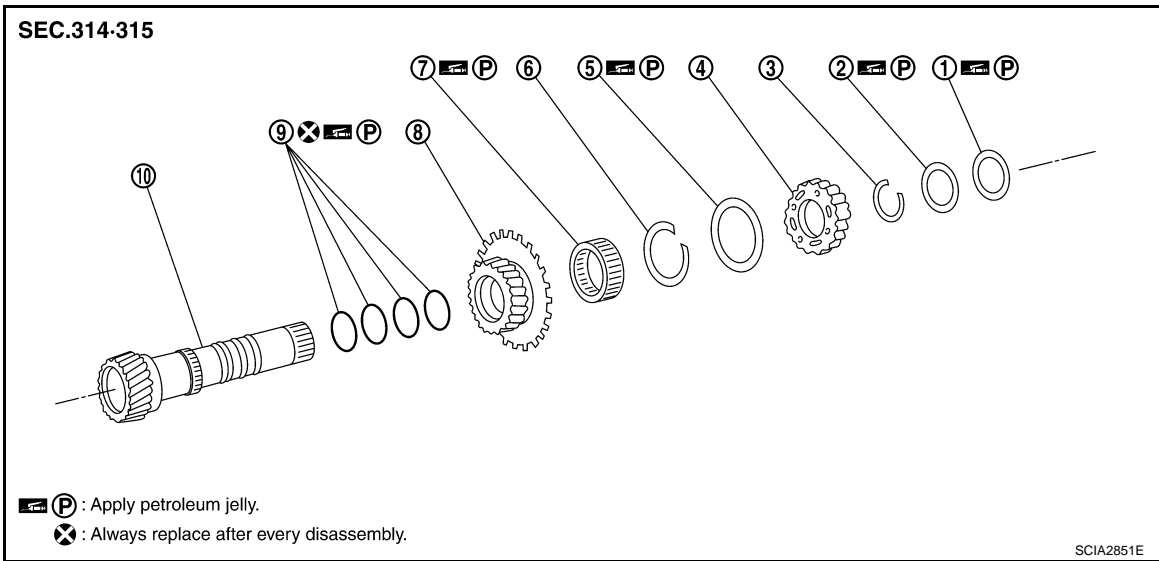
< DISASSEMBLY AND ASSEMBLY >

MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

Exploded View

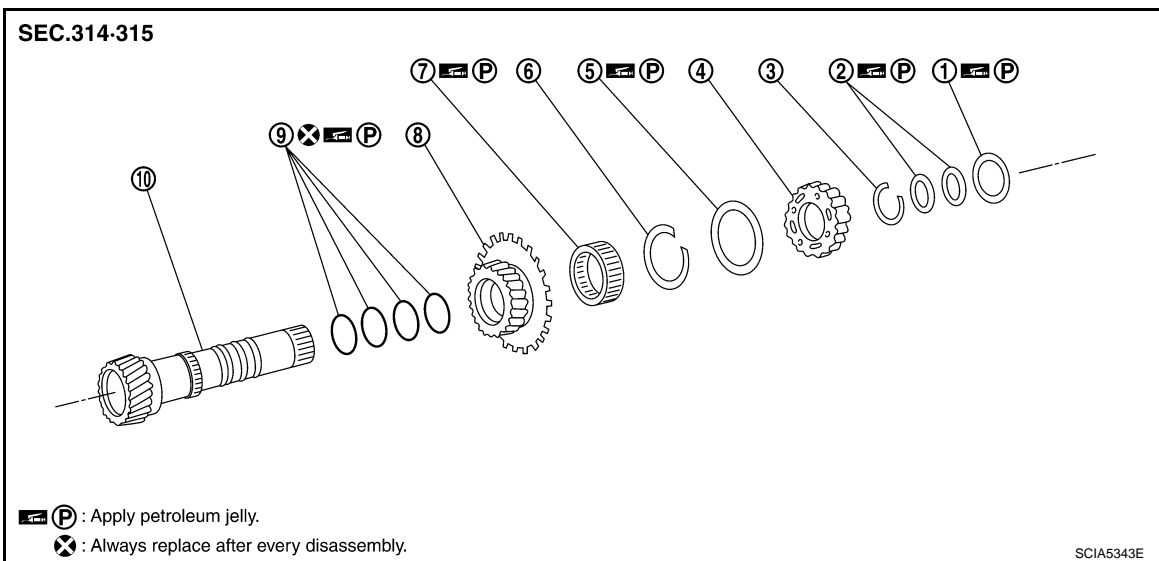
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VQ40DE models



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|------------------------------------|-------------------|--------------|
| 1. Needle bearing | 2. Bearing race | 3. Snap ring |
| 4. High and low reverse clutch hub | 5. Needle bearing | 6. Snap ring |
| 7. 1st one-way clutch | 8. Rear sun gear | 9. Seal ring |
| 10. Mid sun gear | | |

VK56DE models



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|------------------------------------|-------------------|--------------|
| 1. Needle bearing | 2. Bearing race | 3. Snap ring |
| 4. High and low reverse clutch hub | 5. Needle bearing | 6. Snap ring |
| 7. 1st one-way clutch | 8. Rear sun gear | 9. Seal ring |
| 10. Mid sun gear | | |

MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

< DISASSEMBLY AND ASSEMBLY >

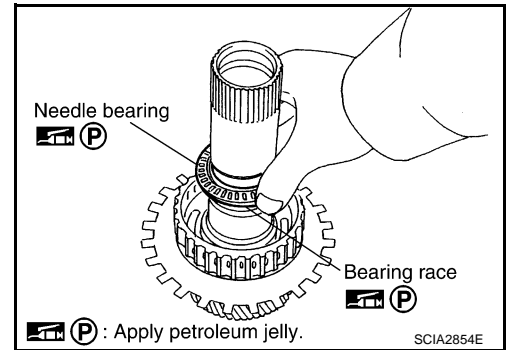
Disassembly and Assembly

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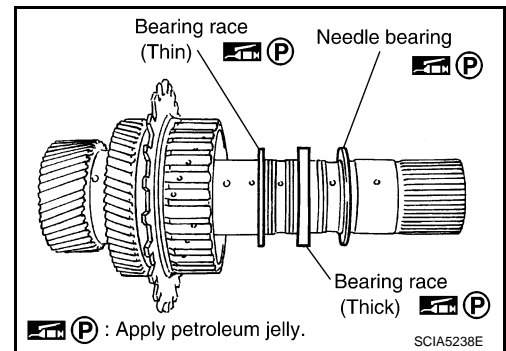
DISASSEMBLY

1. Remove needle bearing and bearing race from high and low reverse clutch hub.

- VQ40DE models

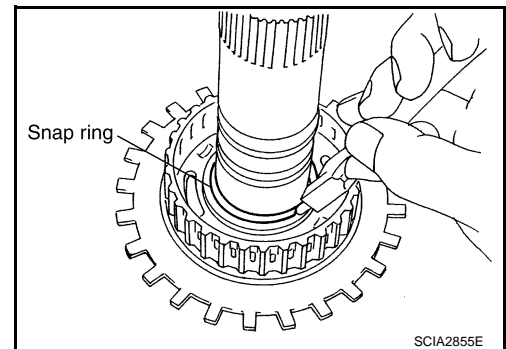


- VK56DE models

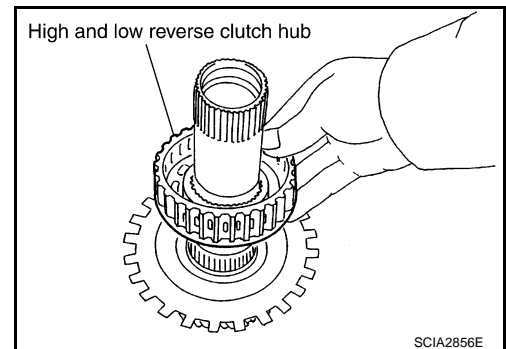


2. Remove snap ring from mid sun gear assembly using suitable tool.

CAUTION:
Do not excessively expand snap ring.



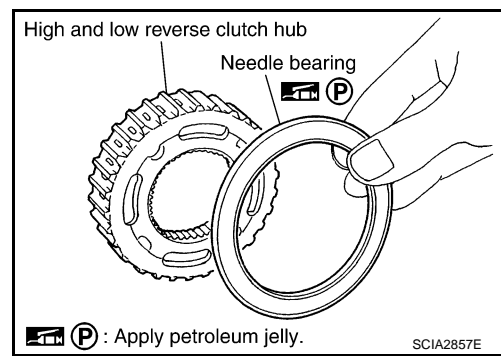
3. Remove high and low reverse clutch hub from mid sun gear assembly.



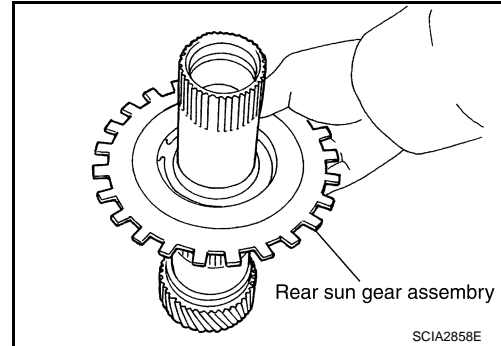
MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

< DISASSEMBLY AND ASSEMBLY >

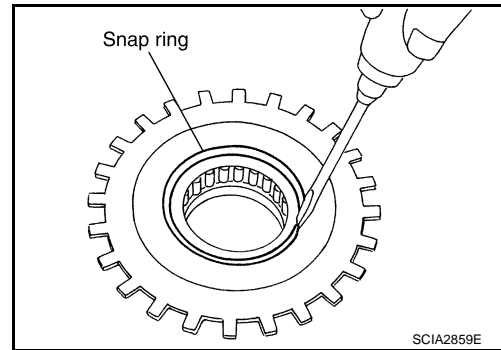
- a. Remove needle bearing from high and low reverse clutch hub.



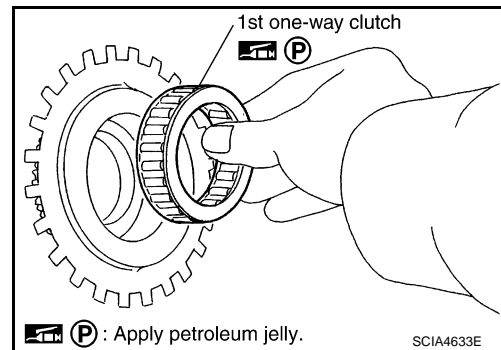
4. Remove rear sun gear assembly from mid sun gear assembly.



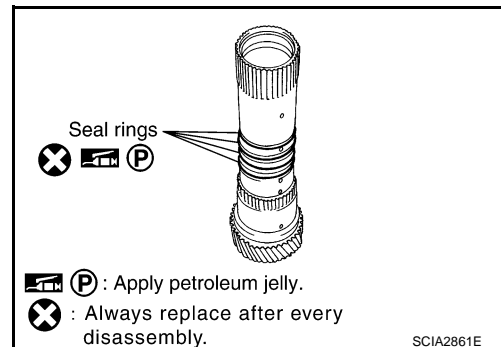
- a. Remove snap ring from rear sun gear using suitable tool.



- b. Remove 1st one-way clutch from rear sun gear.



5. Remove seal rings from mid sun gear.



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MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

< DISASSEMBLY AND ASSEMBLY >

INSPECTION

High and Low Reverse Clutch Hub Snap Ring, Rear Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

CAUTION:

If necessary, replace the snap ring.

1st One-way Clutch

- Check frictional surface for wear or damage.

CAUTION:

If necessary, replace the 1st one-way clutch.

Mid Sun Gear

- Check for deformation, fatigue or damage.

CAUTION:

If necessary, replace the mid sun gear.

Rear Sun Gear

- Check for deformation, fatigue or damage.

CAUTION:

If necessary, replace the rear sun gear.

High and Low Reverse Clutch Hub

- Check for deformation, fatigue or damage.

CAUTION:

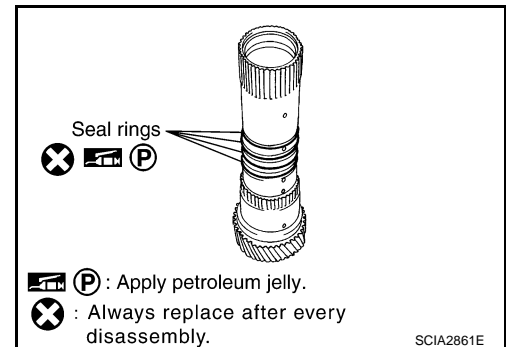
If necessary, replace the high and low reverse clutch hub.

ASSEMBLY

1. Install seal rings to mid sun gear.

CAUTION:

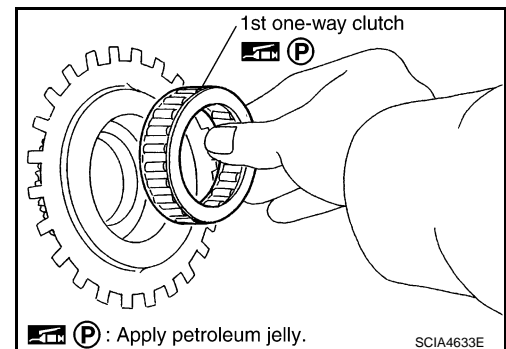
- Do not reuse seal rings.
- Apply petroleum jelly to seal rings.



2. Install 1st one-way clutch to rear sun gear.

CAUTION:

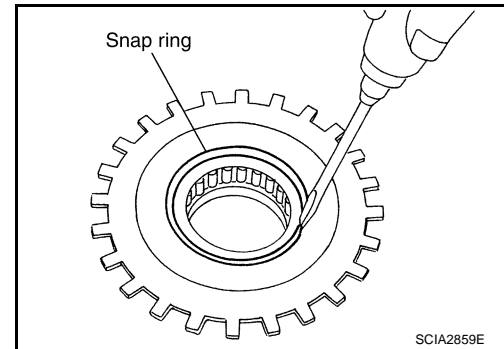
Apply petroleum jelly to 1st one-way clutch.



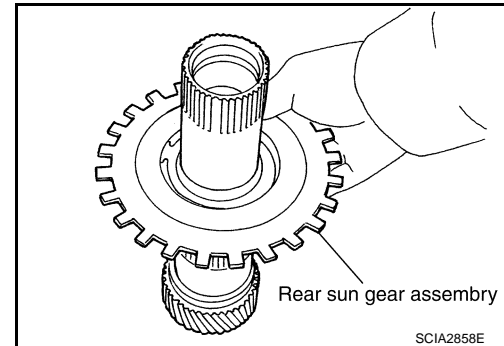
MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

< DISASSEMBLY AND ASSEMBLY >

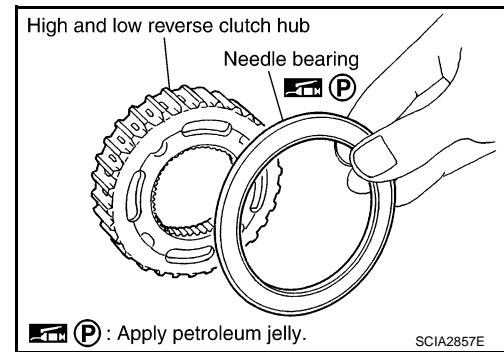
3. Install snap ring to rear sun gear using suitable tool.



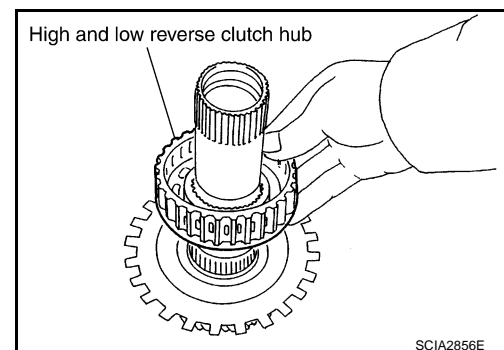
4. Install rear sun gear assembly to mid sun gear assembly.



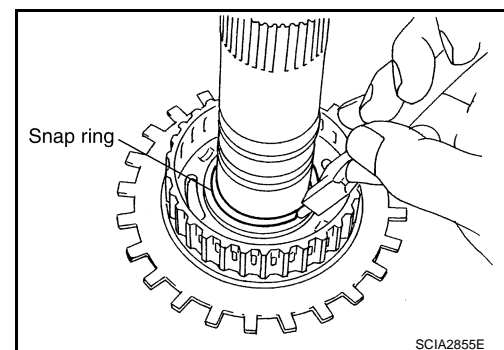
5. Install needle bearing to high and low reverse clutch hub.
CAUTION:
Apply petroleum jelly to needle bearing.



6. Install high and low reverse clutch hub to mid sun gear assembly.



7. Install snap ring to mid sun gear assembly using suitable tool.
CAUTION:
Do not excessively expand snap ring.



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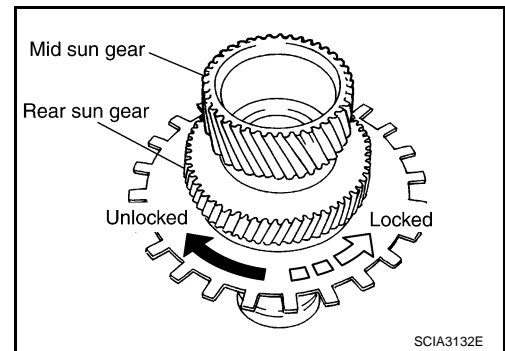
MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

< DISASSEMBLY AND ASSEMBLY >

8. Check operation of 1st one-way clutch.
 - a. Hold mid sun gear and turn rear sun gear.
 - b. Check 1st one-way clutch for correct locking and unlocking directions.

CAUTION:

If not as shown, check installation direction of 1st one-way clutch.

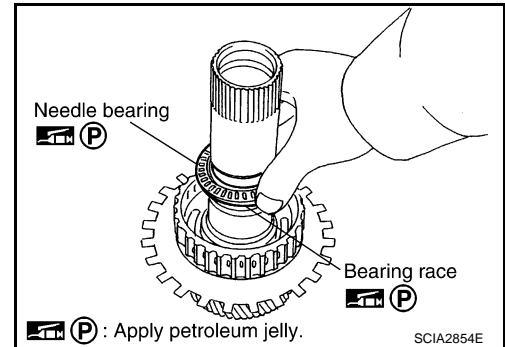


9. Install needle bearing and bearing race to high and low reverse clutch hub.

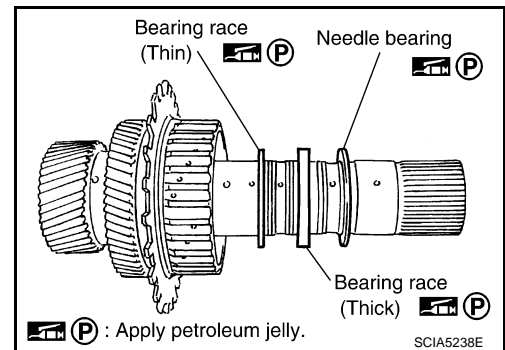
CAUTION:

Apply petroleum jelly to needle bearing and bearing race.

- VQ40DE models



- VK56DE models



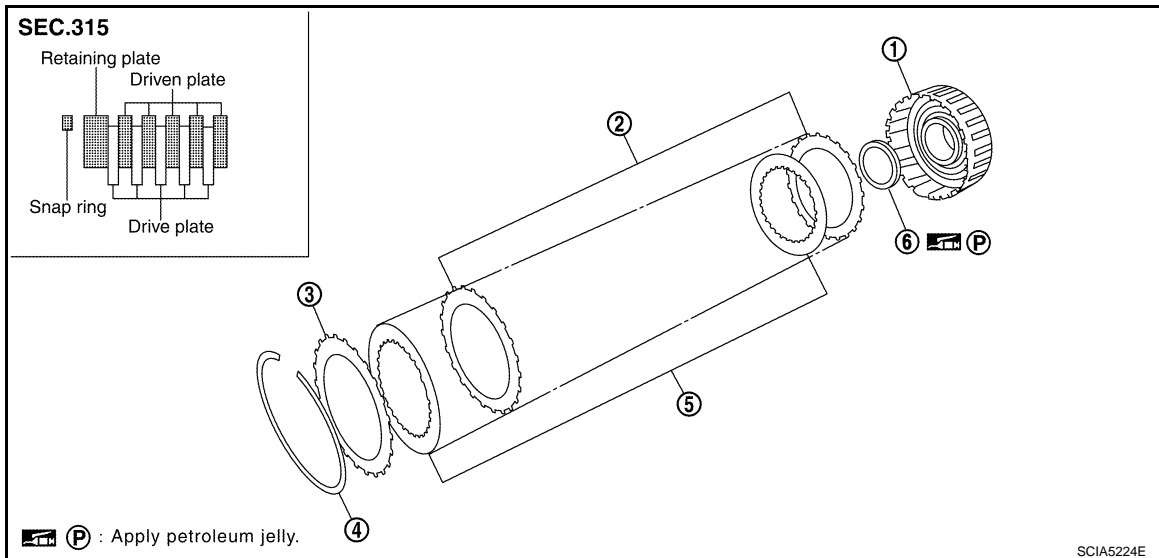
HIGH AND LOW REVERSE CLUTCH

< DISASSEMBLY AND ASSEMBLY >

HIGH AND LOW REVERSE CLUTCH

Exploded View

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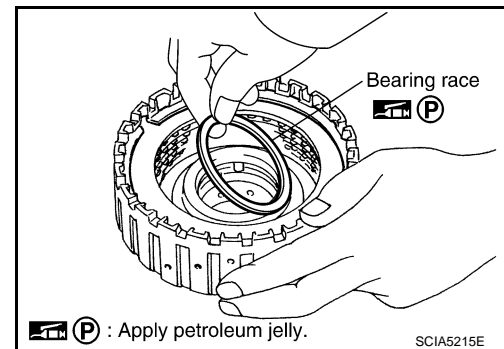
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|-------------------------------------|-----------------|--------------------|
| 1. High and low reverse clutch drum | 2. Driven plate | 3. Retaining plate |
| 4. Snap ring | 5. Drive plate | 6. Bearing race |

Disassembly and Assembly

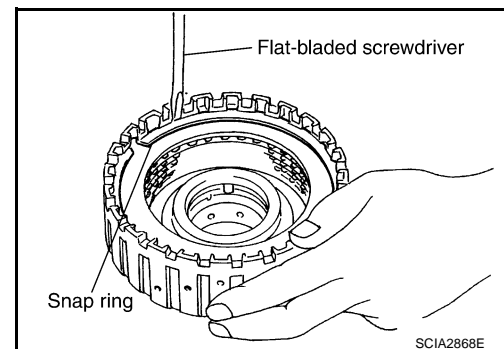
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DISASSEMBLY

1. Remove bearing race from high and low reverse clutch drum.



2. Remove snap ring from high and low reverse clutch drum using suitable tool.
3. Remove drive plates, driven plates and retaining plate from high and low reverse clutch drum.



INSPECTION

- Check the following, and replace high and low reverse clutch assembly if necessary.

High and Low Reverse Clutch Snap Ring

- Check for deformation, fatigue or damage.

High and Low Reverse Clutch Drive Plates

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HIGH AND LOW REVERSE CLUTCH

< DISASSEMBLY AND ASSEMBLY >

- Check facing for burns, cracks or damage.

High and Low Reverse Clutch Retaining Plate and Driven Plates

- Check facing for burns, cracks or damage.

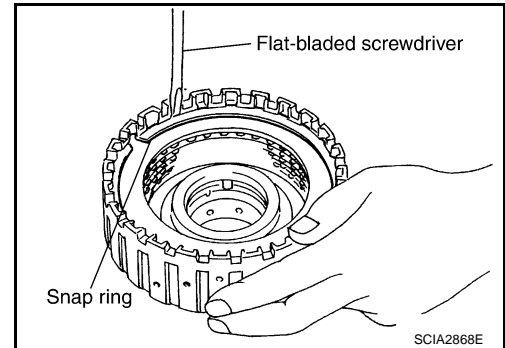
ASSEMBLY

1. Install drive plates, driven plates and retaining plate in high and low reverse clutch drum.

CAUTION:

Take care with order of plates.

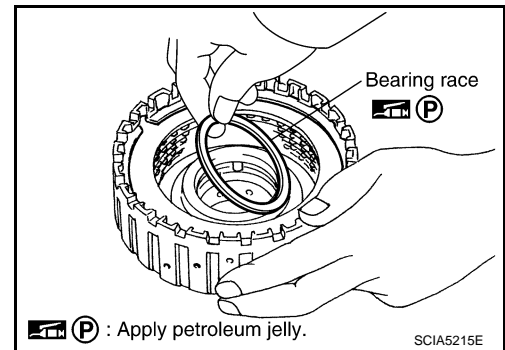
2. Install snap ring in high and low reverse clutch drum using suitable tool.



3. Install bearing race to high and low reverse clutch drum.

CAUTION:

Apply petroleum jelly to bearing race.



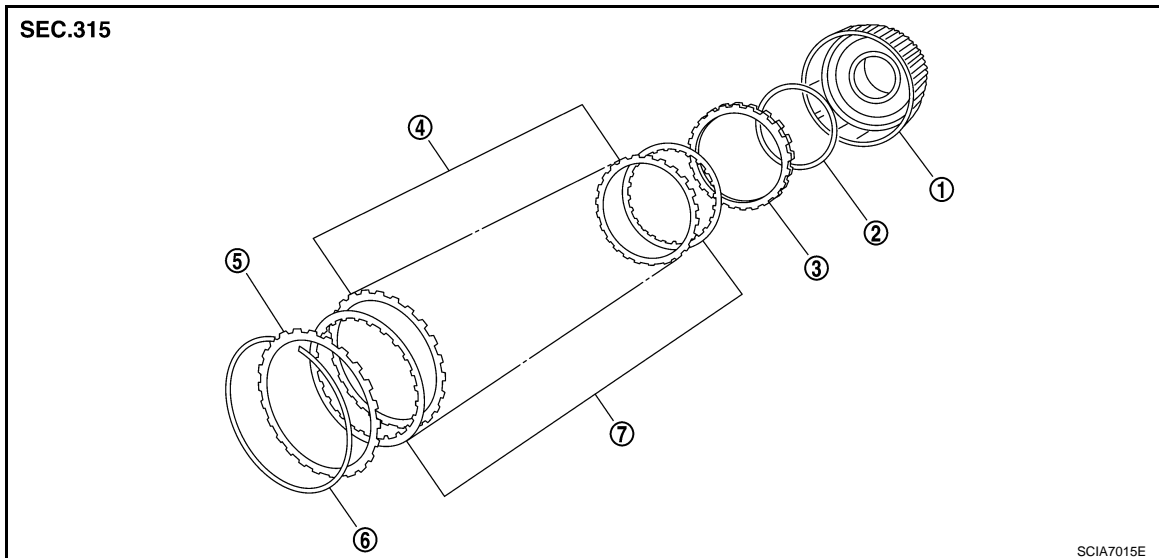
DIRECT CLUTCH

< DISASSEMBLY AND ASSEMBLY >

DIRECT CLUTCH

Exploded View

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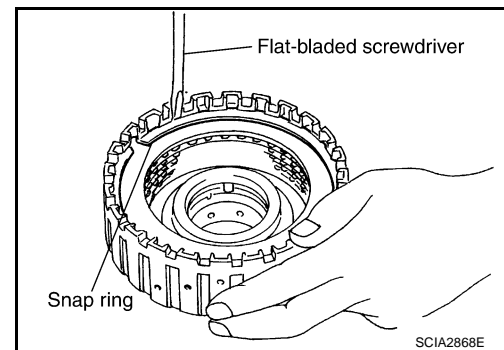
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| 1. Direct clutch drum | 2. Dish plate | 3. Retaining plate |
| 4. Driven plate | 5. Retaining plate | 6. Snap ring |
| 7. Drive plate | | |

Disassembly and Assembly

INFOID:000000001726762

DISASSEMBLY

1. Remove snap ring from direct clutch drum using suitable tool.
2. Remove retaining plates, drive plates, driven plates and dish plate from direct clutch drum.



INSPECTION

- Check the following, and replace direct clutch assembly if necessary.

Direct Clutch Snap Ring

- Check for deformation, fatigue or damage.

Direct Clutch Drive Plates

- Check facing for burns, cracks or damage.

Direct Clutch Retaining Plate and Driven Plates

- Check facing for burns, cracks or damage.

ASSEMBLY

DIRECT CLUTCH

< DISASSEMBLY AND ASSEMBLY >

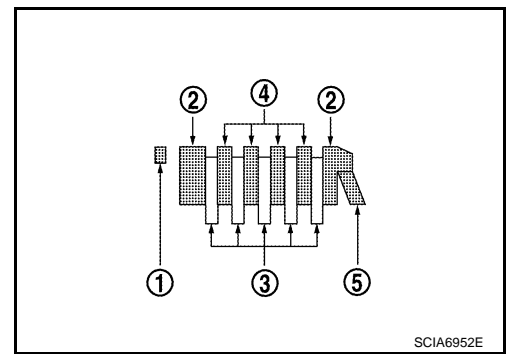
1. Install dish plate retaining plates drive plates and driven plates in direct clutch drum.

CAUTION:

Take care with order of plates.

- VQ40DE models

- Snap ring (1)
- Retaining plate (2)
- Drive plate (3)
- Driven plate (4)
- Dish plate (5)
- Driveplate/Driven plate: 5/4

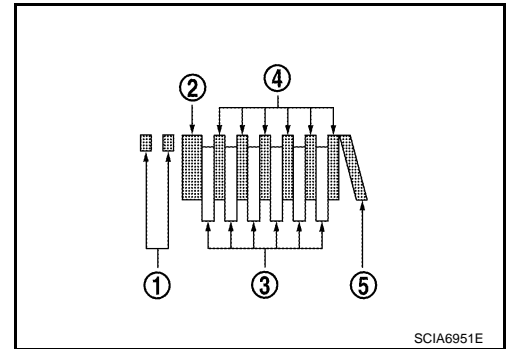


CAUTION:

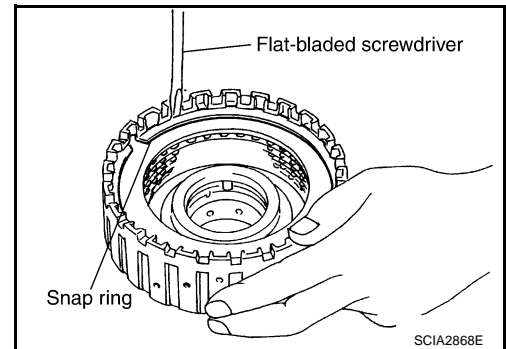
Take care with order of plates.

- VK56DE models

- Snap ring (1)
- Retaining plate (2)
- Drive plate (3)
- Driven plate (4)
- Dish plate (5)
- Driveplate/Driven plate: 6/6



2. Install snap ring in direct clutch drum using suitable tool.



ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

ASSEMBLY

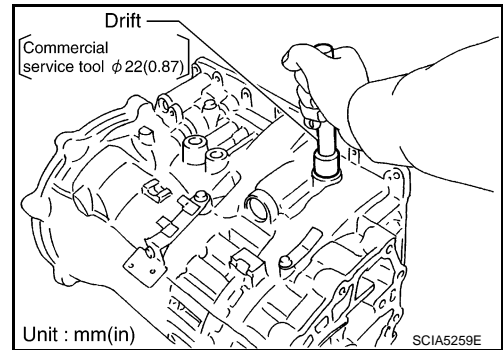
Assembly (1)

INFOID:000000001282994

1. Drive manual shaft oil seals into the transmission case until they are flush using suitable tool.

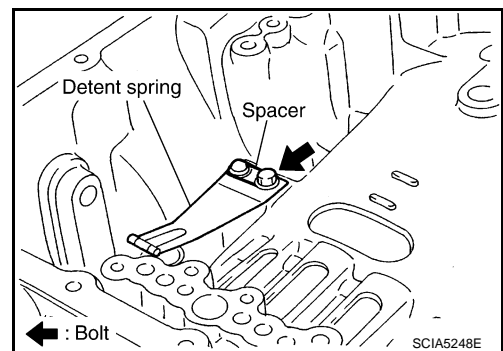
CAUTION:

- Apply ATF to manual shaft oil seals.
- Do not reuse manual shaft oil seals.

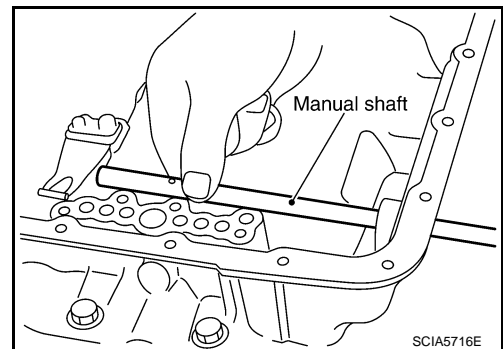


2. Install detent spring and spacer in transmission case and secure with the bolt.

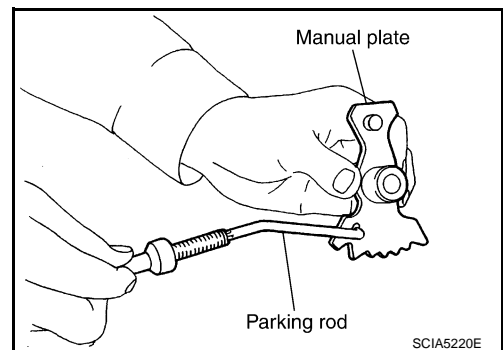
Bolt : 7.9 N·m (0.81 kg-m, 70 in-lb)



3. Install manual shaft to transmission case.



4. Install parking rod to manual plate.

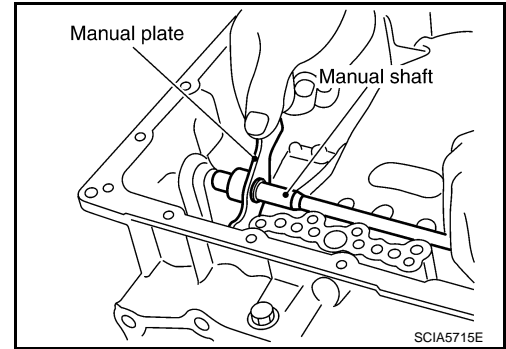


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5. Install manual plate (with parking rod) to manual shaft.

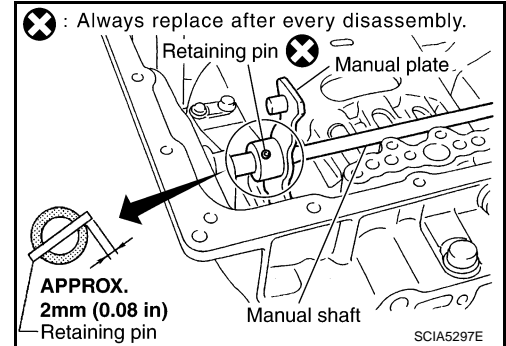


6. Install retaining pin into the manual plate and manual shaft.

- a. Align pinhole of the manual plate to pinhole of the manual shaft using suitable tool.
- b. Tap the retaining pin into the manual plate using suitable tool.

CAUTION:

- Drive retaining pin to 2 ± 0.5 mm (0.08 ± 0.020 in) over the manual plate.
- Do not reuse retaining pin.

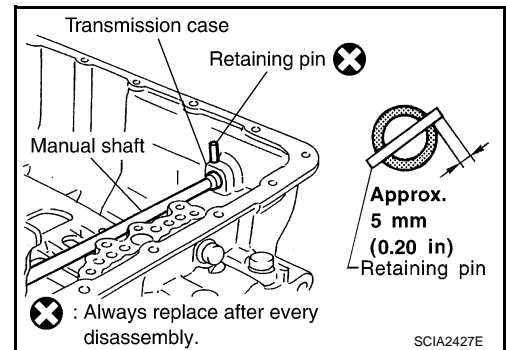


7. Install retaining pin into the transmission case and manual shaft.

- a. Align pinhole of the transmission case to pinhole of the manual shaft using suitable tool.
- b. Tap the retaining pin into the transmission case using suitable tool.

CAUTION:

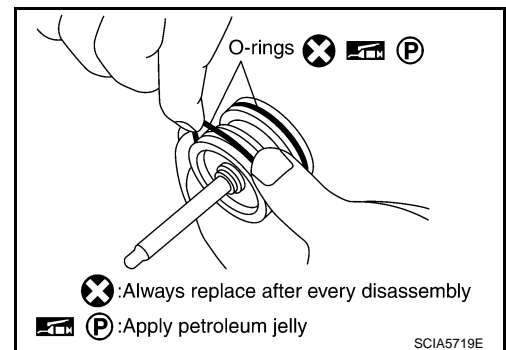
- Drive retaining pin to 5 ± 1 mm (0.20 ± 0.04 in) over the transmission case.
- Do not reuse retaining pin.



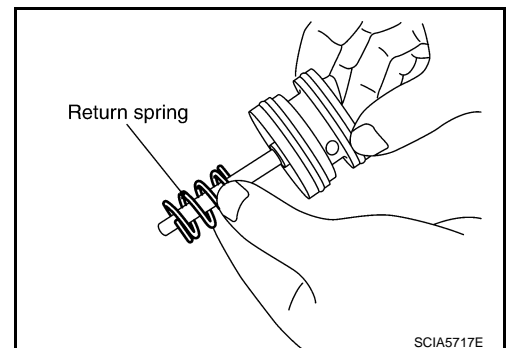
8. Install O-rings to servo assembly.

CAUTION:

- Do not reuse O-rings.
- Apply petroleum jelly to O-rings.



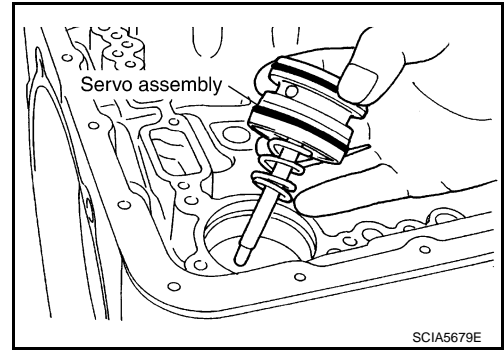
9. Install return spring to servo assembly.



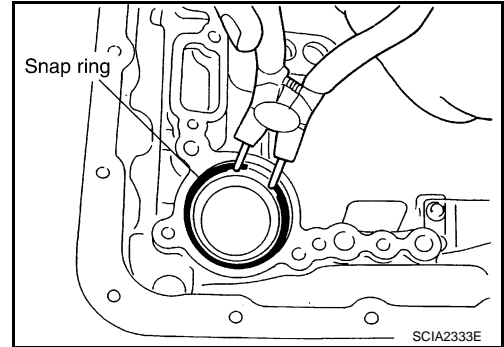
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10. Install servo assembly in transmission case.



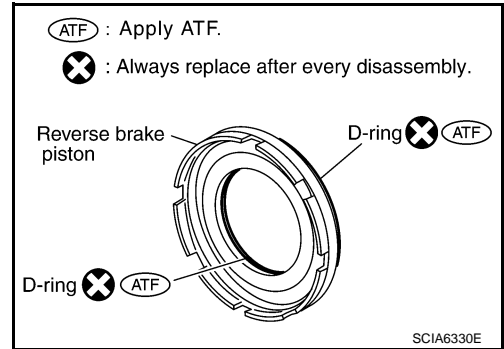
11. Install snap ring to transmission case using suitable tool.



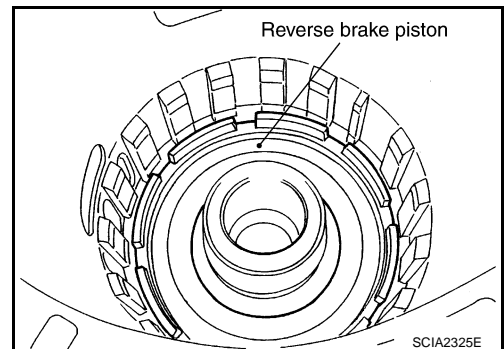
12. Install D-rings in reverse brake piston.

CAUTION:

- Do not reuse D-rings.
- Apply ATF to D-rings.



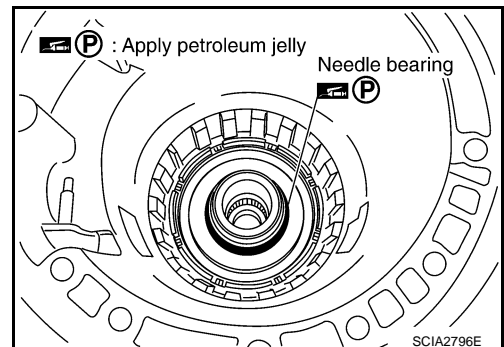
13. Install reverse brake piston in transmission case.



14. Install needle bearing to drum support edge surface.

CAUTION:

- Apply petroleum jelly to needle bearing.



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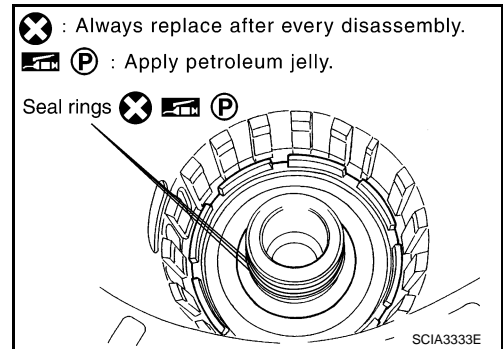
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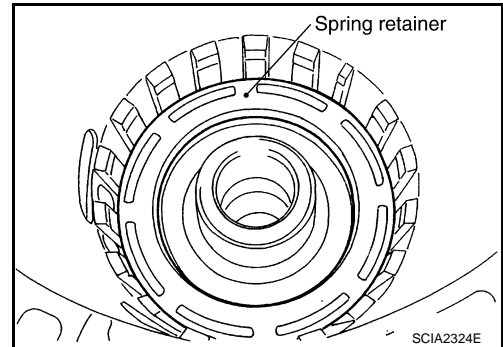
15. Install seal rings to drum support.

CAUTION:

- Do not reuse seal rings.
- Apply petroleum jelly to seal rings.



16. Install spring retainer and return spring in transmission case.

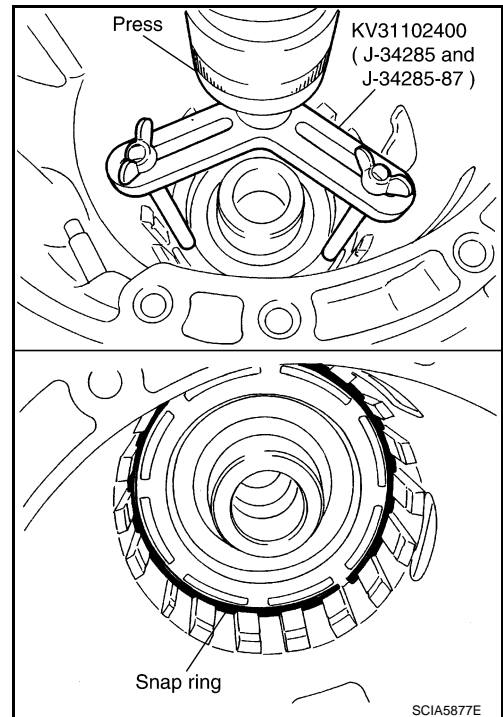


17. Install snap ring in transmission case while compressing return spring using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

CAUTION:

Securely assemble them using a flat-bladed screwdriver so that snap ring tension is slightly weak.

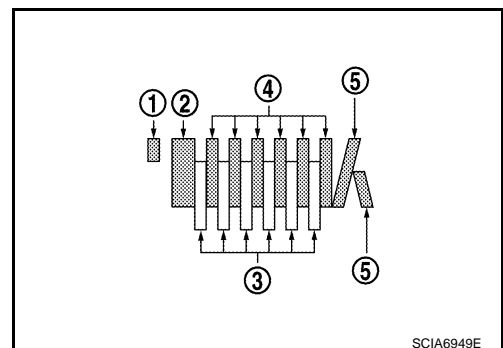


18. Install reverse brake drive plates driven plates and dish plates in transmission case.

CAUTION:

Take care with order of plates.

- VQ40DE models
- Snap ring (1)
- Retaining plate (2)
- Drive plate (3)
- Driven plate (4)
- Dish plate (5)
- Driveplate/Driven plate:6/6



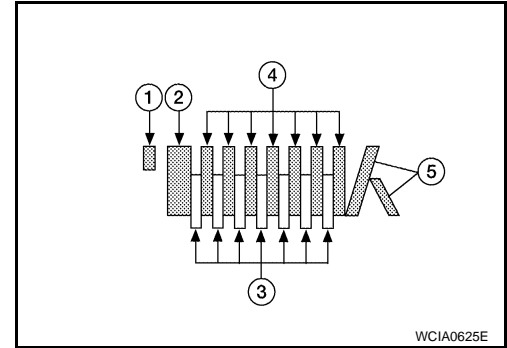
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CAUTION:

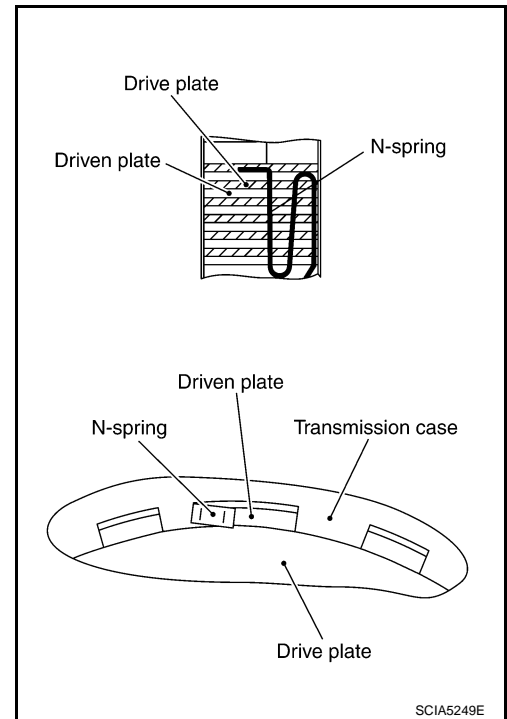
Take care with order of plates.

- VK56DE models
- Snap ring (1)
- Retaining plate (2)
- Drive plate (3)
- Driven plate (4)
- Dish plate (5)
- Driveplate/Driven plate: 7/7

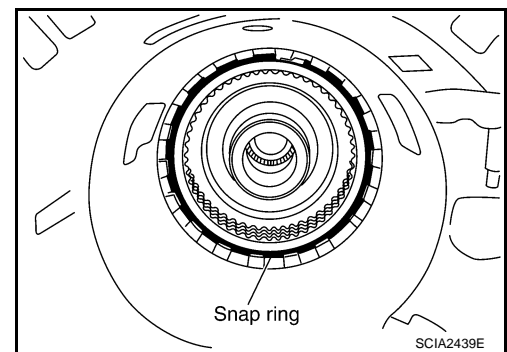


19. Assemble N-spring.

20. Install reverse brake retaining plate in transmission case.



21. Install snap ring in transmission case.



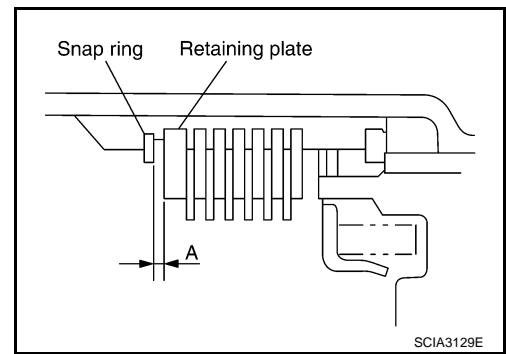
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22. Measure clearance (A) between retaining plate and snap ring. If not within specified clearance, select proper retaining plate.

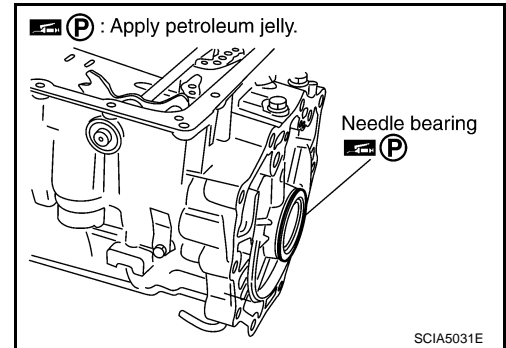
Clearance "A" : 0.7 - 1.1mm (0.028 - 0.043 in)
Retaining plate : Refer to [TM-316, "Reverse brake"](#).



23. Install needle bearing to transmission case.

CAUTION:

- Take care with the direction of needle bearing. Refer to [TM-248, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#).
- Apply petroleum jelly to needle bearing.

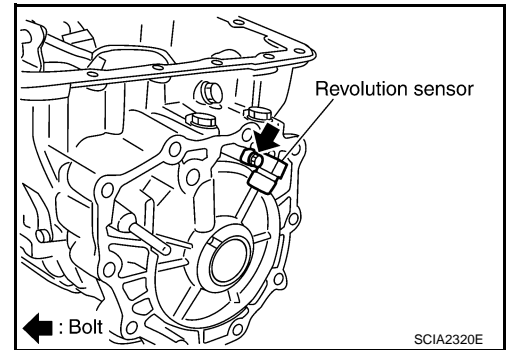


24. Install revolution sensor to transmission case and tighten bolt to specified torque.

Revolution sensor bolt : 5.8 N-m (0.59 kg-m, 51 in-lb)

CAUTION:

- Do not subject sensor to impact by dropping or hitting it.
- Do not disassemble sensor.
- Do not allow metal filings or any foreign material to get on the sensor's front edge magnetic area.
- Do not place sensor in an area affected by magnetism.

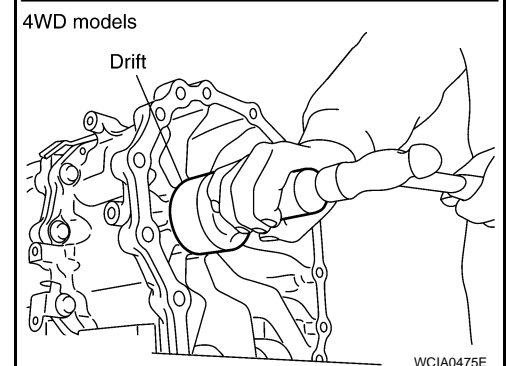
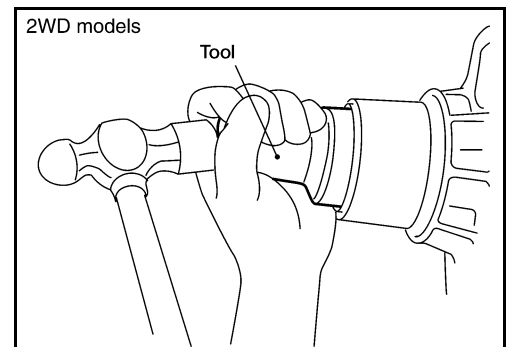


25. Install new rear oil seal until it is flush into the rear extension case (2WD models) using Tool or adapter case (4WD models) using suitable tool.

Tool number : ST33400001 (J-26082)

CAUTION:

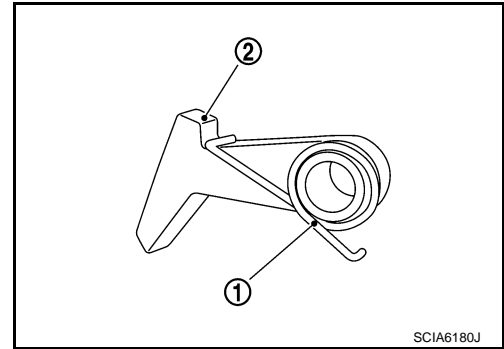
- Apply ATF to rear oil seal.
- Do not reuse rear oil seal.



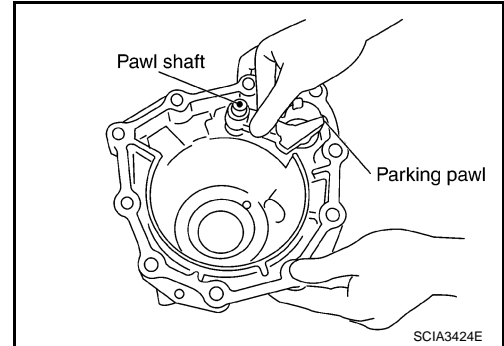
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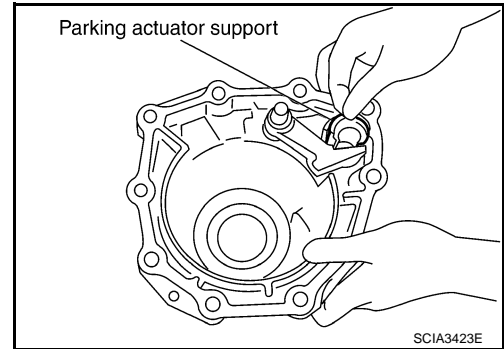
26. Install return spring (1) to parking pawl (2).



27. Install parking pawl (with return spring) and pawl shaft to rear extension (2WD models) or adapter case (4WD models).



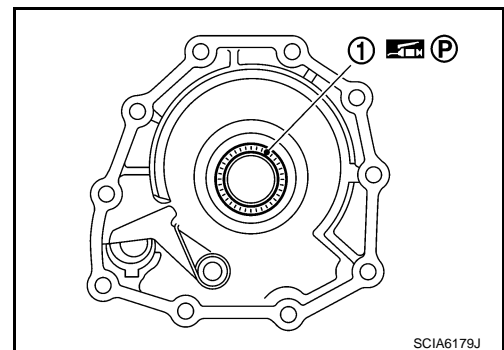
28. Install parking actuator support to rear extension (2WD models) or adapter case (4WD models).



29. Install needle bearing (1) to rear extension (2WD models) or adapter case (4WD models).

CAUTION:

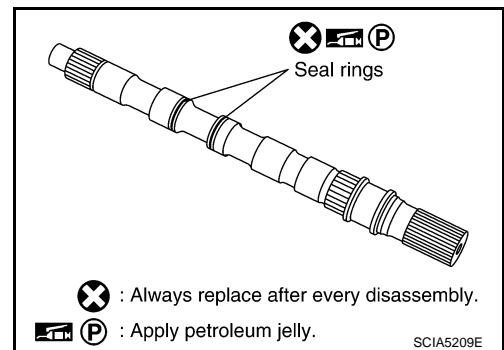
Apply petroleum jelly to needle bearing.



30. Install seal rings to output shaft.

CAUTION:

- Do not reuse seal rings.
- Apply petroleum jelly to seal rings.



⊗ : Always replace after every disassembly.

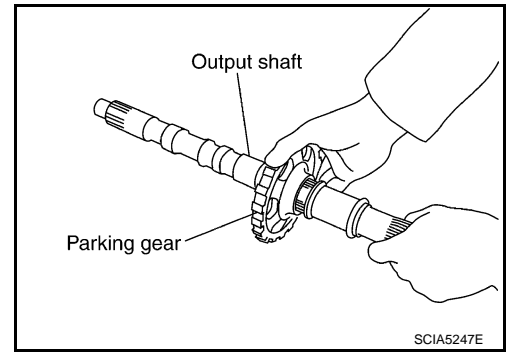
🛢️ (P) : Apply petroleum jelly.

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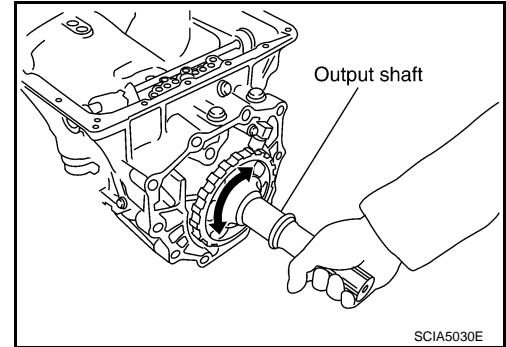
31. Install parking gear to output shaft.



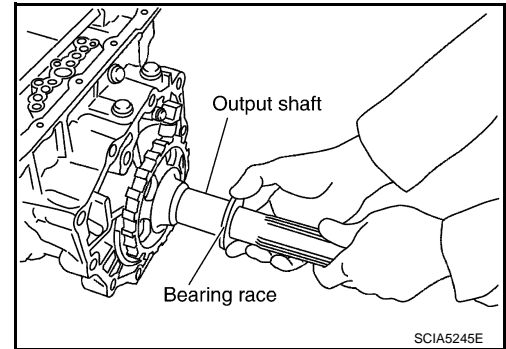
32. Install output shaft in transmission case.

CAUTION:

Do not mistake front of shaft for rear because both sides look similar (thinner end is front side).



33. Install bearing race to output shaft.



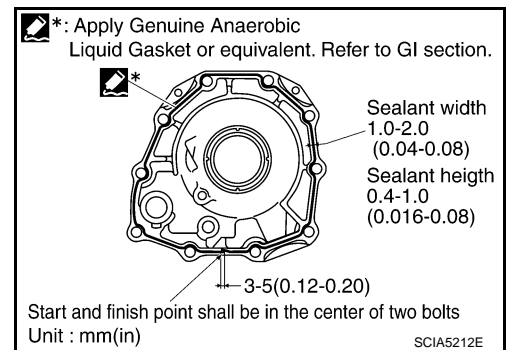
34. Install rear extension assembly (2WD models) or adapter case assembly (4WD models) according to the following procedures.

a. **2WD models**

i. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-26, "Recommended Chemical Products and Sealants"](#).) to rear extension assembly as shown.

CAUTION:

Completely remove all moisture, oil, old sealant and any foreign material from the transmission case and rear extension assembly mating surfaces.



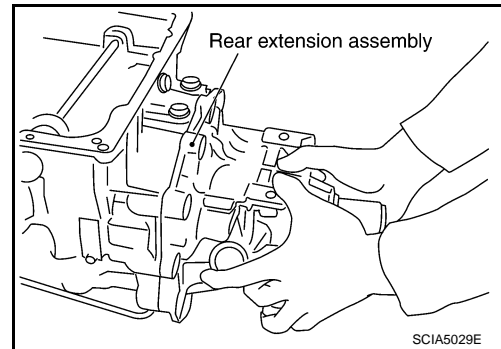
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- ii. Install rear extension assembly to transmission case.

CAUTION:

Insert the tip of parking rod between the parking pawl and the parking actuator support when assembling the rear extension assembly.



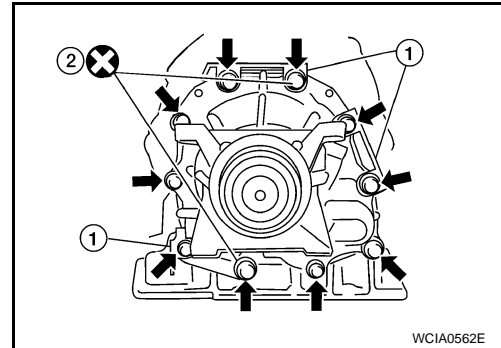
- iii. Install brackets (VK56DE models only)
 iv. Tighten rear extension assembly bolts to specified torque.
- 1: Self sealing bolts
 - 2: Rear extension assembly bolts

Rear extension assembly bolt : 52 N·m (5.3 kg·m, 38 ft·lb)

Self-sealing bolt : 61 N·m (6.2 kg·m, 45 ft·lb)

CAUTION:

Do not reuse self-sealing bolt.

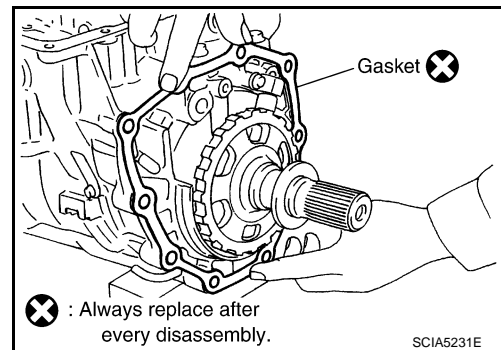


- b. 4WD models

- i. Install gasket onto transmission case.

CAUTION:

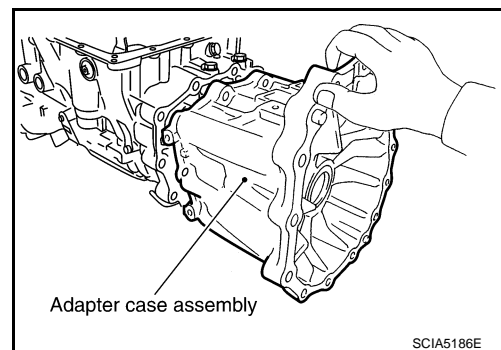
- Completely remove all moisture, oil, old gasket and any foreign material from the transmission case and adapter case assembly mating surfaces.
- Do not reuse gasket.



- ii. 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 rear extension assembly.



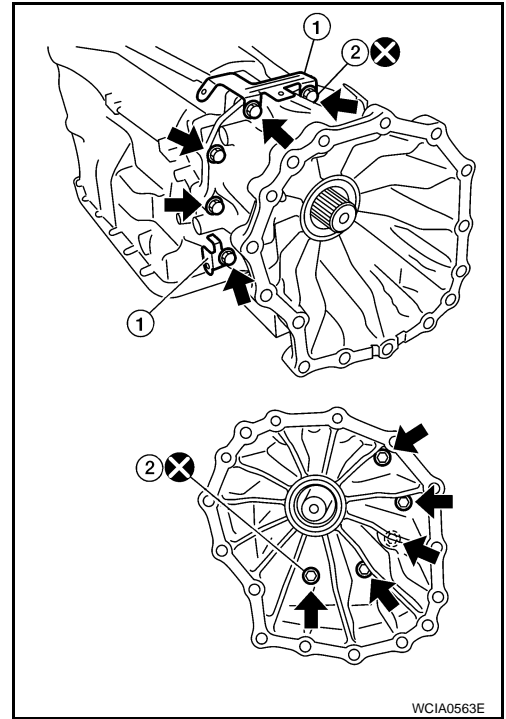
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iii. Install brackets (VK56DE models only)

- 1: Brackets
- 2: Self-sealing bolts



iv. Tighten adapter case assembly to specified torque.

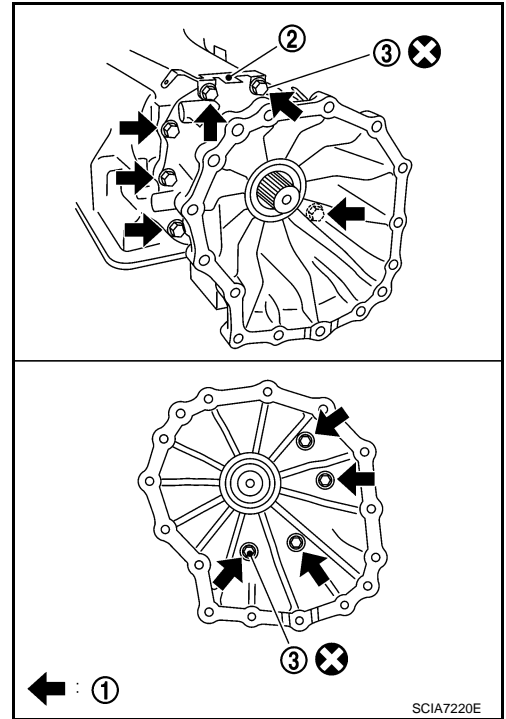
- 1: ➡
- 2: Brackets
- 3: Self-sealing bolts

CAUTION:

Do not reuse self-sealing bolt (2).

Adapter case assembly bolt : 52 N·m (5.3 kg·m, 38 ft·lb)

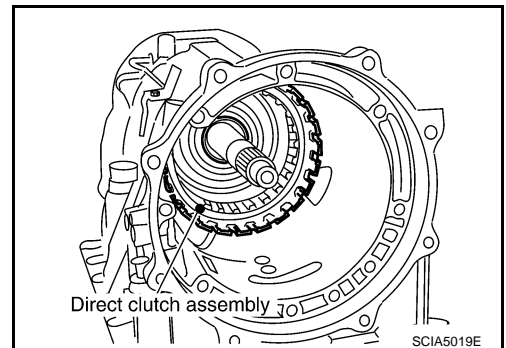
Self-sealing bolt : 61 N·m (6.2 kg·m, 45 ft·lb)



35. Install direct clutch assembly in reverse brake.

CAUTION:

Make sure that drum support edge surface and direct clutch inner boss edge surface come to almost same place.



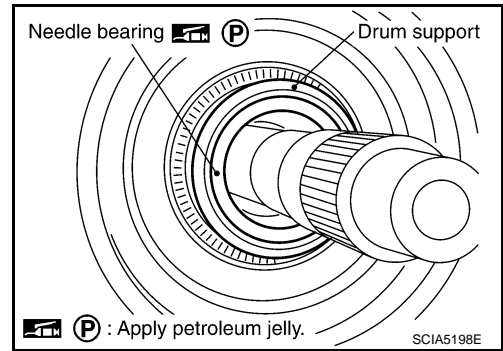
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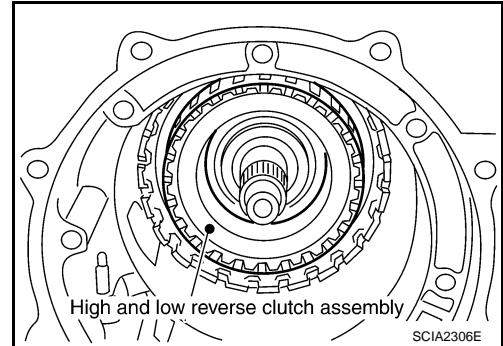
36. Install needle bearing in drum support.

CAUTION:

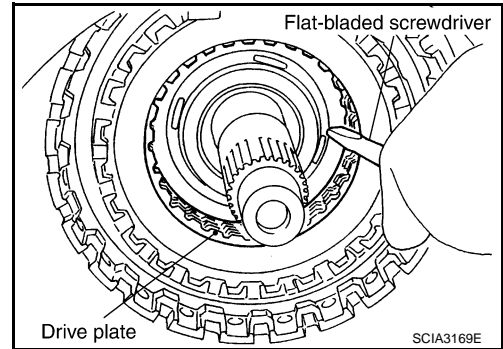
Apply petroleum jelly to needle bearing.



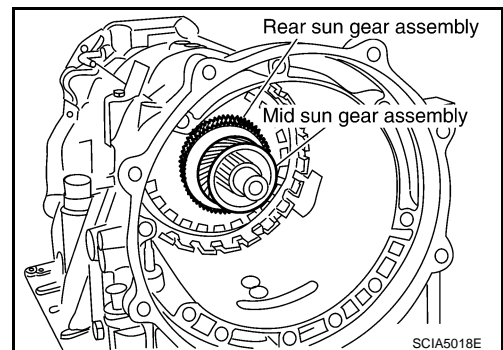
37. Install high and low reverse clutch assembly in direct clutch.



38. Align the drive plate using suitable tool.



39. Install high and low reverse clutch hub, mid sun gear assembly and rear sun gear assembly as a unit.

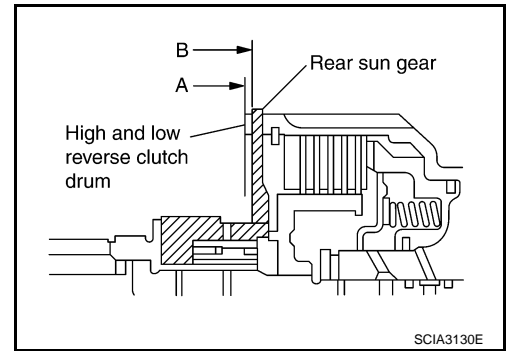


CAUTION:

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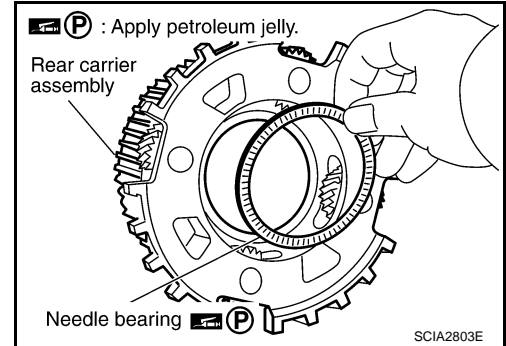
Make sure that portion "A" of high and low reverse clutch drum protrudes approximately 2 mm (0.08 in) beyond portion "B" of rear sun gear.



40. Install needle bearing in rear carrier assembly.

CAUTION:

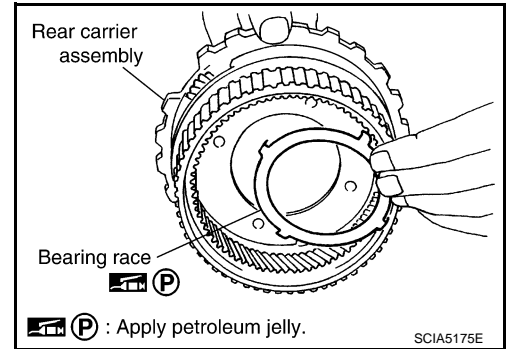
Apply petroleum jelly to needle bearing.



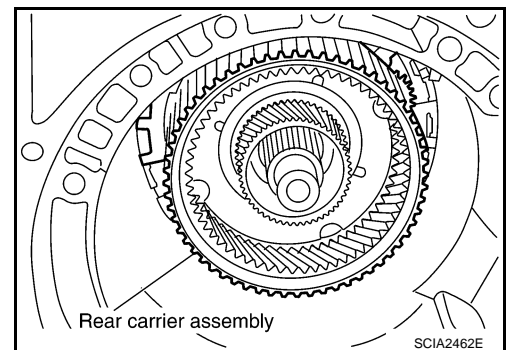
41. Install bearing race in rear carrier assembly.

CAUTION:

Apply petroleum jelly to bearing race.



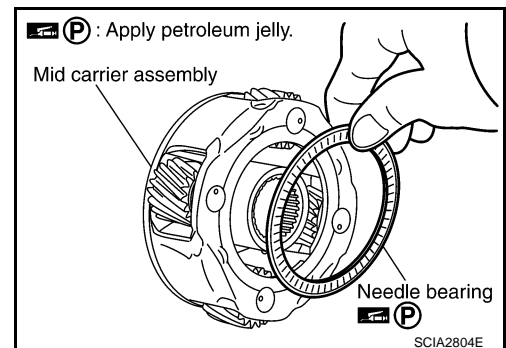
42. Install rear carrier assembly in direct clutch drum.



43. Install needle bearing (rear side) to mid carrier assembly.

CAUTION:

Apply petroleum jelly to needle bearing.



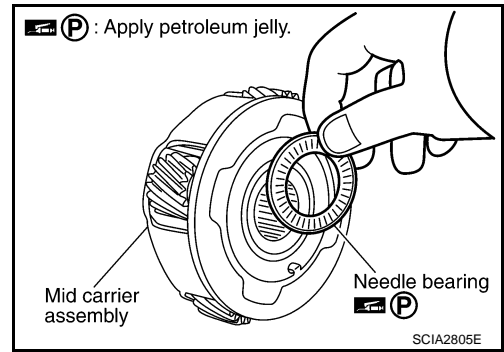
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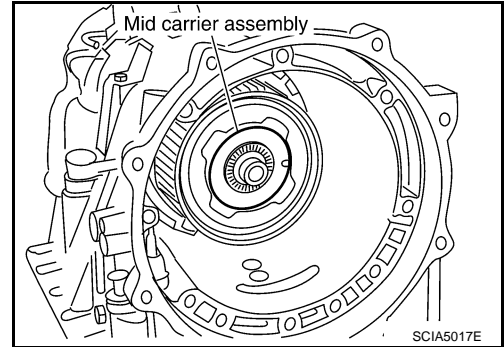
44. Install needle bearing (front side) to mid carrier assembly.

CAUTION:

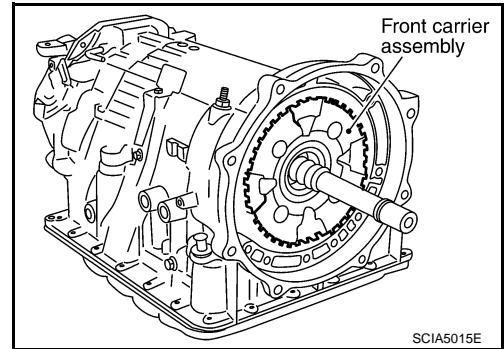
Apply petroleum jelly to needle bearing.



45. Install mid carrier assembly in rear carrier assembly.



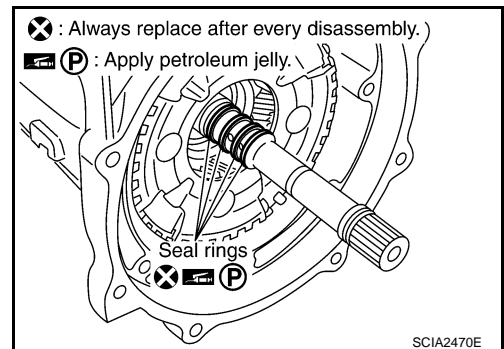
46. Install front carrier assembly, input clutch assembly and rear internal gear as a unit.



47. Install seal rings in input clutch assembly.

CAUTION:

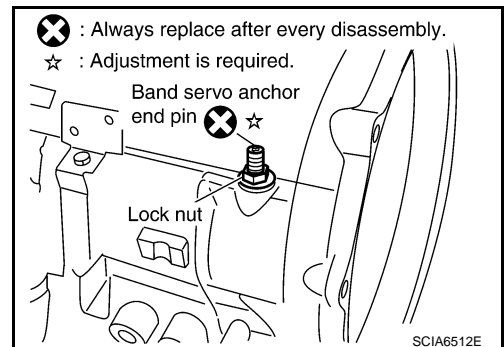
- Do not reuse seal rings.
- Apply petroleum jelly to seal rings.



48. Install band servo anchor end pin and lock nut in transmission case.

CAUTION:

Do not reuse band servo anchor end pin.



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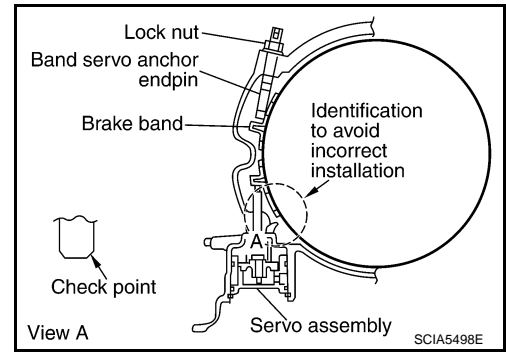
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49. Install brake band in transmission case.

CAUTION:

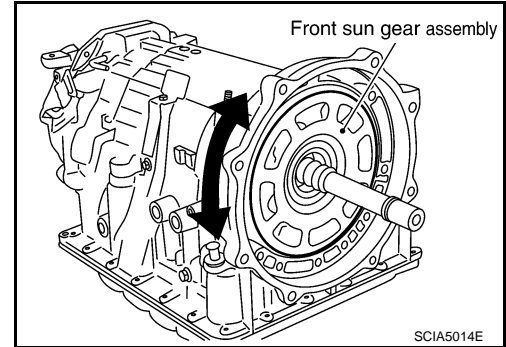
Install it so that the identification to avoid incorrect installation faces the servo side.



50. Install front sun gear to front carrier assembly.

CAUTION:

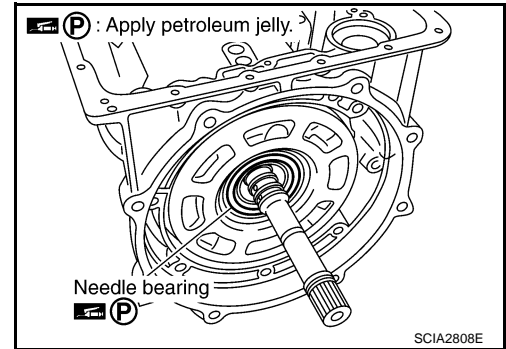
Apply ATF to front sun gear bearing and 3rd one-way clutch end bearing.



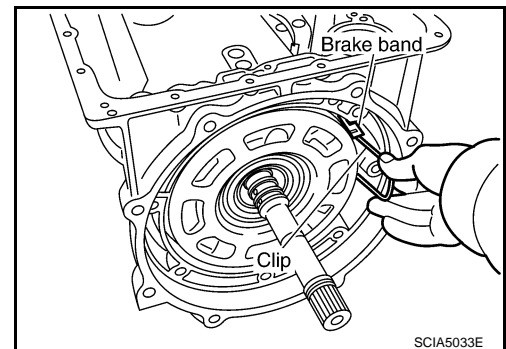
51. Install needle bearing to front sun gear.

CAUTION:

Apply petroleum jelly to needle bearing.



52. Adjust brake band tilting using a clip so that brake band contacts front sun gear drum evenly.

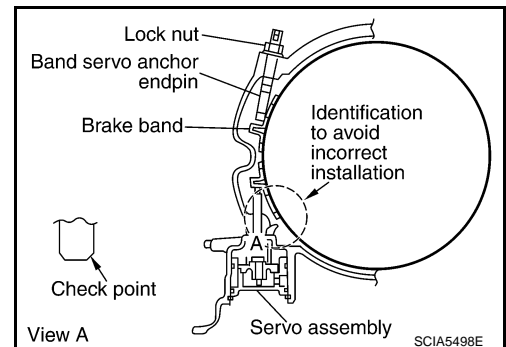


53. Adjust brake band.

- Loosen lock nut.
- Tighten band servo anchor end pin to specified torque.

Anchor end pin : 5.0 N·m (0.51 kg·m, 44 in·lb)

- Back off band servo anchor end pin three turns.
- Holding band servo anchor end pin, tighten lock nut to specified torque.



ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

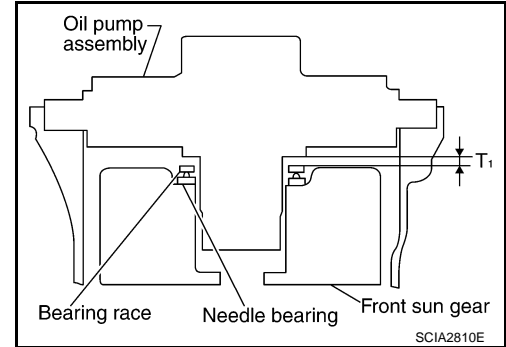
Lock nut : 46 N·m (4.7 kg-m, 34 ft-lb)

Adjustment

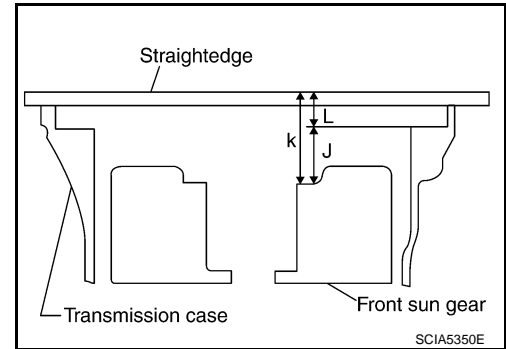
INFOID:000000001282995

TOTAL END PLAY

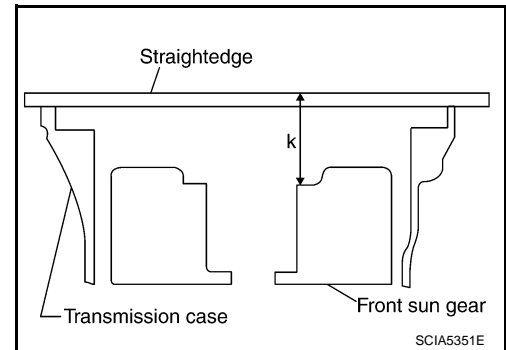
- Measure clearance between front sun gear and bearing race for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.



1. Measure dimensions "K" and "L" and then calculate dimension "J".



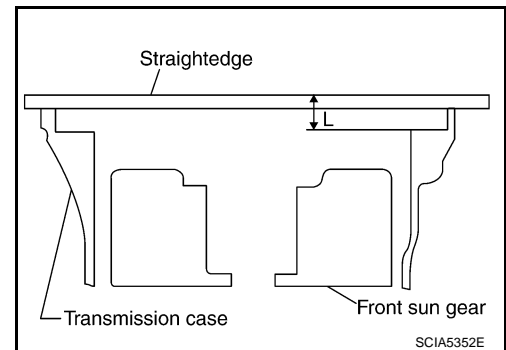
- a. Measure dimension "K".



- b. Measure dimension "L".
- c. Calculate dimension "J".

"J": Distance between oil pump fitting surface of transmission case and needle bearing mating surface of front sun gear.

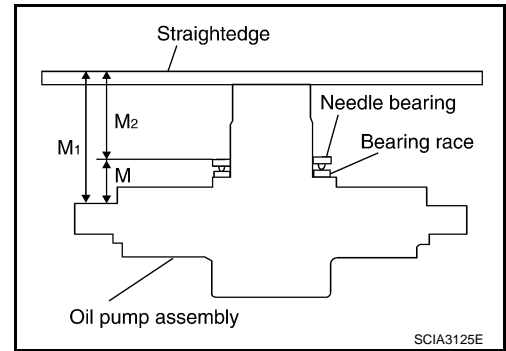
$$J = K - L$$



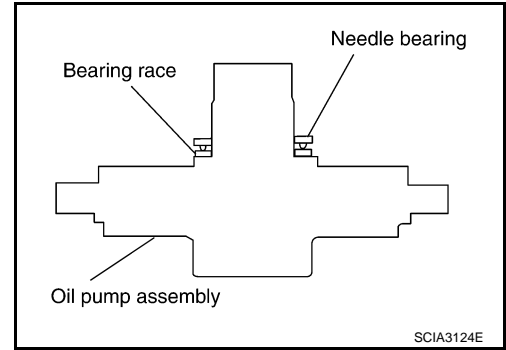
ASSEMBLY

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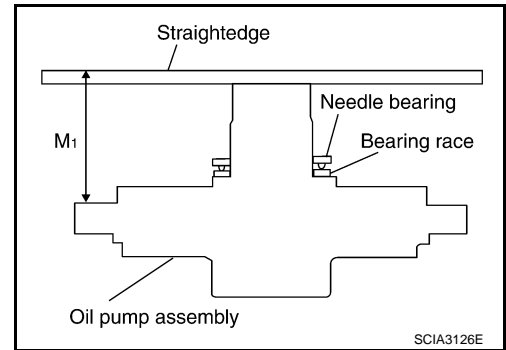
2. Measure dimensions “M1” and “M2” and then calculate dimension “M”.



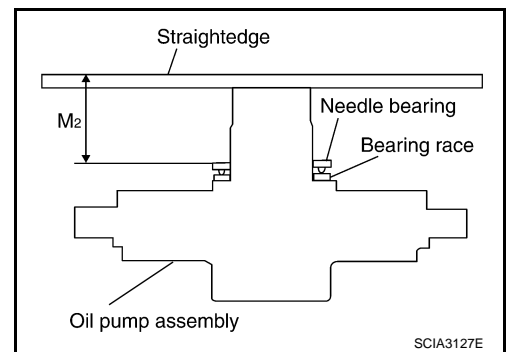
- a. Place bearing race and needle bearing on oil pump assembly.



- b. Measure dimension “M1”.



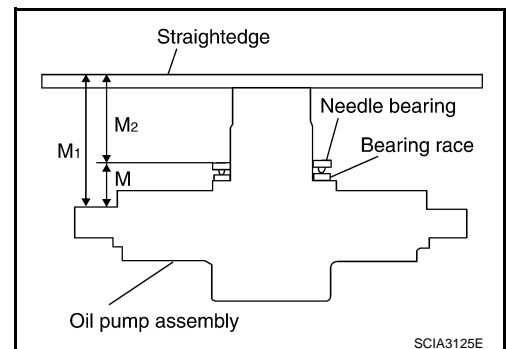
- c. Measure dimension “M2”.



- d. Calculate dimension “M”.

“M”: Distance between transmission case fitting surface of oil pump and needle bearing on oil pump.

$$M = M1 - M2$$



ASSEMBLY

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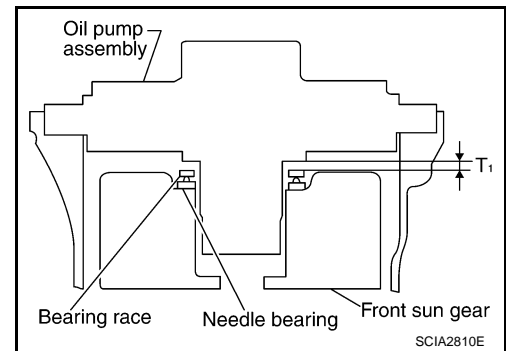
- Adjust total end play "T1".

$$T_1 = J - M$$

Total end play "T1" : 0.25 - 0.55 mm (0.0098 - 0.0217 in)

- Select proper thickness of bearing race so that total end play is within specifications.

Bearing races :Refer to [TM-316](#), "Total End Play".



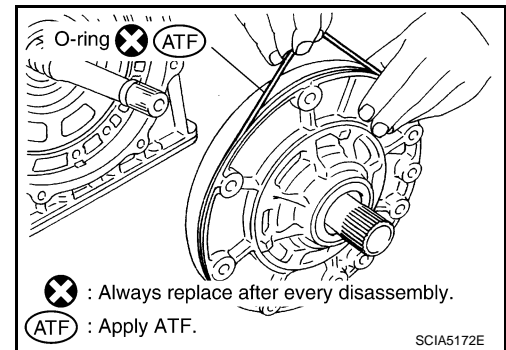
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Assembly (2)

- Install O-ring to oil pump assembly.

CAUTION:

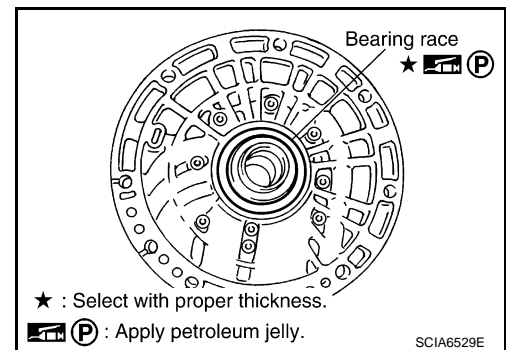
- Do not reuse O-ring.
- Apply ATF to O-ring.



- Install bearing race to oil pump assembly.

CAUTION:

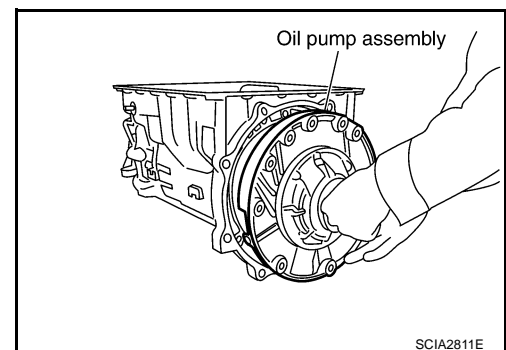
Apply petroleum jelly to bearing race.



- Install oil pump assembly in transmission case.

CAUTION:

Apply ATF to oil pump bearing.



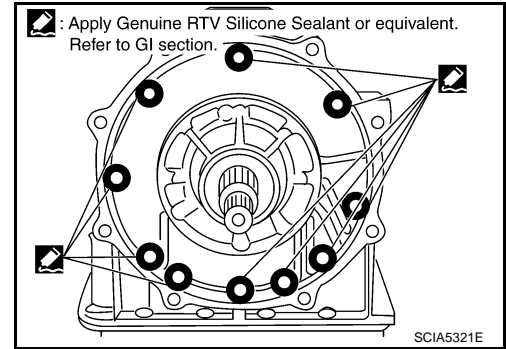
ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

4. Apply recommended sealant (Genuine RTV Silicone Sealant or equivalent. Refer to [GI-26, "Recommended Chemical Products and Sealants"](#).) to oil pump assembly as shown.

CAUTION:

Completely remove all moisture, oil, old sealant and any foreign material from the oil pump bolts and oil pump bolt mating surfaces.

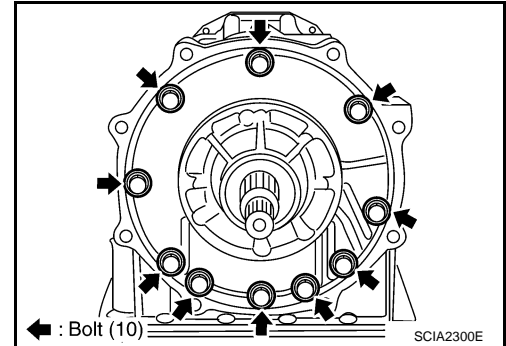


5. Tighten oil pump bolts to specified torque.

Oil pump bolts : 48 N·m (4.9 kg·m, 35 ft·lb)

CAUTION:

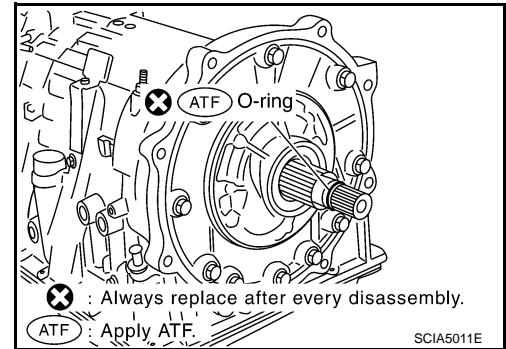
Apply ATF to oil pump bushing.



6. Install O-ring to input clutch assembly.

CAUTION:

- Do not reuse O-ring.
- Apply ATF to O-ring.



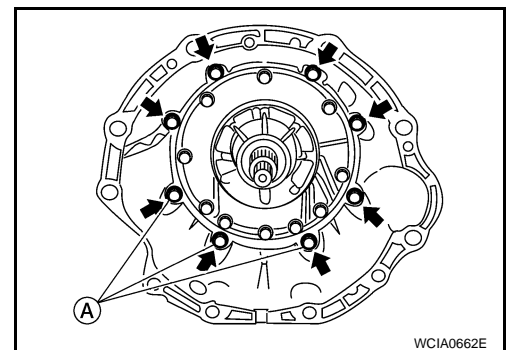
7. Install converter housing to transmission case and tighten bolts to specified torque.

Converter housing bolt : 52 N·m (5.3 kg·m, 38 ft·lb)

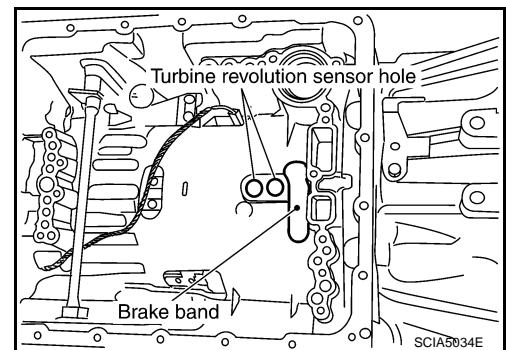
Self-sealing bolt (A) : 61 N·m (6.2 kg·m, 45 ft·lb)

CAUTION:

Do not reuse self-sealing bolt (A).



8. Make sure that brake band does not close turbine revolution sensor hole.

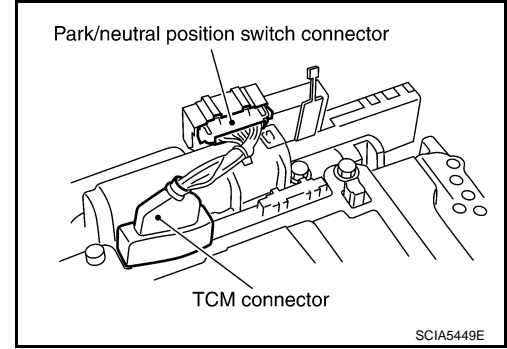


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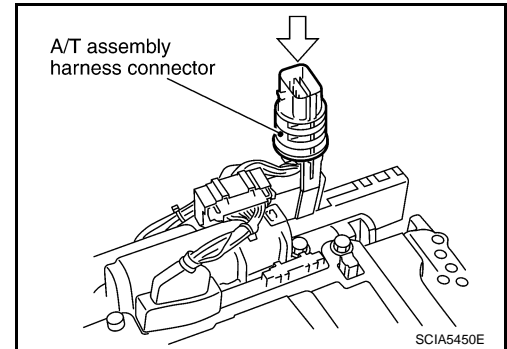
< DISASSEMBLY AND ASSEMBLY >

9. Install control valve with TCM.

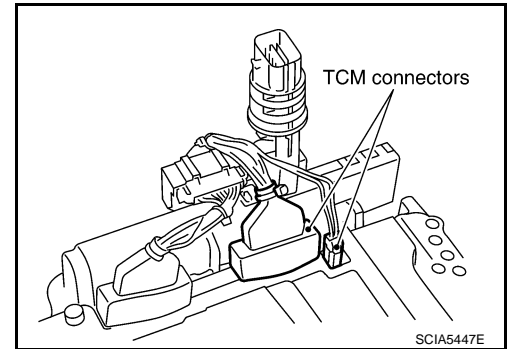
- a. Connect TCM connector and park/neutral position switch connector.



- b. Install A/T assembly harness connector to control valve with TCM.



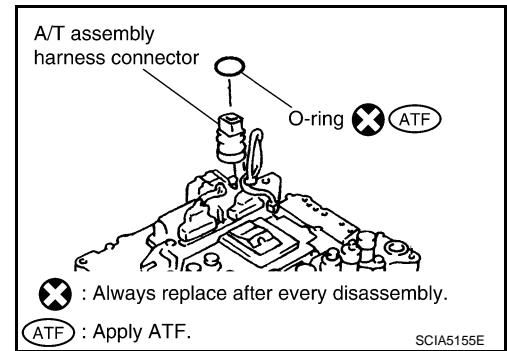
- c. Connect TCM connectors.



- d. Install O-ring to A/T assembly harness connector.

CAUTION:

- Do not reuse O-ring.
- Apply ATF to O-ring.

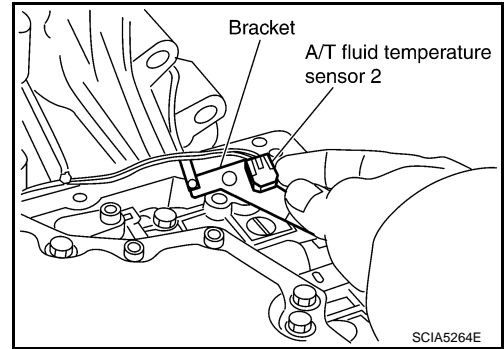


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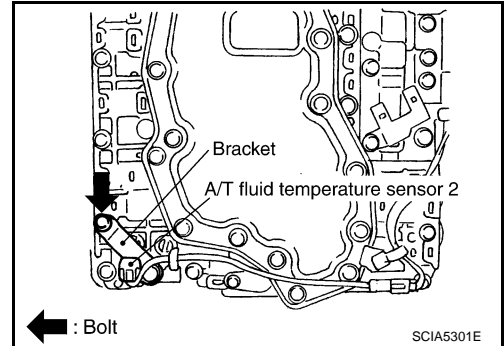
e. Install A/T fluid temperature sensor 2 to bracket.



f. Install A/T fluid temperature sensor 2 (with bracket) to control valve with TCM and tighten bolt to specified torque.

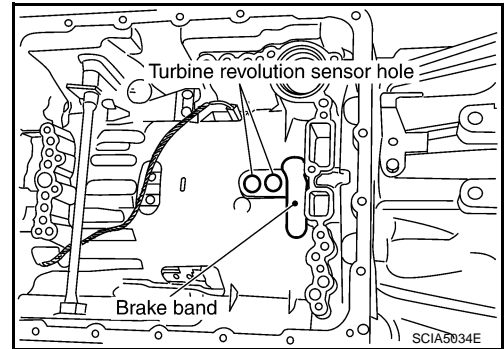
Bracket bolt : 7.9 N·m (0.81 kg·m, 70 in·lb)

CAUTION:
Adjust bolt hole of bracket to bolt hole of control valve.

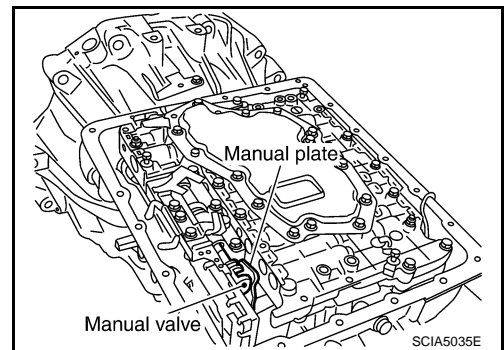


g. Install control valve with TCM in transmission case.

- CAUTION:**
- Make sure that turbine revolution sensor is securely installed into turbine revolution sensor hole.
 - Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.
 - Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.

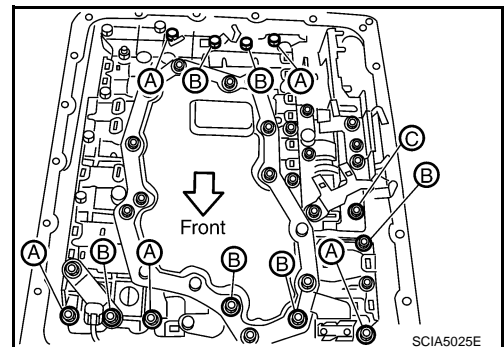


- Assemble it so that manual valve cutout is engaged with manual plate projection.



h. Install bolts (A), (B) and (C) to control valve with TCM.

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1

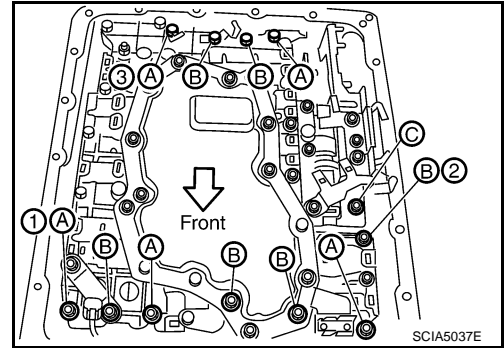


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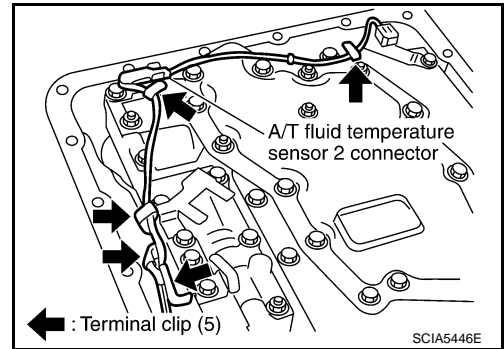
< DISASSEMBLY AND ASSEMBLY >

- i. Tighten bolt (1), (2) and (3) temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts.

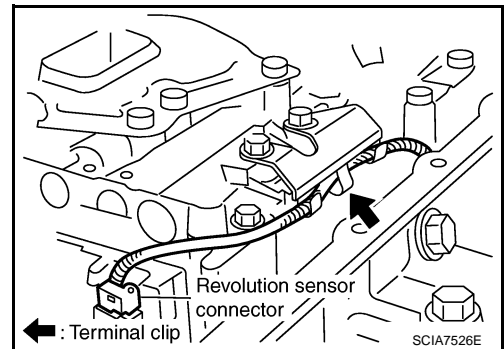
Bolts : 7.9 N·m (0.81 kg·m, 70 in·lb)



10. Connect A/T fluid temperature sensor 2 connector.
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips.

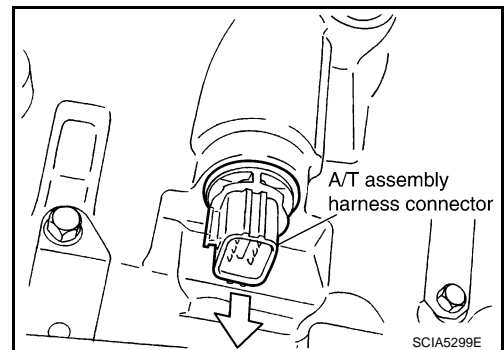


12. Connect revolution sensor connector.
13. Securely fasten revolution sensor harness with terminal clip.



14. Pull down A/T assembly harness connector.

CAUTION:
Do not damage connector.

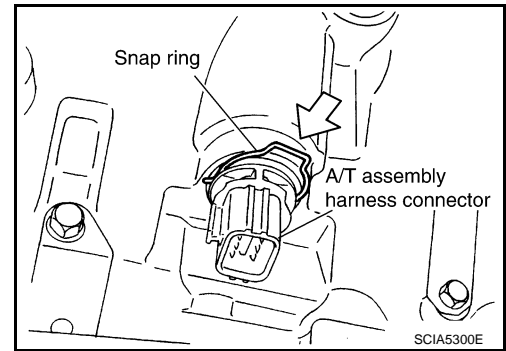


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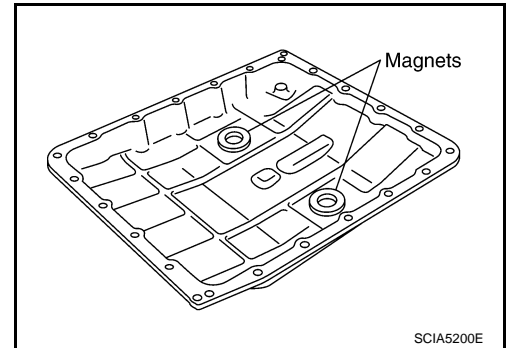
ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

15. Install snap ring to A/T assembly harness connector.



16. Install magnets in oil pan.



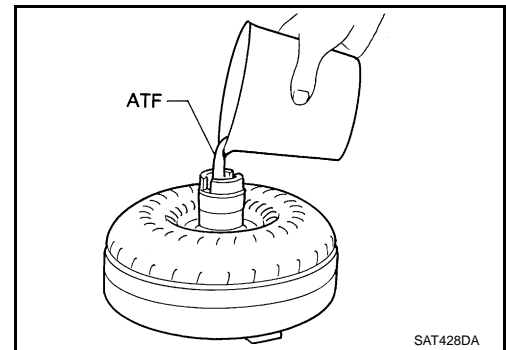
17. Install oil pan to transmission case. Refer to [TM-197, "Removal and Installation"](#).

18. Install torque converter.

a. Pour ATF into torque converter.

NOTE:

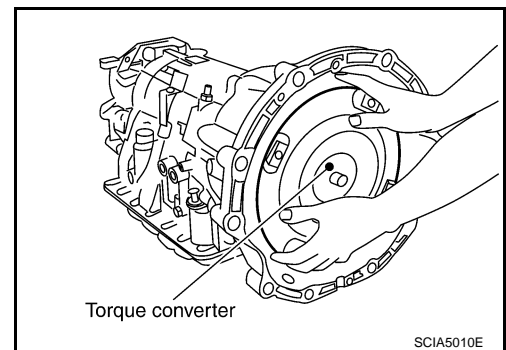
- Approximately 2 liters (2-1/8 US qt. 1-3/4 Imp qt) of fluid is required for a new torque converter.
- When reusing old torque converter, add the same amount of fluid as was drained.



b. Install torque converter while aligning notches of torque converter with notches of oil pump.

CAUTION:

Install torque converter while rotating it.



ASSEMBLY

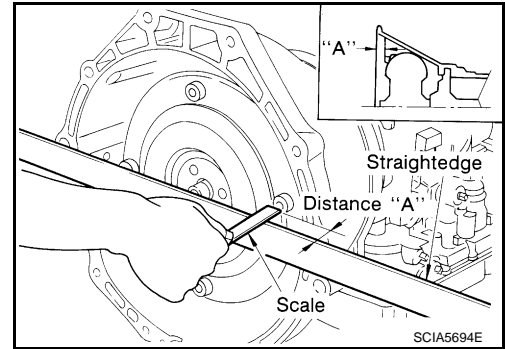
< DISASSEMBLY AND ASSEMBLY >

- c. Measure distance "A" to make sure that torque converter is in proper position.

Distance "A"

VQ40DE models : 25.0 mm (0.98 in) or more

VK56DE models : 24.0 mm (0.94 in) or more



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SERVICE DATA AND SPECIFICATIONS (SDS)

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SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:000000001282997

Applied model		VQ40DE engine		VK56DE engine	
		2WD	4WD	2WD	4WD
Automatic transmission model		RE5R05A			
Transmission model code number		98X3E	98X4A	96X0A	96X0B
Stall torque ratio		1.76: 1		2.0: 1	
Transmission gear ratio	1st	3.842		3.827	
	2nd	2.353		2.368	
	3rd	1.529		1.520	
	4th	1.000		1.000	
	5th	0.839		0.834	
	Reverse	2.765		2.613	
Recommended fluid		Genuine NISSAN Matic J ATF*1 1: Refer to MA-10, "Fluids and Lubricants" .			
Fluid capacity		10.3 liter (10-7/8 US qt, 9-1/8 Imp qt)		10.6 liter (11-1/4 US qt, 9-3/8 Imp qt)	

CAUTION:

- Use only Genuine NISSAN Matic J ATF. Do not mix with other fluid.
- Using automatic transmission fluid other than Genuine NISSAN Matic J ATF will deteriorate in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the warranty.

Vehicle Speed at Which Gear Shifting Occurs

INFOID:000000001282998

VQ40DE MODELS FOR 2WD

Throttle position	Vehicle speed km/h (MPH)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
Full throttle	62 - 66 (39 - 41)	100 - 108 (63 - 68)	156 - 166 (98 - 104)	241 - 251 (151 - 157)	237 - 247 (148 - 154)	145 - 155 (91 - 97)	98 - 96 (55 - 60)	42 - 46 (26 - 29)
Half throttle	50 - 54 (31 - 34)	82 - 88 (51 - 55)	126 - 134 (79 - 84)	153 - 161 (96 - 101)	117 - 125 (73 - 78)	71 - 79 (44 - 49)	50 - 56 (31 - 35)	11 - 15 (7 - 9)

VQ40DE MODELS FOR 4WD

Tire size	Throttle position	Vehicle speed km/h (MPH)							
		D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
P265/75R16	Full throttle	62 - 66 (39 - 41)	100 - 108 (63 - 68)	156 - 166 (98 - 104)	241 - 251 (151 - 157)	237 - 247 (148 - 154)	145 - 155 (91 - 97)	98 - 96 (55 - 60)	42 - 46 (26 - 29)
	Half throttle	50 - 54 (31 - 34)	82 - 88 (51 - 55)	126 - 134 (79 - 84)	153 - 161 (96 - 101)	117 - 125 (73 - 78)	71 - 79 (44 - 49)	50 - 56 (31 - 35)	11 - 15 (7 - 9)
P245/75R16 P265/65R17	Full throttle	59 - 63 (37 - 39)	95 - 103 (59 - 64)	147 - 157 (92 - 98)	228 - 238 (143 - 149)	224 - 234 (140 - 146)	137 - 147 (86 - 92)	83 - 91 (52 - 57)	40 - 44 (25 - 28)
	Half throttle	47 - 51 (29 - 32)	77 - 83 (48 - 52)	119 - 127 (74 - 79)	144 - 152 (90 - 95)	111 - 119 (69 - 74)	67 - 75 (42 - 47)	48 - 54 (30 - 34)	11 - 15 (7 - 9)

VK56DE MODELS

Throttle position	Vehicle speed km/h (MPH)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

Full throttle	64 - 68 (40 - 43)	103 - 111 (64 - 69)	163 - 173 (102 - 108)	230 - 240 (144 - 148)	226 - 236 (141 - 148)	153 - 163 (96 - 102)	92 - 100 (58 - 63)	43 - 47 (27 - 29)
Half throttle	42 - 46 (26 - 29)	69 - 75 (43 - 47)	96 - 104 (60 - 65)	126 - 134 (79 - 84)	102 - 110 (64 - 69)	70 - 78 (44 - 49)	41 - 47 (26 - 29)	10 - 14 (6 - 9)

Vehicle Speed at Which Lock-up Occurs/Releases

INFOID:000000001282999

VQ40DE MODELS FOR 2WD

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up "ON"	Lock-up "OFF"
Closed throttle	57 - 65 (35 - 40)	54 - 62 (34 - 39)
Half throttle	172 - 180 (107 - 112)	136 - 144 (85 - 89)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 1/2 of the full opening.

VQ40DE MODELS FOR 4WD

Tire size	Throttle position	Vehicle speed km/h (MPH)	
		Lock-up "ON"	Lock-up "OFF"
P265/75R16	Closed throttle	57 - 65 (35 - 40)	54 - 62 (34 - 39)
	Half throttle	172 - 180 (107 - 112)	136 - 144 (85 - 89)
P245/75R16 P265/65R17	Closed throttle	54 - 62 (34 - 39)	51 - 59 (32 - 37)
	Half throttle	162 - 170 (101 - 106)	129 - 137 (80 - 85)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 1/2 of the full opening.

VK56DE MODELS FOR 2WD

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up "ON"	Lock-up "OFF"
Closed throttle	60 - 68 (37 - 42)	53 - 61 (33 - 38)
Half throttle	164 - 172 (102 - 107)	126 - 134 (78 - 83)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 1/2 of the full opening.

Stall Speed

INFOID:000000001283000

Engine Model	VQ40DE	VK56DE
Stall speed	2,200 - 2,500 rpm	2,350 - 2,650 rpm

Line Pressure

INFOID:000000001283001

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

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

A/T Fluid Temperature Sensor

INFOID:000000001283002

Name	Condition	CONSULT-II "DATA MONITOR" (Approx.) (V)	Resistance (Approx.) (kΩ)
A/T fluid temperature sensor 1	0°C (32°F)	3.3	15
	20°C (68°F)	2.7	6.5
	80°C (176°F)	0.9	0.9
A/T fluid temperature sensor 2	0°C (32°F)	3.3	10
	20°C (68°F)	2.5	4
	80°C (176°F)	0.7	0.5

Turbine Revolution Sensor

INFOID:000000001283003

Name	Condition	Data (Approx.)
Turbine revolution sensor 1	When running at 50 km/h (31 MPH) in 4th speed with the closed throttle position signal "OFF".	1.3 (kHz)
Turbine revolution sensor 2	When moving at 20 km/h (12 MPH) in 1st speed with the closed throttle position signal "OFF".	

Vehicle Speed Sensor A/T (Revolution Sensor)

INFOID:000000001283004

Name	Condition	Data (Approx.)
Revolution sensor	When moving at 20 km/h (12 MPH).	185 (Hz)

Reverse brake

INFOID:000000001283005

Model code number		98X3E, 98X4A	96X0A, 96X0B
Number of drive plates		6	7
Number of driven plates		6	7
Clearance [mm (in)]	Standard	0.7 - 1.1 (0.028 - 0.043)	
Thickness of retaining plates		Thickness mm (in)	Part number*
		4.2 (0.165)	31667 90X14
		4.4 (0.173)	31667 90X15
		4.6 (0.181)	31667 90X16
		4.8 (0.189)	31667 90X17
		5.0 (0.197)	31667 90X18
		5.2 (0.205)	31667 90X19

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

Total End Play

INFOID:000000001283006

Total end play mm (in)	0.25 - 0.55 (0.0098 - 0.0217)
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BEARING RACE FOR ADJUSTING TOTAL END PLAY

Thickness mm (in)	Part number*
0.8 (0.031)	31435 95X00
1.0 (0.039)	31435 95X01
1.2 (0.047)	31435 95X02
1.4 (0.055)	31435 95X03
1.6 (0.063)	31435 95X04
1.8 (0.071)	31435 95X05

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

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

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