

## HOW TO USE THIS MANUAL

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### Range of Topics

- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
  - Removal/Installation
  - Disassembly/Assembly
  - Replacement
  - Inspection
  - Adjustment
- Simple operations which can be performed easily just by looking at the vehicle (i.e., removal/installation of parts, jacking, vehicle lifting, cleaning of parts, and visual inspection) have been omitted.

### Advisory Messages

- You will find several **Warnings**, **Cautions**, **Notes**, **Specifications** and **Upper and Lower Limits** in this manual.

#### Warning

- A Warning indicates a situation in which serious injury or death could result if the warning is ignored.

#### Caution

- A Caution indicates a situation in which damage to the vehicle or parts could result if the caution is ignored.

#### Note

- A Note provides added information that will help you to complete a particular procedure.

#### Specification





- The values indicate the allowable range when performing inspections or adjustments.






#### Upper and lower limits

- The values indicate the upper and lower limits that must not be exceeded when performing inspections or adjustments.

### Symbols

- There are nine symbols indicating oil, grease, fluids, sealant, and the use of **SST** or equivalent. These symbols show application points or use of these materials during service.

Symbol	Meaning	Kind
	Apply oil	New appropriate engine oil or gear oil
	Apply brake fluid	New appropriate brake fluid
	Apply automatic transmission/transaxle fluid	New appropriate automatic transmission/transaxle fluid
	Apply continuously variable transaxle fluid	New appropriate continuously variable transaxle fluid

Symbol	Meaning	Kind
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly
	Replace part	O-ring, gasket, etc.
	Use SST or equivalent	Appropriate tools

### Service Procedure

#### Inspection, adjustment

- Inspection and adjustment procedures are divided into steps. Important points regarding the location and contents of the procedures are explained in detail and shown in the illustrations.

#### SHOWS PROCEDURE ORDER FOR SERVICE

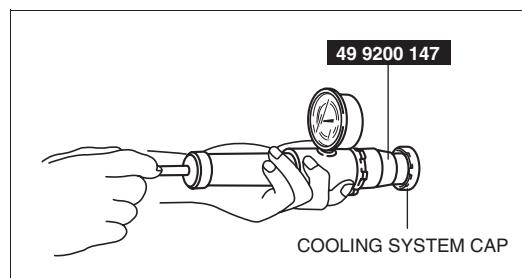
##### COOLING SYSTEM CAP INSPECTION [MZR-CD 2.2]

1. Attach the cooling system cap to the **SST** and a radiator cap tester.
2. Hold the cooling system cap downward and apply pressure gradually. Verify that the pressure is held stable for **10 s**.

#### SHOWS SPECIFICATION

- If the pressure is not held stable, replace the cooling system cap.

**Cooling system cap valve opening pressure**  
93.2—122.6 kPa {0.951—1.250 kgf/cm<sup>2</sup>,  
13.6—17.7 psi}



## Repair procedure

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual part inspection. However, only removal/installation procedures that need to be performed methodically have written instructions.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration. In addition, symbols indicating parts requiring the use of special service tools or equivalent are also shown.
3. Procedure steps are numbered and the part that is the main point of that procedure is shown in the illustration with the corresponding number. Occasionally, there are important points or additional information concerning a procedure. Refer to this information when servicing the related part.

**Procedure**

**SHOWS SERVICE ITEM (S)**

**INDICATES RELEVANT REFERENCES THAT NEED TO BE FOLLOWED DURING INSTALLATION**

**INSTALL THE PARTS BY PERFORMING STEPS 1—3 IN REVERSE ORDER**

**"Removal/Installation" Portion**

**"Inspection After Installation" Portion**

**SHOWS PROCEDURE ORDER FOR SERVICE**

**SHOWS TIGHTENING TORQUE SPECIFICATIONS**

**SHOWS APPLICATION POINTS OF GREASE, ETC.**

**SHOWS SPECIAL SERVICE TOOL (SST) FOR SERVICE OPERATION**

**SHOWS EXPENDABLE PARTS**

**SHOWS DETAILS**

**SHOWS TIGHTENING TORQUE UNITS**

**SHOWS REFERRAL NOTES FOR SERVICE**

**SHOWS REFERRAL NOTES FOR SERVICE**

**SHOWS SPECIAL SERVICE TOOL (SST) NO.**

**LOWER TRAILING LINK, UPPER TRAILING LINK REMOVAL/INSTALLATION**

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the undercover. (See 01-10-4 Undercover Removal)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Inspect the rear wheel alignment and adjust it if necessary.

**44—60 (4.4—6.2, 32—44)**

**43—56 (4.3—5.8, 32—41)**

**94—116 (9.5—11.9, 69—86)**

**118—156 (12.0—16.0, 87—115)**

**N·m (kgf·m, ft·lbf)**

1	Split pin	7	Split pin
2	Nut	8	Nut
3	Lower trailing link ball joint (See 02-14-5 Lower Trailing Link Ball Joint Removal Note)	9	Upper trailing link ball joint (See 02-14-5 Upper Trailing Link Ball Joint Removal Note)
4	Bolt	10	Nut
5	Lower trailing link	11	Upper trailing link
6	Dust boot (lower trailing link)	12	Dust boot (upper trailing link)

**Lower Trailing Link Ball Joint, Upper Trailing Link Ball Joint Removal Note**

- Remove the ball joint using the SSTs.

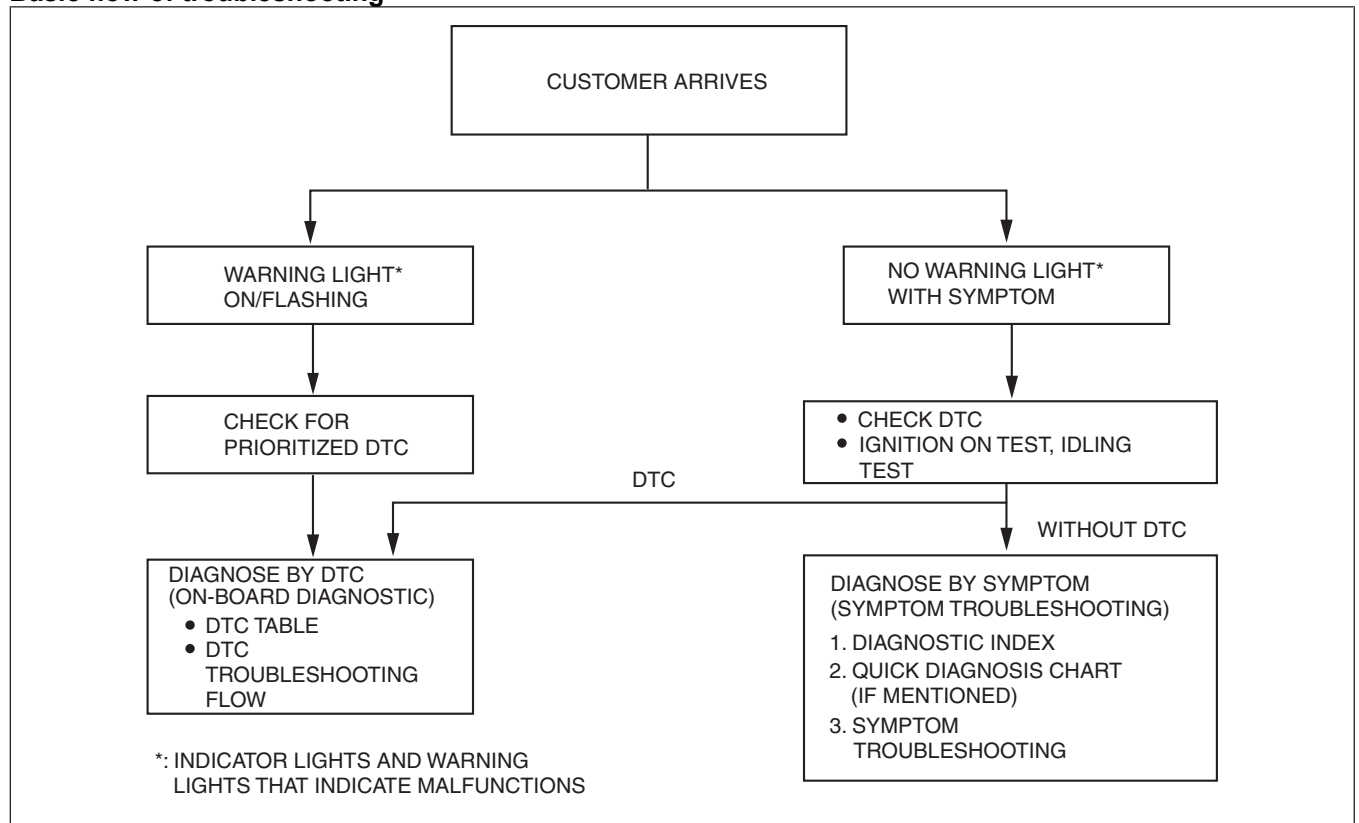
**49 T028 304** UPPER TRAILING LINK  
**49 T028 305** LOWER TRAILING LINK

**49 T028 303**

**KNUCKLE**

## Troubleshooting Procedure

### Basic flow of troubleshooting



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### DTC troubleshooting flow (on-board diagnostic)

- Diagnostic trouble codes (DTCs) are important hints for repairing malfunctions that are difficult to simulate. Perform the specific DTC diagnostic inspection to quickly and accurately diagnose the malfunction.
- The on-board diagnostic function is used during inspection. When a DTC is shown specifying the cause of a malfunction, continue the diagnostic inspection according to the items indicated by the on-board diagnostic function.

### Diagnostic index

- The diagnostic index lists the symptoms of specific malfunctions. Select the symptoms related or most closely relating to the malfunction.

### Quick diagnosis chart (If mentioned)

- The quick diagnosis chart lists diagnosis and inspection procedures to be performed specifically relating to the cause of the malfunction.

### Symptom troubleshooting

- Symptom troubleshooting quickly determines the location of the malfunction according to symptom type.

### Procedures for Use

#### Using the basic inspection (section 05)

- Perform the basic inspection procedure before symptom troubleshooting.
- Perform each step in the order shown.
- The reference column lists the location of the detailed procedure for each basic inspection.
- Although inspections and adjustments are performed according to the reference column procedures, if the cause of the malfunction is discovered during basic inspection, continue the procedures as indicated in the action column.

SHOWS INSPECTION ORDER

SHOWS ITEM NAMES FOR DETAILED PROCEDURES

SHOW POINTS REQUIRING ATTENTION BASED ON INSPECTION RESULTS

BASIC INSPECTION

STEP	INSPECTION	ACTION	
1	Perform the mechanical system test. (See 05-13-3 MECHANICAL SYSTEM TEST.) Is mechanical system normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
2	Turn the ignition switch to the ON position. When the selector lever is moved, does the selector illumination indicate synchronized position to the lever location? Also, when other ranges are selected from N or P during idling, does the vehicle move within 1—2 s?	Yes	Go to next step.
		No	Inspect the selector lever and TR switch. Repair or replace malfunctioning parts. (See 05-14-5 SELECTOR LEVER INSPECTION.) (See 05-13-10 TRANSMISSION RANGE (TR) SWITCH INSPECTION.) If the selector lever and TR switch are normal, go to the next step.
3	Inspect the ATF color condition. (See 05-13-8 AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION.) Are ATF color and odor normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result. Flush ATX and cooler line as necessary.
4	Perform the line pressure test. (See 05-13-3 Line Pressure Test.) Is the line pressure normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
5	Perform the stall test. (See 05-13-4 Stall Speed Test.) Is the stall speed normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
	Inspect the voltage at the following TCM terminals. (See 05-13-29 TCM INSPECTION.) <ul style="list-style-type: none"><li>Terminal 2J (TFT sensor)</li><li>Terminals 1D, 2B, 2C, 2E (TR switch)</li><li>Terminal 2G (turbine sensor)</li><li>Terminal 2D (down switch)</li><li>Terminal 2I (up switch)</li><li>Terminal 1E (M range switch)</li><li>Terminal 1W (steering shift switch)</li></ul> Is the voltage normal?	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.

REFERENCE COLUMN

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### Using the DTC troubleshooting flow

- DTC troubleshooting flow shows diagnostic procedures, inspection methods, and proper action to take for each DTC.

**DETECTION CONDITION**  
describes the condition under which the DTC is detected.

**POSSIBLE CAUSE**  
describes possible point(s) of malfunction

Indicates the inspection step No. to be performed

Indicates the direction in which to visually inspect the connector

**STEP** shows the order of troubleshooting

**INSPECTION** describes the method to quickly determine the malfunctioning part(s).

**DTC C0020:01/C0020:1C/C0020:71 [ABS]**

DTC	C0020:01, C0020:1C, C0020:71	Pump motor, motor relay
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>C0020:01 — ABS motor relay signal does not correspond to ABS HU/CM ON signal.</li> <li>C0020:1C — ABS motor monitor signal does not correspond to ABS HU/CM OFF signal.</li> <li>— ABS motor monitor signal does not correspond to ABS HU/CM ON signal.</li> <li>C0020:71 — ABS HU/CM motor monitor ON signal is not input within specified time limit or more when motor signal is switched from ON to OFF by ABS HU/CM.</li> </ul>	
<b>FAIL-SAFE FUNCTION</b>	<ul style="list-style-type: none"> <li>Illuminates the ABS warning light and TCS/DSC indicator light.</li> <li>Inhibits the ABS, TCS, DSC and brake assist controls.</li> </ul>	
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ABS 40A fuse malfunction</li> <li>Open or short circuit in ABS HU/CM internal motor relay, or stuck motor relay</li> <li>Open or short circuit in ABS HU/CM internal pump motor, or frozen pump motor</li> <li>Open circuit or short to ground in the wiring harness between the battery and ABS HU/CM terminal Y</li> <li>Open circuit in the wiring harness between ABS HU/CM terminal B and body ground</li> <li>Poor connection at connectors (female terminal)</li> </ul>	

01 and 05 section

except 01 and 05 section

ABS HU/CM WIRING HARNESS-SIDE CONNECTOR

**TROUBLE CONDITION**

**FAIL-SAFE FUNCTION**  
Indicates control status at time of DTC detection

Indicates the circuit to be inspected

Indicates the connector related to the inspection

**ACTION**  
describes the appropriate action to be taken according to the result (Yes/No) of the INSPECTION.

Reference item(s) to perform ACTION.

**Diagnostic procedure**

STEP	INSPECTION	Yes	ACTION
1	<b>INSPECT ABS FUSE CONDITION</b> • Is the ABS fuse (ABS 40A) normal?	Yes	Go to the next step.
		No	Replace the fuse, then go to Step 6.
2	<b>VERIFY PUMP MOTOR OPERATION</b> • Switch the ignition to off. • Connect the M-MDS to the DLC-2. • Switch the ignition to ON. • Access PMP_MTR active command modes using the M-MDS. • Does the pump motor operate?	Yes	Go to the next step.
		No	Replace the ABS HU/CM, then go to Step 6. (See ABS HU/CM REMOVAL/INSTALLATION.)
3	<b>INSPECT MOTOR RELAY POWER SUPPLY FOR OPEN CIRCUIT</b> • Switch the ignition to off. • Disconnect the ABS HU/CM connector. • Inspect for continuity between ABS HU/CM terminal Y and the positive battery terminal. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 6.
4	<b>INSPECT MOTOR RELAY POWER SUPPLY FOR SHORT CIRCUIT</b> • Inspect for continuity between ABS HU/CM terminal Y and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness, then go to Step 6.
		No	Go to the next step.
5	<b>INSPECT PUMP MOTOR GROUND FOR OPEN CIRCUIT</b> • Inspect for continuity between ABS HU/CM terminal B and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.
6	<b>VERIFY THAT THE SAME DTC IS NOT PRESENT</b> • Reconnect all disconnected connectors. • Clear the DTCs from the memory. (See ON-BOARD DIAGNOSIS [ABS].) • Start the engine and drive the vehicle at 10 km/h {6.2 mph} or more. • Are the same DTCs present?	Yes	Repeat the inspection from Step.1. If the malfunction recurs, replace the ABS CM, then go to the next step. (See ABS HU/CM REMOVAL/INSTALLATION.)
		No	Go to the next step.
7	<b>VERIFY THAT NO OTHER DTCs ARE PRESENT</b> • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See ON-BOARD DIAGNOSIS [ABS].)
		No	DTC troubleshooting completed.

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### Using the diagnostic index

- Malfunction symptoms are listed in the diagnostic index under symptom troubleshooting.
- The exact malfunction symptoms can be selected by following the index.
- Correctly verify the malfunction symptom according to "DESCRIPTION".

No.	TROUBLESHOOTING ITEM		DESCRIPTION	Page
1	Melting of main or other fuses		—	(See 01-03-6 MELT NO.1 MAIN OR OTHER FUSE)
2	MIL comes on		MIL is illuminated incorrectly.	(See 01-03-7 NO.2 MIL COMES ON)
3	Will not crank		Starter does not work.	(See 01-03-8 NO. 3 WILL NOT CRANK)
4	Hard start/long crank/erratic start/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	(See 01-03-9 NO. 4 HARD START/ LONG CRANK/ERRATIC CRANK)
5	Engine stalls.	After start/at idle	Engine stops unexpectedly at idle and/or after start.	(See 01-03-11 NO. 5 ENGINE-STALLS AFTER START/AT IDLE)
6	Crank normally but will not start		Starter cranks engine at normal speed but engine will not run.	(See 01-03-15 NO.6 CRANKS NORMALLY BUT WILL NOT START)
7	Slow return to idle		Engine takes more time than normal to return to idle speed.	(See 01-03-19 NO. 7 SLOW RERUN TO IDLE)
8	Engine runs rough/rotling		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	(See 01-03-20 NO. 8 ENGINE RUNS ROUGH/ROLLING IDLE )
9	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition key is turned to OFF.	(See 01-03-23 NO. 9 FAST IDLE/RUNS ON)

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### Using the quick diagnosis chart

- The related malfunction cause can be understood.
- The relation between the malfunction symptom and cause is indicated.
- The relation between the malfunction symptom and cause can be detected quickly, and if multiple malfunction symptoms occur, the area which is the common cause among the multiple malfunctions can be specified.
- The effective inspection procedure for the malfunction cause specified from the malfunction symptoms can be selected using the inspection procedure chart.

## MALFUNCTION CAUSE SPECIFIED BY MALFUNCTION SYMPTOM

### SYMPTOM QUICK DIAGNOSTIC CHART

② SPECIFY  
MALFUNCTIONING  
PART  
CORRESPONDING  
TO MALFUNCTION  
SYMPTOM

① SELECT  
MALFUNCTION  
SYMPTOM

Possible factor		Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch open	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel seized	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture improperly	Cooling system malfunction (Radiator, hoses, overflow system, thermostat, etc.)	Cooling fan system malfunction	Engine or transaxle mounts improperly installed	Cooling fan or condenser fan seat improperly	Accelerator cable free play mis-adjustment	Fuel quality
Troubleshooting item																						
1	Melts of main or other fuse																					
2	MIL comes on																					
3	Will not crank	x	x			x	x			x				x								
4	Hard to start/long crank/erratic start/erratic crank																					x
5	Engine stalls After start/at idle						x	x	x													x
6	Cranks normally but will not start						x	x	x													x
7	Slow return to idle																	x				
8	Engine runs rough/rolling idle						x	x														x
9	Fast idle/runs on																				x	
10	Low idle/stalls during deceleration																					
11	Engine stalls/quits Acceleration/cruise						x	x														x
	Engine runs rough Acceleration/cruise						x	x														x
	Misses Acceleration/cruise						x	x														x
	Buck/jerk Acceleration/cruise/ deceleration						x	x														x
	Hesitation/stumble Acceleration						x	x														x
	Surges Acceleration/cruise						x	x														x
12	Lack/loss of power Acceleration/cruise						x	x														x
13	Knocking/pinging Acceleration/cruise						x										x					
14	Poor fuel economy						x	x							x		x	x				x
15	Emissions compliance						x	x					x				x					
16	High oil consumption/leakage										x	x	x									
17	Cooling system concerns Overheating													x	x	x	x	x				
18	Cooling system concerns Runs cold																x	x				
19	Exhaust smoke												x				x					
20	Fuel odor (in engine compartment)																					
21	Engine noise			x									x		x							
22	Vibration concerns (engine)													x					x	x		
23	A/C does not work sufficiently																					
24	A/C always on/ A/C compressor runs continuously																					
25	A/C does not cut off under wide open throttle conditions																					
26	Exhaust sulphur smell																					x
27	Fuel refill concerns																					
28	Fuel filling shut off issues																					
29	Intermittent concerns				x																	
30	Constant voltage																					
31	Spark plug condition						x			x		x				x						x
32	Automatic transaxle concerns Upshift/downshift/ engagement																					

(See 05-01 AUTOMATIC TRANSAXLE SYMPTOM TROUBLESHOOTING)

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### Using the symptom troubleshooting

- Determine the malfunctioning part quickly and accurately based on each malfunction symptom.
- After repair, verify that the malfunction symptom is eliminated.
- There are the troubleshooting procedures and actions for each malfunctioning part.
- Structured as procedures for verifying malfunction symptom quickly and accurately.

**POSSIBLE CAUSE**  
describes possible point of malfunction

**STEP** shows the order of troubleshooting.

**INSPECTION** describes the method to quickly determine the malfunctioning part(s).

Reference item(s) for additional information to perform **INSPECTION**.

## NO.2 VEHICLE MOVES IN N POSITION

**TROUBLE SYMPTOM**

**DESCRIPTION**  
describes what kind of TROUBLE SYMPTOM

<b>2</b>	<b>Vehicle moves in N position</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Vehicle creeps in N position.</li> <li>Vehicle creeps if brake pedal is not depressed in N position.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>If the vehicle moves in N position, basically, the malfunction is in the ATX. Since a malfunction in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related wiring harnesses.               <ol style="list-style-type: none"> <li>Clutch burnt (Forward clutch)                   <ul style="list-style-type: none"> <li>Control valve body malfunction</li> </ul> </li> <li>Selector lever position disparity (Although the selector indicator shows N position, the hydraulic circuit shows D range or R position)</li> </ol> </li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>Before following the troubleshooting steps, make sure that the Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.</li> </ul>

Reference item(s) to perform **ACTION**.

Diagnostic procedure			
STEP	INSPECTION	ACTION	
1	Does the vehicle creep when the selector lever is moved slightly in N position?	Yes	Go to the next step.
		No	Adjust the selector cable. (See SELECTOR CABLE ADJUSTMENT.)
2	Disconnect the TCM connector. Is the resistance between the ground terminal at the TCM connector and the body ground less than 5.0 ohms?	Yes	Go to the next step.
		No	Repair open ground circuit. Reconnect the TCM connector.
3	Inspect the value at the following TCM PID using the M-MDS. (See PID/DATA MONITOR INSPECTION [FS5A-EL].) • LPS Is the LPS PID value normal?	Yes	Overhaul the control valve body and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].) If any problem remains, overhaul the transaxle and repair or replace any malfunctioning parts. (See ATX workshop manual [FS5A-EL].)
		No	Repair or replace any malfunctioning parts
4	<ul style="list-style-type: none"> <li>Verify the test results.               <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If the malfunction remains, inspect the related Service Information and perform repair or diagnosis.                   <ul style="list-style-type: none"> <li>If the vehicle is repaired, troubleshooting is completed.</li> <li>If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>		

**ACTION** describes the appropriate action to be taken according to the result (Yes/No) of the **INSPECTION**.

How to perform **ACTION** is described in the relative material shown.