2008 DRIVELINE/AXLES

Differential - RAV4

ACTIVE TORQUE CONTROL 4WD SYSTEM

PRECAUTION

1. TROUBLESHOOTING PRECAUTION

NOTE:

- Since the Active torque control system (4WD control system) may be influenced by a malfunction in other systems, be sure to check for DTCs in the other systems.
- When removing and installing the 4WD control ECU and each sensor, be sure to check that the normal display is output in test mode inspection and in DTC output inspection after installing all the parts.
- If the DTC of the CAN communication line is output, repair the malfunction in the communication line and troubleshoot the 4WD control system.
- Since the CAN communication line has its own length and route, it cannot be repaired temporarily with a bypass wire, etc.

PARTS LOCATION

Fig. 1: Active Torque Control 4WD System Components Location
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM
SYSTEM DESCRIPTION

1. GENERAL DESCRIPTION

a. The active torque control 4WD system detects the driving conditions based on signals from each ECU, each switch, the steering angle sensor, the wheel speed sensor, and the yaw rate sensor. The system controls the electronic current passing through the linear solenoid of the electromagnetic coupling, and performs electronic control to distribute the optimum torque to the rear wheels.

b. Main components and their functions.

COMPONENTS FUNCTION

<table>
<thead>
<tr>
<th>Component</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>4WD Indicator Light</td>
<td>Displays warning to driver when system malfunctions</td>
</tr>
<tr>
<td>Stop Light Switch</td>
<td>Detects brake operation</td>
</tr>
<tr>
<td>Throttle Position Sensor</td>
<td>Detects opening angle of throttle</td>
</tr>
<tr>
<td>Park/Neutral Position Switch</td>
<td>Detects &quot;P&quot; position</td>
</tr>
<tr>
<td>Steering Angle Sensor</td>
<td>Detects turning of steering wheel</td>
</tr>
<tr>
<td>4WD Linear Solenoid</td>
<td>Detects electronic control limiting clutch operation using signals from 4WD control ECU</td>
</tr>
<tr>
<td>Skid Control ECU with</td>
<td>Detects signals from each sensor and outputs them to 4WD control</td>
</tr>
</tbody>
</table>
2. **DRIVING FUNCTION**

### Actuator

<table>
<thead>
<tr>
<th>Actuator</th>
<th>ECU</th>
</tr>
</thead>
<tbody>
<tr>
<td>4WD Control ECU</td>
<td>Detects signals from each sensor via skid control ECU to operate</td>
</tr>
<tr>
<td></td>
<td>linear solenoid and control system</td>
</tr>
<tr>
<td>Crankshaft Position Sensor</td>
<td>Detects engine rpm and inputs it into ECM</td>
</tr>
<tr>
<td>Yaw Rate Sensor</td>
<td>Detects forward and rearward acceleration of vehicle, and inputs</td>
</tr>
<tr>
<td></td>
<td>it into skid control ECU</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>Detects external ambient temperature and inputs it into body ECU</td>
</tr>
<tr>
<td>Electromagnetic Coupling</td>
<td>Based on amount of current sent from 4WD control ECU, torque is</td>
</tr>
<tr>
<td></td>
<td>distributed to rear wheels</td>
</tr>
<tr>
<td>4WD Lock Switch</td>
<td>Change of side auto mode for lock mode</td>
</tr>
<tr>
<td>4WD Lock Mode Indicator</td>
<td>Lock mode control status is communicated to driver through indicator</td>
</tr>
<tr>
<td>Light</td>
<td>light illumination</td>
</tr>
<tr>
<td></td>
<td>When lock mode is turned ON, indicator light blinks twice and then</td>
</tr>
<tr>
<td></td>
<td>remains illuminated.</td>
</tr>
<tr>
<td></td>
<td>When lock mode is turned OFF, indicator light turns OFF.</td>
</tr>
</tbody>
</table>

### Vehicle Condition

<table>
<thead>
<tr>
<th>Vehicle Condition</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control at Vehicle Startup</td>
<td>This controls the amount of sideway sliding that occurs at rear of</td>
</tr>
<tr>
<td></td>
<td>vehicles when accelerating from stop to improve acceleration and hill</td>
</tr>
<tr>
<td></td>
<td>climbing capacity</td>
</tr>
<tr>
<td>Slip Control at Vehicle Startup</td>
<td>This helps prevent vehicle from sliding sideways. When accelerating</td>
</tr>
<tr>
<td></td>
<td>a stopped vehicle with the steering wheel turned, it ensures steering</td>
</tr>
<tr>
<td></td>
<td>stability</td>
</tr>
<tr>
<td>Slip Control</td>
<td>This ensures high turning performance and that stability is not</td>
</tr>
<tr>
<td></td>
<td>affected by road surface conditions during mid and high speed running</td>
</tr>
<tr>
<td>Control During Acceleration</td>
<td>This controls straight-line running when accelerating during mid and</td>
</tr>
<tr>
<td></td>
<td>high speeds to ensure straight-line stability of the vehicle</td>
</tr>
</tbody>
</table>

3. **REFERENCE MECHANISM**

a. Electromagnetic coupling

1. The outer part of the main clutch is attached together with the front housing. The inner part of the main clutch is attached together with the shaft. The control clutch is attached together with the control cam. The activation energy from the transfer is transferred from the propeller shaft to the front housing. However, when the linear solenoid is not operating, the main clutch and control clutch are in a free state, and the activation energy from the transfer is not transferred to the rear wheels.
2. If current is applied to the linear solenoid, the solenoid magnetizes, and the electromagnet pull force causes the armature to attach to the control clutch side. Or, if there is a difference between the rotation speed of the front and rear wheels and the control clutch attaches, a difference occurs in the rotation of the main cam attached to the shaft and the control cam attached to the front housing. As a result, each ball pushes its cam, and the main clutch attaches. The activation energy from the front housing passes through main clutch to the shaft, and then to the rear differential. Then the activation energy is transferred to the rear wheels.

3. Depending on the rotation difference between the front and rear wheels, the system controls the current flowing to the linear solenoid. Then the activation energy applied to the rear wheels is smoothly controlled. Depending on the amount of current, the restraint energy of the outer and inner side of the main clutch changes, and the activation energy from the propeller shaft is smoothly controlled from a limited condition to condition that is nearly a direct-link 4WD condition.
HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use these procedures to troubleshoot the active torque control 4WD system.
- *: Use Techstream.

1. VEHICLE BROUGHT TO WORKSHOP
2. INSPECT BATTERY VOLTAGE

   Standard voltage: 11 to 14 V

   If the voltage is below 11V, recharge or replace the battery before proceeding.

3. CHECK COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM*
   a. Use the Techstream to check if the CAN communication system is functioning normally.

   Result

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN DTC is not output</td>
<td>A</td>
</tr>
<tr>
<td>CAN DTC is output</td>
<td>B</td>
</tr>
</tbody>
</table>

   B: Go to CAN COMMUNICATION SYSTEM
   A: Go to next step

4. CHECK INDICATOR LIGHT
5. CHECK DTC*
   a. Check for DTCs (see DTC CHECK / CLEAR ).
   b. Clear the DTCs.
c. Recheck for DTCs.

Result

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTC dose not reoccur</td>
<td>A</td>
</tr>
<tr>
<td>DTC dose reoccur</td>
<td>B</td>
</tr>
</tbody>
</table>

B: GO TO STEP 8
A: Go to next step

6. PROBLEM SYMPTOMS TABLE

Result

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault not listed in problem symptoms table</td>
<td>A</td>
</tr>
<tr>
<td>Fault listed in problem symptoms table</td>
<td>B</td>
</tr>
</tbody>
</table>

B: Go to step 8
A: Go to next step

7. OVERALL ANALYSIS AND TROUBLESHOOTING*
   a. See TERMINALS OF ECU.
   b. See DATA LIST / ACTIVE TEST.

8. REPAIR OR REPLACE
9. CONFIRMATION TEST

END

TEST MODE PROCEDURE

1. DESCRIPTION

HINT:

When using a chassis dynamometer, brake tester, etc. to perform a vehicle test, activate test mode to avoid a "different tire diameter installed" incorrect judgment. Test mode does not have a 4WD parameter. Test mode is activated because it will prohibit a different tire diameter judgment.
2. **ACTIVATE TEST MODE**

HINT:

Activate test mode before using a chassis dynamometer, brake tester, etc. to perform a vehicle test.

a. Check that the ignition switch is OFF.

b. Use either of the following methods to change the 4WD ECU to test mode.

1. Test mode activation through Techstream.
   
   - Connect the Techstream to the DLC3 connector and turn the ignition switch ON. Using the test mode activation function (mode 10), activate test mode.

2. Test mode activation by shorting TS terminal
   
   - With the ignition switch OFF, short-circuit the TS and CG terminals of the DLC3 connector. Then turn the ignition switch ON to activate test mode.

**NOTE:** When the ignition switch is turned from OFF to ON, the 4WD indicator light will illuminate for 4 seconds. Then it will turn off.

### 4WD Lock Mode indicator

<table>
<thead>
<tr>
<th>4WD Lock Mode Indicator Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>4WD Lock Switch OFF</td>
</tr>
<tr>
<td>4WD Lock Switch ON</td>
</tr>
</tbody>
</table>

HINT:

When the ignition switch is ON and the 4WD lock switch is turned from OFF to ON, the 4WD lock mode indicator blinks twice and then illuminates.

If the indicator does not illuminate, check the bulb for burnout. Also, inspect the wire harness between the 4WD ECU and combination meter.

**NOTE:** If a part of the 4WD system has a defect, the 4WD indicator light will illuminate.
c. Check if the 4WD indicator light has changed to the test mode display.

d. Start the engine.

3. CONFIRM MODE CHANGE

HINT:

Operate the 4WD lock switch, and check that the 4WD control mode changes.

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![Diagram of 4WD lock switch and components](image_url)

**Fig. 7: Identifying 4WD Indicator Light Blinking Pattern**
**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

<table>
<thead>
<tr>
<th>4WD Lock Switch Status</th>
<th>4WD Lock Mode Indicator Status</th>
<th>4WD Control Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Turns off</td>
<td>4WD auto mode</td>
</tr>
<tr>
<td>ON</td>
<td>Illuminates</td>
<td>4WD lock mode</td>
</tr>
<tr>
<td>Switch changed from OFF to ON</td>
<td>Blinks twice, then illuminates</td>
<td>At moment of illumination, changes to 4WD lock mode</td>
</tr>
</tbody>
</table>

**PROBLEM SYMPTOMS TABLE**

HINT:

- Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

**Active torque control 4WD system**

**ACTIVE TORQUE CONTROL 4WD SYSTEM**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Suspected area</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenomenon of tight-corner braking*</td>
<td>1. Steering angle sensor circuit</td>
<td>DTC C1297/97 STEERING ANGLE SENSOR</td>
</tr>
<tr>
<td></td>
<td>2. Linear solenoid circuit</td>
<td>DTC C1298/98 LINEAR SOLENOID CIRCUIT</td>
</tr>
<tr>
<td></td>
<td>3. 4WD control ECU</td>
<td></td>
</tr>
<tr>
<td>4WD indicator light remains ON</td>
<td>4WD indicator light circuit</td>
<td>4WD INDICATOR LIGHT REMAINS ON</td>
</tr>
<tr>
<td>4WD indicator light does not come ON</td>
<td>4WD indicator light circuit</td>
<td>4WD INDICATOR LIGHT DOES NOT COME ON</td>
</tr>
<tr>
<td>The system is in the DTC output mode although terminals TC and CG of the DLC3 are not short circuited</td>
<td>1 TC and CG terminal circuit</td>
<td>TC AND CG TERMINAL CIRCUIT</td>
</tr>
<tr>
<td></td>
<td>2. 4WD indicator light circuit</td>
<td></td>
</tr>
<tr>
<td>The system is not in the DTC output mode although terminals TC and CG of the DLC3 are not short circuited</td>
<td>1 TC and CG terminal circuit</td>
<td>TC AND CG TERMINAL CIRCUIT</td>
</tr>
<tr>
<td></td>
<td>2. 4WD indicator light circuit</td>
<td></td>
</tr>
</tbody>
</table>

**HINT:**
*:* When driving 4WD mode, the vehicle is hard to turn, as if the brakes were applied, due to the rotational difference between the front and rear tires while turning.

**TERMINALS OF ECU**

1. **CHECK 4WD CONTROL ECU**

---

*Fig. 8: Identifying 4WD Control ECU Terminals*  
*Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.*
a. Measure the voltage and resistance of the connector.

### VOLTAGE AND RESISTANCE SPECIFICATION

<table>
<thead>
<tr>
<th>Symbols (Terminal No.)</th>
<th>Wiring Color</th>
<th>Terminal Description</th>
<th>Condition</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANH (E57-14) - CANL (E57-16)</td>
<td>P - W</td>
<td>CAN communication</td>
<td>Ignition switch OFF</td>
<td>54 to 69 ohms</td>
</tr>
<tr>
<td>GND (E57-23) - Body ground</td>
<td>W-B - Body ground</td>
<td>Ground</td>
<td>Always</td>
<td>Below 1 ohms</td>
</tr>
<tr>
<td>4WDL (E57-7) - Body ground</td>
<td>R - Body ground</td>
<td>Ground</td>
<td>4WD lock mode switch ON</td>
<td>Below 1 ohms</td>
</tr>
<tr>
<td>IG1 (E57-11) - GND (E57-23)</td>
<td>L - W-B</td>
<td>Power source voltage</td>
<td>Ignition switch ON</td>
<td>10 to 14 V</td>
</tr>
<tr>
<td>SLC + (E57-13) - SLC - (E57-32)</td>
<td>W - B</td>
<td>4WD linear solenoid signal</td>
<td>Ignition switch ON</td>
<td>Pulse generation (see waveform 1)</td>
</tr>
<tr>
<td>BSLC (E57-9) - GND (E57-23)</td>
<td>R - W-B</td>
<td>Power source voltage</td>
<td>Ignition switch ON</td>
<td>10 to 14 V</td>
</tr>
</tbody>
</table>

If the result is not as specified, the 4WD control ECU may have a malfunction.

b. Using an oscilloscope, check the waveform 1.

### WAVEFORM 1 REFERENCE

<table>
<thead>
<tr>
<th>Symbols (Terminal No.)</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool setting</td>
<td>5 V/DIV., 2 msec. / DIV.</td>
</tr>
<tr>
<td>Vehicle condition</td>
<td>Engine stop, ignition switch ON</td>
</tr>
</tbody>
</table>

![Fig. 9: Identifying Waveform 1 Graph](https://via.placeholder.com/150?text=Fig.+9+-+Identifying+Waveform+1+Graph)

**Fig. 9: Identifying Waveform 1 Graph**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### DIAGNOSIS SYSTEM

1. DESCRIPTION
Active torque control 4WD system data can be read in the Data Link Connector 3 (DLC3) of the vehicle. When the system seems to be malfunctioning, use the Techstream to check for malfunctions and perform repairs. Therefore when there seems to be a problem with the active torque control 4WD, use the Techstream or SST to check and troubleshoot it.

**SST 09843-18040**

2. **CHECK DLC3**
   
a. The ECU uses CAN (ISO11898-1) and ISO9141-2 for communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO9141-2 format. Verify the conditions listed in the table below.

<table>
<thead>
<tr>
<th>Symbols (Terminal No.)</th>
<th>Terminal Description</th>
<th>Condition</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIL (7) - SG (5)</td>
<td>Bus + line</td>
<td>During transmission</td>
<td>Pulse generation</td>
</tr>
<tr>
<td>CG (4) - Body Ground</td>
<td>Chassis ground</td>
<td>Always</td>
<td>Below 1 ohms</td>
</tr>
<tr>
<td>SG (5) - Body Ground</td>
<td>Signal ground</td>
<td>Always</td>
<td>Below ohms</td>
</tr>
<tr>
<td>BAT (16) - Body Ground</td>
<td>Battery positive</td>
<td>Always</td>
<td>10 to 14 V</td>
</tr>
<tr>
<td>CANH (6) - CANL (14)</td>
<td>CAN bus line</td>
<td>Ignition switch OFF(^{(1)})</td>
<td>54 to 69 ohms</td>
</tr>
<tr>
<td>CANH (6) - CG (4)</td>
<td>HIGH-level CAN bus line</td>
<td>Ignition switch OFF(^{(1)})</td>
<td>200 ohms or higher</td>
</tr>
<tr>
<td>CANL (14) - CG (4)</td>
<td>LOW-level CAN bus line</td>
<td>Ignition switch OFF(^{(1)})</td>
<td>200 ohms or higher</td>
</tr>
<tr>
<td>CANH (6) - BAT (16)</td>
<td>HIGH-level CAN bus line</td>
<td>Ignition switch OFF(^{(1)})</td>
<td>6 kohms or higher</td>
</tr>
<tr>
<td>CANL (14) - BAT (16)</td>
<td>LOW-level CAN bus line</td>
<td>Ignition switch OFF(^{(1)})</td>
<td>6 kohms or higher</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate the ignition switch, other switches or the doors.

If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.
HINT:

Connect the cable of the Techstream to the DLC3, turn the ignition switch ON and attempt to use the tester. If the display indicates that a communication error has occurred, there is a problem either with the vehicle or with the tester.

- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
- If communication is still not possible when the tester is connected to another vehicle, the problem may be in the tester itself. Consult the Service Department listed in the tester's instruction manual.

3. INDICATOR LIGHT
   a. When a problem occurs in the active torque control 4WD system, the 4WD indicator light on the combination meter comes ON to inform the driver of the problem.

   ![Fig. 11: Identifying 4WD Indicator Light](https://www.toyota.com/)

   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DTC CHECK / CLEAR

1. CHECK DTC (When Using Techstream)
   a. Check the DTCs.
      1. Connect the Techstream to the DLC3.
      2. Turn the ignition switch ON.
      3. Read the DTCs by following the prompts on the tester screen.

     HINT:

     Refer to the Techstream operator's manual for further details.
2. CLEAR DTC (When Using Techstream)
   a. Connect the Techstream to the DLC3.
   b. Turn the ignition switch ON.
   c. Operate the Techstream to clear the codes.

   HINT:

   Refer to the Techstream operator's manual for further details.

3. CHECK DTC (When not Using Techstream)
   a. Check the DTCs.
      1. Using the SST, connect terminals TC (13) and CG (4) of the DLC3
         SST 09843-18040
      2. Turn the ignition switch ON.
      3. Read DTCs from the 4WD indicator light ON the combination meter.

   HINT:

   • If the 4WD indicator light does not blink, perform relevant troubleshooting procedures. The relevant troubleshooting procedures are in the sections listed in the table below.
   • If more than 1 DTC is detected at the same time, the DTCs will be displayed in numerical order.
   • As an example, the blinking patterns of the normal system code and DTCs 11 and 21 are shown below.
   • DTCs are explained in "DIAGNOSTIC TROUBLE CODE CHART".
4. CLEAR DTC (When not Using Techstream)
   a. Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.

   **SST 09843-18040**

   b. Turn the ignition switch ON.
   c. Clear the DTCs stored in the 4WD control ECU by depressing the brake pedal 8 times or more within 5 seconds.

   d. Check that the warning light blinks in the normal system code pattern.
   e. Remove SST from the terminals of the DLC3.
   f. Turn the ignition switch OFF.
DTCs cannot be cleared by disconnecting the cable from the negative (-) battery terminal or removing the ECU-IG1 fuse.

FAIL-SAFE CHART

1. FAIL-SAFE FUNCTION

- If following malfunctions occur, the 4WD control ECU will stop the function of 4WD control system or partly change the function to control the system.
- If a malfunction occurs in the sensor signal or actuator, the flow of electricity to the linear solenoid of the electrical coupling is prohibited. As a result, the system enters front wheel drive condition.
- When a component of the system malfunctions and the fail-safe function activates, the component operation is prohibited. However, if the system is controlling the component and the fail-safe function activates, the system operation is gradually stopped to prevent sudden changes in the vehicle condition.
- When system control is not possible, the warning light is illuminated to stop operation of the system operation.

DATA LIST / ACTIVE TEST

1. READ DATA LIST

HINT:

Using the Techstream Data List allows switch, sensor and other item values to be read without removing any parts. Reading the Data List early in troubleshooting is one way to save time.

a. Connect the Techstream to the DLC3.
b. Turn the ignition switch ON.
c. Read the Data List according to the display on the tester.

4WD control ECU

DATA LIST

<table>
<thead>
<tr>
<th>Tester Display</th>
<th>Measurement Item/Range</th>
<th>Normal Condition</th>
<th>Diagnostic Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>4WD warning lamp</td>
<td>4WD indicator light/OFF or ON</td>
<td>OFF: 4WD indicator light OFF ON: 4WD indicator light ON</td>
<td>-</td>
</tr>
<tr>
<td>Slip Indicator Light</td>
<td>Slip indicator light/OFF or ON</td>
<td>OFF: SLIP indicator light OFF ON: SLIP indicator light ON</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF: Brake pedal released</td>
<td></td>
</tr>
</tbody>
</table>
### 2. **PERFORM ACTIVE TEST**

**Hint:**

Performing the Techstream Active Test allows switch and other items to be operated without removing any parts. Performing the Active Test early in troubleshooting is one way to save time. The Data List can be displayed during the Active Test.

1. Connect the Techstream to the DLC3.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Minimum/Maximum</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop lamp SW</td>
<td>Stop light switch/OFF or ON: Brake pedal depressed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steering angle</td>
<td>Steering angle value / Min.: -3276.8 deg</td>
<td>Min.: 3276.8 deg</td>
<td></td>
</tr>
<tr>
<td>FR wheel SPD</td>
<td>FR wheel speed / Min.: 0 km/h (0 mph)</td>
<td>Actual wheel speed</td>
<td>Almost no difference from the speedometer</td>
</tr>
<tr>
<td>FL wheel SPD</td>
<td>FL wheel speed / Min.: 0 km/h (0 mph)</td>
<td>Actual wheel speed</td>
<td>Almost no difference from the speedometer</td>
</tr>
<tr>
<td>RR wheel SPD</td>
<td>RR wheel speed / Min.: 0 km/h (0 mph)</td>
<td>Actual wheel speed</td>
<td>Almost no difference from the speedometer</td>
</tr>
<tr>
<td>RL wheel SPD</td>
<td>RL wheel speed / Min.: 0 km/h (0 mph)</td>
<td>Actual wheel speed</td>
<td>Almost no difference from the speedometer</td>
</tr>
<tr>
<td>Ambi temp</td>
<td>Ambient temperature / Min.: -128°C (198.4°F)</td>
<td>Min.: -128 (198.4°F)</td>
<td></td>
</tr>
<tr>
<td>Coolant temp</td>
<td>Engine coolant temperature / Min.: 0°C (32°F)</td>
<td>Min.: 0°C (32°F)</td>
<td></td>
</tr>
<tr>
<td>Lock SW</td>
<td>4WD lock switch / OFF or ON: 4WD lock switch off</td>
<td>OFF: 4WD lock switch</td>
<td></td>
</tr>
<tr>
<td>SLC CUR</td>
<td>SLC solenoid (4WD linear solenoid) current / Min.: 0 A</td>
<td>Min.: 0 A</td>
<td></td>
</tr>
</tbody>
</table>

2008 Toyota RAV4
2008 DRIVELINE/AXLES Differential - RAV4

Microsoft
Tuesday, August 18, 2009 3:55:49 PM     Page 16  © 2005 Mitchell Repair Information Company, LLC.
b. Turn the ignition switch ON.
c. Perform the Active Test according to the display on the tester.

**Combination Meter**

**ACTIVE TEST DETAIL**

<table>
<thead>
<tr>
<th>Tester Display</th>
<th>Test Part</th>
<th>Control Range</th>
<th>Diagnostic Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>4WD warn light</td>
<td>4WD indicator light</td>
<td>Indicator light is ON / OFF</td>
<td>Observe combination meter</td>
</tr>
<tr>
<td>Lock light</td>
<td>4WD lock indicator light</td>
<td>Indicator light is ON / OFF</td>
<td>Observe combination meter</td>
</tr>
</tbody>
</table>

**DIAGNOSTIC TROUBLE CODE CHART**

<table>
<thead>
<tr>
<th>DTC No.</th>
<th>Detection Item</th>
<th>Trouble Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1241/94</td>
<td>Low Power Supply Voltage</td>
<td>• Battery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• generator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ECU-IG1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wire harness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4WD control ECU</td>
</tr>
<tr>
<td>C1280/82</td>
<td>Engine Circuit Malfunction</td>
<td>• Throttle position sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Throttle position sensor wire harness and connector</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CAN communication system</td>
</tr>
<tr>
<td>C1296/96</td>
<td>ABS Malfunction</td>
<td>• Wire harness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4WD control ECU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Skid control ECU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Speed sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Yaw rate sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CAN communication system</td>
</tr>
<tr>
<td>C1297/97</td>
<td>Steering Angle Sensor</td>
<td>• Steering angle sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CAN communication system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wire harness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4WD control ECU</td>
</tr>
<tr>
<td>C1298/98</td>
<td>Linear Solenoid Circuit</td>
<td>• Wire harness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Electromagnetic coupling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4WD control ECU</td>
</tr>
<tr>
<td>C1299/99</td>
<td>Cancellation of 4WD Control</td>
<td>• Tire size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Electromagnetic coupling</td>
</tr>
</tbody>
</table>
DTC C1241/94 LOW POWER SUPPLY VOLTAGE

DESCRIPTION

If a malfunction in the power source circuit occurs, or a malfunction in communication with the skid control ECU or in a speed sensor occurs, the 4WD control ECU will prohibit operations by the fail-safe function.

DTC DETECTION CONDITION AND TROUBLE AREA

<table>
<thead>
<tr>
<th>DTC No.</th>
<th>DTC Detection Condition</th>
<th>Trouble Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1241/94</td>
<td>When one of following conditions is met:</td>
<td>Battery, Generator, ECU-IG1, Wire harness (IG1 circuit, GND circuit), 4WD control ECU</td>
</tr>
<tr>
<td></td>
<td>1. When following continues for 10 seconds or more:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o At a vehicle speed of 3 km/h (2 mph) or more, voltage of IG1 terminal is 9.5 V or less.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. When both of following continue for 60 seconds or more:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o With the voltage of IG1 terminal 9.5 V or less, communication with the skid control ECU cannot be performed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o A malfunction in communication with skid control ECU.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. When following continue for 3 seconds or more:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o With the voltage of IG1 terminal 9.5 V or more, communication with the skid control ECU cannot be performed.</td>
<td></td>
</tr>
</tbody>
</table>
WIRING DIAGRAM

Fig. 15: Low Power Supply Voltage - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting (see HOW TO PROCEED WITH TROUBLESHOOTING).

1. CHECK FOR DTC
   a. Clear the DTC (see DTC CHECK / CLEAR).
   b. Turn the ignition switch ON and check that no CAN communication system DTC is output.
   c. Start the engine.
   d. Drive the vehicle, accelerate to a speed of 3 km/h (2 mph) or more, and check that no speed sensor DTC (brake control system DTC) is output (see DIAGNOSTIC TROUBLE CODE CHART).

Result

RESULT REFERENCE

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neither CAN communication system DTC nor speed sensor DTC (Brake control system DTC) is output</td>
<td>A</td>
</tr>
<tr>
<td>CAN communication system DTC is output</td>
<td>B</td>
</tr>
<tr>
<td>Speed Sensor DTC (Brake control system DTC) is output</td>
<td>C</td>
</tr>
</tbody>
</table>

B: REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (CAN COMMUNICATION SYSTEM)

C: REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (BRAKE CONTROL SYSTEM)

A: Go to next step
2. **INSPECT FUSE (ECU-IG1)**
   a. Remove the ECU-IG1 fuse from the instrument panel junction block
   b. Measure the resistance of the fuse.

   **Standard resistance: Below 1ohms**

   **HINT:**

   Check for short circuits in all harnesses and connector connected to the ECU-IG1 fuse (see [REPAIR INSTRUCTION](#)).

   **NG: REPLACE FUSE**
   **OK: Go to next step**

3. **CHECK WIRE HARNESS (4WD CONTROL ECU)**
   a. Disconnect the E57 ECU connector.
   b. Measure the voltage of the wire harness side connector.

   **Standard voltage**

   **VOLTAGE SPECIFICATION**

<table>
<thead>
<tr>
<th>Tester Connection</th>
<th>Condition</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E57-11 (IG1) - Body Ground</td>
<td>Ignition switch ON</td>
<td>10 to 14 V</td>
</tr>
</tbody>
</table>

   ![Fig. 16: Identifying E57 ECU Connector](image)

   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   **NG: REPAIR OR REPLACE HARNESS AND CONNECTOR**
   **OK: Go to next step**

4. **CHECK WIRE HARNESS (4WD CONTROL ECU - BODY GROUND)**
   a. Disconnect the E57 ECU connector.
b. Measure the resistance of the wire harness side connector.

**Standard resistance**

**RESISTANCE SPECIFICATION**

<table>
<thead>
<tr>
<th>Tester Connection</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E57-23 (GND) - Body Ground</td>
<td>Below 1 ohms</td>
</tr>
</tbody>
</table>

![Diagram of E57 ECU Connector]

**Fig. 17: Identifying E57 ECU Connector**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: REPAIR OR REPLACE HARNESS AND CONNECTOR

OK: Go to next step

5. **RECONFIRM DTC**
   a. Clear the DTC (see **DTC CHECK / CLEAR**).
   b. Start the engine.
   c. Drive the vehicle, accelerate to a speed of 3 km/h (2 mph or more, and check if the same DTC is output.

**Result**

**RESULT REFERENCE**

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTC is output</td>
<td>A</td>
</tr>
<tr>
<td>DTC is not output</td>
<td>B</td>
</tr>
</tbody>
</table>

**HINT:**

Reinstall the sensor, connectors, etc. and restore the vehicle to its prior condition before rechecking DTCs.

**B: END**
A: REPLACE 4WD CONTROL ECU

DTC C1280/82 ENGINE CIRCUIT MALFUNCTION

DESCRIPTION

If a malfunction in the engine control ECU circuit occurs, the 4WD control ECU will output this DTC.

DTC DETECTION CONDITION AND TROUBLE AREA

<table>
<thead>
<tr>
<th>DTC No.</th>
<th>DTC Detection Condition</th>
<th>Trouble Area</th>
</tr>
</thead>
</table>
| C1280/82 | When the following continues for 5 seconds or more: | • Throttle position sensor  
| | • Communication with engine control ECU is operating normally, but throttle position sensor is malfunctioning. | • Throttle position sensor wire harness and connector  
| | | • CAN communication system |

INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting (see HOW TO PROCEED WITH TROUBLESHOOTING).

1. CHECK FOR DTC
   a. Clear the DTC (see DTC CHECK / CLEAR).
   b. Turn the ignition switch OFF.
   c. Turn the ignition switch ON and check that can communication system DTC is not output.

Result

RESULT REFERENCE

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN communication system DTC is output</td>
<td>A</td>
</tr>
<tr>
<td>Engine control DTC is output</td>
<td>B</td>
</tr>
</tbody>
</table>

B: GO TO ENGINE CONTROL SYSTEM (2AZ-FE) -- RAV4 or ENGINE CONTROL SYSTEM (2GR-FE) -- RAV4

A: GO TO CAN COMMUNICATION SYSTEM

DTC C1296/96 ABS MALFUNCTION

DESCRIPTION

If a malfunction in the speed sensor signal circuit yaw rate sensor circuit occurs, the 4WD control ECU will
output this DTC.

**DTC DETECTION CONDITION AND TROUBLE AREA**

<table>
<thead>
<tr>
<th>DTC No.</th>
<th>DTC Detection Condition</th>
<th>Trouble Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1296/96</td>
<td>When either condition below is met:</td>
<td>• CAN communication line</td>
</tr>
<tr>
<td></td>
<td>1. Wheel speed sensor malfunction is received from skid</td>
<td>• Skid control ECU</td>
</tr>
<tr>
<td></td>
<td>control ECU</td>
<td>• Speed sensor</td>
</tr>
<tr>
<td></td>
<td>2. Deceleration sensor malfunction is received from skid</td>
<td>• 4WD control ECU</td>
</tr>
<tr>
<td></td>
<td>control ECU</td>
<td>• Yaw rate sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wire harness</td>
</tr>
</tbody>
</table>

**INSPECTION PROCEDURE**

**HINT:**

Check the condition of each related circuit connector before troubleshooting (see HOW TO PROCEED WITH TROUBLESHOOTING).

1. **CHECK FOR DTC**
   a. Clear the DTC (see DTC CHECK / CLEAR).
   b. Turn the ignition switch OFF.
   c. Turn the ignition switch ON again and check that CAN communication system DTC(s) is not output.
   d. Drive the vehicle, accelerate to a speed of 20 km/h (12 mph) or more, and check if the speed sensor DTC (brake control system DTC) is output (see DIAGNOSTIC TROUBLE CODE CHART).

**Result**

**RESULT REFERENCE**

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neither CAN communication system DTC nor brake control system DTC is output</td>
<td>A</td>
</tr>
<tr>
<td>CAN communication system DTC is output</td>
<td>B</td>
</tr>
<tr>
<td>Brake control system DTC (speed sensor DTC) is output</td>
<td>C</td>
</tr>
</tbody>
</table>

**HINT:**

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

**B: REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (CAN COMMUNICATION SYSTEM)**

**C: REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (BRAKE CONTROL SYSTEM)**
A: Go to next step

2. **CHECK OPERATION OF 4WD CONTROL ECU**
   a. Replace the 4WD control ECU with a normally functioning or new one.
   b. Reconfirm DTC.

   **OK: DTC is output.**

**OK: REPLACE 4WD CONTROL ECU**

**NG: GO TO BRAKE CONTROL -- RAV4** *(For ANTI-LOCK BRAKE SYSTEM OR VEHICLE STABILITY CONTROL SYSTEM)*

**DTC C1297/97 STEERING ANGLE SENSOR**

**DESCRIPTION**

- The 4WD control ECU determines that the vehicle is turning based on the signals sent from the steering angle sensor.
- The steering angle sensor signal is sent to the 4WD control ECU via the CAN communication system.
- The 4WD control ECU detects the amount of steering wheel movement and performs "slip control at vehicle start up", according to the amount of movement, and "slip control" to secure high turning performance.

**DTC DETECTION CONDITION AND TROUBLE AREA**

<table>
<thead>
<tr>
<th>DTC No.</th>
<th>DTC Detection Condition</th>
<th>Trouble Area</th>
</tr>
</thead>
</table>
| C1297/97 | When voltage of 4WD control ECU IG1 terminal is 9.5 V or more, and steering angle sensor malfunction signal is received. | • Steering angle sensor  
• CAN communication  
• 4WD control ECU  
• Wire harness |

**WIRING DIAGRAM**
INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting (see HOW TO PROCEED WITH TROUBLESHOOTING).

1. CHECK FOR DTC
   a. Clear the DTC (see DTC CHECK / CLEAR).
   b. Turn the ignition switch OFF.
   c. Turn the ignition switch ON again and check that no CAN communication system DTC(s) is output.
   d. Start the engine.
   e. Drive the vehicle and turn the steering wheel to the right and left at a speed of 35 km/h (24 mph) and check that no brake control system (steering angle sensor) DTC (C1231/31) is output (see DIAGNOSTIC TROUBLE CODE CHART).

RESULT REFERENCE

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neither CAN communication system DTC nor brake control system DTC is output</td>
<td>A</td>
</tr>
<tr>
<td>CAN communication system DTC is output</td>
<td>B</td>
</tr>
<tr>
<td>Brake control system (steering angle sensor) DTC (C1231/31) is output</td>
<td>C</td>
</tr>
</tbody>
</table>

HINT:

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

B: REPAIR CIRCUIT INDICATOR OUTPUT CODE (CAN COMMUNICATION SYSTEM)
C: REPAIR OR REPLACE CIRCUIT INDICATOR OUTPUT CODE (STEERING ANGLE SENSOR CIRCUIT)

A: Go to next step

2. CHECK WIRE HARNESS (STEERING ANGLE SENSOR - BATTERY)
   a. Disconnect the E11 sensor connector.
   b. Measure the voltage of the wire harness side connector.

   Standard voltage

   **VOLTAGE SPECIFICATION**

<table>
<thead>
<tr>
<th>Tester Condition</th>
<th>Condition</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E11-1 (IG) - Body ground</td>
<td>Ignition switch ON</td>
<td>10 to 14 V</td>
</tr>
</tbody>
</table>

   ![Diagram](image1)

   **Fig. 19: Identifying E11 Steering Angle Sensor Connector**
   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: REPAIR OR REPLACE HARNESS AND CONNECTOR

OK: Go to next step

3. CHECK WIRE HARNESS (STEERING ANGLE SENSOR - BODY GROUND)
   a. Disconnect the E11 sensor connector.
   b. Measure the resistance of the wire harness side connector.

   ![Diagram](image2)
Fig. 20: Disconnecting E11 Steering Angle Sensor Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESISTANCE SPECIFICATION

<table>
<thead>
<tr>
<th>Tester Condition</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E11-2 (ESS) - Body ground</td>
<td>Below 1 ohms</td>
</tr>
</tbody>
</table>

Result

RESULT REFERENCE

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK (When troubleshooting according to PROBLEM SYMPTOMS TABLE)</td>
<td>A</td>
</tr>
<tr>
<td>OK (When troubleshooting according to DTC chart)</td>
<td>B</td>
</tr>
<tr>
<td>NG</td>
<td>C</td>
</tr>
</tbody>
</table>

B: PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

C: REPAIR OR REPLACE HARNESS AND CONNECTOR

A: REPLACE STEERING ANGLE SENSOR

DTC C1298/98 LINEAR SOLENOID CIRCUIT

DESCRIPTION

The 4WD control ECU receives signals from each sensor to control clutch fluid pressure for limiting the center differential operation, which distributes torque according to the driving conditions.

DTC DETECTION CONDITION AND TROUBLE AREA

<table>
<thead>
<tr>
<th>DTC No.</th>
<th>DTC Detection Condition</th>
<th>Trouble Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1298/98</td>
<td>When the following continues for 1 second or more:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• With the current of the 0.8 A or more, an open or short in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the linear solenoid circuit occurs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Wire harness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Electromagnetic coupling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4WD control ECU</td>
<td></td>
</tr>
</tbody>
</table>

WIRING DIAGRAM
INSPECTION PROCEDURE

1. **INSPECT ELECTROMAGNETIC COUPLING (4WD LINEAR SOLENOID)**
   a. Remove the coupling connector.
   b. Measure the resistance of the solenoid.

   **Standard resistance**

   **RESISTANCE SPECIFICATION**

<table>
<thead>
<tr>
<th>Tester Connection</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (BSF) - 2 (SLC)</td>
<td>2.2 to 2.6 ohms</td>
</tr>
<tr>
<td>1 (BSF) - Body ground</td>
<td>10 kohms or higher</td>
</tr>
<tr>
<td>2 (SLC) - Body ground</td>
<td>10 kohms or higher</td>
</tr>
</tbody>
</table>

2. **CHECK WIRE HARNESS (COUPLING - 4WD CONTROL ECU)**
   a. Disconnect the E57 ECU connector.
b. Measure the resistance of the wire harness side connector.

**Standard resistance**

**RESISTANCE SPECIFICATION**

<table>
<thead>
<tr>
<th>Tester Connection</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E57-13 (SLC+) - 01-1 (BSF)</td>
<td>Below 1 ohms</td>
</tr>
<tr>
<td>E57-32 (SLC-) - 01-2 (SLC)</td>
<td>Below 1 ohms</td>
</tr>
<tr>
<td>E57-13 (SLC+) - Body ground</td>
<td>10 kohms or higher</td>
</tr>
<tr>
<td>E57-32 (SLC-) - Body ground</td>
<td>10 kohms or higher</td>
</tr>
</tbody>
</table>

**NG: REPAIR OR REPLACE HARNESS AND CONNECTOR**

**OK: REPLACE 4WD CONTROL ECU**

**DTC C1299/99 CANCELLATION OF 4WD CONTROL**

**DESCRIPTION**

- If wheel slip continues, differential control will be disabled when the torque-distribution ratio of the differential clutch exceeds the set value and a malfunction in the output of the wheel speed sensors, etc. occurs.
- If a difference in diameter between the front and rear wheels is determined, differential control will be disabled.

**DTC DETECTION CONDITION AND TROUBLE AREA**

<table>
<thead>
<tr>
<th>DTC No.</th>
<th>DTC Detection Condition</th>
<th>Trouble Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1299/99</td>
<td>When one of the following conditions is met:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Control coupling lock is detected 4 more times.</td>
<td>• Electromagnetic</td>
</tr>
<tr>
<td></td>
<td>• Condition that controls coupling calorific value is predefined</td>
<td>coupling</td>
</tr>
<tr>
<td></td>
<td>value or more.</td>
<td>• Tire size</td>
</tr>
</tbody>
</table>
INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting (see HOW TO PROCEED WITH TROUBLESHOOTING).

1. CHECK TIRE CONDITION
   a. Check the size and condition of all 4 tires (see INSPECTION).

   HINT:

   This DTC is output when tire deformation or a difference in tire size is detected.

   OK:

   The diameter and air pressure of all 4 tires are the same.

   NG: REPLACE TIRE SO THAT ALL 4 TIRES ARE THE SAME IN SIZE

   OK: Go to next step

2. RECONFIRM DTC
   a. Clear the DTC (see DTC CHECK / CLEAR).
   b. Start the engine.
   c. Drive the vehicle at the speed of 20 km/h (12 mph) or more and check that same DTC is output.

   Result

   RESULT REFERENCE

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTC is output</td>
<td>A</td>
</tr>
<tr>
<td>DTC is not output</td>
<td>B</td>
</tr>
</tbody>
</table>

   B: REPLACE ELECTROMAGNETIC COUPLING

   A: REPLACE 4WD CONTROL ECU

DTC U0073/86 CONTROL MODULE COMMUNICATION BUS OFF; DTC U0100/85 LOST
COMMUNICATION WITH ECM / PCM "A"; DTC U0126/84 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE; DTC U0129/83 LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE

DESCRIPTION

- The 4WD control ECU inputs the signals sent from the ECM, skid control ECU, and steering angle sensor via the CAN communication system.
- When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

DTC DETECTION CONDITION AND TROUBLE AREA

<table>
<thead>
<tr>
<th>DTC No.</th>
<th>DTC Detection Condition</th>
<th>Trouble Area</th>
</tr>
</thead>
</table>
| U0073/86 | 1. When the following continues for 5 seconds or more:  
  o Signals from the 4WD control ECU are not received.  
  2. When the following occurs 10 times consecutively:  
  o A communication malfunction (bus off) occurs one or more times within 0.1 second. | Wire harness (CANL, CANH circuit)  
  4WD control ECU |
| U0100/85 | 1. When both of the following continue for 2 seconds or more:  
  o The voltage of the IG1 terminal is 10 V or more.  
  o At a vehicle speed of 60 km/h (38 mph) or more, communication with the ECM cannot be performed | Wire harness (CANL, CANH circuit)  
  4WD control ECU  
  ECM |
| U0126/84 | 1. When both of the following continue for 1 second or more:  
  o The voltage of the IG1 terminal is 10 V or more.  
  o Communication with the steering angle sensor cannot be performed.  
  2. When all of the following occur 10 times consecutively:  
  o The condition that communication with the steering angle sensor cannot be performed occurs once within 5 seconds  
  o The voltage of the IG1 terminal is 10 V or more.  
  o Occurs 10 times or more within 60 seconds. | Wire harness (CANL, CANH circuit)  
  4WD control ECU  
  Steering angle sensor |
| U0129/83 | 1. When the following continues for 3 seconds or more:  
  o The voltage of the IG1 terminal is 10 V or more.  
  o Communication with the skid control ECU cannot be performed. | Wire harness (CANL, CANH circuit)  
  4WD control ECU  
  Skid control ECU |

INSPECTION PROCEDURE

1. **CHECK FOR DTC**
a. Check for DTC (see DTC CHECK / CLEAR).
b. Record the output DTC (4WD control system).

HINT:

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

GO TO CAN COMMUNICATION SYSTEM

4WD INDICATOR LIGHT REMAINS ON

DESCRIPTION

The 4WD control ECU is connected to the combination meter via the CAN communication system.

If the 4WD control ECU stores any DTCs which are related to the active torque control 4WD system, the 4WD indicator light comes on in the combination meter.

WIRING DIAGRAM

![Fig. 24: 4WD Indicator Light - Wiring Diagram](Image)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting (see HOW TO PROCEED WITH TROUBLESHOOTING).

1. CHECK FOR DTC
   a. Check the output DTC (see DTC CHECK / CLEAR).

   Result
RESULT REFERENCE

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neither CAN communication system DTC nor 4WD control system DTC is output</td>
<td>A</td>
</tr>
<tr>
<td>CAN communication DTC is output</td>
<td>B</td>
</tr>
<tr>
<td>4WD control system DTC is output</td>
<td>C</td>
</tr>
</tbody>
</table>

HINT:

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

B: REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (CAN COMMUNICATION SYSTEM)

C: REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (4WD CONTROL SYSTEM)

A: Go to next step

2. PERFORM ACTIVE TEST BY TECHSTREAM (4WD INDICATOR LIGHT)
   a. Using the Techstream Active Test, generate a control command, and then check that the 4WD indicator light operates.

   Combination Meter

   ACTIVE TEST DETAIL

<table>
<thead>
<tr>
<th>Tester Display</th>
<th>Test Part</th>
<th>Control Range</th>
<th>Diagnostic Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>4WD warn light</td>
<td>4WD indicator light</td>
<td>Indicator light is ON / OFF</td>
<td>Observer combination meter</td>
</tr>
</tbody>
</table>

   OK:
   The 4WD indicator light turns OFF

   OK: REPLACE 4WD CONTROL ECU

   NG: Go to next step

3. CHECK WIRE HARNESS (4WD CONTROL ECU - BATTERY)
   a. Disconnect the E57 ECU connector.
   b. Measure the voltage of the wire harness side connector.

   Voltage

   VOLTAGE SPECIFICATION

<table>
<thead>
<tr>
<th>Tester Connection</th>
<th>Condition</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E57-11 (IG1) - Body Ground</td>
<td>Ignition switch ON</td>
<td>10 to 14 V</td>
</tr>
</tbody>
</table>
NG: REPAIR OR REPLACE HARNESS AND CONNECTOR

OK: Go to next step

4. CHECK COMBINATION METER
   a. Check the combination meter system.

   Result:
   The combination meter system is normal.

   NG: REPLACE COMBINATION METER

   OK: REPLACE 4WD CONTROL ECU

4WD INDICATOR LIGHT DOES NOT COME ON

DESCRIPTION

Refer to "4WD INDICATOR LIGHT REMAINS ON".

WIRING DIAGRAM

Refer to "4WD INDICATOR LIGHT REMAINS ON".

INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting (see HOW TO PROCEED WITH TROUBLESHOOTING).

1. CHECK CAN COMMUNICATION SYSTEM
   a. Check if the CAN communication system DTC is output.
RESULT REFERENCE

<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTC is not output</td>
<td>A</td>
</tr>
<tr>
<td>DTC is output</td>
<td>B</td>
</tr>
</tbody>
</table>

HINT:

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

**B: REPAIR CAN COMMUNICATION SYSTEM**

A: Go to next step

2. **PERFORM ACTIVE TEST BY TECHSTREAM (4WD INDICATOR LIGHT)**
   a. Using the Techstream Active Test, generate a control command, and then check that the 4WD indicator light operates.

Combination Meter

**ACTIVE TEST DETAIL**

<table>
<thead>
<tr>
<th>Tester Display</th>
<th>Test Part</th>
<th>Control Range</th>
<th>Diagnostic Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>4WD warn light</td>
<td>4WD indicator light</td>
<td>Indicator light is ON / OFF</td>
<td>Observer combination meter</td>
</tr>
</tbody>
</table>

OK:

The 4WD indicator light turns ON and OFF.

**OK: REPLACE 4WD CONTROL ECU**

NG: Go to next step

3. **CHECK COMBINATION METER**
   a. Inspect the combination meter (see **ON-VEHICLE INSPECTION**).

Result:

The combination meter assembly system is normal.

**NG: REPLACE COMBINATION METER**

**OK: REPLACE 4WD CONTROL ECU**
TC AND CG TERMINAL CIRCUIT

DESCRIPTION

Connecting terminals TC and CG of the DLC3 causes the 4WD control ECU to display 2-digit DTCs by flashing the 4WD indicator light.

WIRING DIAGRAM

Fig. 26: TC And CG Terminal Circuit - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting (see HOW TO PROCEED WITH TROUBLESHOOTING).

1. CHECK DLC3 (TC VOLTAGE)
   a. Turn the ignition switch ON.
   b. Measure the voltage of the DLC3.

   Standard voltage

   VOLTAGE SPECIFICATION

<table>
<thead>
<tr>
<th>Tester Connection</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E13-13 (TC) - E13 - 4 (CG)</td>
<td>10 to 14 V</td>
</tr>
</tbody>
</table>
Fig. 27: Identifying DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Go to step 3

OK: Go to next step

2. CHECK CAN COMMUNICATION SYSTEM
   a. Check if the CAN communication DTC is output (see DTC CHECK / CLEAR).

   Result

   RESULT REFERENCE
<table>
<thead>
<tr>
<th>Result</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTC is not output</td>
<td>A</td>
</tr>
<tr>
<td>DTC is output</td>
<td>B</td>
</tr>
</tbody>
</table>

   B: REPAIR CIRCUIT INDICATED BY OUTPUT DTC

   A: REPLACE 4WD CONTROL ECU

3. CHECK WIRE HARNESS (DLC3 - ECM AND BODY GROUND)
   a. Turn the ignition switch OFF.
   b. Disconnect the A9 ECM connector.
   c. Measure the resistance of the wire harness side connectors.

   Standard resistance

   RESISTANCE SPECIFICATION
<table>
<thead>
<tr>
<th>Tester Connection</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E13-13 (TC) - A9-27 (TC)</td>
<td>Below ohms</td>
</tr>
<tr>
<td>E13-13 (TC) - Body Ground</td>
<td>10 kohms or higher</td>
</tr>
</tbody>
</table>
NG: REPAIR OR REPLACE HARNESS AND CONNECTOR

OK: Go to next step

4. CHECK WIRE HARNESS (DLC3 - BODY GROUND)
   a. Measure the resistance of the DLC3.

   Standard resistance

   RESISTANCE SPECIFICATION
   
<table>
<thead>
<tr>
<th>Tester Connection</th>
<th>Specified Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E13-4 (CG) - Body ground</td>
<td>Below 1 ohms</td>
</tr>
</tbody>
</table>

   B: REPAIR OR REPLACE HARNESS AND CONNECTOR
   A: Go to next step

5. CHECK CAN COMMUNICATION SYSTEM
   a. Check if the CAN communication DTC is output (see DTC CHECK / CLEAR ).
Result

<table>
<thead>
<tr>
<th>Result Reference</th>
<th>Proceed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTC is not output</td>
<td>A</td>
</tr>
<tr>
<td>DTC is output</td>
<td>B</td>
</tr>
</tbody>
</table>

**B: REPAIR CIRCUIT INDICATED BY OUTPUT DTC**

**A: REPLACE 4WD CONTROL ECU**

**DIFFERENTIAL SYSTEM**

**PRECAUTION**

1. Before disassembling the differential assembly, thoroughly clean it by removing any sand, mud or foreign matter. This will help prevent contamination during disassembly and reassembly.
2. When removing the rear differential carrier cover or any other light alloy part, do not pry it off with a screwdriver or other tool that may cause damage. Instead, tap the part with a plastic-faced hammer.
3. Always arrange disassembled parts in the order they were removed and protect them from foreign matter.
4. Before installation of each part, thoroughly clean and dry it. Then apply hypoid gear oil SX to it. Do not use alkaline chemicals to clean aluminum parts, rubber parts or ring gear set bolts. Also, do not use white gasoline or other cleaning oils to clean O-rings, oil seals or rubber parts.
5. Coat any sliding surface and rotating parts with hypoid gear oil SX.
6. Do not directly fix a part in a vise. Place aluminum plates between the part and vise.
7. Be careful not to damage the contact surfaces of the case. Such damage may cause oil leakage.
8. Before applying sealant, remove deposited oil sealant and clean the part to be sealed using white gasoline.
9. After sealing parts, do not allow oil to contact the seal for at least an hour.
10. Do not allow scratches on a part's contact surface with an oil seal, O-ring or gasket. Scratches may lead to oil leakage.
11. When press-fitting an oil seal, be careful not to damage the lip of the oil seal and its outside periphery.
12. When replacing a bearing, replace the inner and outer races as a set.

**PROBLEM SYMPTOMS TABLE**

**HINT:**

Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking...
the suspected areas in the order they are listed. Replace parts as necessary.

Differential system

**DIFFERENTIAL SYSTEM**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Suspected Area</th>
<th>See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise in rear differential</td>
<td>Oil (Level low or wrong grade)</td>
<td>DIFFERENTIAL OIL</td>
</tr>
<tr>
<td></td>
<td>Ring gear or drive pinion (Worn or chipped)</td>
<td>REAR DIFFERENTIAL CARRIER ASSEMBLY</td>
</tr>
<tr>
<td></td>
<td>Backlash adjustment (Defective)</td>
<td>REAR DIFFERENTIAL CARRIER ASSEMBLY</td>
</tr>
<tr>
<td></td>
<td>Preload adjustment (Defective)</td>
<td>REAR DIFFERENTIAL CARRIER ASSEMBLY</td>
</tr>
<tr>
<td></td>
<td>Tooth contact between ring gear and drive pinion (Defective)</td>
<td>REAR DIFFERENTIAL CARRIER ASSEMBLY</td>
</tr>
<tr>
<td></td>
<td>Bearing (Worn)</td>
<td>REAR DIFFERENTIAL CARRIER ASSEMBLY</td>
</tr>
<tr>
<td>Oil leak from rear differential</td>
<td>Oil (Level too high or wrong grade)</td>
<td>DIFFERENTIAL OIL</td>
</tr>
<tr>
<td></td>
<td>Side gear shaft oil seal (Worn or damaged)</td>
<td>REAR DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL</td>
</tr>
<tr>
<td></td>
<td>Seal packing (Damaged)</td>
<td>REAR DIFFERENTIAL CARRIER ASSEMBLY</td>
</tr>
</tbody>
</table>

**DIFFERENTIAL OIL**

**ON-VEHICLE INSPECTION**

1. **CHECK DIFFERENTIAL OIL**
   a. Stop the vehicle on a level surface.
   b. Using a 10 mm socket hexagon wrench, remove the rear differential filler plug and gasket.

![Fig. 30: Locating Rear Differential Filler Plug](image)

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c. Check that the oil level is between 0 and 5 mm (0 and 0.20 in.) from the bottom lip of the differential filler plug hole.

**NOTE:**
- After changing the oil seal, drive the vehicle and then check the oil level again.
- Too much or too little oil will lead to differential problems.

**HINT:**
If necessary, fill the differential carrier assembly with hypoid gear oil.

**Recommended viscosity:**

**SAE 90**

**Standard oil grade:**

**Hypoid gear oil SX API GL-5**

**Standard differential oil capacity:**

0.45 to 0.55 liters (0.48 to 0.58 US qts., 0.40 to 0.48 imp. qts.)

d. Using a 10 mm socket hexagon wrench, install a new gasket and the rear differential filler plug.

Torque: 39 N*m (398 kgf*cm, 29 ft.*lbf)

**REAR DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL**

**COMPONENTS**
REMOVAL

1. DRAIN DIFFERENTIAL OIL (See REMOVAL)
2. REMOVE TAILPIPE ASSEMBLY
   a. Remove the tailpipe (see EXHAUST PIPE (2AZ-FE) or EXHAUST PIPE (2GR-FE)).
3. REMOVE CENTER EXHAUST ASSEMBLY
a. Remove the center pipe (see **EXHAUST PIPE** (2AZ-FE) or **EXHAUST PIPE** (2GR-FE)).

4. **REMOVE PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY** (See **REMOVAL**)

5. **REMOVE REAR DIFFERENTIAL CARRIER SUB-ASSEMBLY** (See **REMOVAL**)

6. **REMOVE REAR DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL**
   a. Using a SST, tap out the 2 oil seals.

   **SST 09308-00010**

   ![Image of rear differential side gear shaft oil seal removal](image)

   **Fig. 35: Removing Rear Differential Side Gear Shaft Oil Seal**
   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**INSTALLATION**

1. **INSTALL REAR DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL**
   a. Apply a light coat of MP grease to the lip of a new rear differential side gear shaft oil seal.
   b. Using SST and a hammer, tap the 2 rear differential side gear shaft oil seals into the rear differential carrier and differential side bearing retainer according to the specification.

   **SST 09223-00010**

   Standard oil seal tapping amount (A value): 7.2 ±0.5 mm (0.28 ±0.02 in.)

   ![Image of rear differential side gear shaft oil seal installation](image)

   **Fig. 36: Installing Rear Differential Side Gear Shaft Oil Seal**
   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **INSTALL REAR DIFFERENTIAL CARRIER ASSEMBLY** (See **INSTALLATION**)

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3. TEMPORARILY INSTALL PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (See INSTALLATION)
4. TIGHTEN PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (See INSTALLATION)
5. INSPECT AND ADJUST JOINT ANGLE (See INSPECTION)
6. INSTALL CENTER EXHAUST PIPE ASSEMBLY
   a. Install the center pipe (see INSTALLATION (2AZ-FE) or INSTALLATION (2GR-FE)).
7. INSTALL TAILPIPE ASSEMBLY
   a. Install the tailpipe (see INSTALLATION (2AZ-FE) or INSTALLATION (2GR-FE)).
8. ADD DIFFERENTIAL OIL
   a. Add differential oil (see DIFFERENTIAL OIL).
9. INSPECT FOR DIFFERENTIAL OIL LEAK
10. INSPECT FOR EXHAUST GAS LEAK

If gas is leaking, tighten the areas necessary to stop the leak. Replace damaged parts as necessary.

DIAPHRAGM OIL SEAL

COMPONENTS

Fig. 37: Identifying Diaphragm Oil Seal Components With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. DRAIN DIFFERENTIAL OIL
   a. Using a 10 mm socket hexagon wrench, remove the rear differential drain plug and gasket, and drain the oil.
   b. Install a new gasket to the rear differential drain plug.
   c. Using a 10 mm socket hexagon wrench, install the rear differential drain plug and gasket.
Fig. 38: Locating Rear Differential Drain Plug  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (See REMOVAL)
3. REMOVE ELECTROMAGNETIC COUPLING (See DISASSEMBLY)
4. REMOVE 4WD LINEAR SOLENOID (See DISASSEMBLY)
5. REMOVE YOKE (See DISASSEMBLY)
6. REMOVE TRANSMISSION COUPLING CONICAL SPRING WASHER (See DISASSEMBLY)
7. REMOVE TRANSMISSION COUPLING SHIM (See DISASSEMBLY)
8. REMOVE DIAPHRAGM OIL SEAL
   a. Using SST, remove the oil seal from the rear differential carrier.

   SST 09308-10010

Fig. 39: Removing Diaphragm Oil Seal  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL DIAPHRAGM OIL SEAL
   a. Apply a light coat of MP grease No. 2 to the lip of a new diaphragm oil seal.
   b. Using SST and a hammer, tap the diaphragm oil seal into the rear differential carrier according to the specification.

   SST 09710-30021 (09710-03121), 09950-60010 (09951-00570), 09950-70010 (09951-07100)
Standard distance: 7.0 ±0.5 mm (0.28 ±0.02 in.)

Fig. 40: Installing Diaphragm Oil Seal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL TRANSMISSION COUPLING SHIM (See REASSEMBLY)
3. INSTALL TRANSMISSION COUPLING CONICAL SPRING WASHER (See REASSEMBLY)
4. INSTALL YOKE (See REASSEMBLY)
5. INSTALL 4WD LINEAR SOLENOID (See REASSEMBLY)
6. INSTALL ELECTROMAGNETIC COUPLING (See REASSEMBLY)
7. TEMPORARILY INSTALL PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (See INSTALLATION)
8. FULLY TIGHTEN PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (See INSTALLATION)
9. INSPECT AND ADJUST JOINT ANGLE (See INSPECTION)
10. ADD DIFFERENTIAL OIL
    a. Add differential oil (see DIFFERENTIAL OIL).
11. INSPECT FOR DIFFERENTIAL OIL LEAK

If gas is leaking, tighten the areas necessary to stop the leak. Replace damaged parts as necessary.

REAR DIFFERENTIAL CARRIER ASSEMBLY

COMPONENTS
Fig. 41: Identifying Rear Differential Carrier Assembly Replacement Components With Torque Specifications (1 Of 7)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Fig. 42: Identifying Rear Differential Carrier Assembly Replacement Components With Torque Specifications (2 Of 7)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Fig. 43: Identifying Rear Differential Carrier Assembly Replacement Components With Torque Specifications (3 Of 7)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.
Fig. 44: Identifying Rear Differential Carrier Assembly Replacement Components With Torque Specifications (4 Of 7)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Fig. 45: Identifying Rear Differential Carrier Assembly Replacement Components With Torque Specifications (5 Of 7)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Fig. 46: Identifying Rear Differential Carrier Assembly Replacement Components With Torque Specifications (6 Of 7)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.
**REMOVAL**

1. **DRAIN DIFFERENTIAL OIL**
2. **REMOVE REAR WHEEL**
3. **REMOVE FUEL TANK ASSEMBLY**
   a. Remove the fuel tank for 2AZ-FE (see **REMOVAL**).
   b. Remove the fuel tank for 2GR-FE (see **REMOVAL**).
4. **REMOVE TAILPIPE ASSEMBLY**
   a. Remove the tailpipe (see **EXHAUST PIPE** (2AZ-FE) or **EXHAUST PIPE** (2GR-FE)).
5. **REMOVE CENTER EXHAUST PIPE ASSEMBLY**
   a. Remove the center pipe (see **EXHAUST PIPE** (2AZ-FE) or **EXHAUST PIPE** (2GR-FE)).
6. **REMOVE PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY** (See **REMOVAL**)
7. **REMOVE REAR SUSPENSION MEMBER BRACE LH**
   a. Remove the 2 bolts and brace from the suspension member.
8. **REMOVE REAR SUSPENSION MEMBER BRACE RH**

**HINT:**

Use the same procedures described for the LH side.
9. REMOVE REAR DIFFERENTIAL CARRIER SUB-ASSEMBLY
   a. Disconnect the harness clamp.
   b. Remove the breather tube.
   c. Disconnect the connector.

   ![Diagram of Rear Differential Carrier Sub-Assembly]

   **Fig. 49: Identifying Rear Differential Carrier Sub-Assembly**
   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   d. Support the rear differential carrier with a transmission jack or equivalent.
   e. Fix the nuts in place and remove the 2 bolts A and bolt B.

   **NOTE:** Do not loosen the nuts. Loosen the bolts.

   ![Diagram of Rear Differential Carrier Bolts]

   **Fig. 50: Locating Rear Differential Carrier Bolts**
   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   f. Slowly lower the jack and then tilt the rear differential carrier.
g. Set the tip of the tire lever to the position on the rear drive shaft inboard joint shown in the illustration. Then, using the ribbed part of the rear differential carrier as a fulcrum, disconnect the left and right rear drive shafts.

**NOTE:** Do not scratch the rear drive shaft dust cover.

10. **REMOVE REAR DIFFERENTIAL NO. 1 AND NO. 2 SUPPORT**
   a. Remove the 4 bolts and differential No. 1 and No. 2 supports from the differential carrier.
11. REMOVE REAR DIFFERENTIAL SUPPORT
   a. Remove the 4 bolts and differential support from the differential carrier.

DISASSEMBLY

1. FIX DIFFERENTIAL CARRIER SUB-ASSEMBLY
   a. Fix the rear differential carrier in place with the overhaul attachment.

2. REMOVE STUD BOLT
   a. Remove the 4 stud bolts from the transmission coupling.

3. REMOVE DIFFERENTIAL DRAIN PLUG
   a. Using a 10 mm socket hexagon wrench, remove the rear differential drain plug and gasket.

4. REMOVE DIFFERENTIAL FILLER PLUG
   a. Using a 10 mm socket hexagon wrench, remove the rear differential filler plug and gasket.
5. **REMOVE DIFFERENTIAL CARRIER COVER PLUG**
   a. Using an 8 mm socket hexagon wrench, remove rear differential carrier cover plug.

6. **REMOVE DIFFERENTIAL CARRIER COVER BREATHER PLUG**
   a. Using a chisel and hammer, slightly lift up the rear differential carrier cover breather plug.
   b. Using a screwdriver, lightly pry up and remove the rear differential carrier cover breather plug.

7. **INSPECT RUNOUT OF TRANSMISSION COUPLING ASSEMBLY**
a. Install a dial gauge so that it is perpendicular to the inner side of the transmission coupling.

b. Using SST, rotate the transmission coupling assembly forward and backward and measure the vertical runout.

SST 09564-32011

**Maximum vertical runout:**

0.06 mm (0.0024 in.)

c. Install a dial gauge perpendicularly onto the transmission coupling assembly, as shown in the illustration.

d. Using SST, rotate the transmission coupling assembly forward and backward and measure the lateral runout.

SST 09564-32011

**Maximum lateral runout:**

0.07 mm (0.0028 in.)

8. **REMOVE ELECTROMAGNETIC COUPLING**

a. Remove the 4 bolts and, using a plastic-faced hammer, lightly tap the rear differential carrier cover to remove it from the rear differential carrier.

**NOTE:** Set the brass bar on the ribbed part of the rear differential carrier cover.
9. **REMOVE 4WD LINEAR SOLENOID**
   a. Using a snap ring expander, remove the snap ring.

   ![Snap Ring Diagram](image)

   **Fig. 60: Locating Rear Differential Carrier Cover Bolts**
   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   b. Remove the solenoid from the yoke.

   c. Remove the O-ring from the solenoid.

   ![Solenoid Diagram](image)

   **Fig. 61: Removing Snap Ring Using Snap Ring Expander**
   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. **REMOVE YOKE**
    a. Using a 5 mm socket hexagon wrench, remove the 3 bolts and yoke from the differential carrier.
11. REMOVE TRANSMISSION COUPLING CONICAL SPRING WASHER  
a. Remove the spring washer from the differential carrier.

12. REMOVE TRANSMISSION COUPLING SHIM  
a. Remove the shim from the differential carrier.

13. INSPECT DIFFERENTIAL RING GEAR BACKLASH  
a. Insert a dial gauge through the rear differential carrier cover plug hole, and set it perpendicular to the ring gear tooth surface's tip.  
b. Using SST, fix the drive pinion in place.
c. Using SST, rotate the rear differential case forward and backward, and measure the backlash.

SST 09564-32011

Standard backlash:

0.09 to 0.16 mm (0.0034 to 0.0063 in.)

**NOTE:** Measure at 3 or more areas around the circumference of the ring gear.

---

14. **INSPECT DIFFERENTIAL DRIVE PINION PRELOAD**

a. Using SST and a torque wrench, inspect the preload (starting torque) within the differential drive pinion and differential ring gear backlash area.

SST 09556-16011

Standard drive pinion preload:

0.24 to 0.37 N*m (2 to 4 kgf*cm, 2 to 3 in.*lbf)

**NOTE:** For a more accurate measurement, rotate the case bearing forward and backward before measuring.
15. INSPECT TOTAL PRELOAD
   a. Using SST and a torque wrench, inspect the preload (starting torque) with the teeth of the
differential drive pinion and differential ring gear in contact.

   SST 09556-16011

   Standard total preload:

   Standard drive pinion preload plus 0.99 to 1.63 N*m (10 to 17 kgf*cm, 9 to 14 in.*lbf)

   NOTE: For a more accurate measurement, rotate the case bearing forward
and backward before measuring.

16. REMOVE DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL
   a. Using SST, tap out the 2 rear differential side shaft gear oil seals from the rear differential carrier.

   SST 09308-00010
17. REMOVE DIAPHRAGM OIL SEAL
   a. Using SST, remove the diaphragm oil seal from the rear differential carrier.

   **SST 09308-10010**

18. REMOVE DRIVE PINION NUT
   a. Using SST and a hammer, unstake the rear drive pinion nut.

   **SST 09930-00010**

   **NOTE:**
   - Use SST with the tapered part against the shaft side.
   - Do not modify the SST tip with a grinder or equivalent.
   - Fully unstake the rear drive pinion nut
b. Using SST, fix the differential drive pinion in place and remove the rear drive pinion nut from the differential drive pinion.

**SST 09556-16011, 09564-16020**

19. **REMOVE REAR DRIVE PINION FRONT TAPERED ROLLER BEARING**

   a. Using SST, remove the rear drive pinion tapered roller bearing front (inner race) from the rear differential carrier.

   **SST 09556-30010**
20. **REMOVE DIFFERENTIAL SIDE BEARING RETAINER**
   
   a. Remove the 8 bolts.

   ![Fig. 74: Locating Differential Side Bearing Retainer Bolts](image)

   **Fig. 74: Locating Differential Side Bearing Retainer Bolts**
   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   b. Using a brass bar and hammer, lightly tap out the differential side bearing retainer.

   **NOTE:** Set the brass bar on the ribbed part of the differential side bearing retainer.

   ![Fig. 75: Removing Differential Side Bearing Retainer](image)

   **Fig. 75: Removing Differential Side Bearing Retainer**
   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

21. **REMOVE DIFFERENTIAL CASE SUB-ASSEMBLY**
   
   a. Remove the rear differential case from the rear differential carrier.
22. REMOVE DIFFERENTIAL DRIVE PINION
   a. Remove the differential drive pinion from the rear differential carrier.

23. REMOVE DIFFERENTIAL DRIVE PINION BEARING SPACER
   a. Remove the rear differential drive pinion bearing spacer from the differential drive pinion.

24. REMOVE REAR DRIVE PINION REAR TAPERED ROLLER BEARING
   a. Using SST and a press, press out the rear drive pinion tapered roller bearing rear (inner race) from
the differential drive pinion.

SST 09950-00020

NOTE: If the rear differential drive pinion or differential ring gear is damaged, replace them both.

b. Remove the rear differential drive pinion washer.

Fig. 79: Removing Rear Drive Pinion Rear Tapered Roller Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

25. REMOVE REAR DRIVE PINION FRONT TAPERED ROLLER BEARING
   a. Using SST, remove the rear drive pinion tapered roller bearing front (outer race) from the rear
differential carrier.

SST 09612-65014 (09612-01020, 09612-01050)

Fig. 80: Removing Rear Drive Pinion Front Tapered Roller Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

26. REMOVE REAR DRIVE PINION REAR TAPERED ROLLER BEARING
   a. Using a brass bar and hammer, lightly and uniformly tap out the rear drive pinion tapered roller
bearing rear (outer race).

   NOTE: Set the brass bar on the notch.
27. REMOVE DIFFERENTIAL CASE BEARING

SST 09950-60010 (09951-00460), 09950-70010 (09951-07100), 09649-17010 (09951-00510)

a. Using SST and a press, press out the rear differential case bearing RH (outer race) and rear differential side gear shaft plate washer from the rear differential carrier.

SST 09950-60010, 09950-70010 (09951-07100)

b. Using SST and a press, press out the rear differential case bearing LH (outer race) and rear differential side gear shaft plate washer from the differential side bearing retainer.

SST 09950-60010 (09951-00460), 09950-70010 (09951-07100), 09649-17010
28. REMOVE DIFFERENTIAL CASE BEARING
   a. Using SST, remove the rear differential case bearing RH (inner race) from the rear differential case.

      SST 09950-40011 (09951-04010, 09952-04010, 09953-04020, 09954-04010, 09955-04061, 09957-04010, 09958-04011), 09950-60010 (09951-00320, 09955-04071)

      **NOTE:** Before using SST center bolt (09953-04020), apply hypoid gear oil to its threads and tip.

   b. Using SST, remove the rear differential case bearing LH (inner race) from the rear differential case.

      SST 09950-40011 (09951-04010, 09952-04010, 09953-04020, 09954-04010, 09955-04071, 09957-04010, 09958-04011), 09950-60010 (09951-00320)

      **NOTE:** Before using SST center bolt (09953-04020), apply hypoid gear oil to its threads and tip.

   **HINT:**

   If the race is remains on the rear differential case, repeat the step above to remove the race.
29. REMOVE DIFFERENTIAL RING GEAR
   a. Place matchmarks on the rear differential case and differential ring gear.
   b. Remove the 10 bolts.
   c. Using a plastic-faced hammer, lightly tap the outer circumference of the differential ring gear to remove it from the rear differential case.

30. REMOVE DIFFERENTIAL BREather PLUG OIL DEFLECTOR
   a. Using a 5 mm socket hexagon wrench, remove the 2 bolts and rear differential breather plug oil deflector.
31. REMOVE STRAIGHT PIN

![Fig. 88: Locating Straight Pins](image1)

**Fig. 88: Locating Straight Pins**
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

a. Using pliers, remove the 4 straight pins from the rear differential carrier.

32. REMOVE ELBOW TUBE
33. REMOVE WIRING HARNESS CLAMP BRACKET
   a. Remove the bolt and bracket.

**REASSEMBLY**

1. INSTALL WIRING HARNESS CLAMP BRACKET
   a. Install the bracket with the bolt.
2. INSTALL ELBOW TUBE
3. INSTALL STRAIGHT PIN

![Fig. 89: Locating Straight Pins](image2)

**Fig. 89: Locating Straight Pins**
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

a. Using a plastic hammer, install the 4 straight pins to the rear differential carrier.
b. Thoroughly clean oil and water from the surface of the rear differential case that will face the differential ring gear.
4. **INSTALL DIFFERENTIAL BREATHER PLUG OIL DEFLECTOR**
   a. Using a 5 mm socket hexagon wrench, install the rear differential breather plug oil deflector with the 2 bolts.

   Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

   **NOTE:** Install it so that the arrow mark faces the front (transmission coupling side) of the vehicle.

   ![Fig. 90: Locating Differential Breather Plug Oil Deflector Bolts](image)

   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **INSTALL DIFFERENTIAL RING GEAR**
   a. Align the matchmarks on the rear differential case and differential ring gear, and install the differential ring gear.
   
   b. Install 10 new differential case bolts.

   Torque: 90 N*m (918 kgf*cm, 66 ft.*lbf)

   **NOTE:**
   - The new bolts are coated with heat resistant oil. Do not wash it off.
   - Install the rear differential case bolts by tightening diametrically opposite bolts uniformly in several passes.

   ![Fig. 91: Locating Differential Ring Gear Bolts](image)
6. INSTALL DIFFERENTIAL CASE BEARING

   SST 09223-50010

   **NOTE:** If the rear differential case bearing inner race is damaged, replace it with a new one.

   ![Fig. 92: Installing Rear Differential Case Bearing RH (Inner Race)](image1)

   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   b. Using SST and a press, press-fit the rear differential case bearing LH (inner race) to the rear differential case.

   SST 09223-50010

   **NOTE:** If the rear differential case bearing inner race is damaged, replace it with a new one.

   ![Fig. 93: Installing Rear Differential Case Bearing LH (Inner Race)](image2)

   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. INSTALL DIFFERENTIAL CASE BEARING
a. Using SST and a press, press-fit the rear differential side gear shaft washer and rear differential case bearing LH (outer race) to the differential side bearing retainer.

SST 09950-60010 (09951-00510, 09951-00620, 09952-06010), 09950-70010 (09951-07150)

NOTE:

- Install each rear differential side gear shaft washer to the place it was removed from.
- When replacing a bearing, replace the inner and outer races as a set.
- Install the rear differential side gear shaft oil seal after performing the teeth contact inspection and backlash adjustment.

Fig. 94: Installing Rear Differential Case Bearing LH (Outer Race)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Using SST and a press, press-fit the rear differential side gear shaft washer and rear differential case bearing RH (outer race) to the rear differential carrier.

SST 09950-60010 (09951-00510, 09951-00620, 09952-06010), 09950-09951-07150

NOTE:

- Install each rear differential side gear shaft washer to the place it was removed from.
- When replacing a bearing, replace the inner and outer races as a set.
- Install the rear differential side gear shaft oil seal after performing the teeth contact inspection and backlash adjustment.
8. **INSTALL REAR DRIVE PINION FRONT TAPERED ROLLER BEARING**
   
   a. Using SST and a press, press-fit the rear drive pinion tapered roller bearing front (outer race) to the rear differential carrier.

   SST 09950-60010 (09951-00550), 09950-60020 (09951-00680), 09950-70010 (09951-07100)

9. **INSTALL REAR DRIVE PINION REAR TAPERED ROLLER BEARING**
   
   a. Using SST, bolts, nuts and washers, install the rear drive pinion tapered roller bearing rear (outer race) to the rear differential carrier.

   SST 09950-60010 (09951-00600), 09950-60020 (09951-00680, 09951-00750)

   **HINT:**

   Use M12 x P1.25 bolts with shaft lengths of 186 mm (part No. 90101-12159) and M12 x P1.25 nuts (part No. 90179-12051) for the installation.
10. **INSTALL REAR DRIVE PINION REAR TAPERED ROLLER BEARING**
   a. Install the rear differential drive pinion washer to the differential drive pinion.
   
   **NOTE:** Install each rear differential drive pinion washer to the place it was removed from.
   
   b. Using SST and a press, press-fit the tapered roller rear (inner race) to the differential drive pinion.
   
   **SST 09506-30012**

11. **ADJUST DIFFERENTIAL DRIVE PINION PRELOAD**
   a. Install the differential drive pinion (with rear drive pinion tapered roller bearing rear inner race) to the rear differential carrier.
   b. Install the rear drive pinion tapered roller bearing front inner race and a new rear drive pinion nut to the differential drive pinion.

   **NOTE:**
   - New bearings are coated with anti-rust oil. If using new bearings, do not wash it off.
   - If reusing a bearing, coat it with hypoid gear oil SX.
c. Using SST, tighten a new rear drive pinion nut a little at a time until the specified preload is reached. Do not exceed the torque limit shown below.

**SST 09556-16011, 09564-16020**

**Torque:**

- **245 N*m (2,500 kgf*cm, 181 ft.*lbf)** for use without SST
- **223 N*m (2,273 kgf*cm, 164 ft.*lbf)** for use with SST

**Fig. 99: Tightening Rear Drive Pinion Nut**

*Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.*

**HINT:**

Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)

d. Using SST and a torque wrench, measure the starting torque of the differential drive pinion.

**SST 09556-16011**

**Standard drive pinion preload (start torque)**

**STANDARD DRIVE PINION PRELOAD (START TORQUE)**

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Preload</th>
</tr>
</thead>
<tbody>
<tr>
<td>New bearing</td>
<td>1.31 to 2.18 N<em>m (13 to 22 kgf</em>cm, 12 to 19 in.*lbf)</td>
</tr>
<tr>
<td>Reused bearing</td>
<td>0.24 to 0.37 N<em>m (2 to 4 kgf</em>cm, 2 to 3 in.*lbf)</td>
</tr>
</tbody>
</table>
12. **INSTALL DIFFERENTIAL CASE**
   a. Install the rear differential case to the rear differential carrier.

13. **INSTALL DIFFERENTIAL SIDE BEARING RETAINER**
   a. Using a scraper and wire brush, clean the seal packing from the rear differential carrier and differential side bearing retainer.

   **NOTE:**
   - For a more accurate measurement, rotate the bearing forward and backward before inspecting.
   - Record the preload measurement for use with the total preload inspection.

   **NOTE:**
   - Do not scratch the installation area.

b. Install the differential side bearing retainer to the rear differential carrier with the 8 bolts.

   **Torque:** 34 N*m (350 kgf*cm, 25 ft.*lbf)
14. ADJUST DIFFERENTIAL RING GEAR BACKLASH
   a. Insert a dial gauge through the rear differential carrier cover plug hole, and set it perpendicular to the ring gear tooth surface's tip.
   b. Using SST, fix the drive pinion in place.
      SST 09556-16011
   c. Using SST, rotate the rear differential case forward and backward, and measure the backlash.
      SST 09564-16020
   
      NOTE: Measure at 3 or more areas around the circumference of the ring gear.
   
   d. If the result is not within the specified range, select washers that are thicker or thinner as necessary, where the thickness for the left and right side is the same. Then perform the rear differential case bearing outer race installation.

   HINT:
   
   • If the backlash is small, select a thick washer for the RH side and a thin washer for the LH side.
   • If the backlash is large, select a thin washer for the RH side and a thick washer for the LH side.
Rear differential side gear shaft washer

### REAR DIFFERENTIAL SIDE GEAR SHAFT WASHER THICKNESS SPECIFICATION

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Thickness mm (in.)</th>
<th>Identifying Mark</th>
<th>Part No.</th>
<th>Thickness mm (in.)</th>
<th>Identifying Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>90564-37022</td>
<td>1.59 to 1.61 (0.0625 to 0.0633)</td>
<td>A0</td>
<td>90564-37040</td>
<td>2.13 to 2.15 (0.0839 to 0.0846)</td>
<td>B8</td>
</tr>
<tr>
<td>90564-37023</td>
<td>1.62 to 1.64 (0.0637 to 0.0646)</td>
<td>A1</td>
<td>90564-37041</td>
<td>2.16 to 2.18 (0.0850 to 0.0858)</td>
<td>B9</td>
</tr>
<tr>
<td>90564-37024</td>
<td>1.65 to 1.67 (0.0650 to 0.0657)</td>
<td>A2</td>
<td>90564-37042</td>
<td>2.19 to 2.21 (0.0862 to 0.0870)</td>
<td>C0</td>
</tr>
<tr>
<td>90564-37025</td>
<td>1.68 to 1.70 (0.0661 to 0.0669)</td>
<td>A3</td>
<td>90564-37043</td>
<td>2.22 to 2.24 (0.0874 to 0.0882)</td>
<td>C1</td>
</tr>
<tr>
<td>90564-37026</td>
<td>1.71 to 1.73 (0.0673 to 0.0681)</td>
<td>A4</td>
<td>90564-37044</td>
<td>2.25 to 2.27 (0.0886 to 0.0894)</td>
<td>C2</td>
</tr>
<tr>
<td>90564-37027</td>
<td>1.74 to 1.76 (0.0685 to 0.0693)</td>
<td>A5</td>
<td>90564-37045</td>
<td>2.28 to 2.30 (0.0898 to 0.0906)</td>
<td>C3</td>
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<tr>
<td>90564-37028</td>
<td>1.77 to 1.79 (0.0697 to 0.0705)</td>
<td>A6</td>
<td>90564-37046</td>
<td>2.31 to 2.33 (0.0909 to 0.0917)</td>
<td>C4</td>
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<tr>
<td>90564-37029</td>
<td>1.80 to 1.82 (0.0709 to 0.0717)</td>
<td>A7</td>
<td>90564-37047</td>
<td>2.34 to 2.36 (0.0921 to 0.0929)</td>
<td>C5</td>
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<tr>
<td>90564-37030</td>
<td>1.83 to 1.85 (0.0720 to 0.0728)</td>
<td>A8</td>
<td>90564-37048</td>
<td>2.37 to 2.39 (0.0933 to 0.0941)</td>
<td>C6</td>
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<tr>
<td>90564-37031</td>
<td>1.86 to 1.88 (0.0732 to 0.0740)</td>
<td>A9</td>
<td>90564-37049</td>
<td>2.40 to 2.42 (0.0945 to 0.0953)</td>
<td>C7</td>
</tr>
<tr>
<td>90564-37032</td>
<td>1.89 to 1.91 (0.0744 to 0.0752)</td>
<td>B0</td>
<td>90564-37050</td>
<td>2.43 to 2.45 (0.0957 to 0.0965)</td>
<td>C8</td>
</tr>
<tr>
<td>90564-37033</td>
<td>1.92 to 1.94 (0.0756 to 0.0764)</td>
<td>B1</td>
<td>90564-37051</td>
<td>2.46 to 2.48 (0.0969 to 0.0976)</td>
<td>C9</td>
</tr>
<tr>
<td>90564-37034</td>
<td>1.95 to 1.97 (0.0768 to 0.0776)</td>
<td>B2</td>
<td>90564-37052</td>
<td>2.49 to 2.51 (0.0980 to 0.0988)</td>
<td>D0</td>
</tr>
<tr>
<td>90564-</td>
<td>1.98 to 2.00 (0.0780 to 0.0788)</td>
<td>B3</td>
<td>90564-</td>
<td>2.52 to 2.54 (0.0992 to 0.0999)</td>
<td>D1</td>
</tr>
</tbody>
</table>
15. **INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION**

a. Remove the 8 bolts and differential side bearing retainer from the rear differential carrier.
b. Remove the rear differential carrier case.
c. Uniformly apply a light coat of prussian blue on both sides of the differential ring gear teeth.
d. Install the rear differential case.
e. Temporarily install the differential side bearing retainer to the differential carrier with the 8 bolts.
f. Rotate the differential side pinion several times.
g. Remove the 8 bolts and rear differential side bearing retainer from the differential carrier.
h. Check the tooth contact pattern of the differential drive pinion and differential ring gear.

![Fig. 104: Identifying Differential Ring Gear Tooth Contact Pattern](image)

**NOTE:** Check the tooth contact pattern at 2 or more positions around circumference of the differential ring gear.

i. Perform the following procedures for face or flank contact.
   1. Select washers that are thicker or thinner as necessary, where the thickness for the left and right side is the same. Then install the rear differential case bearing outer race.(*1)
   2. Repeat the differential ring gear and differential drive pinion tooth contact pattern inspection.

**HINT:**

<table>
<thead>
<tr>
<th>37035</th>
<th>to 0.0787</th>
<th>37053</th>
<th>to 0.1000</th>
</tr>
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<tbody>
<tr>
<td>90564-37036</td>
<td>2.02 to 2.04 (0.0795 to 0.0803)</td>
<td>B4</td>
<td>90564-37054</td>
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<tr>
<td>90564-37037</td>
<td>2.04 to 2.06 (0.0803 to 0.0811)</td>
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<td>90564-37055</td>
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<tr>
<td>90564-37038</td>
<td>2.07 to 2.09 (0.0815 to 0.0823)</td>
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<tr>
<td>90564-37039</td>
<td>2.10 to 2.12 (0.0827 to 0.0835)</td>
<td>B7</td>
<td>90564-37057</td>
</tr>
</tbody>
</table>
If the tooth contact pattern is not correct, repeat* 1.

3. Repeat the differential ring gear and differential drive pinion backlash inspection.

HINT:

If the differential ring gear and differential drive pinion backlash is not as specified, replace the differential ring gear and differential drive pinion with new ones.

j. Perform the following procedures for heel or toe contact.

1. Select a drive pinion washer again and perform the rear drive pinion tapered roller bearing rear installation.

### Rear differential drive pinion washer

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Thickness (mm)</th>
<th>Identifying Mark</th>
<th>Part No.</th>
<th>Thickness (mm)</th>
<th>Identifying Mark</th>
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</thead>
<tbody>
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<td>90564-35041</td>
<td>1.695 to 1.705 (0.0667 to 0.0671)</td>
<td>41</td>
<td>90564-35071</td>
<td>1.955 to 1.965 (0.0770 to 0.0774)</td>
<td>71</td>
</tr>
<tr>
<td>90564-35042</td>
<td>1.705 to 1.715 (0.0671 to 0.0675)</td>
<td>42</td>
<td>90564-35072</td>
<td>1.965 to 1.975 (0.0774 to 0.0778)</td>
<td>72</td>
</tr>
<tr>
<td>90564-35043</td>
<td>1.715 to 1.725 (0.0675 to 0.0679)</td>
<td>43</td>
<td>90564-35073</td>
<td>1.975 to 1.985 (0.0778 to 0.0781)</td>
<td>73</td>
</tr>
<tr>
<td>90564-35044</td>
<td>1.725 to 1.735 (0.0679 to 0.0683)</td>
<td>44</td>
<td>90564-35074</td>
<td>1.985 to 1.995 (0.0781 to 0.0785)</td>
<td>74</td>
</tr>
<tr>
<td>90564-35045</td>
<td>1.735 to 1.745 (0.0683 to 0.0687)</td>
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<td>90564-35075</td>
<td>1.995 to 2.005 (0.0785 to 0.0789)</td>
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<td>90564-35046</td>
<td>1.745 to 1.755 (0.0687 to 0.0690)</td>
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<td>90564-35076</td>
<td>2.005 to 2.015 (0.0789 to 0.0793)</td>
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<tr>
<td>90564-35047</td>
<td>1.755 to 1.765 (0.0690 to 0.0695)</td>
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<td>90564-35077</td>
<td>2.015 to 2.025 (0.0793 to 0.0797)</td>
<td>77</td>
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<tr>
<td>90564-35048</td>
<td>1.765 to 1.775 (0.0695 to 0.0699)</td>
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<td>90564-35078</td>
<td>2.025 to 2.035 (0.0797 to 0.0801)</td>
<td>78</td>
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<tr>
<td>90564-35049</td>
<td>1.775 to 1.785 (0.0699 to 0.0703)</td>
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<td>90564-35079</td>
<td>2.035 to 2.045 (0.0801 to 0.0805)</td>
<td>79</td>
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<tr>
<td>90564-35050</td>
<td>1.785 to 1.795 (0.0703 to 0.0707)</td>
<td>50</td>
<td>90564-35080</td>
<td>2.045 to 2.055 (0.0805 to 0.0809)</td>
<td>80</td>
</tr>
<tr>
<td>90564-35051</td>
<td>1.795 to 1.805 (0.0707 to 0.0711)</td>
<td>51</td>
<td>90564-35081</td>
<td>2.055 to 2.065 (0.0809 to 0.0813)</td>
<td>81</td>
</tr>
<tr>
<td>90564-35052</td>
<td>1.805 to 1.815 (0.0711 to 0.0715)</td>
<td>52</td>
<td>90564-35082</td>
<td>2.065 to 2.075 (0.0813 to 0.0817)</td>
<td>82</td>
</tr>
<tr>
<td>90564-35053</td>
<td>1.815 to 1.825 (0.0715 to 0.0719)</td>
<td>53</td>
<td>90564-35083</td>
<td>2.075 to 2.085 (0.0817 to 0.0821)</td>
<td>83</td>
</tr>
</tbody>
</table>
16. **INSPECT TOTAL PRELOAD**
   a. Using SST and a torque wrench, measure the starting torque with the teeth of the differential drive pinion and differential ring gear in contact.

   **SST 09556-16011**

   **Standard total preload:**

   **Standard drive pinion preload plus**

   **DRIVE PINION PRELOAD SPECIFICATION**

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Preload</th>
</tr>
</thead>
<tbody>
<tr>
<td>New bearing</td>
<td>1.18 to 1.63 N<em>m (12 to 17 kgf</em>cm, 10 to 14 in.*lbf)</td>
</tr>
<tr>
<td>Reused bearing</td>
<td>0.99 to 1.63 N<em>m (10 to 17 kgf</em>cm, 9 to 14 in.*lbf)</td>
</tr>
</tbody>
</table>
b. If the results are not within the specification, perform the procedures below.
   1. Select a side gear shaft washer for the RH side again, and then perform the rear differential case bearing outer race installation (RH side only).
   2. Repeat the total preload inspection.
   3. Repeat the ring gear backlash inspection.
   4. Repeat the differential ring gear and drive pinion tooth contact pattern inspection.

17. **REMOVE DIFFERENTIAL SIDE BEARING RETAINER**
   a. Remove the 8 bolts and differential side bearing retainer from the rear differential carrier.

18. **REMOVE DIFFERENTIAL CASE**
   a. Remove the rear differential case from the rear differential carrier.

19. **REMOVE DIFFERENTIAL DRIVE PINION**

20. **INSTALL DIFFERENTIAL DRIVE PINION BEARING SPACER**
   a. Install a new rear differential drive pinion bearing spacer to the differential drive pinion.

21. **INSTALL DIFFERENTIAL DRIVE PINION**
a. Install the differential drive pinion to the rear differential carrier.

22. INSTALL REAR DRIVE PINION NUT
   a. Apply hypoid gear oil LSD to the threads of the rear drive pinion nut.

   ![Fig. 107: Installing Differential Drive Pinion To Rear Differential Carrier](image)

   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Install a new rear drive pinion nut to the differential drive pinion. Using SST, tighten the nut while confirming the preload.

   SST 09556-16011, 09564-16020

   SST 09564-16020

   Torque:

   245 N*m (2,500 kgf*cm, 181 ft.*lbf) for use without SST

   223 N*m (2,273 kgf*cm, 164 ft.*lbf) for use with SST

   ![Fig. 108: Tightening Rear Drive Pinion Nut](image)

   Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   HINT:

   Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).
23. **ADJUST DIFFERENTIAL DRIVE PINION PRELOAD**

   a. Using SST and a torque wrench, inspect the starting torque.

   **SST 09556-16011**

   **Standard drive pinion preload**

   **DRIVE PINION PRELOAD SPECIFICATION**

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Preload</th>
</tr>
</thead>
<tbody>
<tr>
<td>New bearing</td>
<td>1.31 to 2.18 N*m (13 to 22 kgf*cm, 12 to 19 in.*lbf)</td>
</tr>
<tr>
<td>Reused bearing</td>
<td>0.24 to 0.37 N*m (2 to 4 kgf*cm, 2 to 3 in.*lbf)</td>
</tr>
</tbody>
</table>

   **Fig. 109: Inspecting Differential Drive Pinion Preload**

  Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   **NOTE:**

   - For a more accurate measurement, rotate the bearing forward and backward before adjusting.
   - Adjust it so that it matches the drive pinion temporary adjustment starting torque.

   b. If the preload is insufficient, use SST to tighten the drive pinion nut 5 to 10° at a time. Measure the starting torque and repeat the adjustment as necessary until the preload matches the specified, torque.

   **SST 09564-16020**

   c. If the tightening torque of the rear drive pinion nut exceeds 245 N\*m \{2500 kgf\*cm\} but the preload is still insufficient, loosen the rear drive pinion nut. Then check if the rear drive pinion nut and differential drive pinion screw threads are damaged.

   d. If there is no defect, replace the rear drive differential drive pinion bearing spacer, apply hypoid gear oil LSD to its threads and repeat the procedure above.
24. INSTALL DIFFERENTIAL CASE
25. INSTALL DIFFERENTIAL SIDE BEARING RETAINER
   a. Install the differential side bearing retainer to the rear differential carrier with the 8 bolts.

   Torque: 34 N*m (350 kgf*cm, 25 ft.*lbf)

26. INSPECT DIFFERENTIAL RING GEAR BACKLASH
27. INSPECT TOTAL PRELOAD
   a. Using SST and a torque wrench, measure the starting torque with the teeth of the differential drive pinion and differential ring gear in contact.

   SST 09556-16011
Standard total preload:

Standard drive pinion preload plus

**DRIVE PINION PRELOAD SPECIFICATION**

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Preload</th>
</tr>
</thead>
<tbody>
<tr>
<td>New bearing</td>
<td>1.18 to 1.90 N<em>m (12 to 19 kgf</em>cm, 10 to 17 in.(^{*})lbf)</td>
</tr>
<tr>
<td>Reused bearing</td>
<td>0.99 to 1.63 N<em>m (10 to 17 kgf</em>cm, 9 to 14 in.(^{*})lbf)</td>
</tr>
</tbody>
</table>

**NOTE:** For a more accurate measurement, rotate the case bearing forward and backward before measuring.

b. If the results are not within the specified range, select a rear differential side gear shaft washer for the RH side again, and then perform the rear differential case bearing outer race installation (RH side only).

**NOTE:** If using a different rear differential side gear shaft washer, adjust the ring gear backlash. Then adjust the total preload.

28. **REMOVE DIFFERENTIAL SIDE BEARING RETAINER**
   a. Remove the 8 bolts and side bearing retainer from the rear differential carrier.

29. **INSTALL DIFFERENTIAL SIDE BEARING RETAINER**
   a. Using white gasoline, remove grease and oil from the alignment surfaces of the rear differential carrier and differential side bearing retainer.
   b. Apply seal packing to the areas indicated in the illustration of the differential side bearing retainer.

**Seal Packing:**

**Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent**

**NOTE:**
- Apply seal packing in a continuous line 2 to 3 mm (0.08 to 0.12 in.) in diameter.
c. Install the differential side bearing retainer to the rear differential carrier with the 8 bolts.

Torque: 34 N*m (350 kgf*cm, 25 ft.*lbf)

**NOTE:** After installing the cover, do not add oil or drive the vehicle, and leave it alone for 1 hour or more. Also, avoid sudden acceleration and deceleration for 12 hours or more.

---

30. **INSPECT TOTAL PRELOAD**

   a. Using SST and a torque wrench, inspect the starting torque with the teeth of the differential drive pinion and differential ring gear in contact.

   **SST 09556-16011**

   **Standard total preload:**

   Standard drive pinion preload plus
DRIVE PINION PRELOAD SPECIFICATION

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Preload</th>
</tr>
</thead>
<tbody>
<tr>
<td>New bearing</td>
<td>1.18 to 1.90 N<em>m (12 to 19 kgf</em>cm, 10 to 17 in.*lbf)</td>
</tr>
<tr>
<td>Reused bearing</td>
<td>0.99 to 1.63 N<em>m (10 to 17 kgf</em>cm, 9 to 14 in.*lbf)</td>
</tr>
</tbody>
</table>

Fig. 114: Inspecting Differential Drive Pinion Preload
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: For a more accurate measurement, rotate the case bearing forward and backward before inspecting.

31. INSPECT DIFFERENTIAL RING GEAR BACKLASH
   a. Insert a dial gauge through the rear differential carrier cover plug hole, and set it perpendicular to the ring gear tooth surface's tip.
   b. Using SST, fix the drive pinion in place.

   SST 09556-16011

   c. Using SST, rotate the rear differential case forward and backward, and inspect the backlash.

   SST 09564-16020

   Standard backlash:

   0.09 to 0.16 mm (0.0004 to 0.0063 in.)

   NOTE: Inspect at 3 or more areas around the circumference of the ring gear.
32. INSTALL REAR DRIVE PINION NUT  
   a. Using a chisel and hammer, stake the rear drive pinion nut.

33. INSTALL DIAPHRAGM OIL SEAL  
   a. Apply a light coat of MP grease No. 2 to the lip of a new diaphragm oil seal.  
   b. Using SST and a hammer, tap the diaphragm oil seal into the rear differential carrier according to the specification.

   SST 09710-30021 (09710-03121), 09950-60010 (09951-00570), 09950-70010 (09951-07100)

   Standard distance: 7.0 ±0.5 mm (0.28 ±0.02 in.)

34. INSTALL DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL  
   a. Apply a light coat of MP grease No. 2 to the lip of a new rear differential side gear shaft oil seal.  
   b. Using SST and a hammer, tap the 2 rear differential side gear shaft oil seals into the rear differential carrier and differential side bearing retainer according to the specification.

   SST 09223-00010

   Standard distance:
7.2 ± 0.5 mm (0.28 ± 0.02 in.)

![Fig. 117: Installing Rear Differential Side Gear Shaft Oil Seals](image)

35. **INSTALL TRANSMISSION COUPLING SHIM**

   a. Measure each of the dimensions.

   **HINT:**
   - Dimension A: Bearing axis distance
   - Dimension B: Drive pinion axis distance

   b. Select a transmission coupling shim based on the difference between dimensions A and B, and install the shim.

![Fig. 118: Identifying Bearing And Drive Pinion Axis Distance](image)

**Transmission coupling shim**

<p>| TRANSMISSION COUPLING SHIM THICKNESS SPECIFICATION |
|---------------------------------|------------------|-----------------|
| Difference of dimension A and B mm | Part No.  | Thickness mm (in.) | Identifying Mark |
| (in.)  |         |                  |                 |
| 3.96 to 4.01 (0.156 to 0.158) | 90564-25024 | 1.98 to 2.02 (0.078 to 0.080) | 1 |</p>
<table>
<thead>
<tr>
<th>Measurement</th>
<th>Part Number</th>
<th>Range</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.26 to 4.31</td>
<td>90564-25025</td>
<td>2.28 to 2.32</td>
<td>2</td>
</tr>
<tr>
<td>(0.168 to 0.170)</td>
<td></td>
<td>(0.090 to 0.091)</td>
<td></td>
</tr>
<tr>
<td>4.56 to 4.61</td>
<td>90564-25026</td>
<td>2.58 to 2.62</td>
<td>3</td>
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<tr>
<td>(0.180 to 0.181)</td>
<td></td>
<td>(0.102 to 0.103)</td>
<td></td>
</tr>
<tr>
<td>3.81 to 3.86</td>
<td>90564-25027</td>
<td>1.83 to 1.87</td>
<td>4</td>
</tr>
<tr>
<td>(0.150 to 0.152)</td>
<td></td>
<td>(0.072 to 0.074)</td>
<td></td>
</tr>
<tr>
<td>4.11 to 4.16</td>
<td>90564-25028</td>
<td>2.13 to 2.17</td>
<td>5</td>
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<tr>
<td>(0.162 to 0.164)</td>
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<td>(0.084 to 0.085)</td>
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</tr>
<tr>
<td>4.41 to 4.46</td>
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<td>2.43 to 2.47</td>
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<tr>
<td>(0.174 to 0.176)</td>
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<td>(0.096 to 0.097)</td>
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</tr>
<tr>
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<td>1.73 to 1.77</td>
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<tr>
<td>(0.146 to 0.148)</td>
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<td>(0.068 to 0.070)</td>
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</tr>
<tr>
<td>3.76 to 3.81</td>
<td>90564-25032</td>
<td>1.78 to 1.82</td>
<td>9</td>
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<tr>
<td>(0.148 to 0.150)</td>
<td></td>
<td>(0.070 to 0.072)</td>
<td></td>
</tr>
<tr>
<td>3.86 to 3.91</td>
<td>90564-25033</td>
<td>1.88 to 1.92</td>
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<tr>
<td>(0.151 to 0.154)</td>
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<td>(0.074 to 0.076)</td>
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</tr>
<tr>
<td>3.91 to 3.96</td>
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<tr>
<td>(0.154 to 0.156)</td>
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<td>(0.076 to 0.078)</td>
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</tr>
<tr>
<td>4.01 to 4.06</td>
<td>90564-25035</td>
<td>2.03 to 2.07</td>
<td>12</td>
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<tr>
<td>(0.158 to 0.160)</td>
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<td>(0.080 to 0.081)</td>
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</tr>
<tr>
<td>4.06 to 4.11</td>
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<td>2.08 to 2.12</td>
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<tr>
<td>(0.160 to 0.162)</td>
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<td>(0.082 to 0.083)</td>
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</tr>
<tr>
<td>4.16 to 4.21</td>
<td>90564-25037</td>
<td>2.18 to 2.22</td>
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<tr>
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<td>(0.086 to 0.087)</td>
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</tr>
<tr>
<td>4.21 to 4.26</td>
<td>90564-25038</td>
<td>2.23 to 2.27</td>
<td>15</td>
</tr>
<tr>
<td>(0.166 to 0.168)</td>
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<td>(0.088 to 0.089)</td>
<td></td>
</tr>
<tr>
<td>4.31 to 4.36</td>
<td>90564-25039</td>
<td>2.33 to 2.37</td>
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<tr>
<td>(0.170 to 0.172)</td>
<td></td>
<td>(0.092 to 0.093)</td>
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</tr>
<tr>
<td>4.36 to 4.41</td>
<td>90564-25040</td>
<td>2.38 to 2.42</td>
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</tr>
<tr>
<td>(0.172 to 0.174)</td>
<td></td>
<td>(0.094 to 0.095)</td>
<td></td>
</tr>
<tr>
<td>4.46 to 4.51</td>
<td>90564-25041</td>
<td>2.48 to 2.52</td>
<td>18</td>
</tr>
<tr>
<td>(0.176 to 0.178)</td>
<td></td>
<td>(0.098 to 0.099)</td>
<td></td>
</tr>
<tr>
<td>4.51 to 4.56</td>
<td>90564-25042</td>
<td>2.53 to 2.57</td>
<td>19</td>
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<tr>
<td>(0.178 to 0.180)</td>
<td></td>
<td>(0.100 to 0.101)</td>
<td></td>
</tr>
<tr>
<td>4.61 to 4.66</td>
<td>90564-25043</td>
<td>2.63 to 2.67</td>
<td>20</td>
</tr>
<tr>
<td>(0.181 to 0.183)</td>
<td></td>
<td>(0.104 to 0.105)</td>
<td></td>
</tr>
<tr>
<td>4.66 to 4.71</td>
<td>90564-25044</td>
<td>2.68 to 2.72</td>
<td>21</td>
</tr>
<tr>
<td>(0.183 to 0.185)</td>
<td></td>
<td>(0.106 to 0.107)</td>
<td></td>
</tr>
</tbody>
</table>

36. **REMOVE TRANSMISSION COUPLING CONICAL SPRING WASHER**
   
a. Install the transmission coupling conical spring washer to the rear differential carrier.

**NOTE:** Install the transmission coupling conical spring washer so that the green marking (protruding part) is facing the front of the vehicle
37. INSTALL YOKE  
   a. Using a 5 mm socket hexagon wrench, install the yoke with the 3 bolt.  
      
      Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

38. INSTALL 4WD LINEAR SOLENOID  
   a. Install a new O-ring to the solenoid.  
      
      NOTE: Do not damage or twist the O-ring.

   b. Install the solenoid to the yoke.  
   c. Install the snap ring.

39. INSTALL ELECTROMAGNETIC COUPLING  
   a. Using white gasoline, remove grease and oil from the alignment surfaces of the rear differential carrier and transmission coupling.  
   b. Apply seal packing 1281 to the areas indicated in the illustration of the transmission coupling.  
   c. Apply seal packing 1281 in a continuous line 2 to 3 mm (0.08 to 0.12 in.) in diameter.  
   d. Perform the installation with 3 minutes of applying seal packing 1281.
c. Install the rear differential carrier cover to the rear differential carrier assembly with the 4 bolts.

   Torque: 19.6 N*m (200 kgf*cm, 14 ft.*lbf)

40. **INSTALL DIFFERENTIAL CARRIER COVER BREATHER PLUG**
   a. Using a plastic-faced hammer, tap in the breather plug.

   **SST 09612-07010 (09612-10061)**
41. **INSTALL DIFFERENTIAL CARRIER COVER PLUG**
   
a. Using an 8 mm socket hexagon wrench, install a new rear differential carrier cover plug.

   Torque: 30 N*m (306 kgf*cm, 22 ft.*lbf)

   ![Fig. 123: Locating Rear Differential Carrier Cover Plug](image)

  Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

42. **INSTALL DIFFERENTIAL FILLER PLUG**
   
a. Install a new gasket to the rear differential filler plug.
   
b. Using a 10 mm socket hexagon wrench, install the rear differential filler plug.

   Torque: 39 N*m (400 kgf*cm, 29 ft.*lbf)

   ![Fig. 124: Locating Rear Differential Filler Plug](image)

  Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

43. **INSTALL DIFFERENTIAL DRAIN PLUG**
   
a. Install a new gasket to the rear differential drain plug.
   
b. Using a 10 mm socket hexagon wrench, install the rear differential drain plug.

   Torque: 39 N*m (400 kgf*cm, 29 ft.*lbf)
44. **INSPECT RUNOUT OF TRANSMISSION COUPLING ASSEMBLY**
   
   a. Install a dial gauge so that it is perpendicular to the inner side of the transmission coupling.
   b. Using SST, rotate the transmission coupling forward and backward and measure the vertical runout.

   **SST 09564-16020**

   Maximum vertical runout:

   0.06 mm (0.0024 in.)

   c. Install a dial gauge perpendicularly onto the transmission coupling, as shown in the illustration.
   d. Using SST, rotate the transmission coupling forward and backward and measure the lateral runout.

   **SST 09564-16020**

   Maximum lateral runout:

   0.07 mm (0.0028 in.)

45. **INSTALL STUD BOLT**
a. Install the differential support assembly rear with the 4 bolts.

Torque: 8 N*m (82 kgf*cm, 71 in.*lbf)

Fig. 127: Identifying Stud Bolt Dimension
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL REAR DIFFERENTIAL SUPPORT
   a. Install the differential support to the differential carrier with the 4 bolts.

   Torque: 98 N*m (999 kgf*cm, 72 ft.*lbf)

Fig. 128: Locating Rear Differential Support Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL REAR DIFFERENTIAL NO. 1 AND NO. 2 SUPPORT
   a. Install the differential No. 1 and No. 2 supports with the 4 bolts to the differential carrier.

   Torque: 55 N*m (561 kgf*cm, 41 ft.*lbf)
3. **INSTALL REAR DIFFERENTIAL CARRIER SUB-ASSEMBLY**
   
a. Support the rear differential carrier with a transmission jack or equivalent
b. Apply hypoid gear oil to the splines of the left and right rear drive shaft inboard joints.
c. Align the splines of the rear drive shaft inboard joints and, using a brass bar and hammer, tap in the left and right rear drive shafts.
d. Slowly raise the transmission jack, fix the nuts in place and install the 3 bolts.

**Torque:**

- 86 N*m (877 kgf*cm, 63 ft.*lbf) for bolt A
- 140 N*m (1,428 kgf*cm, 103 ft.*lbf) for bolt B

**NOTE:** Tighten the bolts, not the nuts.

e. Connect the connector.
Fig. 132: Identifying Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

f. Install the breather tube.
g. Connect the harness clamp.

4. INSTALL REAR SUSPENSION MEMBER BRACE LH
   a. Install the member brace to the suspension member with the 2 bolts.

   Torque: 60 N*m (612 kgf*cm, 44 ft.*lbf)

5. INSTALL REAR SUSPENSION MEMBER BRACE RH

   HINT:
   Use the same procedures described for the LH side.

6. TEMPORARILY INSTALL PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (See INSTALLATION)
7. TIGHTEN PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (See INSTALLATION)
8. INSPECT JOINT ANGLE (See INSPECTION)
9. INSTALL CENTER EXHAUST PIPE ASSEMBLY (See INSTALLATION (2AZ-FE) or INSTALLATION (2GR-FE))
10. INSTALL TAILPIPE ASSEMBLY (See INSTALLATION (2AZ-FE) or INSTALLATION (2GR-FE))
11. INSTALL FUEL TANK ASSEMBLY
    a. Install the fuel tank for 2AZ-FE (see INSTALLATION).
    b. Install the fuel tank for 2GR-FE (see INSTALLATION).
12. INSTALL REAR WHEEL

   Torque: 103 N*m (1,050 kgf*cm, 76 ft.*lbf)

13. ADD DIFFERENTIAL OIL
    a. Add differential oil (see DIFFERENTIAL OIL).
14. **INSPECT FOR DIFFERENTIAL OIL LEAK**
15. **INSPECT FOR EXHAUST GAS LEAK**

If gas is leaking, tighten the areas necessary to stop the leak. Replace damaged parts as necessary.