

<b>DTC</b>	<b>C0273/13</b>	<b>OPEN CIRCUIT IN ABS MOTOR RELAY CIRCUIT</b>
<b>DTC</b>	<b>C0274/14</b>	<b>B+ SHORT CIRCUIT IN ABS MOTOR RELAY CIRCUIT</b>
<b>DTC</b>	<b>C1361/91</b>	<b>SHORT CIRCUIT IN ABS MOTOR FAIL SAFE RELAY CIRCUIT</b>

## CIRCUIT DESCRIPTION

- The ABS motor relays consist of 2 relays and are included in the ABS R/B.
- The ABS cut relay is turned on after turning the ignition switch to the ON position. If the DTCs in the ABS pump motor circuit are memorized, the ABS cut relay cuts off the power supply to the ABS motor relay and performs the fail safe.
- While any of the ABS, BA, TRAC and VSC is operating, the skid control ECU (included in the actuator) turns the ABS motor relay on to operate the actuator pump motor.
- If the voltage applied to the ABS motor relays (+BM) drops below value where the DTCs are detected due to shortage of the battery or alternator output, the DTCs may be memorized.

DTC No.	DTC Detecting Condition	Trouble Area
C0273/13	When any of the following (1 to 2) is detected: (1) All the following conditions continue for at least 0.2 seconds. • IG1 voltage is between 9.5 and 17.2 V. • During initial check. • ABS, BA, TRAC, and VSC are in operation. • Relay contact is open when the relay is ON. (2) All the following conditions continue for at least 0.2 seconds. • IG1 voltage is less than 9.5 V. • Relay contact remains open when the relay is ON.	<ul style="list-style-type: none"> <li>• ABS No.1 fuse</li> <li>• ABS MTR relay</li> <li>• ABS MTR relay circuit</li> <li>• ABS R/B</li> </ul>
C0274/14	The following condition continues for at least 4 seconds. • Relay contact is closed when the relay is OFF.	<ul style="list-style-type: none"> <li>• ABS No.1 fuse</li> <li>• ABS MTR relay</li> <li>• ABS MTR relay circuit</li> <li>• ABSR/B</li> </ul>
C1361/91	All the following conditions continue for at least 4 seconds. • Immediately after turning IG switch to the ON position. • Relay contact is closed when fail-safe relay is OFF.	<ul style="list-style-type: none"> <li>• ABS No.1 fuse</li> <li>• ABS R/B</li> <li>• ABS cut relay</li> <li>• ABS cut relay circuit</li> </ul>

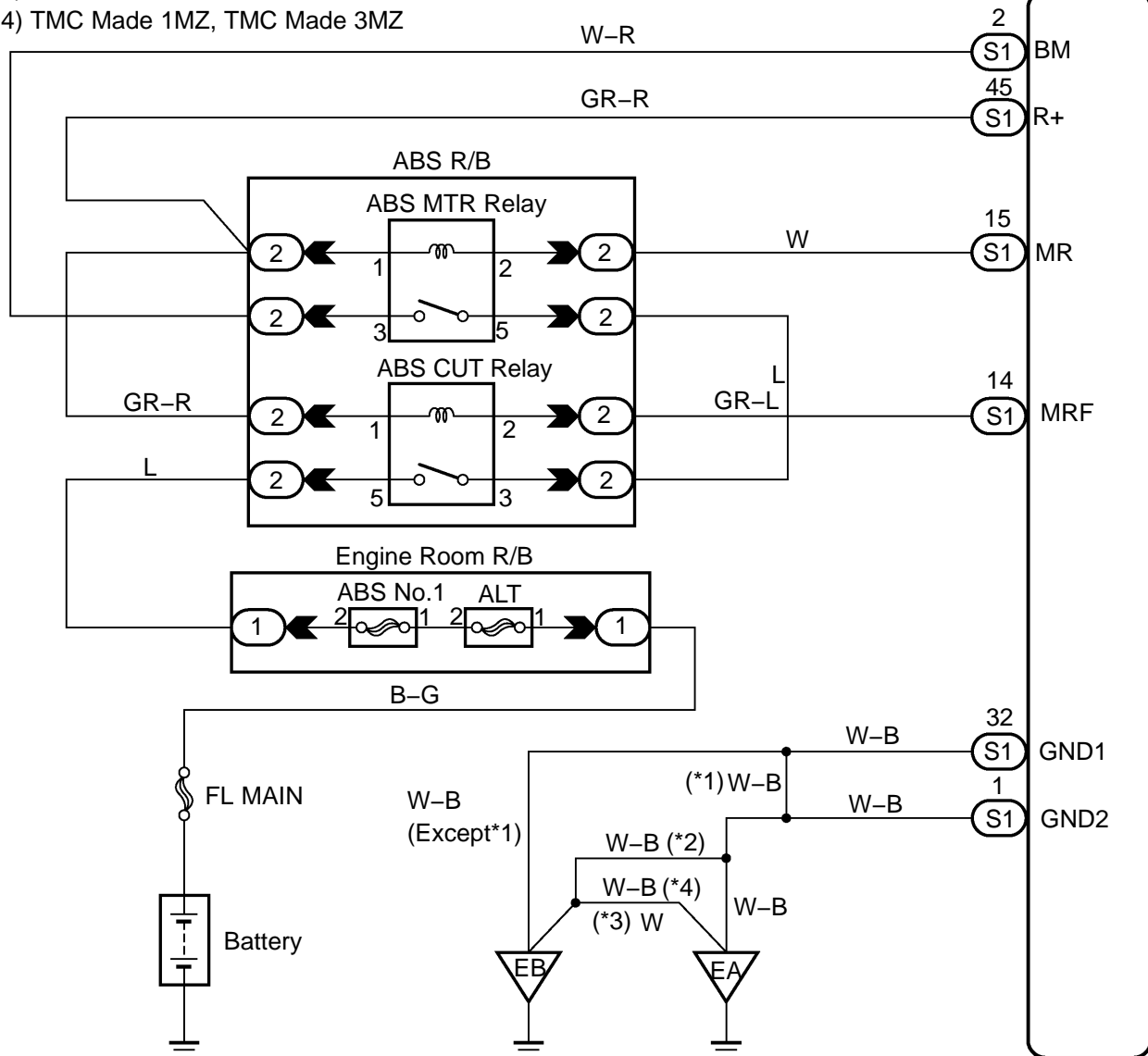
## WIRING DIAGRAM

(\*1) TMC Made 2AZ

(\*2) TMMK Made 1MZ, TMMK Made 3MZ TMC Made

(\*3) TMMK Made 2AZ

(\*4) TMC Made 1MZ, TMC Made 3MZ

Brake Actuator Assy  
(Skid Control ECU with Actuator)

## INSPECTION PROCEDURE

### NOTICE:

When replacing the brake actuator assy, perform zero point calibration (see page 05-987).

### HINT:

Start the inspection from step 1 when using the hand-held tester and start from step 2 when not using the hand-held tester.

1	<b>PERFORM ACTIVE TEST BY HAND-HELD TESTER(ABS MOTOR RELAY OPERATION)</b>
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- (a) Connect the hand-held tester to the DLC3.
- (b) Start the engine.
- (c) Select ACTIVE TEST mode on the hand-held tester.
- (d) Check the operation sound of the ABS motor individually when operating it with the hand-held tester.

Item	Vehicle Condition / Test Details	Diagnostic Note
ABS MOT RELAY	Turns ABS motor relay ON / OFF	Operation of motor can be heard

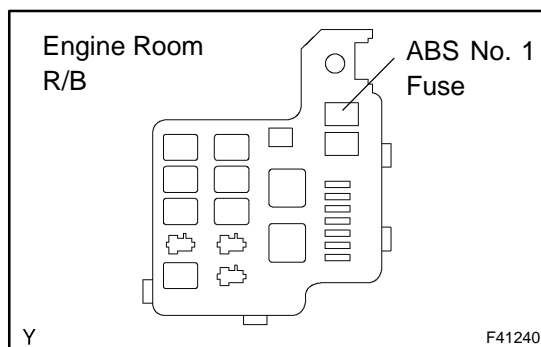
### OK:

The operation sound of the ABS motor should be heard.

**NG****Go to step 2****OK**

## REPLACE BRAKE ACTUATOR ASSY (SEE PAGE 32-63)

2	<b>INSPECT FUSE(ABS NO.1 FUSE)</b>
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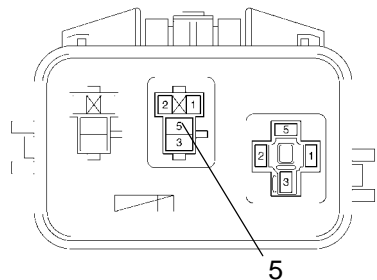


- (a) Remove the ABS No.1 fuse from the engine room R/B.
- (b) Measure the resistance according to the value(s) in the table below.

### Standard:

ABS No.1 fuse	1 $\Omega$ or less (Continuity)
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**NG****CHECK FOR SHORT IN ALL HARNESS AND CONNECTOR CONNECTED TO FUSE AND REPLACE FUSE****OK**

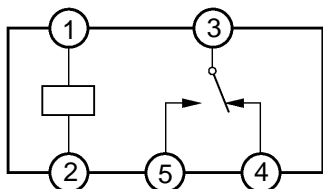
**3 CHECK TERMINAL VOLTAGE(ABS CUT RELAY 5 TERMINAL OF ABS R/B)****ABS R/B:**

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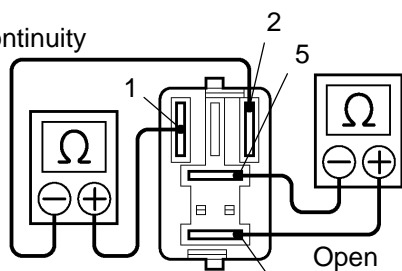
- Remove the ABS cut relay from the ABS R/B.
- Turn the ignition switch to the ON position.
- Measure the voltage according to the value(s) in the table below.

**Standard:**

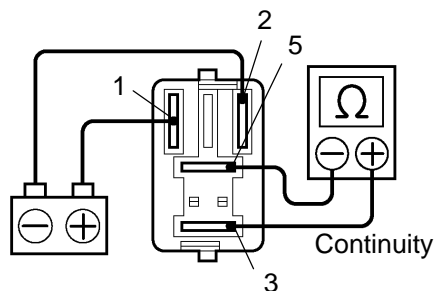
Terminal 5 – Body ground	10 to 14 V
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**NG****REPAIR OR REPLACE HARNESS AND CONNECTOR****OK****4 INSPECT ABS CUT RELAY**

Continuity



Open



Continuity

- Measure the resistance according to the value(s) in the table below.

**Standard:**

Tester Connection	Specified Condition
Terminal 1 – Terminal 2	About 100 $\Omega$
Terminal 3 – Terminal 5	10 k $\Omega$ or higher (No continuity)

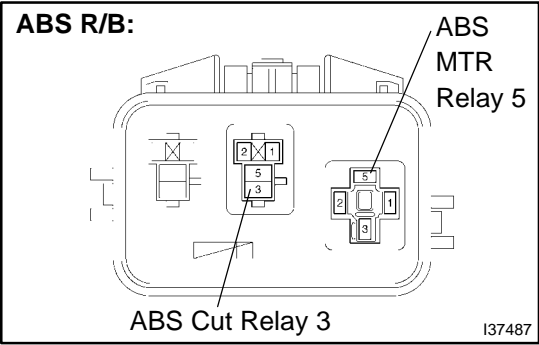
- Apply battery voltage between terminals 1 and 2.
- Measure the resistance according to the value(s) in the table below.

**Standard:**

Tester Connection	Specified Condition
Terminal 3 – Terminal 5	Below 1 $\Omega$ (Continuity)

**NG****REPLACE ABS CUT RELAY****OK**

5 INSPECT ABS R/B (ABS MTR RELAY – ABS CUT RELAY)



- (a) Remove the ABS MTR relay and ABS CUT relay from the ABS R/B.
- (b) Measure the resistance according to the value(s) in the table below.

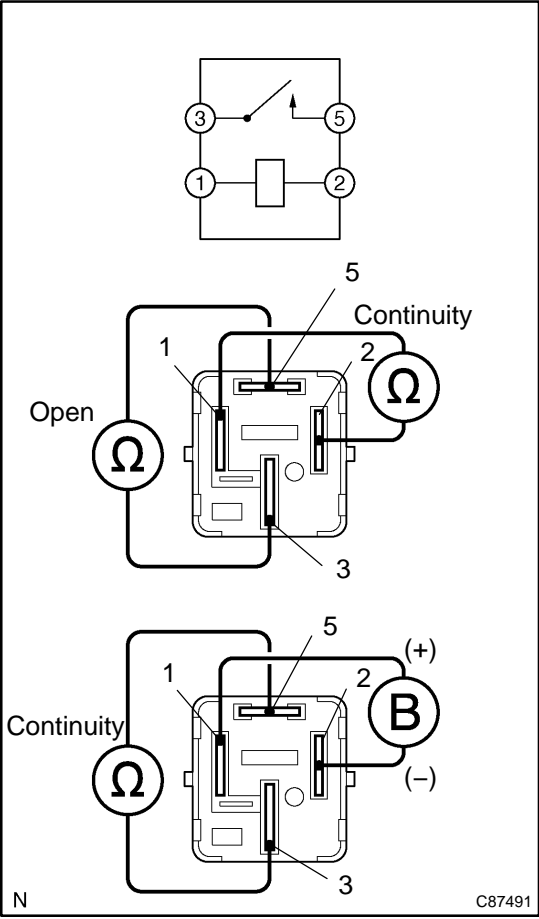
Standard:

Tester Connection	Specified Condition
5 (ABS MTR relay) – 3 (ABS CUT relay)	Below 1 Ω

NG REPAIR OR REPLACE ABS R/B

OK

6 INSPECT ABS MOTOR RELAY



- (a) Measure the resistance according to the value(s) in the table below.

Standard:

Tester Connection	Specified Condition
Terminal 1 – Terminal 2	About 80 Ω
Terminal 3 – Terminal 5	10 kΩ or higher (No continuity)

- (b) Apply battery positive voltage between terminals 1 and 2.
- (c) Measure the resistance according to the value(s) in the table below.

Standard:

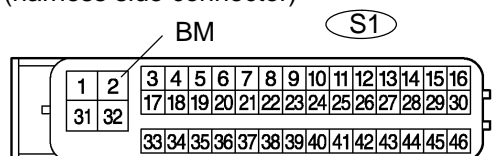
Tester Connection	Specified Condition
Terminal 3 – Terminal 5	Below 1 Ω (Continuity)

NG REPLACE ABS MOTOR RELAY

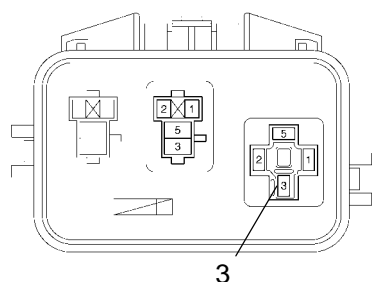
OK

## 7 CHECK HARNESS AND CONNECTOR(ABS MOTOR RELAY – SKID CONTROL ECU ASSY)

Skid Control ECU  
(harness side connector)



T  
ABS R/B:



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- (a) Disconnect the skid control ECU connector and ABS MTR relay.
- (b) Measure the resistance according to the value(s) in the table below.

**Standard:**

Tester Connection	Specified Condition
S1-2 (BM) – ABS R/B (3)	Below 1 $\Omega$

- (c) Measure the resistance according to the value(s) in the table below.

**Standard:**

Tester Connection	Specified Condition
S1-2 (BM) – Body ground	10 k $\Omega$ or higher

NG

**REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

## 8 RECONFIRM DTC

HINT:

These codes are detected when a problem is determined in the brake actuator assy.

The motor circuit is in the brake actuator assy.

Therefore, motor circuit inspection and motor unit inspection cannot be performed.

Be sure to check if the DTC codes are output before replacing the brake actuator assy.

- (a) Clear the DTCs (see page 05-1002).
- (b) Turn the ignition switch to the ON position.
- (c) Are the same DTCs recorded? (see page 05-1002)

NO

**END**

HINT:

These DTCs may be memorized due to a malfunction in the connector terminal.

YES

**REPLACE BRAKE ACTUATOR ASSY (SEE PAGE 32-63)**