DTC	P0037	OXYGEN SENSOR HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2)

DTC	P0038	OXYGEN SENSOR HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2)

DTC	P0057	OXYGEN SENSOR HEATER CONTROL CIRCUIT LOW (BANK 2 SENSOR 2)

DTC	P0058	OXYGEN SENSOR HEATER CONTROL CIRCUIT HIGH (BANK 2 SENSOR 2)

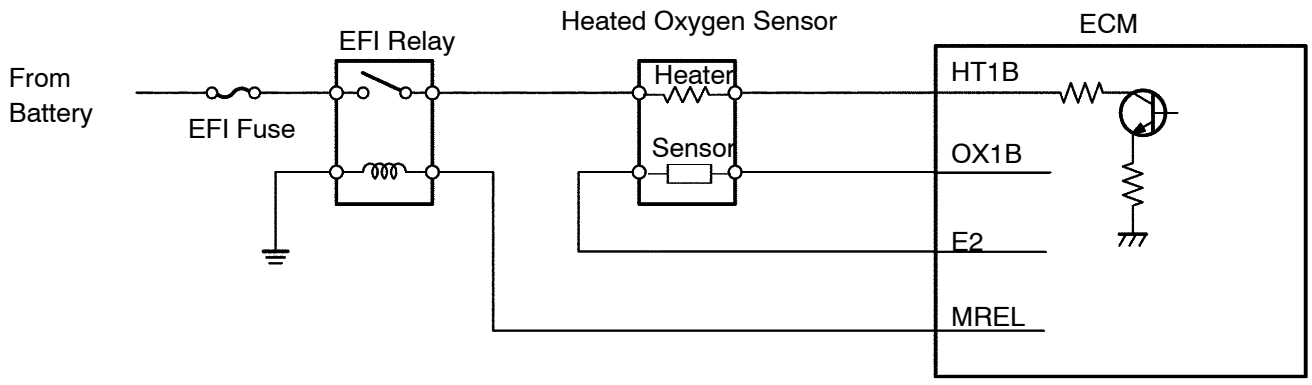
CIRCUIT DESCRIPTION

Refer to DTC P0136/29 on page 05–81.

HINT:

The ECM provides a pulse width modulated control circuit to adjust current through the heater. The heated oxygen sensor heater circuit uses a relay on the B+ side of the circuit.

Reference (Bank 1 Sensor 2 System Drawing)



DTC No.	DTC Detection Condition	Trouble Area
P0037 P0057	Heated current is 0.2 A or less when the heater operates with +B > 10.5 V and < 11.5 V (1 trip detection logic)	• Open or short in heater circuit of the heated oxygen sensor • Heated oxygen sensor heater • EFI relay • ECM
	Heated current is 0.25 A or less when the heater operates with +B ≧ 11.5 V (1 trip detection logic)	
P0038 P0058	When the heater operates, heated current exceeds 2 A (1 trip detection logic)	

HINT:

- Bank 1 refers to the bank that includes cylinder No.1.
- Bank 2 refers to the bank that does not include cylinder No.1.
- Sensor 1 refers to the sensor closest to the engine assembly.
- Sensor 2 refers to the sensor farthest away from the engine assembly.

WIRING DIAGRAM

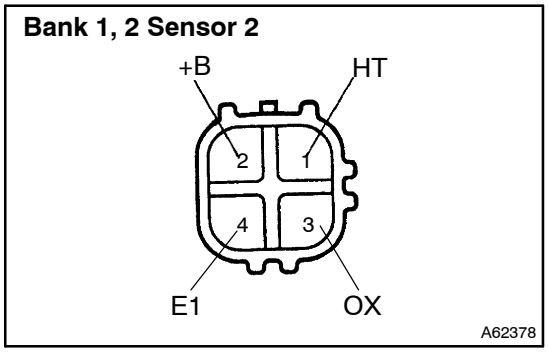
Refer to DTC P0136/29 on page 05–81.

INSPECTION PROCEDURE

HINT:

- If different DTCs that are related to a different system are output simultaneously while terminal E2 is used as a ground terminal, terminal E2 may be open.
- Read freeze frame data using the hand–held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1 INSPECT HEATED OXYGEN SENSOR(HEATER RESISTANCE)



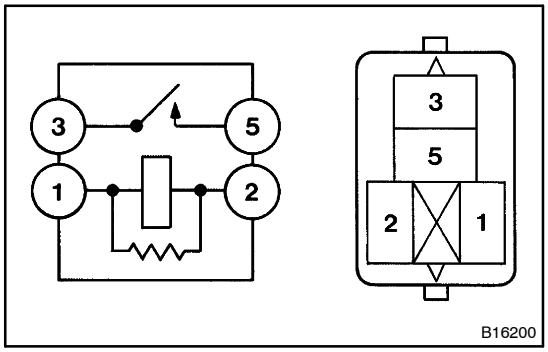
(a) Disconnect the heated oxygen sensor connector.
(b) Measure the resistance between the terminals of the heated oxygen sensor connector.
Standard (Bank 1, 2 sensor 2):

Terminal No.	Resistance
1 (HT) – 2 (+B)	5 to 10 Ω at 20 °C (68 °F)
1 (HT) – 4 (E1)	No Continuity

NG → **REPLACE HEATED OXYGEN SENSOR**

OK

2 INSPECT EFI RELAY



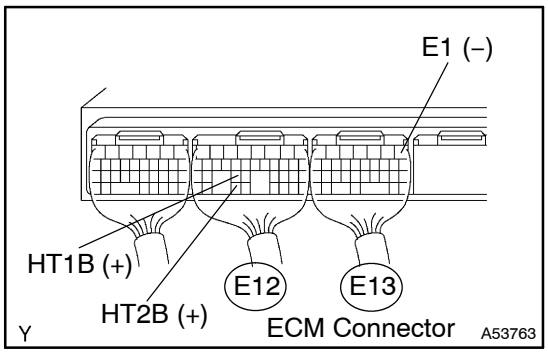
(a) Remove the EFI relay from the engine room R/B.
(b) Inspect the EFI relay.
Standard:

Terminal No.	Specified condition
1 – 2	Continuity
3 – 5	No Continuity
	Continuity (Apply battery voltage terminals 1 and 2)

NG → **REPLACE EFI RELAY**

OK

3 INSPECT ECM(HT1B OR HT2B VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between the applicable terminals of the E12 and E13 ECM connectors.
Standard:

Symbols (Terminal No.)	Specified condition
HT1B (E12–25) – E1 (E13–1)	9 to 14 V
HT2B (E12–33) – E1 (E13–1)	

HINT:

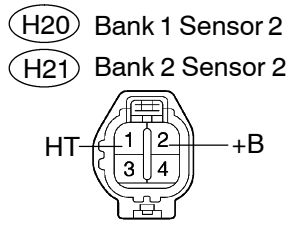
- The HT1B means the heated oxygen sensor bank 1 sensor 2.
- The HT2B means the heated oxygen sensor bank 2 sensor 2.

OK	CHECK AND REPLACE ECM (See page 01–35)

NG

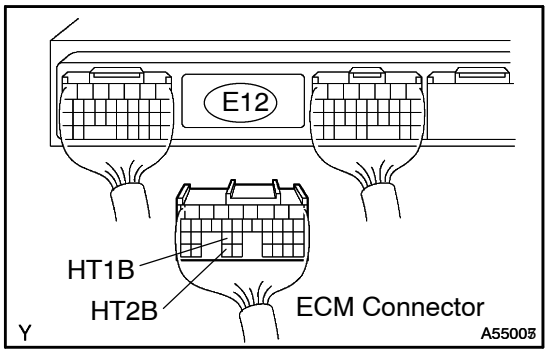
4	CHECK HARNESS AND CONNECTOR(HEATED OXYGEN SENSOR – ECM, HEATED OXYGEN SENSOR – EFI RELAY)

Wire Harness Side

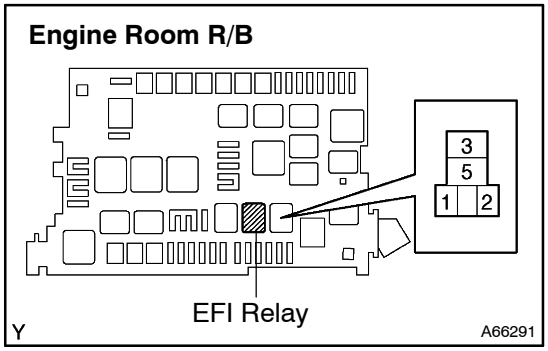


Heated Oxygen Sensor Connector

A72895



Engine Room R/B



(a) Check the harness and the connector between the ECM and the heated oxygen sensor connectors.

(1) Disconnect the H20 or H21 heated oxygen sensor connector.

(2) Disconnect the E12 ECM connector.

(3) Check for continuity between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
HT (H20–1) – HT1B (E12–25)	Continuity
HT (H21–1) – HT2B (E12–33)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
HT (H20–1) or HT1B (E12–25) – Body ground	No continuity
HT (H21–1) or HT2B (E12–33) – Body ground	

(b) Check the harness and the connector between the heated oxygen sensor connector and the EFI relay.

(1) Disconnect the H20 or H21 heated oxygen sensor connector.

(2) Remove the EFI relay from the engine room R/B.

(3) Check for continuity between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
+B (H20–2) – EFI relay (3)	Continuity
+B (H21–2) – EFI relay (3)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
+B (H20–2) or EFI relay (3) – Body ground	No continuity
+B (H21–2) or EFI relay (3) – Body ground	

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE ECM (See page 01–35)