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)

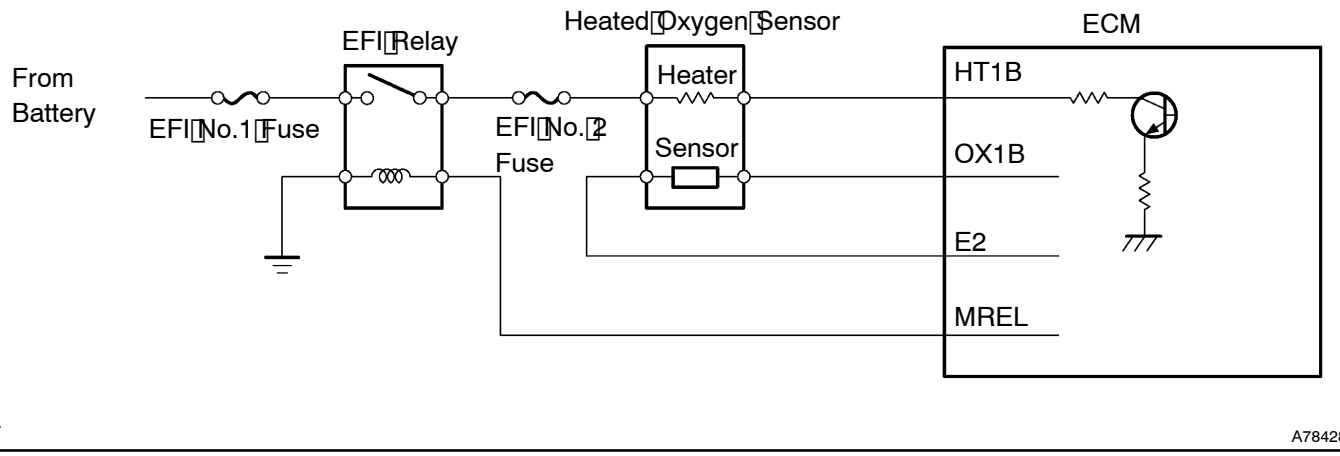
CIRCUIT DESCRIPTION

Refer to DTC P0136 on page 05–76.

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 0.25 A or less when the heater operates with +B greater than 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
P0038 P0058	When the heater operates, heated current exceeds 2 A (1 trip detection logic)	• Open or short in heater circuit of the heated oxygen sensor • Heated oxygen sensor heater • EFI relay • ECM

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

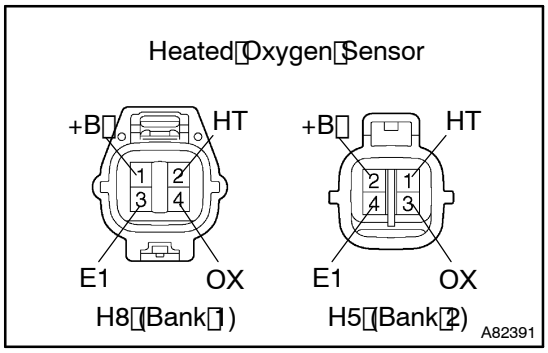
Refer to DTC P0136 on page 05–76.

INSPECTION PROCEDURE

HINT:

- If different DTCs related to different systems that have terminal E2 as the ground terminal are output simultaneously, terminal E2 may be open.
- Read freeze frame data using the hand–held tester. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

1 INSPECT HEATED OXYGEN SENSOR (HEATER RESISTANCE)



(a) Disconnect the H5 or H8 heated oxygen sensor connector.

(b) Check the resistance of the heated oxygen sensor terminals.

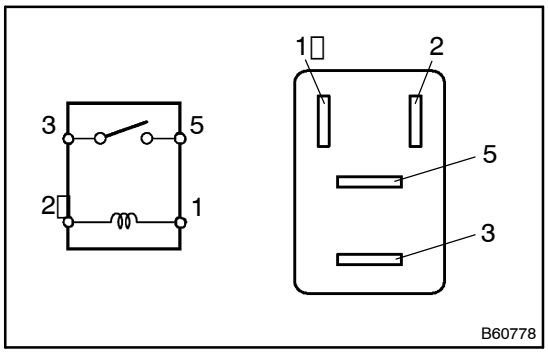
Standard (bank 1, 2 sensor 2):

Tester Connection	Condition	Specified Condition
H8–2 (HT) – H8–1 (+B) H5–1 (HT) – H5–2 (+B)	20°C (68°F)	11 to 16 Ω
H8–2 (HT) – H8–3 (E1) H5–1 (HT) – H5–4 (E1)	800°C (1,472°F)	23 to 32 Ω

NG → REPLACE HEATED OXYGEN SENSOR

OK

2 INSPECT EFI RELAY (EFI)



(a) Remove the EFI relay from the engine room J/B.

(b) Check the resistance of the EFI relay.

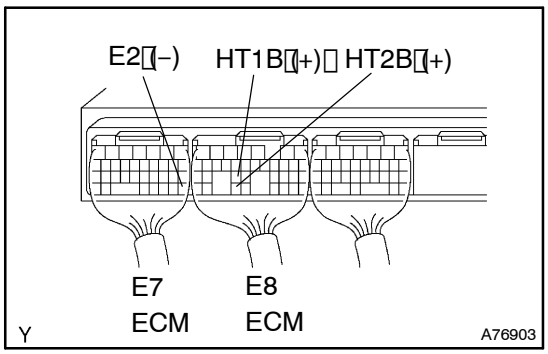
Standard:

Tester Connection	Specified Condition
3 – 5	10 kΩ or higher
3 – 5	Continuity (when battery voltage is applied to terminals 1 and 2)

NG → REPLACE EFI RELAY

OK

3	CHECK ECM (HT1B OR HT2B VOLTAGE)



(a) Turn the ignition switch ON.

(b) Check the voltage of the ECM connectors.

Standard:

Tester Connection	Specified Condition
E8–25 (HT1B) – E7–28 (E2) E8–33 (HT2B) – E7–28 (E2)	9 to 14 V

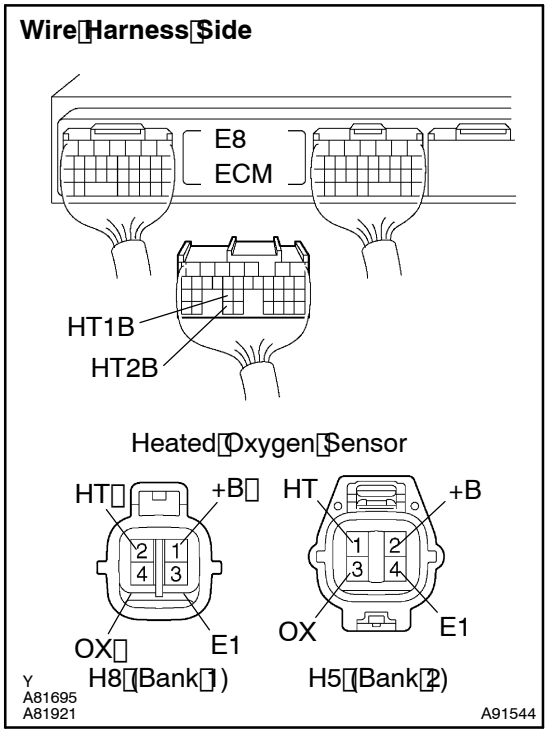
HINT:

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

OK ⇨ **REPLACE ECM (See page 10–13)**

NG

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



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

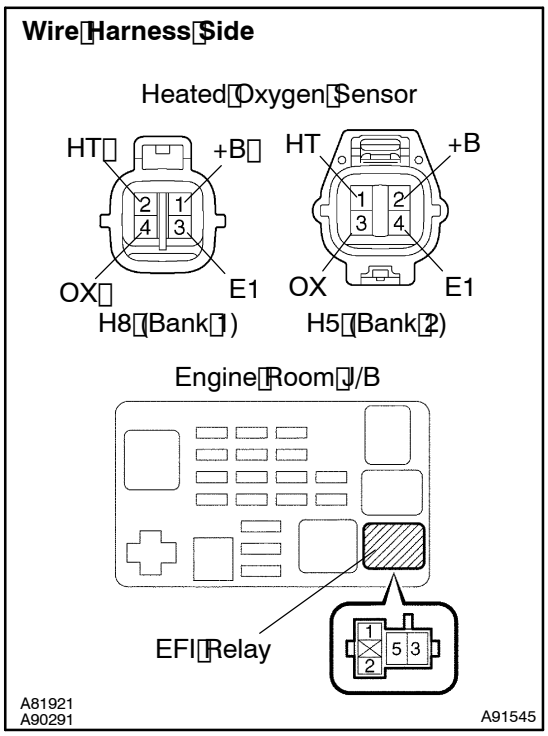
(1) Disconnect the E8 ECM connector.

(2) Disconnect the H5 or H8 heated oxygen sensor connector.

(3) Check the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
H8–1 (HT) – E8–25 (HT1B) H5–1 (HT) – E8–33 (HT2B)	Below 1 Ω
H8–1 (HT) or E8–25 (HT1B) – Body ground H5–1 (HT) or E8–33 (HT2B) – Body ground	10 kΩ or higher



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

(1) Disconnect the H5 or H8 heated oxygen sensor connector.

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

(3) Check the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
H8–2 (+B) – J/B EFI relay terminal 3 H5–2 (+B) – J/B EFI relay terminal 3	Below 1 Ω
H8–2 (+B) or J/B EFI relay terminal 3 – Body ground H5–2 (+B) or J/B EFI relay terminal 3 – Body ground	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK →

REPLACE ECM (See page 10–13)