DTC	P0134	OXYGEN SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1)

CIRCUIT DESCRIPTION

Refer to DTC P0130 on page 05–101.

DTC No.	DTC Detecting Condition	Trouble Area
P0134	After engine is warmed up, heated oxygen sensor (bank 1 sensor 1) output does not indicate RICH (greater than 0.45 V) even once when conditions (a), (b), (c), (d) and (e) continue for more than 65 seconds (1 trip detection logic) : (a) Engine speed: 1,400 rpm or more (b) Vehicle speed: 24.8 mph (40 km/h) or more (c) Throttle valve is not fully closed (d) 180 seconds or more after starting engine (e) Engine coolant temperature is more than 40 °C (104 °F)	• Open or short in heated oxygen sensor (bank 1 sensor 1) circuit • Heated oxygen sensor (bank 1 sensor 1) • Heated oxygen sensor heater (bank 1 sensor 1) • EFI relay • Air induction system • Fuel pressure • PCV hose connection • PCV valve and hose • Injector • Gas leakage in exhaust system • PCV piping • ECM

HINT:
After confirming DTC P0134, check the output voltage of the heated oxygen sensor (bank 1 sensor 1) in the ”DIAGNOSIS / ENHANCED OBD II / DATA LIST / ALL” using the hand−held tester or the OBD II scan tool. If the output voltage of the heated oxygen sensor is always less than 0.1 V, the sensor circuit may be open or short.

MONITOR DESCRIPTION

The ECM uses the heated oxygen sensor to optimize the air–fuel mixture in the closed–loop fuel control. This control helps decrease exhaust emissions by providing the catalyst with a nearly stoichiometric mixture. The sensor detects the oxygen level in the exhaust gas and the ECM uses this data to control the air–fuel ratio. The sensor output voltage ranges from 0 V to 1 V. If the signal voltage is less than 0.4 V, the air–fuel ratio is LEAN. If the signal voltage is more than 0.5 V, the air–fuel ratio is RICH. If the sensor does not indicate RICH even once despite the conditions for the closed–loop fuel control being met and a specified time period has passed, the ECM will conclude that the closed–loop fuel control is malfunctioning. The ECM will illuminate the MIL and a DTC is set.

MONITOR STRATEGY

Related DTCs	P0134	Excessive time to enter closed loop
Required sensors/components	Main sensors	Front heated oxygen sensor
	Related sensors	Crank shaft position sensor, engine coolant temperature sensor, vehicle speed sensor
Frequency of operation	Once per drive cycles	
Duration	65 seconds	
MIL operation	1 driving cycles	
Sequence of operation	None	

TYPICAL ENABLING CONDITION

Item	Specification	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present	See "List of Disable a Monitor" (On page 05–25)	
Time after following conditions are met:	50 seconds	–
Engine coolant temperature	40°C	–
Engine speed	1,400 rpm	–
Vehicle speed	25 mph (40 km/h)	–
Idle	OFF	
Time after engine start	180 seconds	–

TYPICAL MALFUNCTION THRESHOLDS

Detection Criteria	Threshold
Front heated oxygen sensor voltage	less than 0.45 V

COMPONENT OPERATING RANGE

Parameter	Standard Value
In the normal condition, the font heated oxygen sensor voltage	0 to 1 V

WIRING DIAGRAM

Refer to DTC P0130 on page 05–101.

INSPECTION PROCEDURE

HINT:

Hand–held tester only:

Narrowing down the trouble area is possible by performing "A/F CONTROL" ACTIVE TEST (heated oxygen sensor or other trouble areas can be distinguished).

(a) Perform ACTIVE TEST using hand–held tester (A/F CONTROL).

HINT:

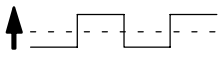
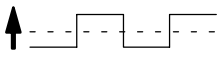
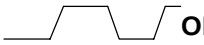
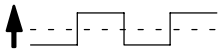
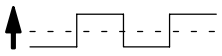
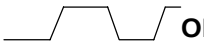
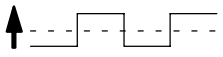
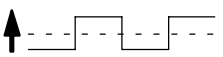
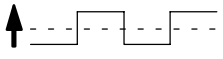
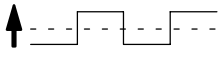
"A/F CONTROL" is the ACTIVE TEST which changes the injection volume to –12.5 % or +25 %.

(1) Connect the hand–held tester to the DLC3 on the vehicle.
(2) Turn the ignition switch ON.
(3) Warm up the engine by running the engine speed at 2,500 rpm for approximately 90 seconds.
(4) Select the item "DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / A/F CONTROL".
(5) Perform "A/F CONTROL" with the engine in an idle condition (press the right or left button).

Result:

Heated oxygen sensor reacts in accordance with increase and decrease of injection volume
+25 % → rich output: More than 0.5 V,
–12.5 % → lean output: Less than 0.4 V

NOTICE:
There is a delay of few seconds in the sensor 1 (front sensor) output, and there is about 20 seconds delay at maximum in the sensor 2 (rear sensor).

	Output voltage of heated oxygen sensor (sensor 1: front sensor)	Output voltage of heated oxygen sensor (sensor 2: rear sensor)	Mainly suspect trouble area
Case 1	Injection volume +25 % –12.5 %  Output voltage More than 0.5 V Less than 0.4V  **OK**	Injection volume +25 % –12.5 %  Output voltage More than 0.5 V Less than 0.4V  **OK**	—
Case 2	Injection volume +25 % –12.5 %  Output voltage No reaction **NG**	Injection volume +25 % –12.5 %  Output voltage More than 0.5 V Less than 0.4V  **OK**	Sensor 1: front sensor (sensor 1, heater, sensor 1 circuit)
Case 3	Injection volume +25 % –12.5 %  Output voltage More than 0.5 V Less than 0.4V  **OK**	Injection volume +25 % –12.5 %  Output voltage No reaction **NG**	Sensor 2: rear sensor (sensor 2, heater, sensor 2 circuit)
Case 4	Injection volume +25 % –12.5 %  Output voltage No reaction **NG**	Injection volume +25 % –12.5 %  Output voltage No reaction **NG**	Extremely rich or lean actual air–fuel ratio (Injector, fuel pressure, gas leakage in exhaust system, etc.)

The following of A/F CONTROL procedure enables the technician to check and graph the voltage outputs of both the heated oxygen sensors.
For displaying the graph indication, enter ”ACTIVE TEST / A/F CONTROL / USER DATA”, then select ”O2S B1S1 and O2S B1S2” by pressing ”YES” button and push ”ENTER” button before pressing ”F4” button.
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 or the OBD II scan tool. 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.
- A high heated oxygen sensor (sensor 1) voltage (0.5 V or more) could be caused by a rich air fuel mixture. Check for conditions that would cause the engine to run rich.
- A low heated oxygen sensor (sensor 1) voltage (0.4 V or less) could be caused by a lean air fuel mixture. Check for conditions that would cause the engine to run lean.

1	CHECK OTHER DTC OUTPUT(IN ADDITION TO DTC P0134)

(a) Connect the hand–held tester or the OBD II scan tool to the DLC3.
(b) Turn the ignition switch ON and push the hand–held tester or the OBD II scan tool main switch ON.
(c) Select the item ”DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES”.
(d) Read the DTCs.

Result:

Display (DTC output)	Proceed to
P0134	A
P0134 and other DTCs	B

HINT:
If any other codes besides P0134 are output, perform the troubleshooting for those DTCs first.

B → **GO TO RELEVANT DTC CHART (See page 05–35)**

A

2	READ VALUE OF HAND–HELD TESTER OR OBD II SCAN TOOL(OUTPUT VOLTAGE OF HEATED OXYGEN SENSOR)

(a) Connect the hand–held tester or the OBD II scan tool to the DLC3.
(b) Turn the ignition switch ON and push the hand–held tester or the OBD II scan tool main switch ON.
(c) Select the item ”DIAGNOSIS / ENHANCED OBD II / DATA LIST / ALL / O2S B1S1”.
(d) Warm up the engine to the normal operating temperature above 75°C (169°F).
(e) Read the output voltage of the heated oxygen sensor when the engine speed is suddenly increased.

HINT:
Quickly accelerate the engine to 4,000 rpm 3 times by using the accelerator pedal.

Standard:
Heated oxygen sensor outputs a RICH signal (0.45 V or more) at least once.

OK → **Go to step 12**

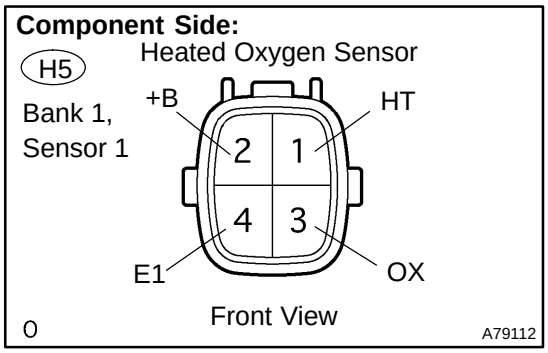
NG

3	CHECK CONNECTION OF PCV HOSE

NG → **REPAIR OR REPLACE PCV HOSE**

OK

4 INSPECT HEATED OXYGEN SENSOR(HEATER RESISTANCE)



(a) Disconnect the H5 heated oxygen sensor connector.
(b) Measure the resistance between the terminals of the heated oxygen sensor connector.

Standard:

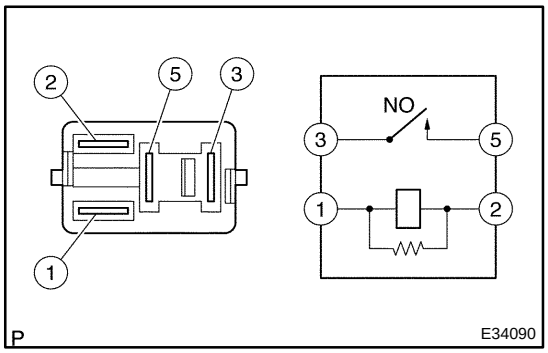
Tester Connection	Specified Condition
HT (H5–1) – +B (H5–2)	5 to 10 Ω at 20 °C (68 °F)
HT (H5–1) – E1 (H5–4)	10 kΩ or higher

(c) Reconnect the heated oxygen sensor connector.

NG → **REPLACE HEATED OXYGEN SENSOR**

OK

5 INSPECT EFI RELAY



(a) Remove the EFI relay from the engine room R/B.
(b) Check for continuity in the EFI relay.

Standard:

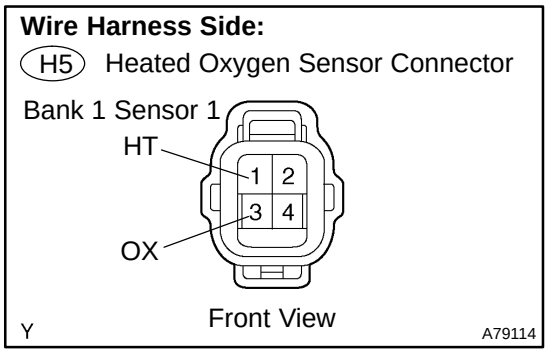
Tester Connection	Specified Condition
1 – 2	Continuity
3 – 5	No continuity
	Continuity (Apply battery voltage to terminals 1 and 2)

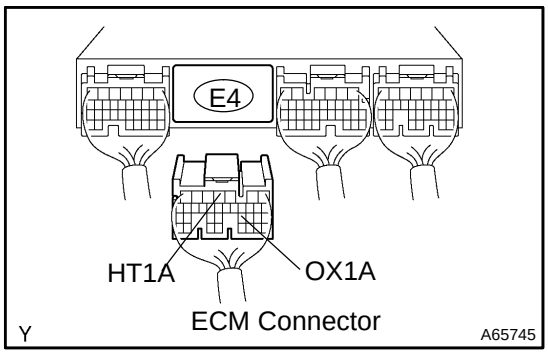
(c) Install the EFI relay.

NG → **REPLACE EFI RELAY**

OK

6	CHECK HARNESS AND CONNECTOR(HEATED OXYGEN SENSOR – ECM)





(a) Disconnect the H5 heated oxygen sensor connector.
(b) Disconnect the E4 ECM connector.
(c) Check the resistance between the wire harness side connectors.

Standard (Check for open):

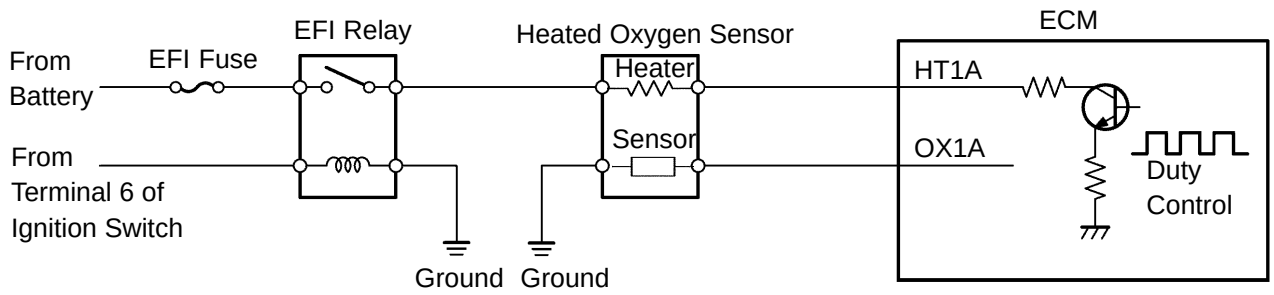
Tester Connection	Specified Condition
HT (H5–1) – HT1A (E4–4)	Below 1 Ω
OX (H5–3) – OX1A (E4–23)	

Standard (Check for short):

Tester Connection	Specified Condition
HT (H5–1) or HT1A (E4–4) – Body ground	10 kΩ or higher
OX (H5–3) or– OX1A (E4–23) – Body ground	

(d) Reconnect the ECM connector.
(e) Reconnect the heated oxygen sensor connector.

Reference (Bank 1 Sensor 1 System Drawing):



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

OK

7	CHECK WHETHER MISFIRE IS OCCURRED OR NOT BY MONITORING DTC AND DATA LIST

NG → **PERFORM TROUBLESHOOTING FOR MISFIRE (See page 05–149)**

OK

8	CHECK AIR INDUCTION SYSTEM

(a) Check the air induction system for vacuum leaks.

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

9	CHECK FUEL PRESSURE (See page 11–5)

(a) Check the fuel pressure (high or low pressure).

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

10	INSPECT FUEL INJECTOR ASSY(INJECTION AND VOLUME) (See page 11–7)

NG → REPLACE FUEL INJECTOR ASSY

OK

11	CHECK FOR EXHAUST GAS LEAKS

NG → REPAIR OR REPLACE EXHAUST GAS LEAKAGE POINT

OK

REPLACE HEATED OXYGEN SENSOR

12	PERFORM CONFIRMATION DRIVING PATTERN (See page 05–101)

HINT:
Clear all DTCs prior to performing the confirmation pattern.

GO

13	READ OUTPUT DTC(DTC P0134 IS OUTPUT AGAIN)

(a) Connect the hand–held tester or the OBD II scan tool to the DLC3.
(b) Turn the ignition switch ON and push the hand–held tester or the OBD II scan tool main switch ON.
(c) Select the item ”DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES”.
(d) Read the DTCs.
Result:

Display (DTC output)	Proceed to
No output	A
P0134	B

B → REPLACE ECM (See page 10–11)

A

14	CONFIRM IF VEHICLE HAS RUN OUT OF FUEL IN PAST

NO → CHECK FOR INTERMITTENT PROBLEMS (See page 05–41)

YES

DTC IS CAUSED BY RUNNING OUT OF FUEL