

DTC	P0134	Oxygen Sensor Circuit No Activity Detected (Bank 1 Sensor 1)
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DESCRIPTION

The heated oxygen sensor (HO2S) located on the front of the catalyst converter is used to control the fuel trim.

Refer to the description of DTC P0130 for detailed information (see page [ES-110](#)).

DTC No.	DTC Detecting Condition	Trouble Area
P0134	(a) HO2S voltage (bank 1 sensor 1) does not exceed 0.45 V while intrusive closed loop with short-term fuel trim is 18% or more for 15 seconds (2 trip detection logic) Intrusive closed loop runs when all of the following conditions are met for 20 seconds: <ul style="list-style-type: none"> • Driving at 40 km/h (25 mph) or more • Not idle • HO2S voltage is less than 0.45 V 	<ul style="list-style-type: none"> • HO2S (bank 1 sensor 1) • Fuel pressure • Air induction system • Ventilation hose • Ventilation valve • Injector • Exhaust gas leakage
	(b) With warm engine, Heated Oxygen (HO2) sensor (bank 1 sensor 1) output does not indicate rich (more than 0.45 V) even once when conditions (1), (2), (3), (4), (5) and (6) continue for 30 seconds or more (2 trip detection logic) (1) After detection condition (a) is determined to be normal (2) Engine running (3) Engine coolant temperature more than 75°C (167°F) (4) Throttle valve not fully closed (5) Fuel system status is closed loop (6) Short-term fuel trim is 18% or more	

HINT:

If this DTC is set, check the output voltage of the HO2 sensor (bank 1 sensor 1) by entering the following menus on the intelligent tester: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / O2S B1S1.

MONITOR DESCRIPTION

To monitor the heated oxygen sensor (HO2S) activity, the ECM (PCM) performs the intrusive closed loop if the HO2S voltage does not exceed 0.45 V while the vehicle is running under the closed loop. In the intrusive closed loop, the ECM (PCM) varies the fuel trim and checks whether the HO2S voltage exceeds 0.45V or not.

Then, the HO2S voltage varies between 0.1 and 0.9 V when the HO2S functions. If the HO2S voltage does not exceed 0.45 V, the ECM (PCM) interprets this as a malfunction. The ECM (PCM) illuminates the MIL and sets the DTC (2 trip detection logic).

MONITOR STRATEGY

Related DTCs	P0134: Excessive time to enter closed loop for HO2S (bank 1 sensor 1)
Required Sensors/Components (Main)	HO2 sensor (bank 1 sensor 1)
Required Sensors/Components (Related)	None
Frequency of Operation	Once per driving cycle
Duration	110 seconds
MIL Operation	2 driving cycle
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Intrusive closed loop

Monitor runs whenever these DTCs not present	P0031, P0032 (heated oxygen sensor 1) P0100 - P0103 (MAF meter) P0110 - P0113 (IAT sensor) P0115 - P0118 (ECT sensor) P0120 - P0123 (TP sensor) P0125 (insufficient ECT for closed loop) P0130 (heated oxygen sensor - sensor 1) P0171, P0172 (fuel system) P0300 - P0304 (misfire) P0335 (crankshaft position sensor) P0340 (camshaft position sensor) P0441 - P0456 (EVAP system) P0500 (VSS)
Intrusive closed loop	Running
Intrusive closed loop runs when following conditions are met for:	20 seconds or more
ECT	ECT to enable closed loop or more
Engine rpm	900 rpm or more
Vehicle speed	40 km/h (25 mph) or more
Idle	OFF
HO2S voltage	Less than 0.45 V
Battery voltage	11 V or higher

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Others

Engine	Running
ECT	75°C (167°F) or more
Fuel system status	Closed loop
Idle	OFF

TYPICAL MALFUNCTION THRESHOLDS

Intrusive closed loop

HO2S voltage in intrusive closed loop	Less than 0.45 V for 15 seconds with short-term fuel trim 18% or more
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Others

HO2S voltage	Less than 0.45 V for 30 seconds with short-term fuel trim 18% or more
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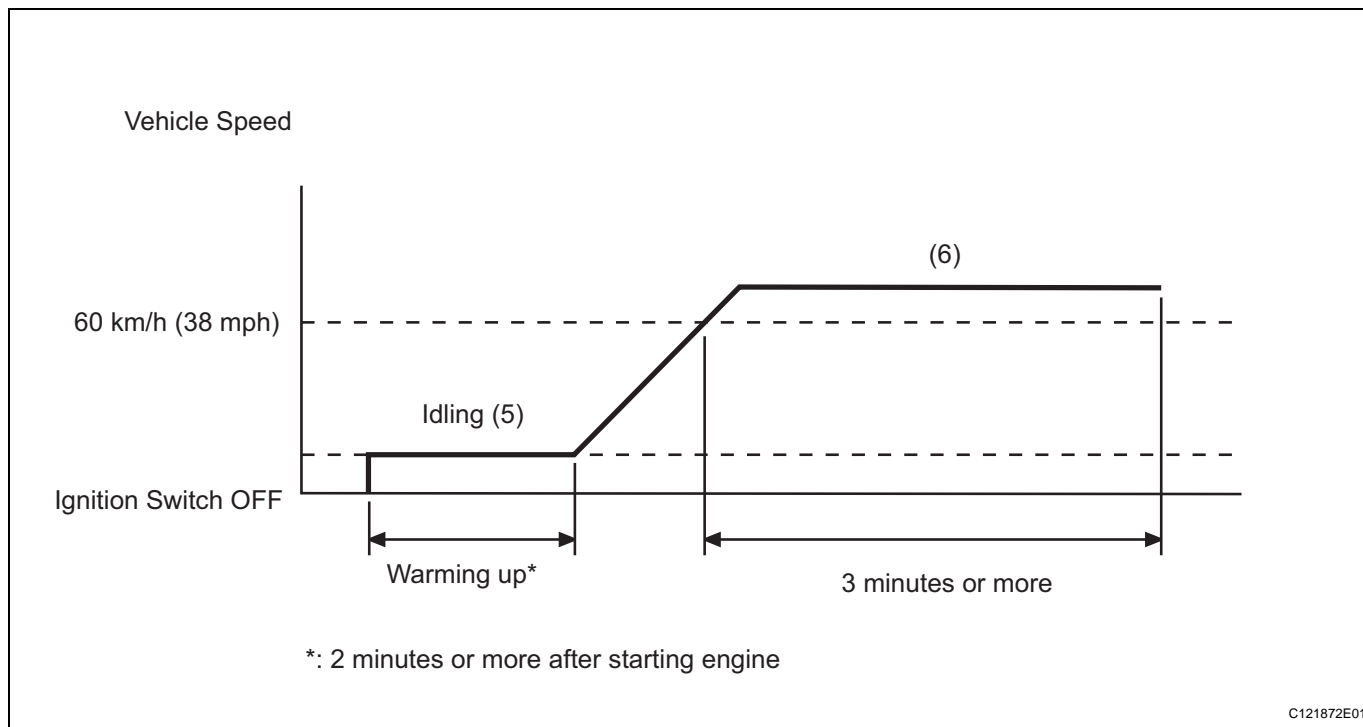
COMPONENT OPERATING RANGE

HO2S voltage in closed loop	Switching between 0.1 and 0.9 V
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WIRING DIAGRAM

Refer to DTC P0130 (see page [ES-113](#)).

CONFIRMATION DRIVING PATTERN



HINT:

This confirmation driving pattern is used in the "PERFORM CONFIRMATION DRIVING PATTERN" procedure of the following diagnostic troubleshooting procedure.

- (1) Connect the intelligent tester to the DLC3.
- (2) Turn the ignition switch ON and turn the tester ON.
- (3) Clear DTCs (see page [ES-37](#)).
- (4) Start the engine.
- (5) Allow the engine to idle until the engine coolant temperature reaches 40°C (104°F). Drive the vehicle at a speed of more than 60 km/h (38 mph) for 3 minutes or more.

NOTICE:

If the conditions in this test are not strictly followed, malfunctions may not be detected.

HINT:

Malfunctioning areas can be identified by performing the A/F CONTROL function provided in the ACTIVE TEST. The A/F CONTROL function can help to determine whether the Heated Oxygen (HO₂) sensors and other potential trouble areas are malfunctioning.

The following instructions describe how to conduct the A/F CONTROL operation using the intelligent tester.

1. Connect the intelligent tester to the DLC3.
2. Start the engine and turn the tester ON.
3. Warm up the engine at an engine speed of 2,500 rpm for approximately 90 seconds.
4. Enter the following menus: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / A/F CONTROL.
5. Perform the A/F CONTROL operation with the engine in an idling condition (press the RIGHT or LEFT button to change the fuel injection volume).
6. Monitor the voltage output of the HO₂ sensors (O₂S B1S1 and O₂S B1S2) displayed on the tester.

HINT:

- The A/F CONTROL operation lowers the fuel injection volume by 12.5% or increases the injection volume by 25%.
- Each sensor reacts in accordance with increases and decreases in the fuel injection volume.









Standard

Tester Display (Sensor)	Injection Volumes	Status	Voltages
O2S B1S1 (Front HO2 Sensor)	+25%	Rich	More than 0.55
O2S B1S1 (Front HO2 Sensor)	-12.5%	Lean	Less than 0.4
O2S B1S2 (Rear HO2 Sensor)	+25%	Rich	More than 0.5
O2S B1S2 (Rear HO2 Sensor)	-12.5%	Lean	Less than 0.4

NOTICE:

The front HO2 sensor has an output delay of a few seconds and the rear HO2 sensor has a maximum output delay of approximately 20 seconds.

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Case	Front HO2 Sensor (Sensor 1) Output Voltage	Rear HO2 Sensor (Sensor 2) Output Voltage	Main Suspected Trouble Area	
1	Injection Volume +25% -12.5%		Injection Volume +25% -12.5%	
	Output Voltage More than 0.55 V Less than 0.4 V		Output Voltage More than 0.55 V Less than 0.4 V	
2	Injection Volume +25% -12.5%		Injection Volume +25% -12.5%	<ul style="list-style-type: none"> • Front HO2 sensor • Front HO2 sensor heater • Front HO2 sensor circuit
	Output Voltage Almost no reaction		Output Voltage More than 0.55 V Less than 0.4 V	
3	Injection Volume +25% -12.5%		Injection Volume +25% -12.5%	<ul style="list-style-type: none"> • Rear HO2 sensor • Rear HO2 sensor heater • Rear HO2 sensor circuit
	Output Voltage More than 0.55 V Less than 0.4 V		Output Voltage Almost no reaction	
4	Injection Volume +25% -12.5%		Injection Volume +25% -12.5%	<ul style="list-style-type: none"> • Injector • Fuel pressure • Gas leakage from exhaust system (Air-fuel ratio extremely rich or lean)
	Output Voltage Almost no reaction		Output Voltage Almost no reaction	

- Following the A/F CONTROL procedure enables technicians to check and graph the voltage outputs of both the front and rear HO2 sensors.
- To display the graph, enter the following menus on the tester: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST/ A/F CONTROL / USER DATA / O2S B1S1 and O2S B1S2; then press the YES button and ENTER button followed by the F4 button.

NOTICE:

If the vehicle is short of fuel, the air-fuel ratio becomes lean, HO2 sensor DTCs are recorded, and the ECM illuminates the MIL.

HINT:

- If other DTCs relating to different systems that have terminal E2 as the ground terminal are output simultaneously, terminal E2 may have an open circuit.

- Read freeze frame data using the intelligent tester. Freeze frame data records the engine condition when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, 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.
- A high HO2 sensor (sensor 1) voltage (0.55 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 HO2 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 ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P0134)

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and turn the tester ON.
- (c) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- (d) Read DTCs.

ES

Result

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

HINT:

If any DTCs other than P0134 are output, troubleshoot those DTCs first.

B **GO TO DTC CHART**

A

2 READ VALUE OF INTELLIGENT TESTER (OUTPUT VOLTAGE OF HEATED OXYGEN SENSOR)

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and turn the tester ON.
- (c) Start the engine.
- (d) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / O2S B1S1 and ENGINE SPD.
- (e) Warm up the engine until the engine coolant temperature reaches more than 75°C (169°F).
- (f) Rev the engine up to 4,000 rpm 3 times using the accelerator pedal.
- (g) Read the output voltage of the front Heated Oxygen (HO2) sensor displayed on the tester when the engine speed is suddenly increased.

Standard:

HO2 sensor voltage output indicates 0.45 V or more (rich signal) at least once.

OK **Go to step 12**

NG

3 CHECK VENTILATION HOSE CONNECTIONS

OK:

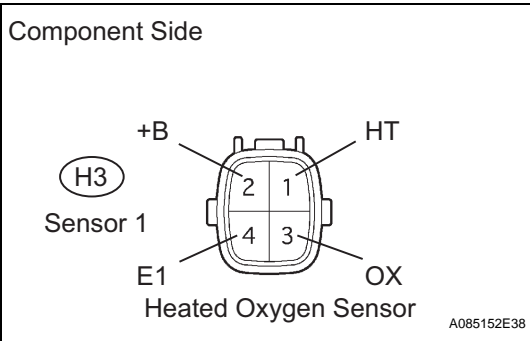
Ventilation hose is connected correctly and is not damaged.

NG → **REPAIR OR REPLACE VENTILATION HOSE**

OK

4 INSPECT HEATED OXYGEN SENSOR (HEATER RESISTANCE)

ES



- (a) Disconnect the H3 HO2 sensor connector.
- (b) Measure the resistance of the HO2 sensor connector.

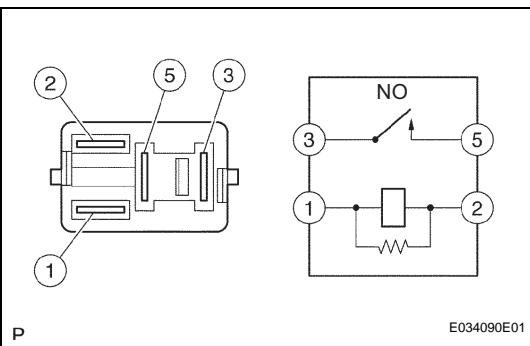
Standard resistance

Tester Connection	Specified Condition
HT (H3-1) - +B (H3-2)	11 to 16 Ω at 20°C (68°F)
HT (H3-1) - E1 (H3-4)	10 kΩ or higher

NG → **REPLACE HEATED OXYGEN SENSOR**

OK

5 INSPECT EFI RELAY (Marking: EFI)



- (a) Remove the EFI relay from the engine room relay block.
- (b) Measure the resistance of the EFI relay.

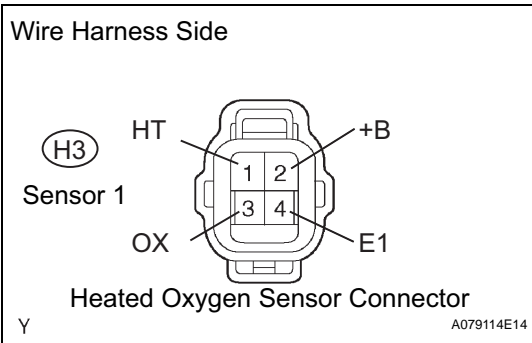
Standard resistance

Tester Connection	Specified Condition
3 - 5	10 kΩ or higher
3 - 5	Below 1 Ω (When battery voltage applied to terminals 1 and 2)

NG → **REPLACE EFI RELAY**

OK

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

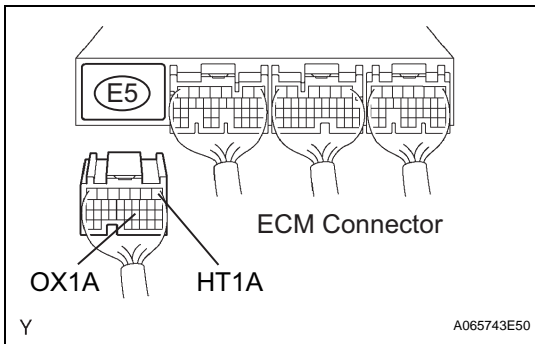


- (a) Disconnect the H3 HO2 sensor connector.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage between the +B terminal of the H3 HO2 sensor connector and body ground.

Standard voltage

Tester Connection	Specified Condition
+B (H3-2) - Body ground	9 to 14 V

- (d) Turn the ignition switch OFF.



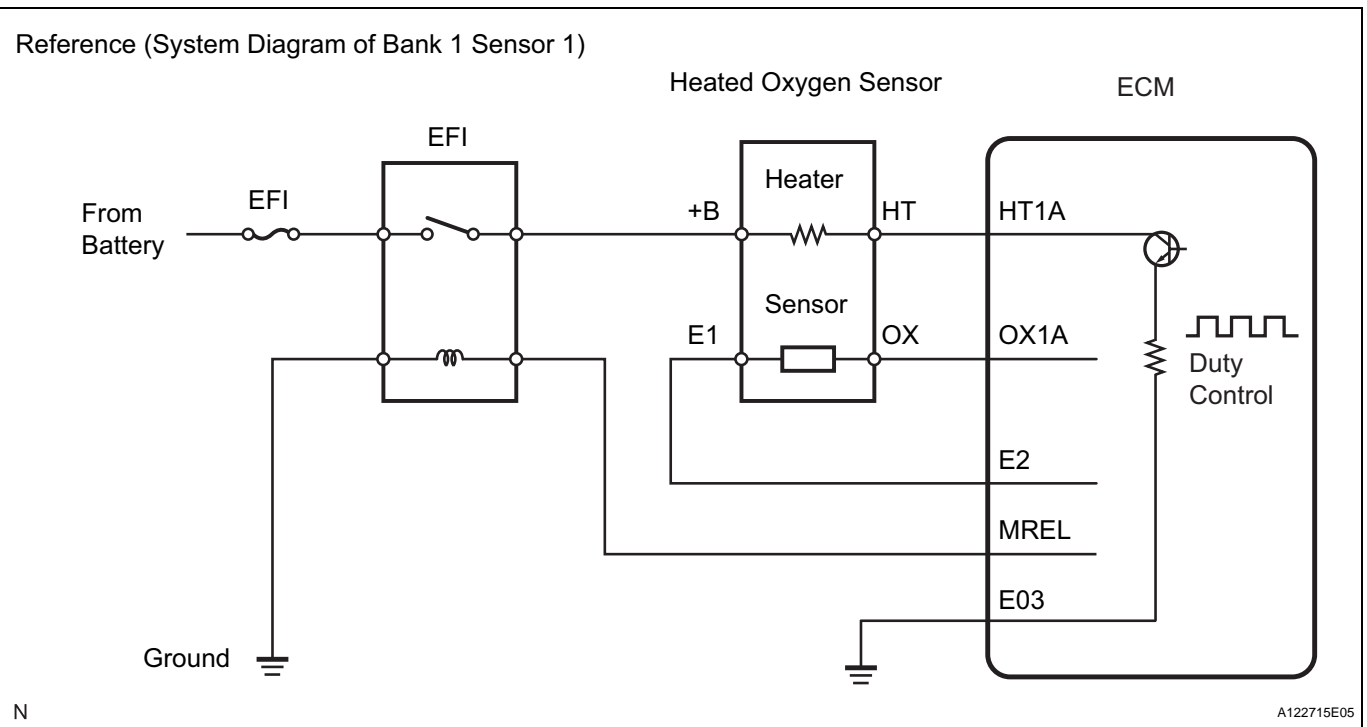
- (e) Disconnect the E5 ECM connector.
- (f) Measure the resistance of the wire harness side connectors.

Standard resistance (Check for open)

Tester Connection	Specified Condition
HT (H3-1) - HT1A (E5-1)	Below 1 Ω
OX (H3-3) - OX1A (E5-21)	Below 1 Ω
E1 (H3-4) - Body ground	Below 1 Ω

Standard resistance (Check for short)

Tester Connection	Specified Condition
HT (H3-1) or HT1A (E5-1) - Body ground	10 kΩ or higher
OX (H3-3) or OX1A (E5-21) - Body ground	10 kΩ or higher



NG **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

7 CHECK WHETHER MISFIRE OCCURS BY MONITORING DTC AND DATA LIST

NG

TROUBLESHOOT MISFIRE

OK

8 CHECK AIR INDUCTION SYSTEM

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

OK:

No leakage from air induction system.

NG

REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

9 CHECK FUEL PRESSURE(a) Check the fuel pressure (see page [FU-7](#)).

NG

REPAIR OR REPLACE FUEL SYSTEM

OK

10 INSPECT FUEL INJECTOR (INJECTION AND VOLUME)(a) Check the injector injection and volume (see page [FU-13](#)).

NG

REPLACE FUEL INJECTOR

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

NEXT

13 CHECK WHETHER DTC OUTPUT RECURS (DTC P0134)

- (a) Read DTCs using the intelligent tester.
- (b) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.

Result

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

ES

B → REPLACE ECM

A

14 CONFIRM WHETHER VEHICLE HAS RUN OUT OF FUEL IN PAST

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC CAUSED BY RUNNING OUT OF FUEL