

DTC	P2195	Oxygen (A/F) Sensor Signal Stuck Lean (Bank 1 Sensor 1)
DTC	P2196	Oxygen (A/F) Sensor Signal Stuck Rich (Bank 1 Sensor 1)
DTC	P2197	Oxygen (A/F) Sensor Signal Stuck Lean (Bank 2 Sensor 1)
DTC	P2198	Oxygen (A/F) Sensor Signal Stuck Rich (Bank 2 Sensor 1)

HINT:

- Although the DTC titles say oxygen sensor, these DTCs relate to the Air-Fuel Ratio (A/F) sensor.
- Sensor 1 refers to the sensor mounted in front of the Three-Way Catalytic Converter (TWC) and located near the engine assembly.

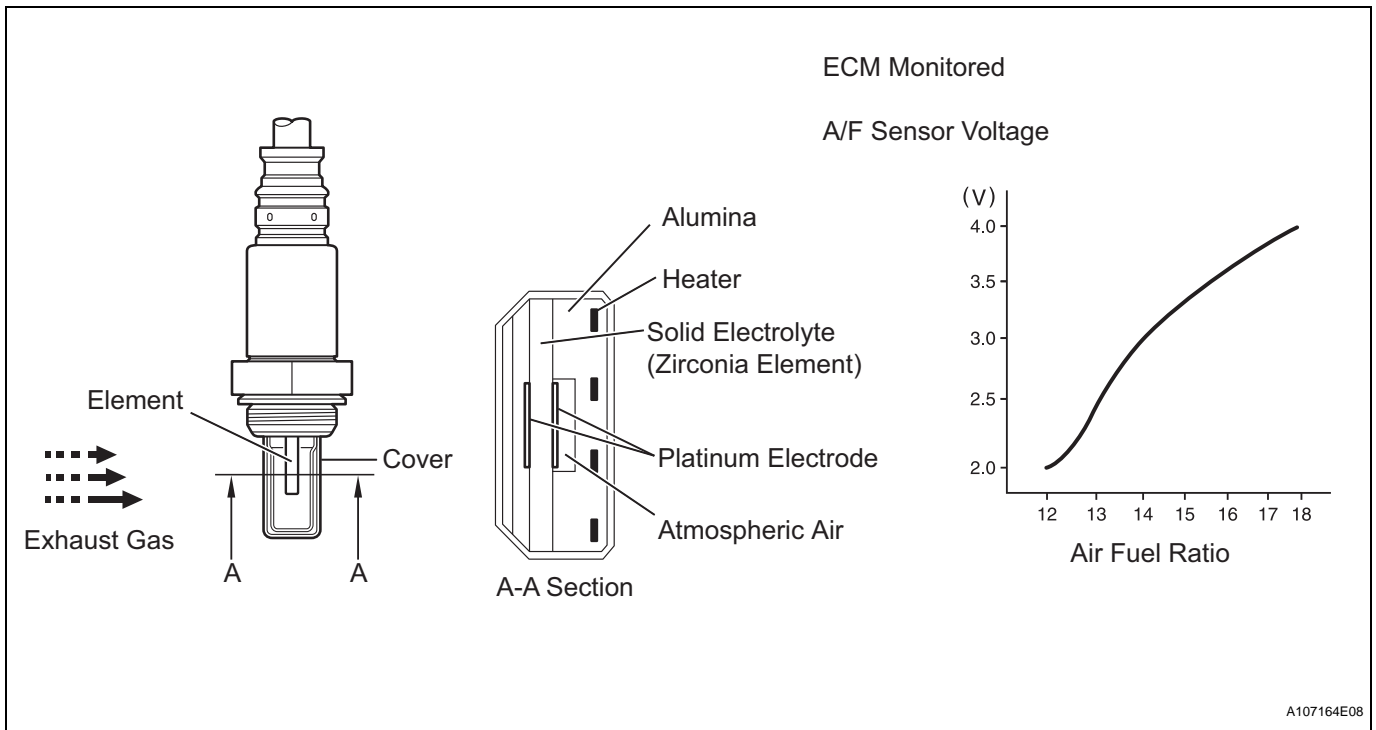
DESCRIPTION

The A/F sensor generates a voltage* that corresponds to the actual air-fuel ratio. This sensor voltage is used to provide the ECM with feedback so that it can control the air-fuel ratio. The ECM determines the deviation from the stoichiometric air-fuel ratio level, and regulates the fuel injection time. If the A/F sensor malfunctions, the ECM is unable to control the air-fuel ratio accurately.

The A/F sensor is the planar type and is integrated with the heater, which heats the solid electrolyte (zirconia element). This heater is controlled by the ECM. When the intake air volume is low (the exhaust gas temperature is low), a current flows into the heater to heat the sensor, in order to facilitate accurate oxygen concentration detection. In addition, the sensor and heater portions are narrower than the conventional type. The heat generated by the heater is conducted to the solid electrolyte through the alumina, therefore the sensor activation is accelerated.

In order to obtain a high purification rate of the carbon monoxide (CO), hydrocarbon (HC) and nitrogen oxide (NOx) components in the exhaust gas, a TWC is used. For the most efficient use of the TWC, the air-fuel ratio must be precisely controlled so that it is always close to the stoichiometric level.

*: Value changes inside the ECM. Since the A/F sensor is the current output element, a current is converted in to a voltage inside the ECM. Any measurements taken at the A/F sensor or ECM connectors will show a constant voltage.



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DTC No.	DTC Detection Conditions	Trouble Areas
P2195 P2197	Conditions (a) and (b) continue for 10 seconds or more (2 trip detection logic) (a) Air-Fuel Ratio (A/F) sensor voltage more than 3.8 V (b) Heated Oxygen (HO2) sensor voltage 0.15 V or more	<ul style="list-style-type: none"> • Open or short in A/F sensor (bank 1, 2 sensor 1) circuit • A/F sensor (bank 1, 2 sensor 1) • A/F sensor (bank 1, 2 sensor 1) heater • A/F sensor heater relay • A/F sensor heater and relay circuits • Air induction system • Fuel pressure • Injector • ECM
P2195 P2197	While fuel-cut operation performed (during vehicle deceleration), air-fuel ratio (A/F) sensor current 3.6 mA or more for 3 seconds (2 trip detection logic)	<ul style="list-style-type: none"> • A/F sensor • ECM
P2196 P2198	Conditions (a) and (b) continue for 10 seconds or more (2 trip detection logic) (a) A/F sensor voltage less than 2.8 V (b) HO2 sensor voltage less than 0.6 V	<ul style="list-style-type: none"> • Open or short in A/F sensor (bank 1, 2 sensor 1) circuit • A/F sensor (bank 1, 2 sensor 1) • A/F sensor (bank 1, 2 sensor 1) heater • A/F sensor heater relay • A/F sensor heater and relay circuits • Air induction system • Fuel pressure • Injector • ECM
P2196 P2198	While fuel-cut operation performed (during vehicle deceleration), air-fuel ratio (A/F) sensor current less than 1.57 mA for 3 seconds (2 trip detection logic)	<ul style="list-style-type: none"> • A/F sensor • ECM

HINT:

- DTCs P2195 and P2196 indicate malfunctions related to bank 1 A/F sensor circuit.
- DTCs P2197 and P2198 indicate malfunctions related to bank 2 A/F sensor circuit.
- Bank 1 refers to the bank that includes cylinder No. 1.
- Bank 2 refers to the bank that includes cylinder No. 2.
- When any of these DTCs are set, check the A/F sensor voltage output by selecting the following menu items on an intelligent tester: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / AFS B1S1 or AFS B2S1.
- Short-term fuel trim values can also be read using an intelligent tester.

- The ECM regulates the voltages at the A1A+, A2A+, A1A- and A2A- terminals of the ECM to a constant level. Therefore, the A/F sensor voltage output cannot be confirmed without using an intelligent tester.
- If a A/F sensor malfunction is detected, the ECM sets a DTC.

MONITOR DESCRIPTION

Sensor voltage detection monitor

Under the air-fuel ratio feedback control, if the A/F sensor voltage output indicates rich or lean for a certain period of time, the ECM determines that there is a malfunction in the A/F sensor. The ECM illuminates the MIL and sets a DTC.

Example:

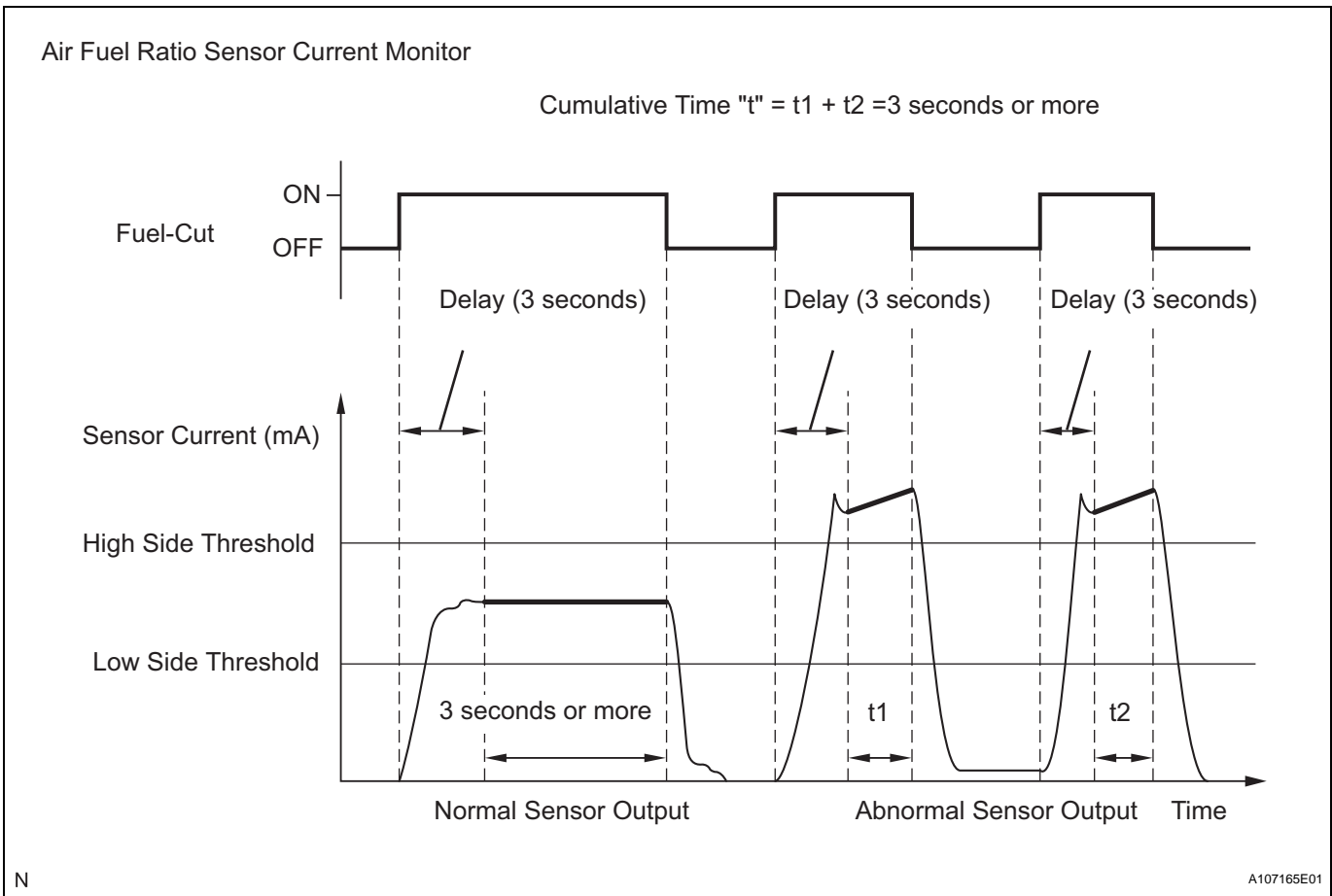
If the A/F sensor voltage output is less than 2.8 V (very rich condition) for 10 seconds, despite the HO2 sensor voltage output being less than 0.6 V, the ECM sets DTC P2196. Alternatively, if the A/F sensor voltage output is more than 3.8 V (very lean condition) for 10 seconds, despite the HO2 sensor voltage output being 0.15 V or more, DTC P2195 is set.

Sensor current detection monitor

A rich air-fuel mixture causes a low A/F sensor current, and a lean air-fuel mixture causes a high A/F sensor current. Therefore, the sensor output becomes low during acceleration, and it becomes high during deceleration with the throttle valve fully closed. The ECM monitors the A/F sensor current during fuel-cut and detects any abnormal current values.

If the A/F sensor output is 3.6 mA or more for more than 3 seconds of cumulative time, the ECM interprets this as a malfunction in the A/F sensor and sets DTC P2195 (high-side stuck). If the A/F sensor output is 1.57 mA or less for more than 3 seconds of cumulative time, the ECM sets DTC P2196 (low-side stuck).

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MONITOR STRATEGY

Related DTCs	P2195: A/F sensor (Bank 1) signal stuck lean P2196: A/F sensor (Bank 1) signal stuck rich P2197: A/F sensor (Bank 2) signal stuck lean P2198: A/F sensor (Bank 2) signal stuck rich
Required Sensors/Components (Main)	A/F sensor
Required Sensors/Components (Related)	HO2 sensor
Frequency of Operation	Continuous
Duration	10 seconds
MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS**ALL**

The monitor will run whenever these DTCs are not present	P0031, P0032, P0051, P0052 (A/F sensor heater - Sensor 1) P0037, P0038, P0057, P0058 (O2 Sensor heater - Sensor 2) P0100 - P0103 (MAF meter) P0110 - P0113 (IAT sensor) P0115 - P0118 (ECT sensor) P0120 - P0223, P2135 (TP sensor) P0125 (Insufficient ECT for closed loop) P0136, P0156 (O2 Sensor - Sensor 2) P0171, P0172 (Fuel system) P0300 - P0306 (Misfire) P0335 (CKP sensor) P0340, P0341 (CMP sensor) P0500 (VSS)
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Sensor voltage detection monitor (Lean side malfunction P2195, P2197):

Time while all of following conditions met	2 seconds or more
Rear HO2 sensor voltage	0.15 V or more
Time after engine start	30 seconds or more
A/F sensor status	Activated
Fuel system status	Closed-loop
Engine	Running

Sensor voltage detection monitor (Rich side malfunction P2196, P2198):

Time while all of following conditions met	2 seconds or more
Rear HO2 sensor voltage	Below 0.6 V
Time after engine start	30 seconds or more
A/F sensor status	Activated
Fuel system status	Closed-loop
Engine	Running

Sensor Current detection monitor (P2195, P2196, P2197 P2198):

Battery voltage	11 V or more
Atmospheric pressure	570 mmHg or higher
Air-fuel ratio sensor status	Activated
Pass/Malfunction determination in this driving cycle	Not determined
Engine coolant temperature	75°C (167°F) or more
Continuous time of fuel cut	3 to 10 seconds

TYPICAL MALFUNCTION THRESHOLDS**Sensor voltage detection monitor (Lean side malfunction P2195, P2197):**

A/F sensor voltage	More than 3.8 V
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Sensor voltage detection monitor (Rich side malfunction P2196, P2198):

A/F sensor voltage	Less than 2.8 V
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Sensor current detection monitor (High side malfunction P2195, P2197):

Following condition met for:	3 seconds or more
Air-fuel ratio sensor current during fuel cut	3.6 mA or more

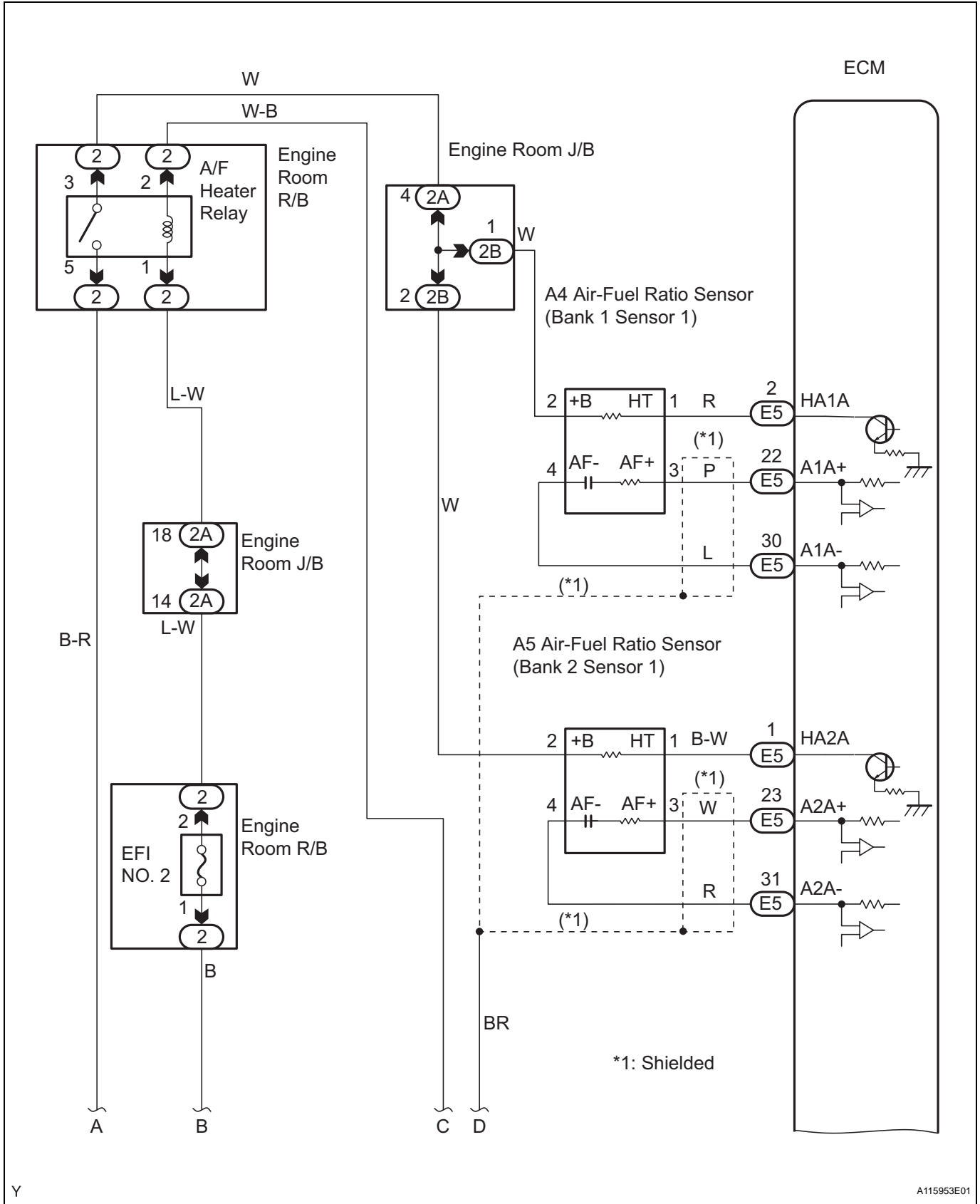
Sensor current detection monitor (Rich side malfunction P2196, P2198):

Following condition met for:	3 seconds or more
Air-fuel ratio sensor current during fuel cut	Less than 1.57 mA

MONITOR RESULT

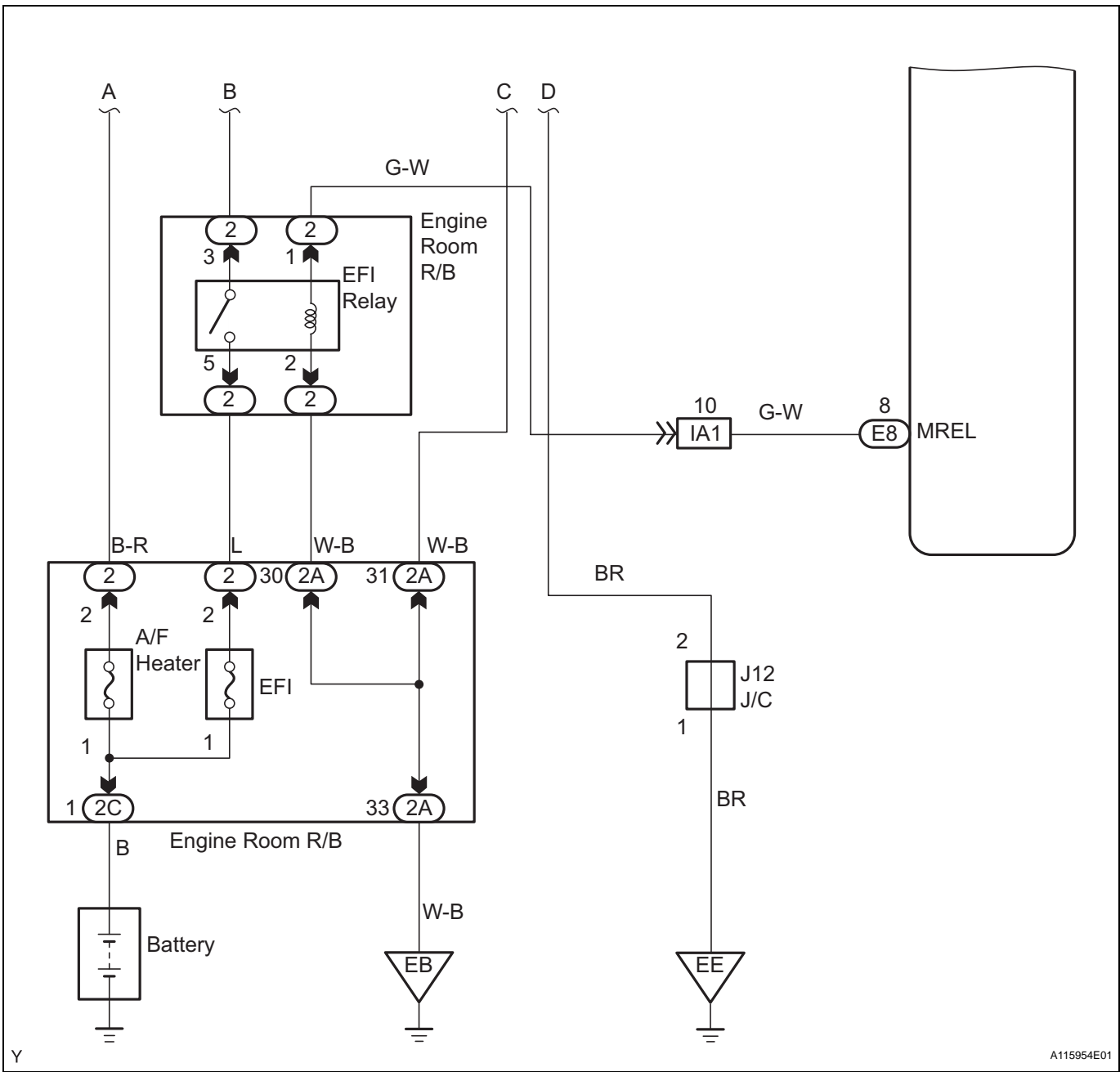
Detailed information on Checking Monitor Status (See page [ES-19](#)).

WIRING DIAGRAM



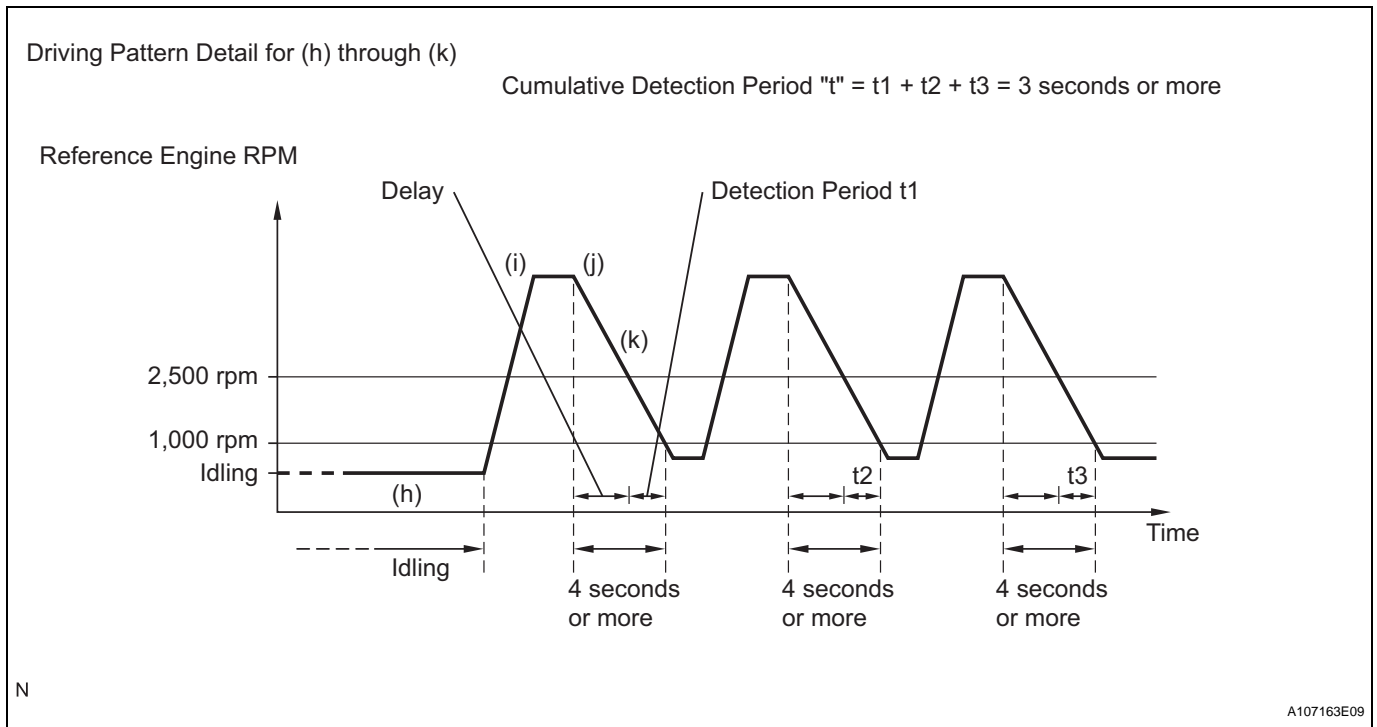
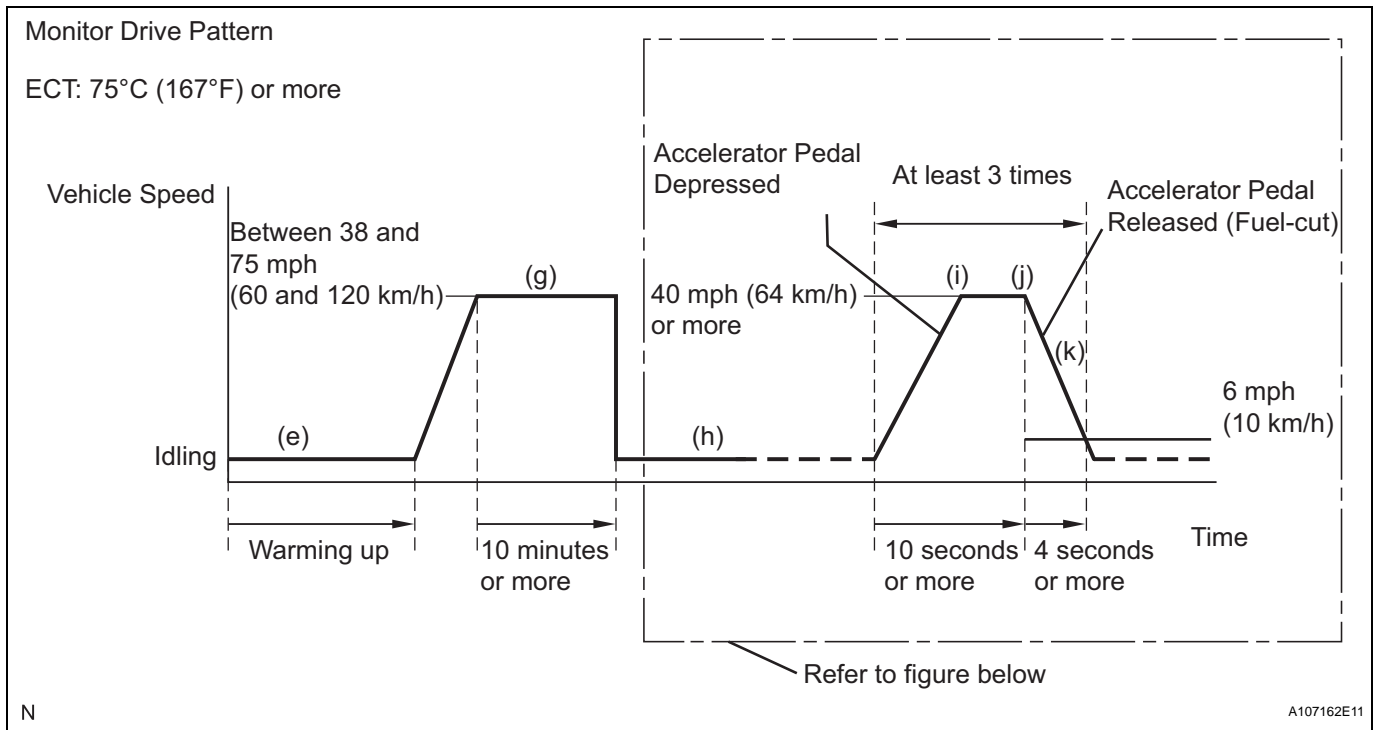
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CONFIRMATION DRIVING PATTERN

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



- Connect an intelligent tester to the DLC3.
- Turn the ignition switch ON.
- Turn the tester ON.
- Clear DTCs (See page [ES-38](#)).
- Start the engine, and warm it up until the ECT reaches 75°C (167°F) or higher.
- Select the following menu items to check the fuel-cut status: DIAGNOSIS / ENHANCED OBD II / DATA LIST / USER DATA / FC IDLE.
- Drive the vehicle at between 38 mph (60 km/h) and 75 mph (120 km/h) for at least 10 minutes.
- Change the transmission to 2nd gear.

(i) Drive the vehicle at proper vehicle speed to perform fuel-cut operation (refer to the following HINT).

HINT:

Fuel-cut is performed when the following conditions are met:

- Accelerator pedal fully released.
- Engine speed is 2,500 rpm or more (fuel injection returns at 1,000 rpm).

(j) Accelerate the vehicle to 40 mph (64 km/h) or more by depressing the accelerator pedal for at least 10 seconds.

(k) Soon after performing step (j) above, release the accelerator pedal for at least 4 seconds without depressing the brake pedal, in order to execute fuel-cut control.

(l) Allow the vehicle to decelerate until the vehicle speed declines to less than 6 mph (10 km/h).

(m) Repeat steps from (h) through (k) above at least 3 times in one driving cycle.

HINT:

Completion of all A/F sensor monitors is required to change the value in TEST RESULT.

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CAUTION:

Strictly observe posted speed limits, traffic laws, and road conditions when performing these drive patterns.

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 Air-Fuel Ratio (A/F) sensor, Heated Oxygen (HO₂) sensor and other potential trouble areas are malfunctioning.

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

- (1) Connect an 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) Select the following menu items: 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 outputs of the A/F and HO₂ sensors (AFS B1S1 and O₂S B1S2 or AFS B2S1 and O₂S B2S2) 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
AFS B1S1 or AFS B2S1 (A/F)	+25 %	Rich	Less than 3.0
AFS B1S1 or AFS B2S1 (A/F)	-12.5 %	Lean	More than 3.35
O ₂ S B1S2 or O ₂ S B2S2 (HO ₂)	+25 %	Rich	More than 0.55
O ₂ S B1S2 or O ₂ S B2S2 (HO ₂)	-12.5 %	Lean	Less than 0.4

NOTICE:

The Air-Fuel Ratio (A/F) sensor has an output delay of a few seconds and the Heated Oxygen (HO₂) sensor has a maximum output delay of approximately 20 seconds.

Case	A/F Sensor (Sensor 1) Output Voltage		HO2 Sensor (Sensor 2) Output Voltage		Main Suspected Trouble Areas
1	Injection volume +25 % -12.5 %		Injection volume +25 % -12.5 %		-
	Output voltage More than 3.35 V Less than 3.0 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"> • A/F sensor • A/F sensor heater • A/F 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"> • HO2 sensor • HO2 sensor heater • HO2 sensor circuit
	Output voltage More than 3.35 V Less than 3.0 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 lean or rich)
	Output voltage Almost no reaction		Output voltage Almost no reaction		

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- Following the A/F CONTROL procedure enables technicians to check and graph the voltage outputs of both the A/F and HO2 sensors.
- To display the graph, select the following menu items on the tester: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / A/F CONTROL / USER DATA / AFS B1S1 and O2S B1S2 or AFS B2S1 and O2S B2S2, and press the YES button and then the ENTER button followed by the F4 button.

HINT:

- Read freeze frame data using an intelligent tester. Freeze frame data record 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 low A/F sensor voltage could be caused by a rich air-fuel mixture. Check for conditions that would cause the engine to run rich.
- A high A/F sensor voltage 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 P2195, P2196, P2197 OR P2198)

- Connect an intelligent tester to the DLC3.
- Turn the ignition switch ON.
- Turn the tester ON.
- Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- Read DTCS.

Result

Display (DTC Output)	Proceed To
P2195, P2196, P2197 or P2198	A
P2195, P2196, P2197 or P2198 and other DTCs	B

HINT:

If any DTCs other than P2195, P2196, P2197 or P2198 are output, troubleshoot those DTCs first.

B

GO TO DTC CHART

A

ES

2

READ VALUE OF INTELLIGENT TESTER (TEST VALUE OF A/F SENSOR)

- (a) Connect an intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and turn the tester ON.
- (c) Clear DTCs (See page [ES-38](#)).
- (d) Allow the vehicle to drive in accordance with the drive pattern described in the CONFIRMATION DRIVING PATTERN.
- (e) Select the following menu items on the tester:
DIAGNOSIS / ENHANCED OBD II / MONITOR INFO / MONITOR STATUS.
- (f) Check that the status of O2S MON is COMPL.
If the status is still INCMPL, drive the vehicle according to the driving pattern again.
HINT:
 - AVAIL indicates that the component has not been monitored yet.
 - COMPL indicates that the component is functioning normally.
 - INCMPL indicates that the component is malfunctioning.
- (g) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / MONITOR INFO / TEST RESULT / RANGE B1S1, then press the ENTER button.
- (h) Check the test value of the A/F sensor output current during fuel-cut.

Result

Test Value	Proceed To
Within normal range (1.57 mA or more, and less than 3.6 mA)	A
Outside normal range (Less than 1.57 mA, or 3.6 mA or more)	B

B

Go to step 20

A

3

READ VALUE OF INTELLIGENT TESTER (OUTPUT VOLTAGE OF A/F SENSOR)

- (a) Connect an intelligent tester to the DLC3.
- (b) Start the engine.
- (c) Turn the tester ON.

- (d) Warm up the Air-Fuel Ratio (A/F) sensor at an engine speed of 2,500 rpm for 90 seconds.
- (e) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / SNAPSHOT / MANUAL SNAPSHOT / USER DATA / AFS B1S1 or AFS B2S1 and ENGINE SPD.
- (f) Check the A/F sensor voltage three times, when the engine is in each of the following conditions:
 - (1) While idling (check for at least 30 seconds)
 - (2) At an engine speed of approximately 2,500 rpm (without any sudden changes in engine speed)
 - (3) Raise the engine speed to 4,000 rpm and then quickly release the accelerator pedal so that the throttle valve is fully closed.

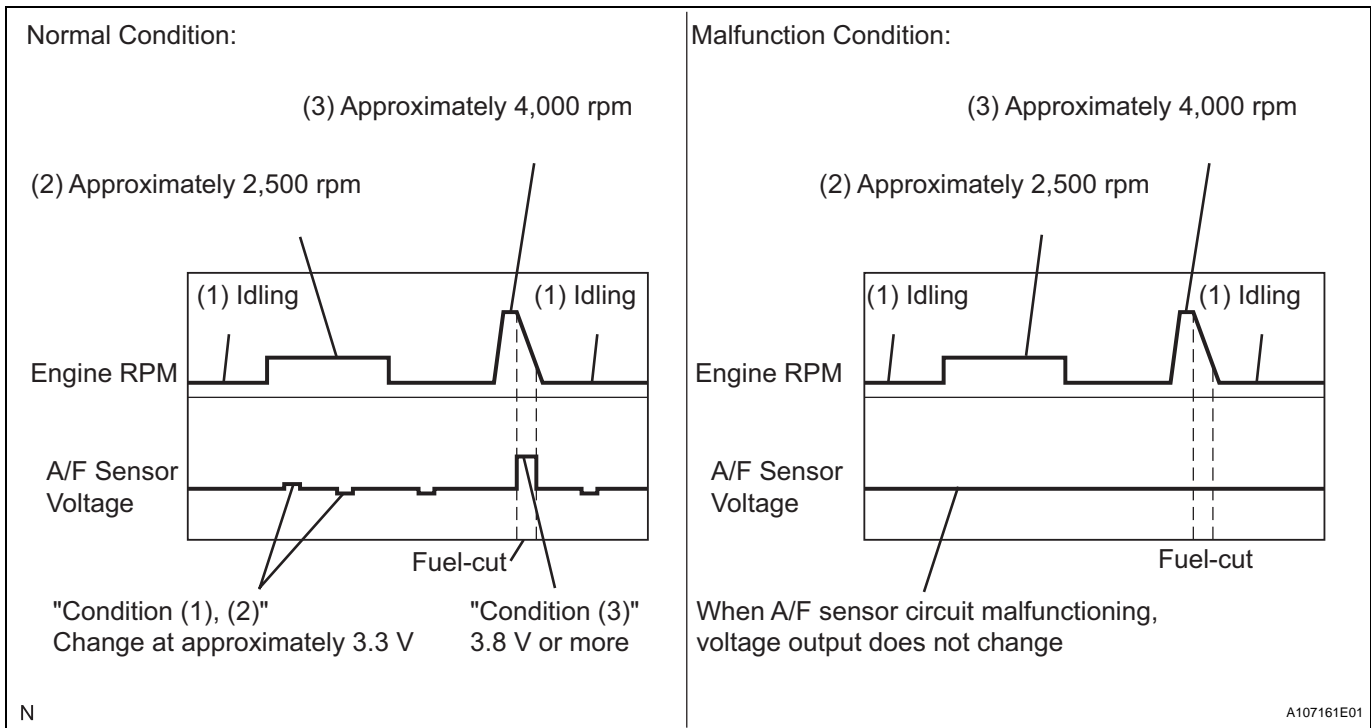


Standard

Conditions	A/F Sensor Voltage Variations	Reference
(1) and (2)	Changes at approximately 3.3 V	Between 3.1 V and 3.5 V
(3)	Increases to 3.8 V or more	This occurs during engine deceleration (when fuel-cut performed)

HINT:

For more information, see the diagrams below.



HINT:

- If the output voltage of the A/F sensor remains at approximately 3.3 V (see Malfunction Condition diagram) under any conditions, including those above, the A/F sensor may have an open circuit. (This will also happen if the A/F sensor heater has an open circuit.)
- If the output voltage of the A/F sensor remains at either approximately 3.8 V or more, or 2.8 V or less (see Malfunction Condition diagram) under any conditions, including those above, the A/F sensor may have a short circuit.

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- The ECM stops fuel injection (fuel cut) during engine deceleration. This causes a lean condition and results in a momentary increase in the A/F sensor output voltage.
- The ECM must establish a closed throttle valve position learning value to perform fuel cut. If the battery terminal has been reconnected, the vehicle must be driven over 10 mph (16 km/h) to allow the ECM to learn the closed throttle valve position.
- When the vehicle is driven:
The output voltage of the A/F sensor may be below 2.8 V during fuel enrichment. For the vehicle, this translates to a sudden increase in speed with the accelerator pedal fully depressed when trying to overtake another vehicle. The A/F sensor is functioning normally.
- The A/F sensor is a current output element; therefore, the current is converted into a voltage inside the ECM. Measuring the voltage at the connectors of the A/F sensor or ECM will show a constant voltage result.

NG **Go to step 10**

OK

4 PERFORM CONFIRMATION DRIVING PATTERN

NEXT

5 CHECK WHETHER DTC OUTPUT RECURS (DTC P2195, P2196, P2197 OR P2198)

- Connect an intelligent tester to the DLC3.
- Turn the ignition switch ON and the tester ON.
- Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / PENDING CODES.
- Read DTCs.

Result

Display (DTC Output)	Proceed To
P2195, P2196, P2197 or P2198	A
No output	B

B **Go to step 9**

A

6 REPLACE AIR FUEL RATIO SENSOR

NEXT

7 PERFORM CONFIRMATION DRIVING PATTERN

NEXT

8 CHECK WHETHER DTC OUTPUT RECURS (DTC P2195, P2196, P2197 OR P2198)

- (a) Connect an intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and the tester ON.
- (c) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / PENDING CODES.
- (d) Read DTCs.

Result

Display (DTC Output)	Proceed To
No output	A
P2195, P2196, P2197 or P2198	B

B → **REPLACE ECM AND PERFORM CONFIRMATION DRIVING PATTERN**

A

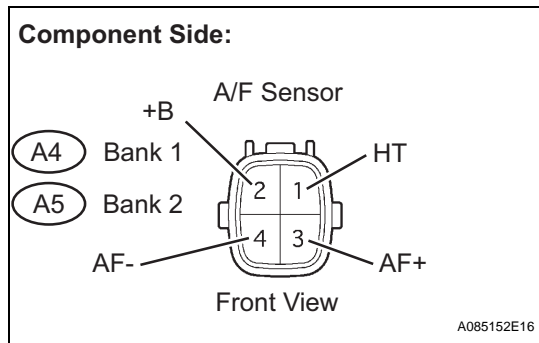
9 CONFIRM WHETHER VEHICLE HAS RUN OUT OF FUEL IN PAST

NO → **CHECK FOR INTERMITTENT PROBLEMS**

YES

DTC CAUSED BY RUNNING OUT OF FUEL

10 INSPECT AIR FUEL RATIO SENSOR (HEATER RESISTANCE)



- (a) Disconnect the A4 or A5 A/F sensor connector.
- (b) Measure the resistance between the terminals of the A/F sensor connector.

Standard Resistance

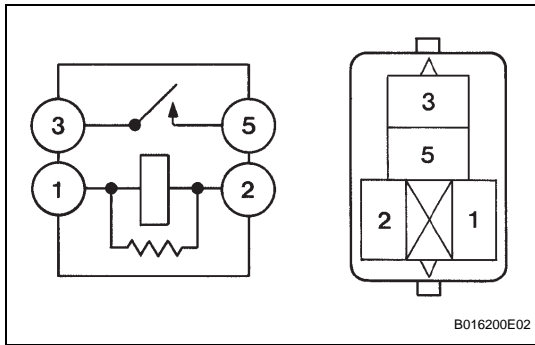
Tester Connections	Specified Conditions
HT (1) - +B (2)	1.8 to 3.4 Ω at 20°C (68°F)
HT (1) - AF- (4)	10 kΩ or higher

- (c) Reconnect the A/F sensor connector.

NG → **REPLACE AIR FUEL RATIO SENSOR**

OK

11 INSPECT AIR FUEL RATIO SENSOR HEATER RELAY



- (a) Remove the A/F sensor heater relay from the engine room R/B.
- (b) Check the A/F sensor heater relay resistance.

Standard Resistance

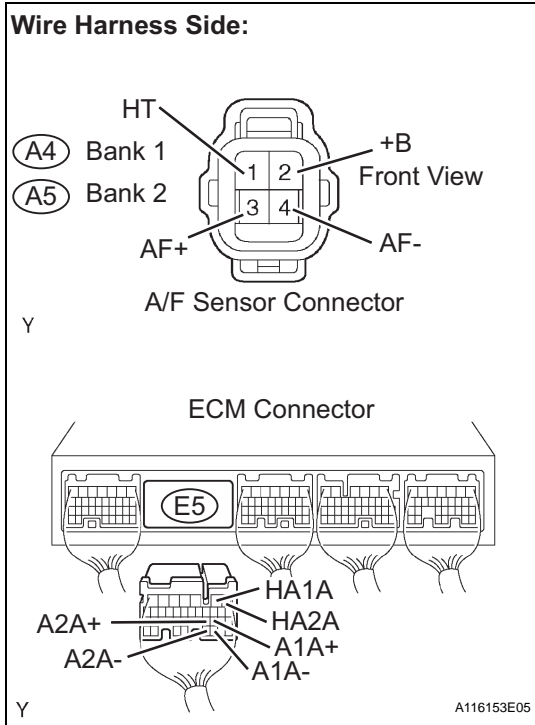
Tester Connections	Specified Conditions
3 - 5	10 kΩ or higher
3 - 5	Below 1 Ω (when battery voltage applied to terminals 1 and 2)

- (c) Reinstall the A/F sensor heater relay.

NG → **REPLACE AIR FUEL RATIO SENSOR HEATER RELAY**

OK

12 CHECK HARNESS AND CONNECTOR (A/F SENSOR - ECM)



- (a) Disconnect the A4 or A5 A/F sensor connector.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage between the +B terminal of the A/F sensor connector and body ground.

Standard Voltage

Tester Connections	Specified Conditions
+B (A4-2) - Body ground	9 to 14 V
+B (A5-2) - Body ground	

- (d) Turn the ignition switch OFF.
- (e) Disconnect the E5 ECM connector.
- (f) Check the resistance.

Standard Resistance (Check for open)

Tester Connections	Specified Conditions
HT (A4-1) - HA1A (E5-2)	Below 1 Ω
AF+ (A4-3) - A1A+ (E5-22)	
AF- (A4-4) - A1A- (E5-30)	
HT (A5-1) - HA2A (E5-1)	
AF+ (A5-3) - A2A+ (E5-23)	
AF- (A5-4) - A2A- (E5-31)	

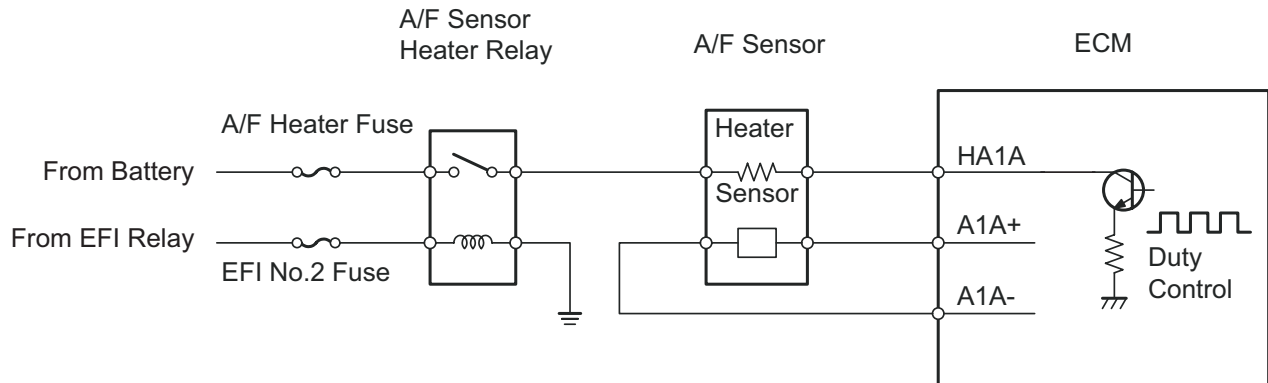
Standard Resistance (Check for short)

Tester Connections	Specified Conditions
HT (A4-1) or HA1A (E5-2) - Body ground	10 kΩ or higher
AF+ (A4-3) or A1A+ (E5-22) - Body ground	
AF- (A4-4) or A1A- (E5-30) - Body ground	
HT (A5-1) or HA2A (E5-1) - Body ground	
AF+ (A5-3) or A2A+ (E5-23) - Body ground	
AF- (A5-4) or A2A- (E5-31) - Body ground	

- (g) Reconnect the ECM connector.
- (h) Reconnect the A/F sensor connector.

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Reference (Bank 1 Sensor 1 System Diagram)



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

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OK

13 CHECK AIR INDUCTION SYSTEM

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

OK:

No leakage from air induction system.

NG → **REPAIR OR REPLACE AIR INDUCTION SYSTEM**

OK

14 CHECK FUEL PRESSURE

(a) Check the fuel pressure.

NG → **REPAIR OR REPLACE FUEL SYSTEM**

OK

15 INSPECT FUEL INJECTOR ASSEMBLY

(a) Check the injector injection (whether fuel volume is high or low, and whether injection pattern is poor).

NG → **REPLACE FUEL INJECTOR ASSEMBLY**

OK

16 REPLACE AIR FUEL RATIO SENSOR

NEXT

17 PERFORM CONFIRMATION DRIVING PATTERN

NEXT

ES

18 CHECK WHETHER DTC OUTPUT RECURS (DTC P2195, P2196, P2197 OR P2198)

- (a) Connect an intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and the tester ON.
- (c) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / PENDING CODES.
- (d) Read DTCs.

Result

Display (DTC Output)	Proceed To
No output	A
P2195, P2196, P2197 or P2198	B

B → REPAIR OR REPLACE ECM AND PERFORM CONFIRMATION DRIVING PATTERN

A

19 CONFIRM WHETHER VEHICLE HAS RUN OUT OF FUEL IN PAST

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC CAUSED BY RUNNING OUT OF FUEL

20 REPLACE AIR FUEL RATIO SENSOR

NEXT

21 PERFORM CONFIRMATION DRIVING PATTERN

NEXT

22 CHECK WHETHER DTC OUTPUT RECURS (DTC P2195, P2196, P2197 OR P2198)

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

Result

Display (DTC Output)	Proceed To
No output	A
P2195, P2196, P2197 or P2198 (A/F sensor pending DTCs)	B

ES

B → **REPLACE ECM**

A

END