DTC P0031: OXYGEN (A/F) SENSOR HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1) & DTC P0032: OXYGEN (A/F) SENSOR HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1)

CAUTION: If Engine Control Module (ECM) replacement is instructed in following test, always ensure ECM connectors and ground circuits are okay. If either are defective, repair and repeat testing to confirm ECM malfunction. On models equipped with engine immobilizer, if ECM is replaced, ECM must be programmed with proper ignition key code for engine immobilizer system. For programming procedures, see appropriate ENGINE IMMOBILIZER SYSTEMS article in ACCESSORIES & EQUIPMENT.

Circuit Description

The ECM provides a pulse width modulated control circuit to adjust current through heater. The oxygen (A/F) sensor circuit uses the EFI relay on the B+ side of circuit.

Possible Causes

DTCs is set when:

- DTC P0031: Oxygen sensor heater current is 3 amps or less when heater operates, (two trip detection logic).
- DTC P0032: Oxygen sensor heater current draw exceeds 19.7 amps, (two trip detection logic).

Possible causes are:

- Oxygen sensor heater circuit is open or shorted.
- Defective Oxygen sensor heater.
- Defective EFI relay.
- Defective ECM.

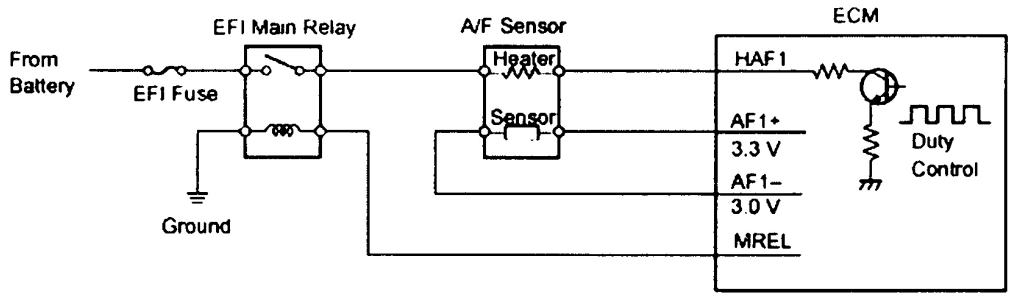
Diagnosis & Repair

NOTE: Using Toyota hand-held tester or scan tool, read FREEZE FRAME data. Freeze frame data records engine conditions when malfunction is detected.

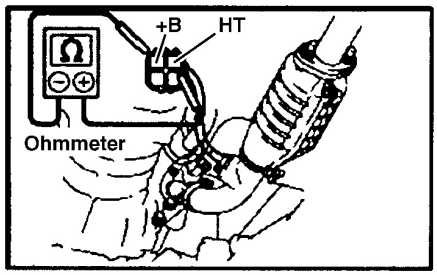
For diagnosis and repair procedure, see **Fig. 10** & **Fig. 11** .

For access to, or replacement of ECM, Engine Control Module (ECM) is located behind glove box. See **Fig. 7** . For ECM connector view, see **Fig. 9** . For circuit wiring diagram, see **Fig. 12** . For testing of systems or components, see **SYSTEM & COMPONENT TESTING - V6 & V8** article. For removal and installation of components, see **REMOVAL & INSTALLATION - V6 & V8** article.

Reference



1	**Check resistance of A/F sensor heater.**



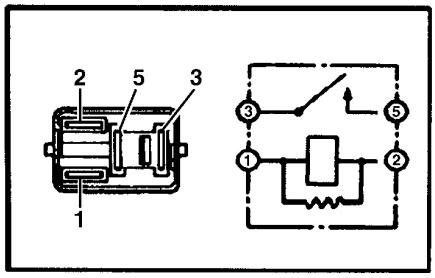
PREPARATION:
Disconnect the sensor connector
CHECK:
Using an ohmmeter, measure the resistance between terminals +B and HT.
OK:

at 20°C (68°F)	0.8 – 1.4 Ω
at 800°C (1,472°F)	1.8 – 3.2 Ω

NG → **Replace A/F sensor.**

OK

2	**Check EFI main relay (Marking : EFI).**



PREPARATION:
Remove the EFI main relay from RB No. 2.
CHECK:
Inspect the EFI main relay.
OK:

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
	3 – 5	No continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

NG → **Replace EFI main relay**

OK

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Fig. 10: DTCs P0031 & P0032 Diagnostic Procedure (Steps 1-2)
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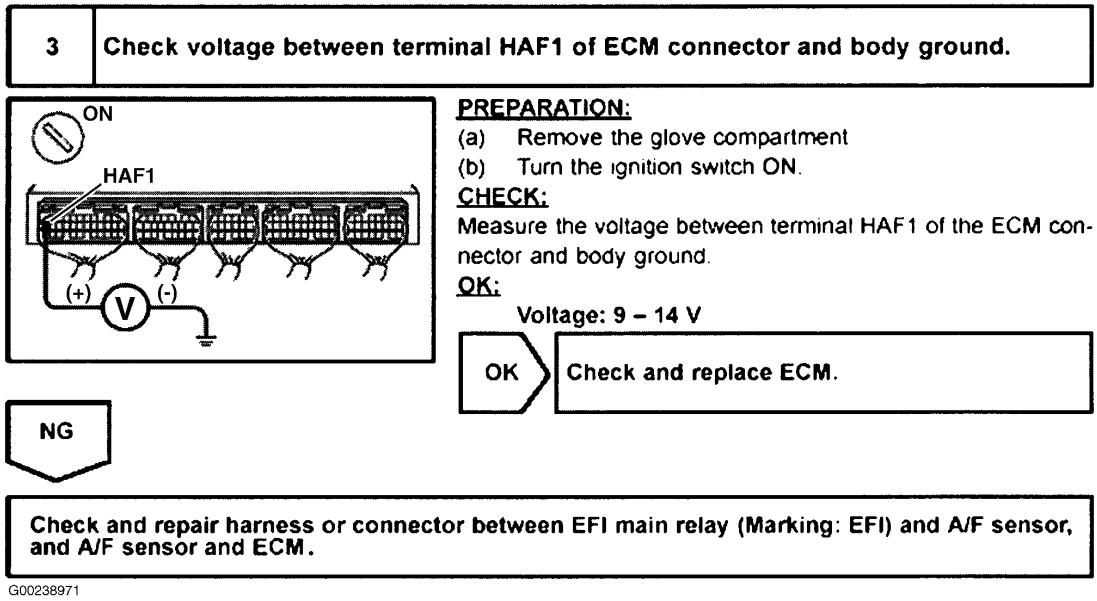

Fig. 11: DTCs P0031 & P0032 Diagnostic Procedure (Step 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

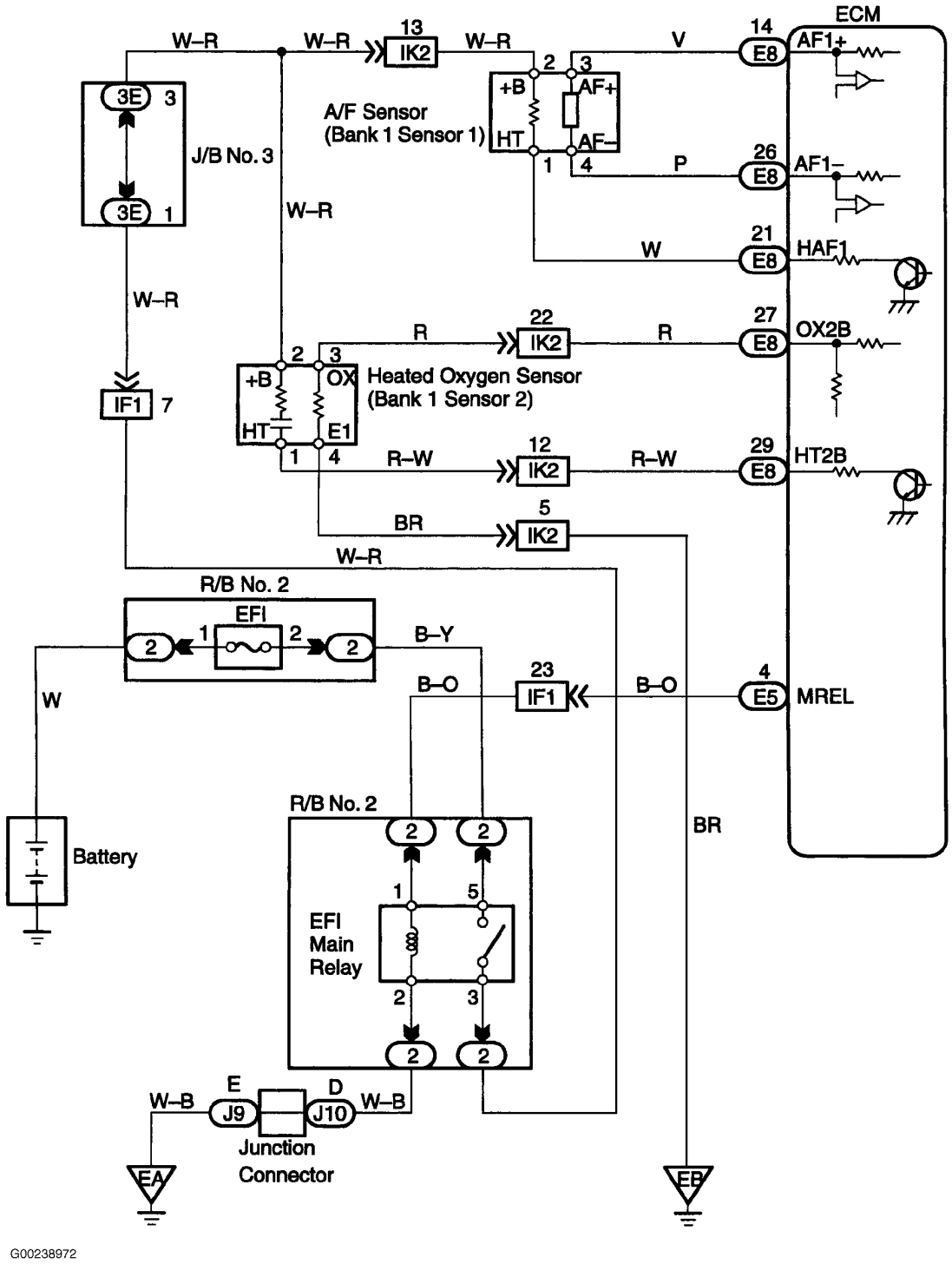

Fig. 12: A/F Sensor & HO2S Circuit Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Possible causes are:

