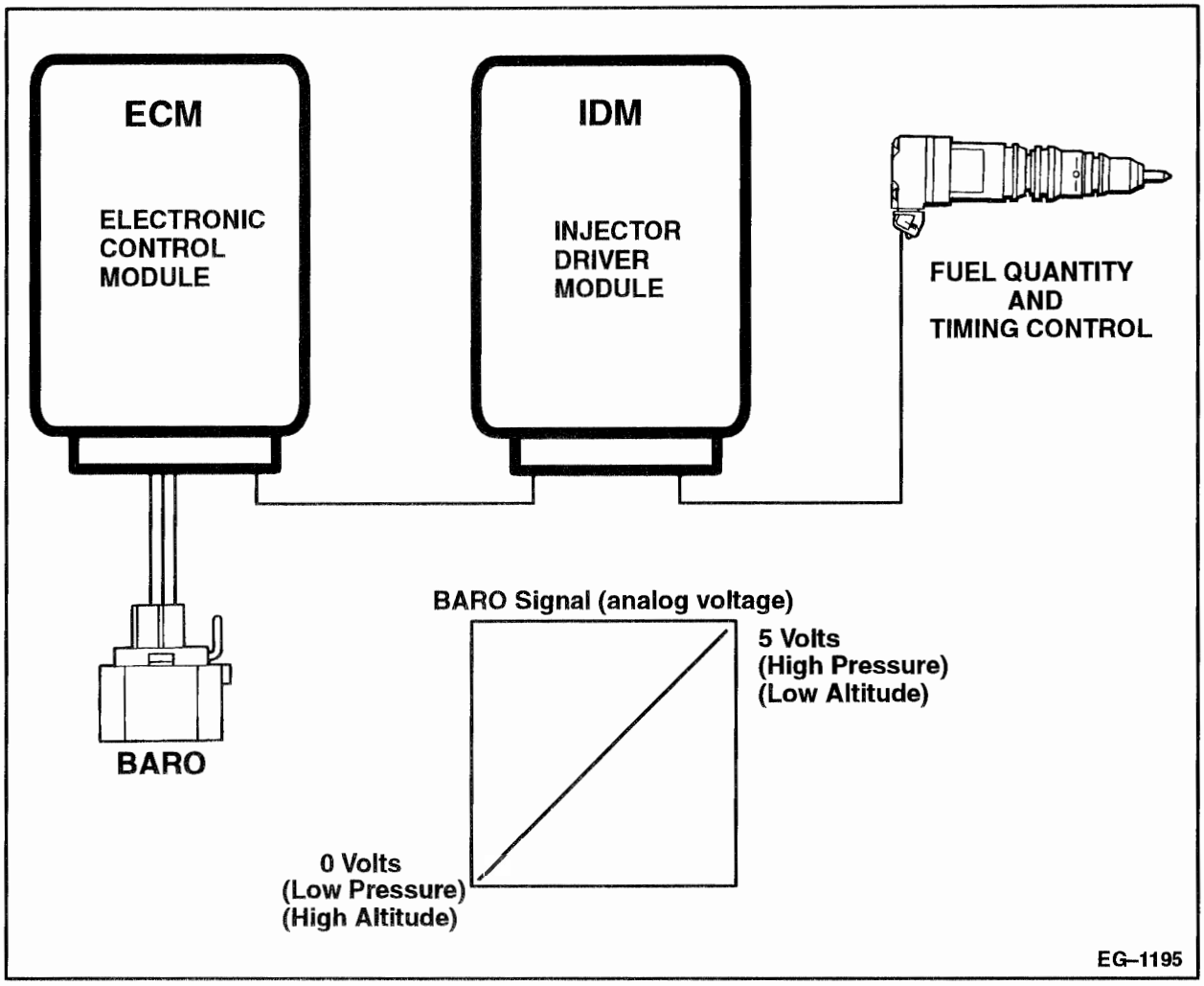
ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

BAROMETRIC PRESSURE SENSOR (BARO)

BAROMETRIC PRESSURE (BARO) SENSOR



SIGNAL FUNCTIONS

The BARO (Barometric Pressure) sensor is a variable capacitance sensor that when supplied with a 5 volt reference signal from the ECM produces a linear analog voltage signal that indicates pressure.

Timing Control – The BARO signal is used to determine altitude to adjust timing and fuel quantity to optimize engine operation and control smoke throughout all altitude conditions.

FAULT DETECTION/MANAGEMENT

A BARO signal that is detected out of range high or low by the ECM will cause the ECM to ignore the BARO signal and use the Manifold Absolute Pressure (MAP) signal generated at low idle as an indication of barometric pressure. If a MAP fault is detected, the BARO will default to 29.6 in. Hg. of barometric pressure.

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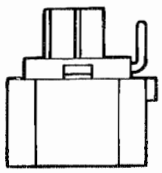
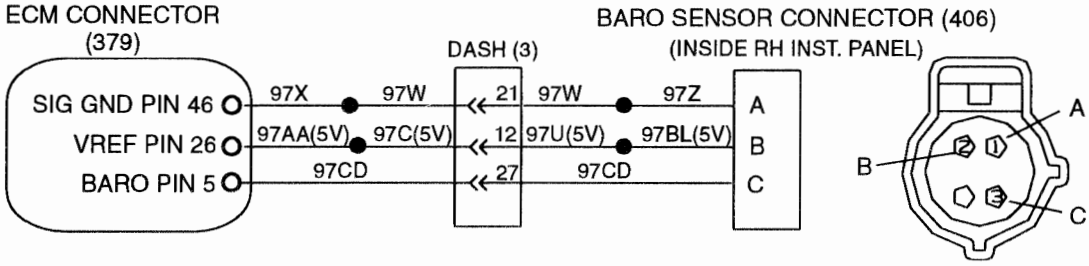
Barometric Pressure Sensor (BARO)



Fault Codes:
151 Out of Range High
152 Out of Range Low



(sensor mounted under dash)

After removing connectors always check for damaged pins, corrosion, loose terminals etc.

Connector Checks to Chassis Ground

(Check with Sensor Connector (406) Disconnected and Ignition key off, all accessories off)

Test Points	Spec.	Comments
A to Grd.	< 5 ohms	Resistance to chassis grd, check with key off, > than 5 ohms the harness is open.
B to Grd.	> 1000 ohms	Resistance less than 1000 ohms indicates a short to ground.
C to Grd.	> 1000 ohms	Resistance less than 1000 ohms indicates a short to ground.

Connector Voltage Checks

(Check with sensor Connector (406) Disconnected, Ignition Key On, all accessories off)

Test Points	Spec.	Comments
B to Grd.	5 Volts + .5	V Ref, check with key ON, if voltage not is spec., see VRef circuit
C to Grd.	0 – .25 v	If voltage is greater than .25 v, signal wire is shorted to V ref or battery.

Harness Resistance Checks

(Check with breakout box installed on engine harness only)

Test Points	Spec.	Comments
#46 to A	< 5 ohms	Resistance from sensor connector to 60 pin connector – Signal ground
#26 to B	< 5 ohms	Resistance from sensor connector to 60 pin connector – VRef
#5 to C	< 5 ohms	Resistance from sensor connector to 60 pin connector – BARO signal

Operational Voltage Checks

(Check with breakout box installed in line with the ECM)

Test Points (+) #5 to (–) #46			
Voltage	In. Hg.	kPA	Comments
4.89	31.0905	105	High atmospheric pressure
4.6	29.61	100	Normal atmospheric pressure at sea level.
2.6	17.766	60	Normal atmospheric pressure at 10,000 feet.

Fault Code Descriptions

151 = Signal voltage was greater than 4.95 volts for more than 1.0 seconds.
152 = Signal voltage was less than 1.0 volts for more than 1.0 seconds.

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ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

BAROMETRIC PRESSURE SENSOR (BARO)

EXTENDED DESCRIPTION
BAROMETRIC PRESSURE SENSOR

Refer to circuit diagram on page 13 for the following discussion.

BAROMETRIC PRESSURE SENSOR (BARO) OPERATION

The ECM sends a regulated 5 volt signal from ECM connector (379) terminal 26 to BARO connector (406) terminal 2. The BARO sensor returns a variable voltage signal (represents atmospheric pressure) from BARO connector (406) terminal 3 to the ECM at terminal 5. The BARO sensor is grounded from connector (406) terminal 1 to the ECM signal ground terminal 46.

ECM DIAGNOSTICS

The ECM continuously monitors the signal from the BARO sensor to ECM terminal 5. If the signal is out of the expected range, a fault is logged (warning light does NOT turn on) and the ECM uses the Manifold Absolute Pressure (MAP) signal generated at low idle to determine barometric pressure.

Flash Code *151*
ATA Code PID 108 FMI 3
ECM: *BARO SIGNAL OUT OF RANGE HIGH*

BARO signal greater than 4.95 volts for more than 1 second.

Flash Code *152*
ATA Code PID 108 FMI 4
ECM: *BARO SIGNAL OUT OF RANGE LOW*

BARO signal less than 1.0 volt for more than 1 second.

TROUBLESHOOTING

The BARO circuits operate with low current levels. When troubleshooting, pay special attention to the connectors.

BEFORE PERFORMING ANY TEST

Inspect connectors for pushed back, damaged, corroded or dirty terminals, as well as making sure that the terminals and wires are properly crimped. Make sure the connectors are properly joined together. Also check for any damage to the wiring and make sure system grounds are clean and tight.

TESTING APS/IVS CIRCUITS

NOTE: If fault codes indicate a problem is also present with the APS/IVS system, troubleshoot that system before performing the following test.

- If BARO flash code 151 or 152 is active, perform Testing Barometric Pressure Sensor Circuits on page 14.

This test systematically checks the BARO circuits for:

A. Short circuits to ground.

B. Short circuits to unwanted voltage sources.

C. Open circuits or excessive circuit resistance.

D. Proper feeds and grounds.

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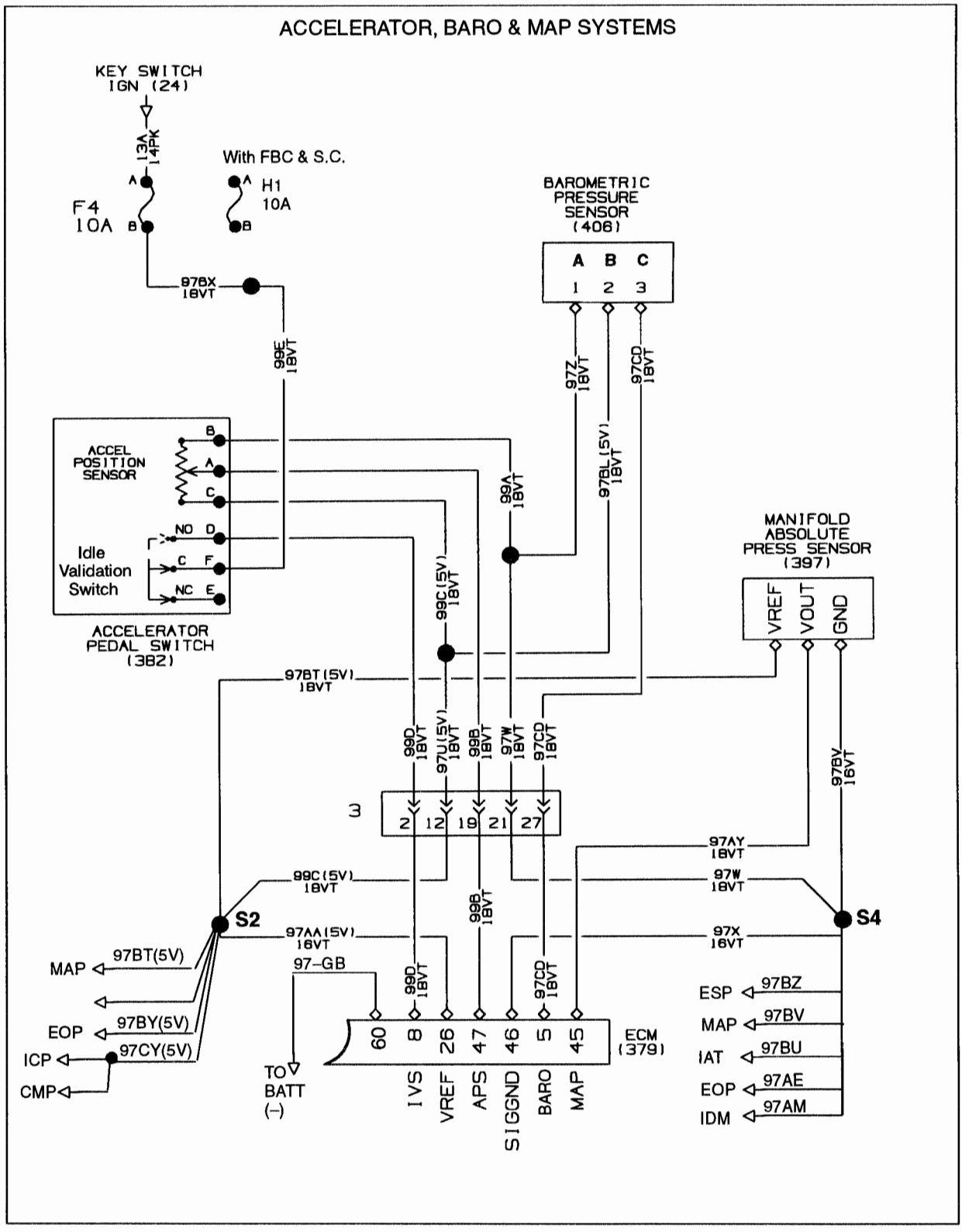
CIRCUIT DIAGRAM

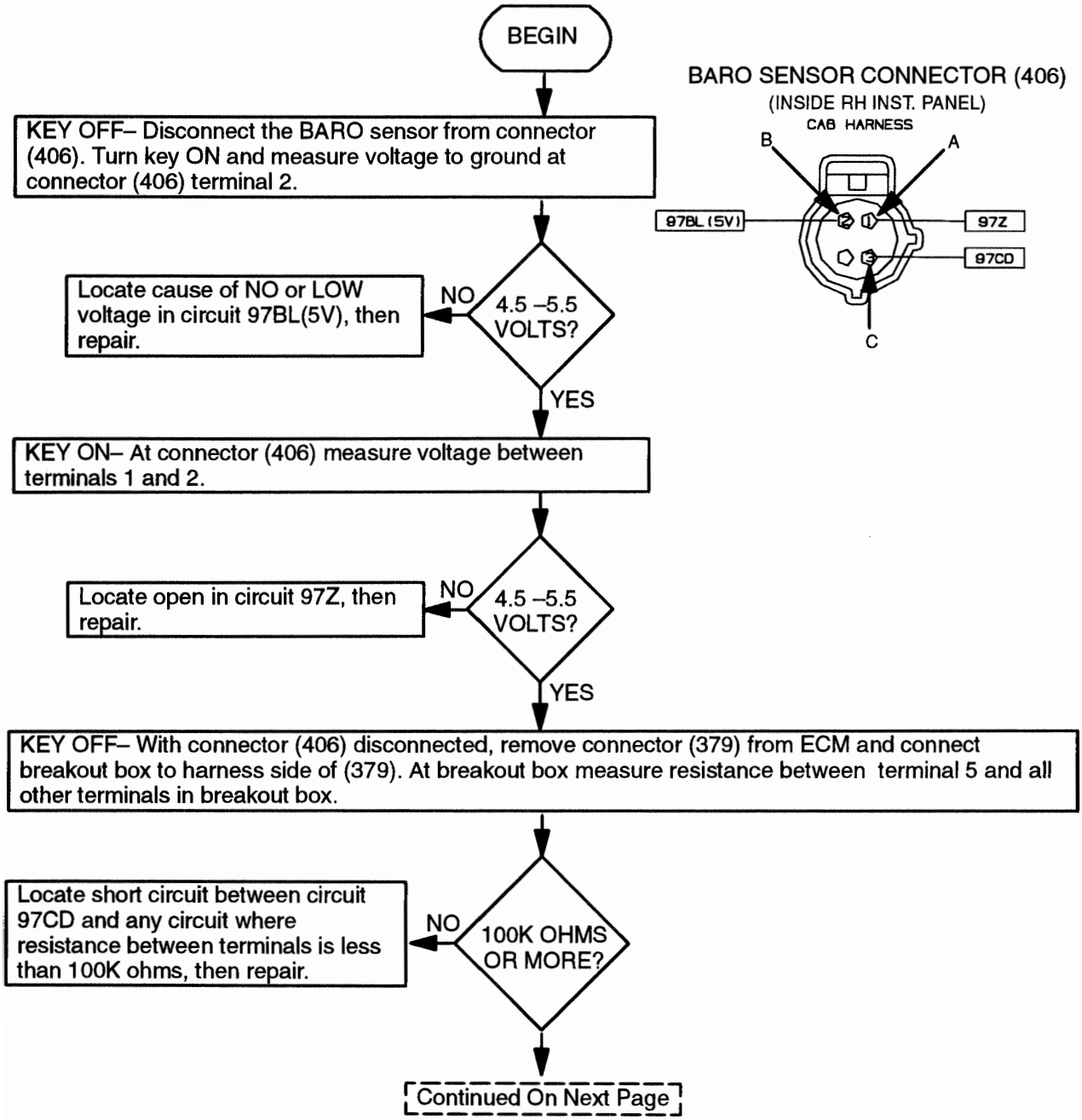


ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

BAROMETRIC PRESSURE SENSOR (BARO)

TESTING BAROMETRIC PRESSURE SENSOR CIRCUITS

Refer to circuit diagram on page 13, while performing this test.



TESTING BAROMETRIC PRESSURE SENSOR CIRCUITS (Continued)