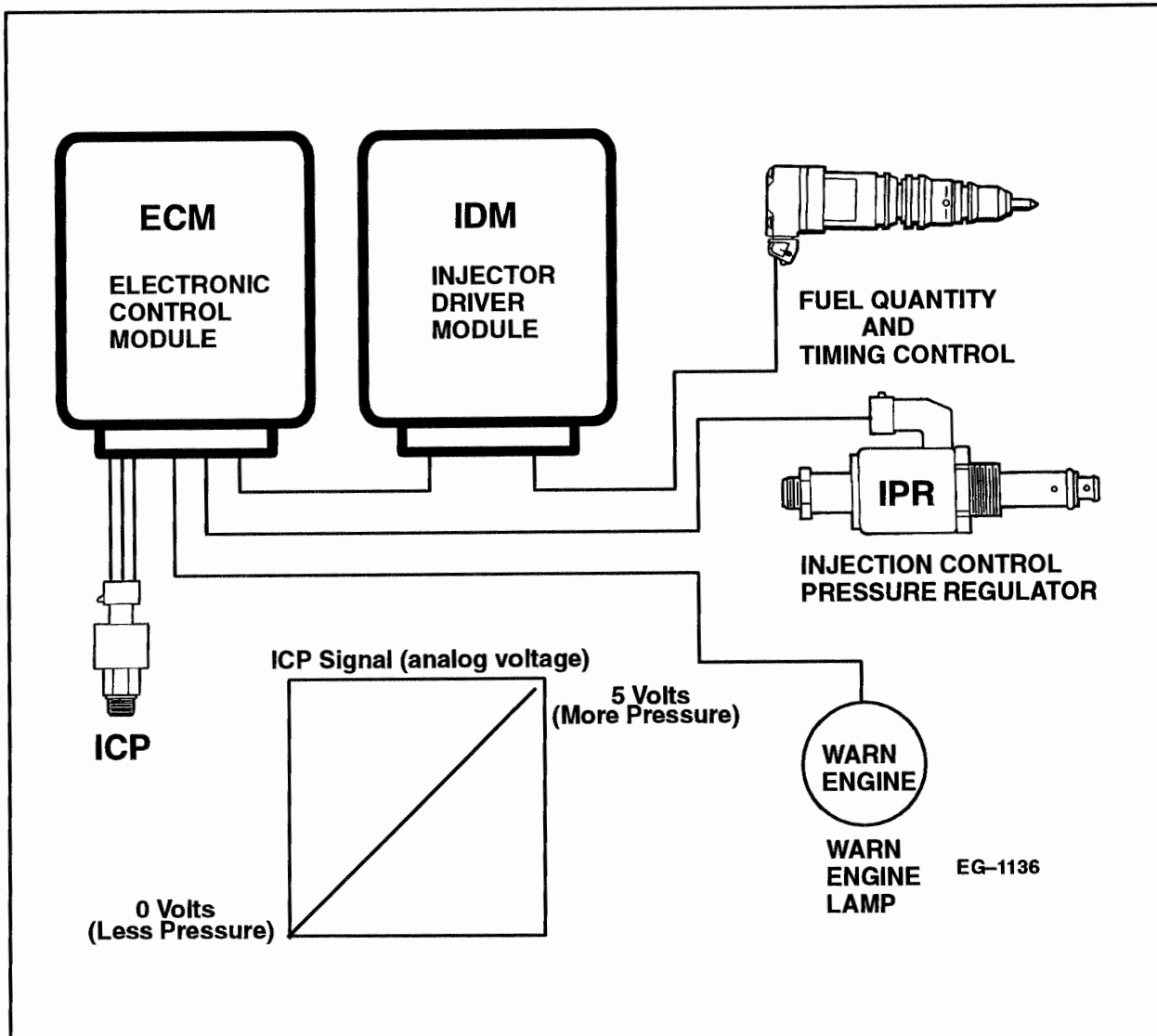


ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

INJECTION CONTROL PRESSURE SENSOR (ICP)

INJECTION CONTROL PRESSURE (ICP) SENSOR



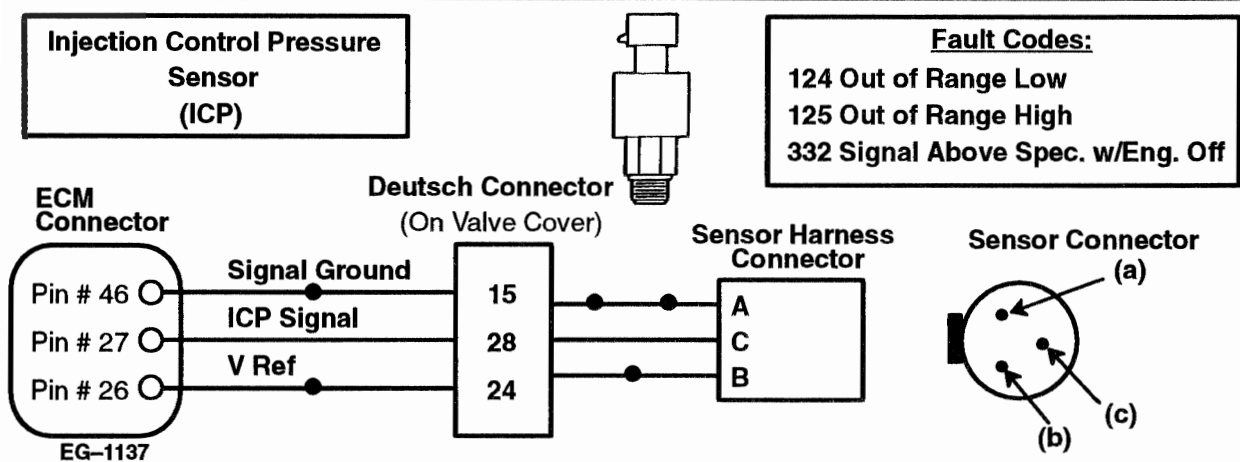
SIGNAL FUNCTIONS

The Injection Control Pressure (ICP) 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.

The ICP sensor's primary function is to provide a feedback signal to indicate injection control pressure to enable the ECM to command the correct injector timing and pulse width and the correct injection control pressure for proper fuel delivery at all speed and load conditions.

FAULT DETECTION/MANAGEMENT

If the ECM detects a malfunctioning ICP sensor, the WARN lamp will illuminate. The ECM will go to open loop control of injection control pressure. (Operate from an estimated ICP pressure.)



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

Connector Checks to Chassis Ground

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

Test Points	Spec.	Comments
A to Grd.	< 5 ohms	Resistance to chassis ground check with key off, if > than 5 ohms 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 Disconnected and Ignition Key On)

Test Points	Spec.	Comments
B to Grd.	5 volts \pm .5	V Ref. check with key ON, if voltage not in spec., see V Ref circuit.
C to Grd.	0-.25 v	If greater than .25 volts, 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 – V Ref
#27 to C	< 5 ohms	Resistance from sensor connector to 60 pin connector – ICP signal

Test Points

(+) #27 to (-) #46

Operational Voltage Checks

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

Voltage	PSI	MPa	Comments
.15 – .25 v	0	0	Atmospheric Pressure with Key ON and Engine OFF. (Altitude dependent)
1.0 v	580	4	Minimum required at engine cranking speed 130 RPM
.66 – .86 v	400–480	2.7–3.3	Normal warm idle voltage signal
3.66 v	2520	17.4	Snap accel or full load pressure signal

Circuit Faults:

Fault Code Descriptions

124 = Signal voltage was less than .039 volts for more than 1.0 seconds.
125 = Signal voltage was greater than 4.90 volts for more than 1.0 seconds.
332 = Signal above 1.625 volts with engine off. (1160 psi, 8 MPa)

ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

INJECTION CONTROL PRESSURE SENSOR (ICP)

INJECTION CONTROL PRESSURE SENSOR EXTENDED SYSTEM DESCRIPTION

FUNCTION

The Navistar engine control system includes an Injection Control Pressure Sensor. The ECM measures the signal from the ICP sensor to determine the Injection Control Pressure as the engine is running to modulate the Injection Control Pressure Regulator. This is a closed loop function which means the ECM continuously monitors and adjusts for ideal Injection Control Pressure determined by operating conditions such as load, speed, and temperature.

The ECM monitors the ICP signal to determine if the performance of the hydraulic system is satisfactory. During engine operation, if the ECM recognizes that the pressure reading is lower or higher than the value that was commanded, the ECM will set a fault code. This strategy is also used during the On Demand tests, commanded by the Electronic Service Tool and referred to as the Engine Running tests.

OPERATION

The Injection Control Pressure Sensor is a variable capacitance sensor that is supplied with a 5 volt reference voltage at terminal B by the ECM from terminal 26. The ICP sensor is also supplied with a return circuit (ground) at terminal A from ECM terminal 46. The ICP sensor sends a signal from terminal C of the sensor to ECM terminal 27.

The ICP signal voltage increases or decreases equally in proportion to an increase or decrease in injection control pressure.

ECM DIAGNOSTICS

The ECM continuously monitors the signal of the ICP sensor to determine if the signal is within an expected range. If the signal voltage is higher or lower than expected, the ECM will set a fault code. The ECM will then ignore the ICP sensor signal and will use a preset value determined by engine operating conditions. If the ignition key is shut off, the code will become an Inactive code.

ICP faults can be retrieved using the Electronic Service Tool or by reading the flash codes from the warning light using the STI diagnostic switch located on the vehicle dash.

If the ignition key is shut off, the code will become an Inactive code. ICP codes will cause the Engine Warning light to be illuminated.

FLASH CODE 124

ATA CODE PID 164 FMI 4

ICP SIGNAL OUT OF RANGE LOW

An out of range low code 124 will be set by the ECM if the signal voltage is less than .039 volts for more than 1.0 seconds.

Code 124 may be set due to an open or short to ground on the signal circuit, a defective sensor or an open VREF circuit.

FLASH CODE 125

ATA CODE PID 164 FMI 3

ICP SIGNAL OUT OF RANGE HIGH

An out of range high code 125 will be set by the ECM if the signal voltage is greater than 4.9 volts for more than 1.0 seconds.

Code 125 may be set by an open return circuit, short to a voltage source on the ICP signal circuit or a defective sensor.

FLASH CODE 332

ATA CODE PID 164 FMI 13

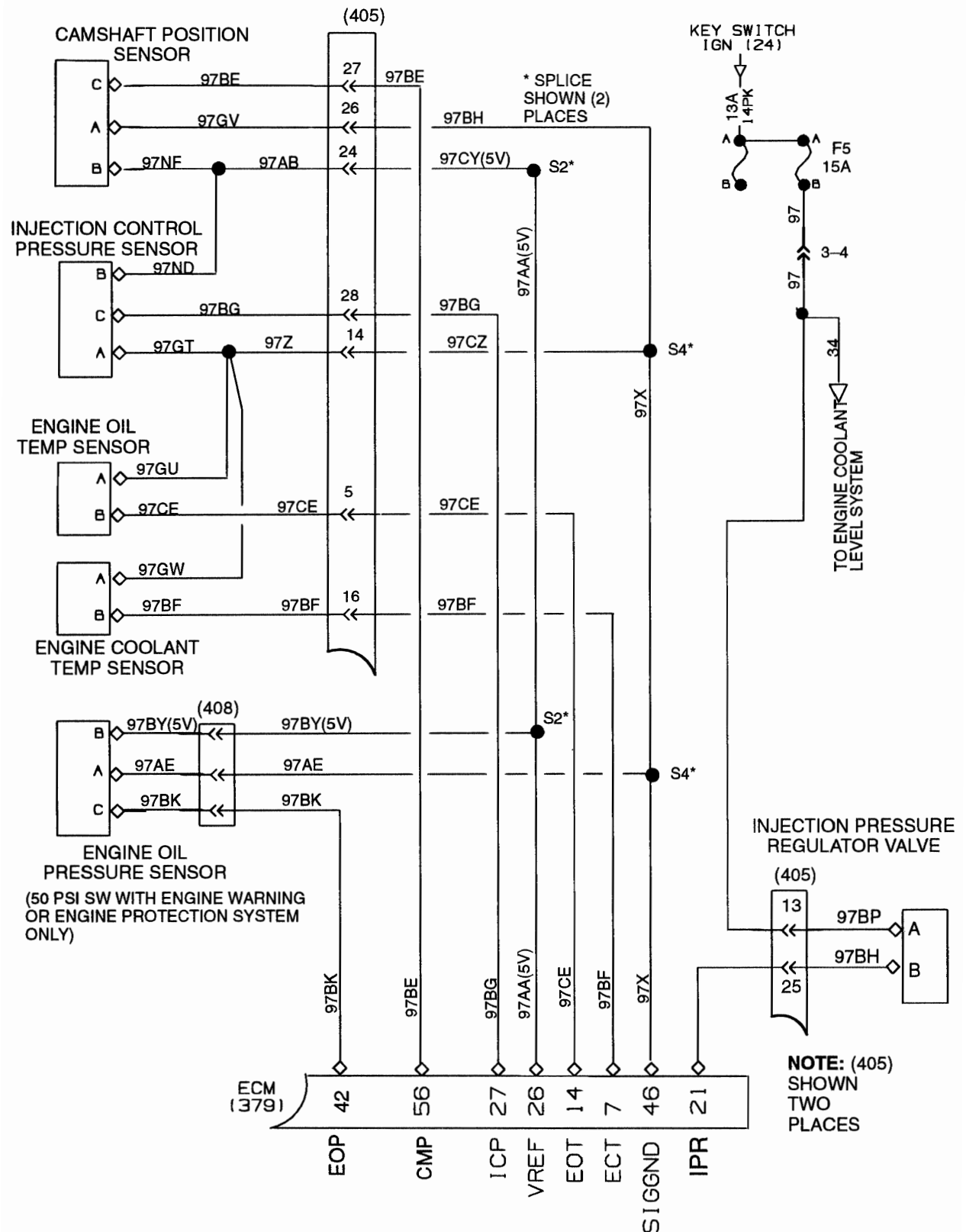
***INJECTION CONTROL PRESSURE ABOVE
SPECIFICATION WITH ENGINE OFF***

Code 332 will be set by the ECM, if the signal from the ICP sensor is higher than expected with the engine not running. If the ECM detects this fault, the ECM will ignore the ICP signal and will operate the IPR with fixed values determined from engine operating conditions.

Code 332 may be caused by a defective sensor or a biased circuit.

INJECTION CONTROL PRESSURE SENSOR (ICP)

SENSOR CIRCUIT DIAGRAM

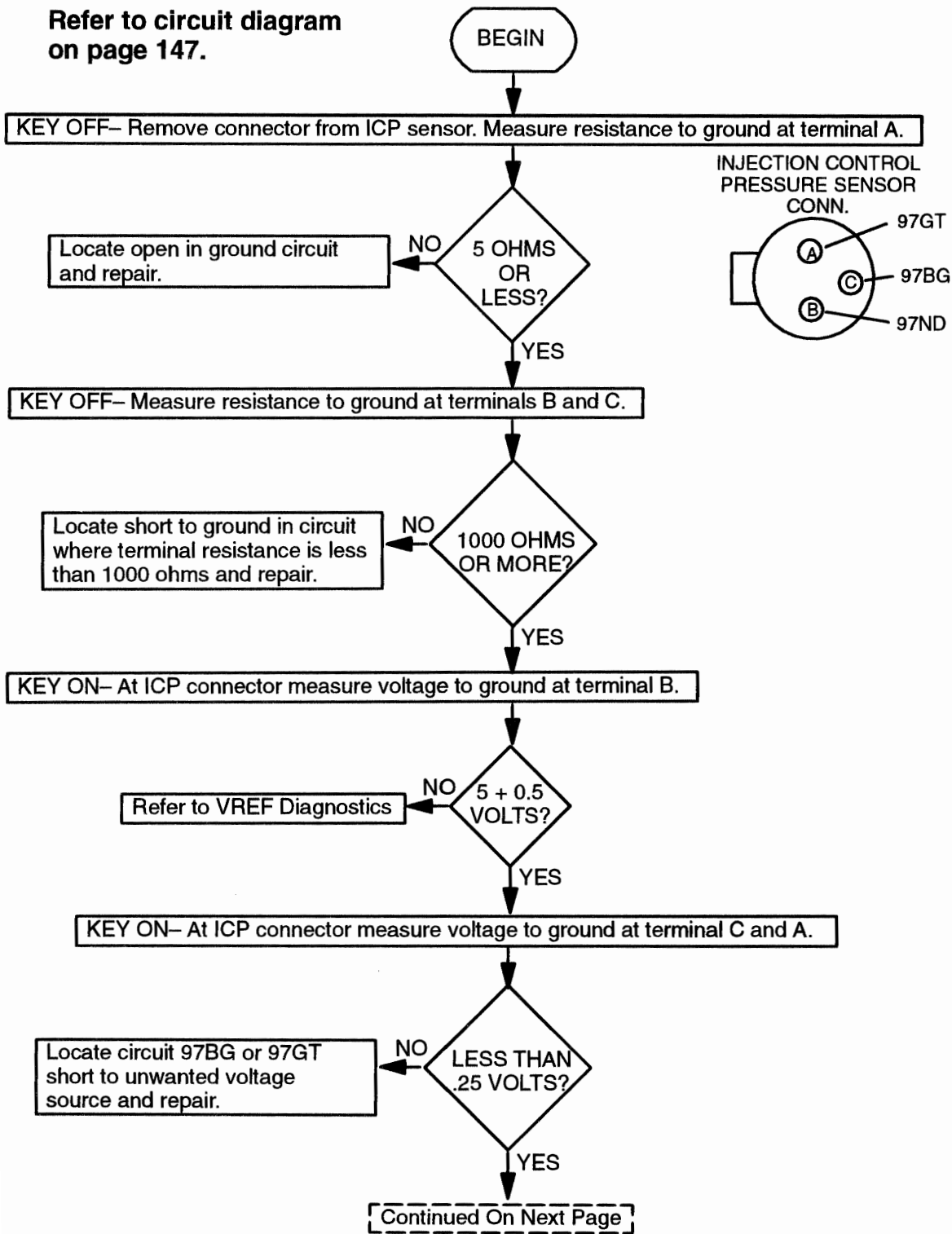


ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

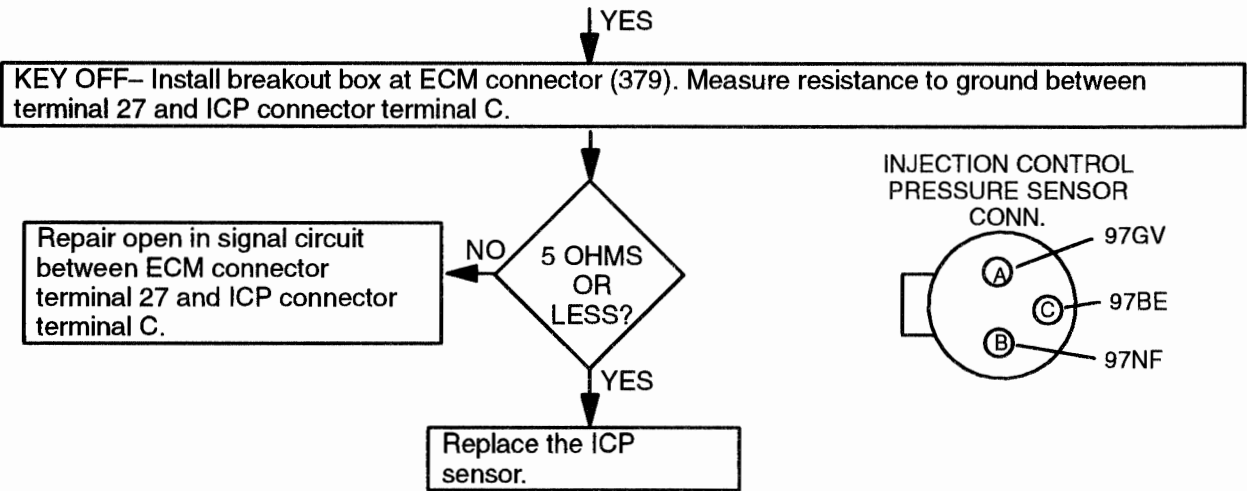
INJECTION CONTROL PRESSURE SENSOR (ICP)

INJECTION CONTROL PRESSURE (ICP) SENSOR DIAGNOSTICS

Refer to circuit diagram
on page 147.



INJECTION CONTROL PRESSURE (ICP) SENSOR DIAGNOSTICS (Continued)



ELECTRONIC CONTROL MODULE (ECM) (379)

