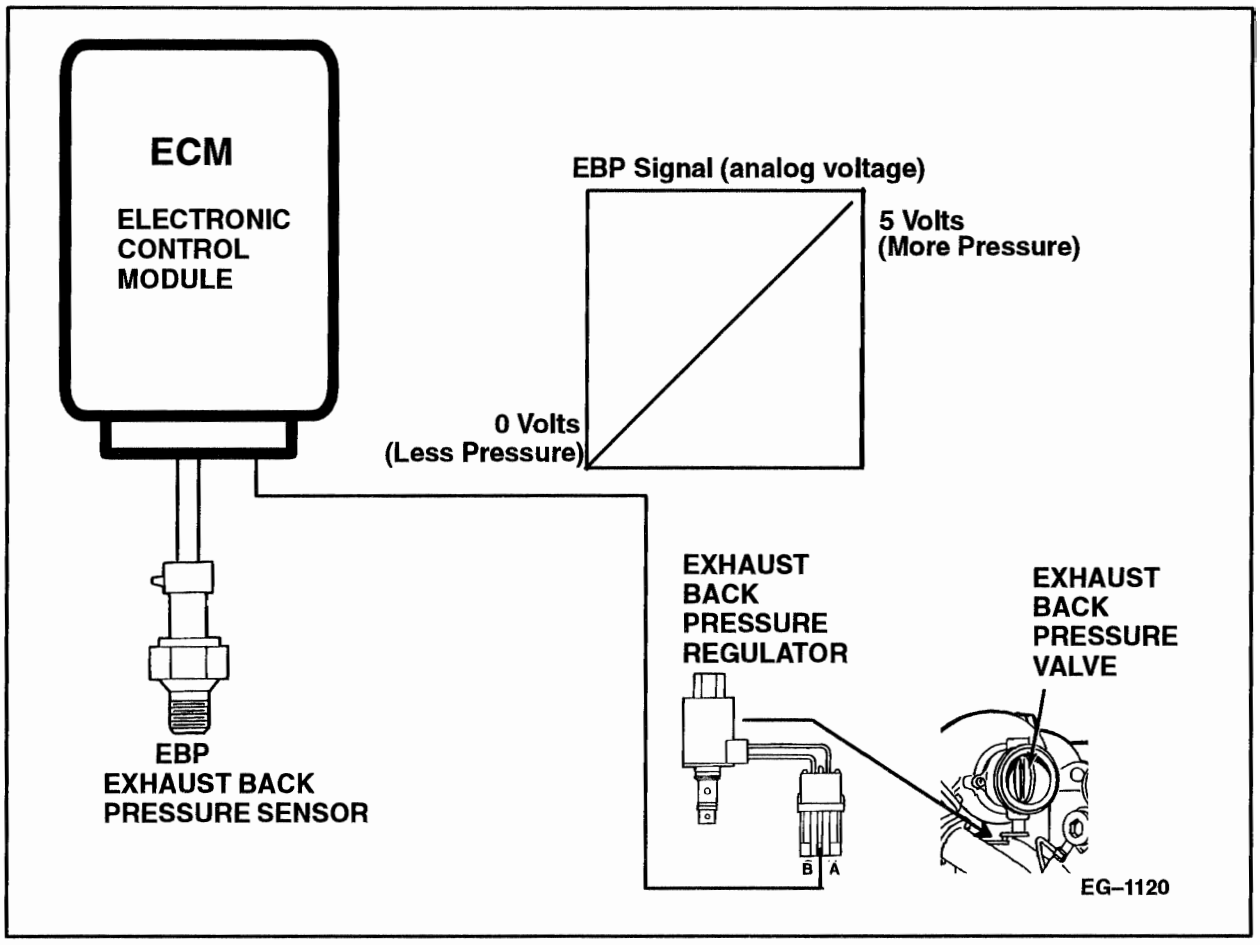
ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

EXHAUST BACK PRESSURE SENSOR (EBP)

EXHAUST BACK PRESSURE (EBP) SENSOR



SIGNAL FUNCTIONS

The EBP (Exhaust Back 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.

The EBP sensor's primary function is to measure exhaust back pressure so that the ECM can control the exhaust back pressure regulator when needed.

FAULT DETECTION/MANAGEMENT

An EBP signal that is detected out of range high or low by the ECM will cause the engine to ignore the EBP signal and disable exhaust back pressure operation.

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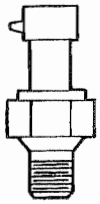
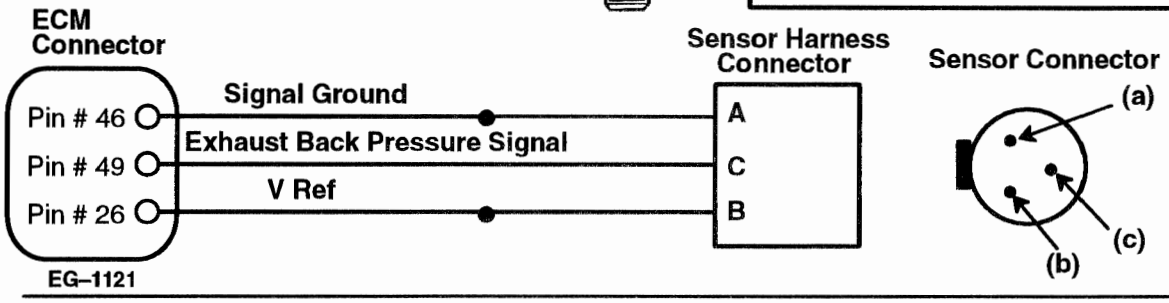


Fault Codes:
341 Out of Range Low
342 Out of Range High
344 Signal Above Spec. w/Eng. Off



EG–1121

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 ± .5	V Ref. check with key ON, if voltage not in spec. , see V Ref circuit
C to Grd.	< .25 volts	If greater than 0.25 volts signal wire is shorted to V Ref of 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
#49 to C	< 5 ohms	Resistance from sensor connector to 60 pin connector – EBP signal

Operational Signal Checks
(Check with breakout box installed in line with the ECM)

Test Points (+) #49 to (–) #46			
Voltage	PSIG	KPAG	Comments
.8 – 1.0 v	0	0	Signal with key "ON" and engine OFF (Value dependent upon atmospheric pressure and altitude.)
.8 – 1.0 v	0	0	Normal warm idle signal.
1.19 v	14.8	10.0	Minimum back pressure signal expected at 2300 RPM (See EPR diagnostics)

Fault Code Descriptions

341 = Signal voltage was less than .039 volts for more than 0.1 seconds.
342 = Signal voltage was greater than 4.90 volts for more than 0.1 seconds.
344 = Signal above 1.34 volts with engine off. 19 psi (130 kPa)

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EXHAUST BACK PRESSURE SENSOR (EBP) EXTENDED SYSTEM DESCRIPTION

FUNCTION

The exhaust back pressure (EPB) sensor is included in the Navistar engine control system only when a vehicle is equipped with an exhaust back pressure valve.

The ECM monitors the EBP signal during engine operation. The EBP's primary function is to measure exhaust back pressure so that the ECM can control the exhaust back pressure regulator when needed to aid in maintaining and achieving normal engine operating temperature.

OPERATION

The exhaust back pressure sensor is a variable capacitance sensor. When pressure is applied to the sensor, the capacitance changes in relation to the pressure.

The ECM supplies a regulated 5 volt signal to terminal B of the EBP sensor from terminal 26 of the ECM. The EBP sensor is supplied a signal return (ground) at terminal A to terminal 46 of the ECM.

During engine operation, exhaust back pressure acting on the sensor causes the sensor's capacitance to vary which changes the incoming 5 volt reference signal in relation to pressure. The sensor's pressure signal at terminal C is sent to terminal 49 of the ECM. This signal increases equally in proportion to an increase in pressure up to a maximum of 38 PSI (262 kPa).

ECM DIAGNOSTICS

The ECM continuously monitors the signal from the EBP sensor to ensure the signal is within the correct operating range. If the signal is lower or higher than required, the ECM will set a fault code. This fault code is retrieved using the Electronic Service Tool (EST) or by reading the flash code using the STI diagnostic switch. If the ignition key is shut off, the code will be stored as an inactive code.

FLASH CODE *341*
ATA CODE SID 34 FMI 20
EXHAUST BACK PRESSURE SIGNAL OUT OF RANGE LOW

Code 341 indicates the ECM has detected a EBP signal voltage less than .039 volts for more than 0.1 seconds. If this fault code is set, the ECM will ignore the EBP signal and continue to operate normally, however, if the fault is active the ECM will disable exhaust back pressure valve operation

Possible causes for code 341: Open Vref signal circuit or a defective EBP sensor.

FLASH CODE *342*
ATA CODE SID 34 FMI 19
EXHAUST BACK PRESSURE SIGNAL OUT OF RANGE HIGH

An out of range high code will be set if the ECM detects a voltage more than 4.9 volts for more than 0.1 seconds. If this fault code is set, the ECM will ignore the EBP signal and continue to operate normally. If this fault is active, the ECM will disable exhaust back pressure operation.

Code 342 may be caused by an open signal return circuit, a short to a voltage source or a defective EBP sensor.

FLASH CODE *344*
ATA CODE SID 34 FMI 29
EXHAUST BACK PRESSURE BELOW WARNING LEVEL

Code 344 indicates the exhaust back pressure was greater than 19 psi (130 Kpa) with the key "ON" and engine "OFF"

Code 344 may be caused by a defective or plugged EBP sensor or a restriction in the tube leading to the sensor. To confirm this, remove sensor and/or tube and inspect for carbon deposits.

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