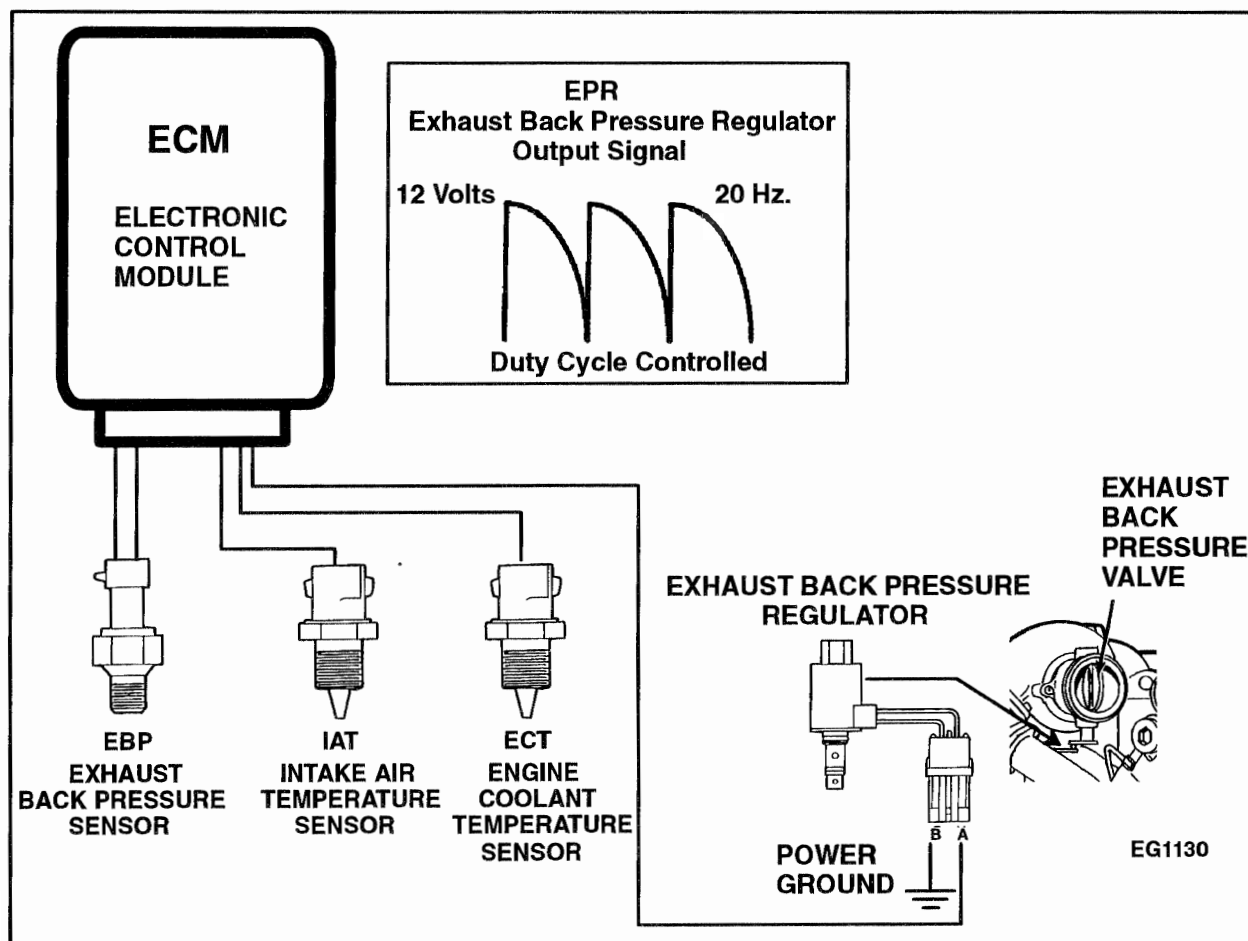


ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

EXHAUST BACK PRESSURE REGULATOR (EPR)

EXHAUST BACK PRESSURE (EPR) REGULATOR



OUTPUT FUNCTIONS

Exhaust Back Pressure Regulator – Is a variable position valve that controls exhaust back pressure during cold ambient temperatures to increase cab heat and decrease the amount of time needed to defrost the windshield. The ECM uses the measured exhaust back pressure, (ambient) intake air temperature, engine coolant temperature and engine load to determine the desired exhaust back pressure. Valve position is controlled by switching the output signal circuit to 12 volts inside the ECM. On/off time is modulated from 0 to 99 % dependent upon the exhaust back pressure desired.

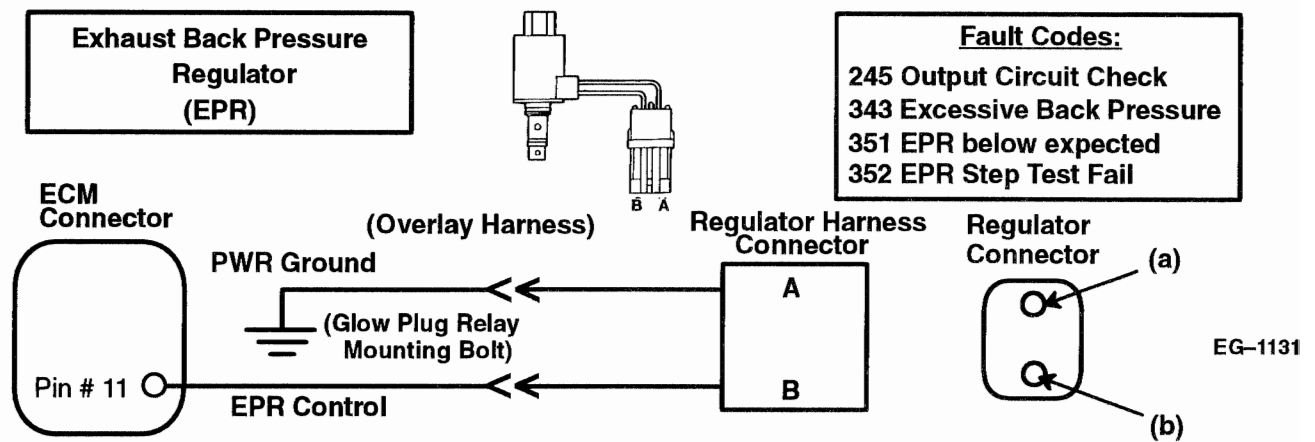
FAULT DETECTION/MANAGEMENT

An open or shorted to ground control circuit can be detected by an on demand output circuit check performed during the engine off test.

Problems with either the Exhaust Back Pressure Device or the tube between the exhaust manifold and the EBP sensor can be detected during the exhaust back pressure step test, in which the ECM commands and then measures a specific preprogrammed pressure then measures time for pressure decay during the engine running test.

If the ECM detects an EBP or IAT sensor fault it will disable the exhaust back pressure regulator.

EXHAUST BACK PRESSURE REGULATOR (EPR)



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

Connector Checks to Chassis Ground
 (Check with Regulator Connector Disconnected, Ignition off, all accessories off.)

Test Points	Spec.	Comments
A to Grd.	< 5 ohms	Resistance greater than 5 ohms indicates an open circuit or bad ground.
B to Grd.	> 1000 ohms	Resistance less than 1000 ohms indicates a short to ground.

Harness Resistance Checks
 (Check with breakout box installed on engine harness only)

Test Points	Spec.	Comments
Pwr. Grd. to Pin #11	2.5 to 20 ohms	Resistance through EPR circuit including regulator, check w/regulator connector connected (unnecessary to check next points if okay).
A to Grd.	< 5 ohms	Resistance from regulator connector to Pwr. Ground.
B to #11	< 5 ohms	Resistance from regulator connector to 60 pin connector.

Circuit Fault Code Descriptions

245 = Output circuit check detected during Standard test, indicates high or low resistance in circuit.

Exhaust Back Pressure System Fault Code Descriptions

343 = EPR pressure was greater than 77 in. Hg. (260 kPaG) for 3 seconds. (3.3 volts)
 351 = Exhaust backpressure is below 29.61 in. Hg. (20 kPaG) for 2.5 seconds (1.19 volts) at engine speeds greater than 2300 RPM (possible plugged line)
 352 = Indicates that EPR pressure of 22 in. Hg. (75 kPa) commanded during EBP engine running test was not obtained. (Plugged line or exhaust back pressure device failure.)

ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

EXHAUST BACK PRESSURE REGULATOR (EPR)

EXHAUST BACK PRESSURE REGULATOR VALVE EXTENDED SYSTEM DESCRIPTION

FUNCTION

The Navistar engine control system includes an Exhaust Back Pressure Regulator (EPR) Valve. The valve controls exhaust back pressure in cold ambient temperatures to increase cab heat and decrease the amount of time required to defrost the windshield. The EPR valve consists of a solenoid, poppet and spool valve assembly and is mounted on the turbocharger pedestal. The ECM regulates exhaust back pressure by controlling the duty cycle of ON/OFF time of the exhaust pressure regulator solenoid. The increase or decrease of ON/OFF time positions a spool valve internal to the EPR which in turn either increases or decreases the amount of exhaust back pressure.

OPERATION

The EPR valve is supplied with voltage at Terminal B of the EPR connector from Terminal 11 of the ECM. Control of the exhaust pressure regulator is accomplished by the ECM varying the pulse width or percentage of ON/OFF time of the EPR solenoid. Normal ON/OFF time varies from 0% to 95%. A high duty cycle indicates that the exhaust back pressure valve is being closed to raise the amount of exhaust back pressure based on (ambient) intake air temperature, engine oil temperature, engine load and exhaust back pressure.

ECM DIAGNOSTICS

The ECM monitors the exhaust back pressure while the engine is in operation. If actual pressure is greater or less than the desired pressure, the ECM will set a fault code. When this occurs the ECM will discontinue exhaust pressure regulator operation leaving the exhaust back pressure valve open, creating no exhaust restriction to aid in warm up of vehicle.

Fault codes can be retrieved using the Electronic Service Tool or the Self Test Input diagnostic switch located on the vehicle dash. If the ignition key is shut off, the code will be sent as an Inactive code.

FLASH CODE 245

ATA CODE SID 35 FMI 11

EPR: OCC SELF TEST FAILED

Code 245 is set only during the Engine Off Standard Output Circuit check. This test indicates the ECM

has performed an output circuit test, measure voltage drop across the EPR circuit and determined it is above or below specification. If the fault is present, the exhaust pressure regulator will be disabled.

Possible Causes: Open feed circuit, open EPR solenoid, an open or shorted EPR signal circuit.

FLASH CODE 343

ATA CODE SID 34 FMI 0

EPR: EXCESSIVE EXHAUST BACK PRESSURE

Code 343 indicates that the ECM has detected exhaust back pressure greater than 77 (in. Hg.) which is greater than the maximum allowable working range.

Possible Causes: Incorrect EBP signal due to faulty circuits or sensor, grounded EPR signal circuit, a collapsed exhaust pipe or stuck exhaust pressure regulator valve.

FLASH CODE 352

ATA CODE SID 34 FMI 10

EPR: EXHAUST BACK PRESSURE ABOVE OR BELOW DESIRED LEVEL

Code 352 may be set during normal engine operation through the continuous monitor function or during the engine running standard test. It indicates the measured pressure does not meet the expected value.

Possible Causes: Incorrect EBP signal due to circuit or sensor malfunctions. EBP signal circuit may be shorted, grounded, or contain excessive resistance. The EPR valve may be sticking or blocked.

FLASH CODE 351

ATA CODE SID 34 FMI 7

EPR: EXHAUST BACK PRESSURE BELOW EXPECTED LEVEL AT HIGH ENGINE SPEEDS.

Code 351 may be set during normal engine operation through the continuous monitor function by the ECM. This code indicates the ECM did not see a minimum of 20 (KPA) pressure data from low idle operation to 2300 RPM engine operation.

Possible Causes: Incorrect EBP signal due to faulty circuit or sensor, plugged exhaust back pressure tube, or exhaust pressure valve stuck.