



Diesel Care & Performance



Diesel Care and Performance Inc 901-380-9290

Glossary

AP: Accelerator Pedal position sensor

Load/demand input; PCM uses this to determine mass fuel desired, adjusts fuel delivery through IPR duty cycle and fuel pulse width and injection timing; 5 volts in, 0.5-0.7 volts at idle, 4.5 volts at WOT. PID: AP

BARO: Barometric pressure sensor

Strategy input; PCM uses this to adjust fuel quantity and injection timing for optimum running and minimum smoke, also glow plug on time to aid starting at higher altitudes; 5 volts in, @4.6 volts/14.7 psi at sea level, decreasing as altitude increases. PID: BARO (pressure)

CMP: CaMshaft Position sensor

Strategy and load input; PCM uses this to monitor engine speed to determine engine state and load, and cylinder position in order to control timing and fuel delivery; Hall Effect sensor which generates a digital voltage signal;

DTC: Diagnostic Trouble Code

System malfunction or fault codes stored in the PCM to aid in diagnosis.

EBP: Exhaust BackPressure sensor

Feedback input; PCM uses this to monitor and control EPR operation; 5.0 volts in, 0.8-1.0 volts/14.7 psi KOEO or at idle, increases with engine RPM/load, decreases as altitude increases. PID: EBP (pressure), EBP V (volts)

EOT: Engine Oil Temperature sensor

Strategy input; PCM uses this for determining glow plug on time, EPR actuation, idle speed, fuel delivery and injection timing and adjusts as temperature increases; 5.0 volts in, 4.37 volts@32°F, 1.37volts@176°F,

EPR: Exhaust backPressure Regulator, also EBP regulator

Output; For quicker engine warm-up at cold temperatures. If the IAT is below 37°F (50°F some models) and the EOT is below 140°F (168° some models) the PCM sends a duty cycle signal to a solenoid which controls oil flow from the turbo pedestal. This causes a servo to close a valve at the turbo exhaust outlet. The PCM monitors the EBP input to determine if the EPR needs to be disabled to provide power for increased load, then reapplies the EPR as load demand decreases until EOT or IAT rises. PID: EPR (duty cycle), EBP (pressure)

GPC: Glow Plug Control

Output; The PCM energizes the glow plug relay for 10 to 120 seconds depending on EOT and BARO. PID: GPC

GPL: Glow Plug Light

Output; The PCM controls the "Wait to start" light independently from the GPC output; 1 to 10 seconds depending on EOT and BARO. PID: GPL.

GPM: Glow Plug Monitor

Feedback input; On 1997 and newer California emission vehicles, the PCM monitors glow plug relay output voltage to determine if any glow plugs are burned out or if the relay is functioning. PID: GPML (left bank current), GPMR (right bank current), GPMC (relay output)

IAT: Intake Air Temperature sensor

Strategy input; The PCM uses this for EPR control. 5 volts in, 3.897volts@32°F, 3.09@68°F, 1.72@122°F. PID:

ICP: Injection Control Pressure sensor

Feedback input; The PCM monitors the high pressure oil system to determine if it needs to be increased if load demand increases. It also uses this to stabilize idle speed. volts in, 1.0volt@580psi, 3.22volts@2520psi. PID: ICP

IDM: Injector Driver Module

The PCM sends a Cylinder Identification and Fuel Demand Control signal to the IDM. The IDM sends a 110 volt signal to the injectors. It then grounds each injector as fuel is required for that cylinder. Fuel Pulse width is increased to deliver more fuel. The IDM sends a feedback signal to the PCM for fault detection. PID: FuelPW

IPR: Injection Pressure Regulator

Output; The PCM controls the high pressure oil system by varying the duty cycle of the IPR. The IPR controls the oil bypass circuit of the high pressure pump. 0%=full return to sump (open valve), 100%=full flow to injectors (closed valve). The PCM monitors the system with the ICP input. The PCM can control fuel delivery to the injectors by increasing the IPR duty cycle which increases fuel pressure through the injector nozzels. PID: IPR (% of duty cycle), MFDES Mass Fuel Desired an internal PCM calculation based on load demand (MG)

IVS:Idle Validation Switch

Strategy input; On-off switch that the PCM uses to identify required operating mode; idle or power. 0 volts at idle, 12 volts off idle. PID: IVS (off/on)

MAP: Manifold Absolute Pressure sensor

Strategy and feedback input; The PCM monitors manifold pressure to control fuel delivery in order to minimize smoke. It also optimizes injection timing for detected boost. It also monitor boost to limit fuel delivery to control maximum turbo boost. Frequency output; 111Hz=14.7psi, 130Hz=20psi, 167Hz=30psi. PID: MAP (pressure baseline 14.7psi), MAP HZ (frequency), MGP Manifold Gauge Pressure (pressure base line 0psi) turbo boost

MAT:Manifold Air Temperature sensor

Strategy input; The PCM uses this signal to adjust fuel and timing. 99 model/year engines. PID: MAT

MIL: Malfunction Indicator Lamp

"Check Engine" or "Service Engine" light that the PCM illuminates when certain system faults are present.

PCM: Powertrain Control Module, also ECU or ECM for Electronic Control Unit or Module

The computer which monitors sensor inputs and calculates the necessary output signals to the engine control systems. It also checks for readings outside of normal parameters and records trouble codes for these faults.

PID: Parameter IDentification, also Data Stream or Sensor Data

Sensor readings displayed to a scan tool that represent sensor readings to- and output signals from the PCM.

Useful PID comparisons

AP--Accelerator Pedal--and IVS--Idle Validation Switch: IVS should switch state when AP voltage is approximately 0.2-0.3 volts higher than base idle position.

ICP--Injection Control Pressure--IPR--Injection Pressure Regulator--and MFDES--Mass Fuel Desired: ICP should rise as IPR duty cycle increases; MFDES and IPR should rise at the same rate as load and/or demand increases (actual readings may not match); ie. ICP=500psi, IPR=12%, MFDES=10MG @500 RPM; ICP=900psi, IPR=22%, MFDES=20MG @1800RPM/cruise; ICP=1800psi, IPR=50%, MFDES=40MG @3000RPM/hard accel.

ICP--Injection Control Pressure--and RPM--CaMshaft Position Sensor: After 3 minutes at 3300 RPM, ICP pressure should be below 1400psi for Federal, 1250psi for California Emmissions, and 1500psi for 99.5. At idle, ICP should be 550-700psi for Federal, 400-600 for California and stable.

V PWR--Battery Voltage--RPM--CaMshaft Position sensor--ICP--Injection Control Pressure--FuelPW--Fuel Pulse Width: When starting V PWR should be above 10volts, ICP should be at least 500psi, at least 100RPM, and FuelPW 1mS-6mS. Once the PCM recognizes CMP speed and cylinder ID, FuelPW should default to 0.42mS,

EOT--Engine Oil--and IAT--Intake Air Temperatures: After a cold soak, before starting EOT and IAT should be within 10 degrees of each other, Key On Engine Off.

BARO--Barometric--MAP--Manifold Absolute--and EBP--Exhaust BackPressures: All three should indicate atmospheric pressure (14.7psi at sea level) and read within 0.5 psi of each other, Key On Engine Off.

ICP--Injection Control Pressure--and ICP V--ICP Voltage: ICP should read 0psi, ICP V should read 0.20-0.25 volts, Key On Engine Off.

EBP--Exhaust BackPressure--MGP--Manifold Gauge Pressure--and RPM--CaMshaft Position Sensor: At full throttle in neutral, EBP should be below 28psi; At full throttle in fourth (manual) or third (auto) gear, MGP should be