

Actuator – A device which performs work in response to an electrical signal.

Address – A specific memory location in the RAM, ROM, or KAM of the ECM. The ECM can either read information from an address or send information (write) to an address (RAM or KAM only).

Analog – A continuously variable voltage.

Analog to Digital Converter (A/D) – A circuit within the processing section of the ECM that takes an analog signal (either DC or AC) and converts it into a usable digital signal for the microprocessor.

Analog Multimedia – A meter that uses a needle to point to a number on a scale of numbers to indicate a measured value (volts, ohms, amperes). Not recommended for use on microprocessor systems because of the possibility of excessive current due to the low impedance of the meter.

APS, Accelerator Position Sensor – A potentiometer style sensor that indicates the operator's pedal position.

ATA Data Link – A serial data link specified by the American Trucking Association and the SAE.

Background Manager – The portion of the computer that performs "housekeeping duties". Typically the Background Manager controls low priority items or items that occur at a slower rate.

BARO Barometric Pressure Sensor – A variable capacitance sensor which, when supplied with a 5 volt reference signal from the ECM, produces a linear analog voltage signal indicating pressure.

BNC, Brake Normally Closed – An on/off switch style sensor used to indicate if the brake is applied. Normal primary function is to disengage cruise control. (normally closed).

BNO, Brake Normally Open – An on/off switch style sensor used to indicate if the brake is applied. Normal primary function is to disengage cruise control. (normally open).

Calibration – The data values used by the strategy to solve equations and make decisions. Calibration values are stored in the ROM as scalars, functions and tables. Calibration values are input into the processor during programming to allow for the engine to operate within certain parameters.

CI, Cylinder Identification – A signal from the ECM to the IDM that identifies the position of the cylinders of the engine.

CLS, Coolant Level Switch – A switch style sensor used to indicate low coolant level.

CMP, Camshaft Position Sensor – A Hall effect sensor used to indicate engine speed and camshaft position. Speed is indicated by the number of vanes counted per revolution. Camshaft position is indicated by a single narrow vane which indicates #1 cylinder position or a wide vane in dual sync application that indicates #4 cylinder.

Continuous Test – A function of the ECM in which the inputs and outputs of the ECM are continuously monitored to assure that the readings are within set limits.

DCL, Data Communication Link – A serial communication link between the ECM and the VPM.

DDS, Driveline Disengagement Switch – A switch indicating when the transmission is going out of gear.

Disable – A type of computer decision which results in a system being deactivated and not allowed to operate.

Driver – A transistor in the output section of the ECM that is used to turn on or off various actuators in the system.

Duty Cycle Signal – A type of wave signal that has a controlled on/off time measure from 0% to 100%. Normally used to control solenoids.

DVOM Digital Volt Ohm Meter – A meter that uses a digital display to indicate a measured value. Preferred for use on microprocessor systems, because a DVOM has a very high internal impedance and will not load down the circuit being measured.

EBP, Exhaust Back Pressure Sensor – A variable capacitance type sensor used to indicate exhaust back pressure.

ECI, Engine Crank Inhibit – An output on the ECM that controls the ECI relay and controls when the starter motor is allowed to operate and crank the engine over.

ECM, Electronic Control Module – The housing which contains the micro computer, Vref regulator, input conditioners and output drivers.

GLOSSARY OF TECHNICAL TERMS

ECM Power Relay – Relay which supplies or removes power to the ECM.

ECT, Engine Coolant Temperature Sensor – A thermistor type sensor which indicates engine temperature.

EF IDM Feedback – A communication line from the IDM to the ECM. In run mode, the signal on EF mirrors the FDCS signal received by the ECM from the IDM. EF extensions will be used to identify detected problems with individual injectors.

EFRC, Engine Family Rating Code – A code readable in the calibration list of the VPM with the EST service tool that identifies the horsepower and emission calibration of the engine.

Engine Off Test – A self test operation that is performed with the ignition switch in the "ON" position with the engine off.

Engine Running Test – Self test operation that is performed with the engine running.

EOP, Engine Oil Pressure sensor – A variable capacitance type sensor used to indicate oil pressure.

EOT, Engine Oil Temperature sensor – A thermistor type sensor which senses engine oil temperature. This sensor is used to provide engine temperature signal to the ECM which uses the information for fuel rate and timing adjustment.

EPR, Exhaust Back Pressure Regulator – A pulse width modulated solenoid valve which allows pressurized lube oil to act upon a piston to open the butterfly valve mounted on the exhaust side of the turbocharger. The regulator valve is controlled by the ECM which determines how much the butterfly valve is closed to control the exhaust back pressure.

EST Electronic Service Tool – The scan tool used for accessing diagnostics and programing the T 444E electronic control system.

EWL – Engine Warning Light Circuit

FDCS, Fuel Demand Command Signal – Command signal generated by the ECM and sent to the IDM which controls when an injector is energized (opened) and how long the injector remains energized (open). This signal determines when and how much fuel the injector delivers to the combustion chamber.

FMEM, Failure Modes Effects Management – An alternate control strategy devised to reduce the adverse effects that can be caused by a system failure. Should a sensor fail, the ECM substitutes a good sensor signal or assumed sensor value in its place. The WARN ENGINE LAMP is then lit to alert the driver to take the vehicle in for service.

Foreground Manager – That portion of the computer that controls the primary engine control functions. The foreground manager responds to external events quickly to maintain correct engine performance under a variety of conditions. Typically the foreground manager controls high priority items.

Function – An input value to a computer which the computer solves for an output.

Fusible Link – A wire designed to melt if more than a specified amount of electrical current flows through it. Often used as a main fuse or backup fuse for large sections of the vehicle's wiring harness.

GPC, Glow Plug Control – Controls the current flow to the glow plugs. Glow plug relay "ON" time is controlled by the ECM and is a function of engine coolant temperature, barometric pressure and battery voltage. "ON" time normally varies between 10 to 120 seconds. The glow plug relay will only cycle on and off repeatedly when there is a voltage condition greater than 13.0 volts.

GPL – Glow Plug Wait Lamp – On time is controlled by the ECM and is a function of ECT and BARO. On time will vary from 2 to 20 seconds.

GPR, Glow Plug Relay – ECM controlled relay which supplies power to the glow plugs.

Hall Effect Sensor – A Hall Effect sensor generates a digital on/off signal that indicates speed and also engine timing. The signal is created by a switching action caused by the passing of a vanes thru a positive and negative voltage potential. When the vane is between this potential a signal is created. When the gap is between this potential is open, no signal is generated. The wider the vane the longer the duty cycle of the signal, the narrower the vane the shorter the duty cycle of the signal. A narrow vane is used to indicate the position of #1 cylinder and a wide vane to indicate the position of #4 cylinder. A Hall Effect sensor has three connections ground, Vref, signal.

HEUI, Hydraulically Actuated, Electronically Controlled, Unit Injectors – Engine description for International T 444E Diesel Engine.

High Speed Digital Inputs – Inputs to the ECM that are from a sensor that generates varying frequencies. Examples of high speed digital input sensors are engine speed, vehicle speed and Manifold Absolute Pressure (MAP) sensors.

IAT, Intake Air Temperature sensor – A thermistor style sensor used to indicate intake air temperature.

ICP, Injector Control Pressure Sensor – A transducer style sensor used to indicate Injection Control Pressure.

IDM, Injector Driver Module – Is an electronic unit which has the primary function of an electronic distributor for the injectors. It also is the power supply for the injectors. It supplies 115 volts dc @ 10 amps to the injectors.

Impedance – A form of opposition to AC current flow measured in Ohms.

Injection Control Pressure – High lube oil pressure generated by a high pressure pump/pressure regulator used to hydraulically actuate the fuel injectors.

Input Conditioner – A device or circuit that conditions or prepares an input signal for use by the microprocessor.

IPR, Injection Control Pressure Regulator – An ECM controlled pulse width modulated regulator valve which regulates injection control oil pressure.

IVS, Idle Validation Switch – An on/off switch sensor that indicates when the accelerator pedal is in the idle position.

KAM, Keep Alive Memory – Is a memory location in the microprocessor which allows the ECM to store information on input failures, identified in normal operations for use in diagnostic routines. Keep Alive Memory can also store alternate calibration parameters generated by the FMEM strategy in event of sensor failure or wear. KAM memory is volatile and will be lost if power is disconnected.

KAMPWR – The circuit that continuously supplies KAM memory with 12 volts to prevent the loss of KAM memory.

Low Speed Digital Inputs – Are switched sensor inputs that generate an on/off (high/low) signal to the ECM. The input supplied to the ECM from the sensor could be from a high input source switch (usually 12 or 5 volts) or could be from a grounding type switch which grounds the signal from a current limiting resistor internal to the ECM and creates a low signal. (0 volts)

MAP, Manifold Absolute Pressure – A MAP sensor is a sensor that generates a digital frequency that indicates manifold boost pressure or vacuum. The signal is created by switching action caused by manifold pressure on a diaphragm connected to a capacitor circuit in the sensor. The digital frequency increases as pressure increases. A MAP sensor has three connections, signal return (grd), MAP signal and Vref.

Microprocessor – An integrated circuit within a micro computer which controls information flow within the computer.

Normally Closed – Refers to a switch or a solenoid that is closed when no control force is acting on it.

Normally Open – Refers to a switch or solenoid that is open when no control force is acting on it.

On Demand Test – A self test which the technician initiates, and is run from a program in the processor.

OCC, Output Circuit Check – An "On Demand" test performed during an "Engine Off" self test that tests the continuity of selected actuators.

Output State Check – An "On Demand" test selected by the technician which forces the processor to activate actuators "High or Low" for additional diagnostics.

OWL – Oil/Water Light and Alarm

Potentiometer – Is an electro-mechanical device (variable voltage divider) which senses the position of a mechanical component. Mechanical motion connected to the wiper causes it to move along the resistance material in a rotary fashion. The voltage on the wiper changes at each point along the resistive material and is proportional to the amount of mechanical movement. Potentiometers have three connections. Vref, Signal out (wiper) and ground.

PROM – Programmable Read Only Memory

PTO, Power Takeoff Unit – Accessory output, usually from the transmission that is used to power a hydraulic pump for garbage packing, lift equipment, etc.

GLOSSARY OF TECHNICAL TERMS

Pulse Width – The length of time an actuator, such as an injector remains energized.

RAM, Random Access Memory – A type of memory that is used to store information. Information can be written to and read from the RAM. Input information such as current engine speed or temperature would be stored here to be compared to values stored in the ROM. All memory in the RAM is lost when the ignition switch is turned off.

Read – A computer operation where information is retrieved from the memory.

RFI – Radio Frequency Interference

ROM, Read Only Memory – A type of memory that is used to store information permanently. Information can not be written to the ROM memory. Operating strategies and calibration tables are the type of information most commonly stored in the ROM.

Sampling – The act of periodically collecting information, as from a sensor. A microprocessor samples inputs from various sensors in the process of controlling a system.

Scalar – A single numerical value that is assigned a label and is used as a calibration parameter. This value can be multiplied, divided, added or subtracted to a given input.

SCCS, Speed Control Command Switches – A set of switches used for cruise control, PTO and remote hand throttle system.

SIG GRD, Signal Ground – The common ground wire to the ECM in wire harness for the sensor inputs.

STI, Self Test Input "Engine Diagnostics" Switch – Diagnostic switch located on vehicle dash used to activate Self Test Input engine diagnostics.

Strategy – A plan or set of operating instructions that the microprocessor follows in order to achieve a desired goal. Strategy is the computer program itself, including all equations and decision making logic. Strategy is always stored in the RAM and thus cannot be changed during calibration.

STOP – Stop Engine Lamp

Switch Sensors – Switch sensors are used to indicate position, levels or pressures. The signal of a switch sensor is a digital signal created by either the opening or closing a switch. The on or off signal can indicate position as in the case of a clutch switch, level as in the case of a coolant level switch, or pressure as in the case of a low oil pressure switch. A switch sensor normally has two connectors signal return (Grd) and the signal. A switch sensor is considered a low speed digital signal input.

TAC, Tachometer Output Signal – Engine speed signal from the ECM to the VPM.

Table – Devices that a computer uses to take two different inputs and solve for an output.

Thermistor – Sensor used to determine temperature. A thermistor changes its resistance value in relation to temperature change. Increasing temperature results in decreasing resistance, decreasing temperature results in increasing resistance. The thermistor in conjunction with a current limiting resistor in the ECM forms a voltage divider that provides a voltage signal that indicates temperature. Since the top half of the voltage divider is the current limiting resistor and is internal to the ECM a thermistor sensor only has two connections, signal return and ground.

Threshold Value – A value stored in the ROM portion of the ECM. This value is compared to the value of a particular sensor provided to the ECM during the continuous self-test. If the value is not within the parameters of the threshold value, a service code is entered into the KAM.

Transducers (load cells) – Transducers are used to sense pressure. Their function is very similar to potentiometers. The 5 volt reference signal is changed by the internal circuitry of the sensor into an analog voltage that indicates pressure. A transducer sensor has three connections Vref, signal and ground.

Transition – Changing from one value or condition to another, such as from positive to negative in an electronic circuit.

TTS – Transmission Tailshaft Speed

UVC, Under Valve Cover – A combination valve cover gasket and harness containing fuel injector and glow plug wiring.

VEPS Vehicle Electronic System Programming System – The computer system used to program electronically controlled vehicles.

VIGN, Voltage Ignition – Voltage supplied by the ignition switch when the key is in the "ON" position.

VIT, Vendor Interface Tool – A vendor (engine supplier) tool used to translate programming information between Navistar's truck VEPS system format to the vehicle.

VPM, Vehicle Personality Module – A module which identifies to the ECM the individual vehicle parameters for the system being used. This module allows for resetting of road speed, PTO set points, cruise control set points, speedometer calibrations and other vehicle features.

VRE Vehicle Retarder Enable – Output from ECM to a vehicle retarder.

V Ref Reference Voltage – A five volt reference supplied by the ECM to operate the engine sensors.

VBAT – Battery voltage.

VPWR – Battery voltage.

VSS Vehicle Speed Sensor – Normally a magnetic pickup style sensor that is mounted on the tailshaft of the transmission to indicate ground speed.

WARN ENGINE Lamp – Lamp in the dash that comes on when selected fault codes are set or when the ECM is utilizing FMEM strategy. Fault codes in some vehicles can be read as flash codes through the WARN ENGINE lamp. To access the flash codes, the STI (Self Test Input "Engine Diagnostics") switch is depressed and held momentarily while the ignition switch is placed in the "ON" position. This will cause the WARN ENGINE lamp to flash any fault codes which were stored while operating the vehicle.

Write – A computer operation where information is sent to and stored in memory.