Appendix A

Glossary

A

Actuator – A mechanism for moving or controlling something indirectly instead of by hand. See also, output actuator.

Amplitude – As it applies to the electronic control system, the amount of voltage produced in an electrical circuit.

Autoprobe – A signal measurement device that when interfaced with the Diagnostic Tester Instrumentation Port can be used for voltage, frequency, duty cycle, and pulse width measurements. When interfaced with V-Bob, the Autoprobe provides signal input for oscilloscope functions.

B

Bank – The group of cylinders which feed an O2 sensor. Bank 1 always contains cylinder #1 (the cylinder closest to the front of the engine). Under the J1979 serial data standard, O2 sensor location is identified by bank (i.e. bank 1 and bank 2) and also by sensor number (i.e. sensor 1, sensor 2) where sensor 1 is the closest to the engine. The following is an example of this type of sensor location information.

On a 1MZ-FE engine, sensor B1, S1 indicates bank 1, sensor 1. This is the main O2 sensor on the right side of the engine (facing the front of the engine). Sensor B1, S2 indicates the sub-O2 sensor located on the right side exhaust.

Base Fuel Schedule (Basic Injection Quantity) – Fuel calibration schedule programmed into the ECM when the vehicle is manufactured. The base fuel schedule is the calculated fuel delivery for a given set of input parameters prior to any trim correction being added.

Baud Rate – The speed at which data can be transmitted over a serial data link, usually measured in "bits per second" (bps).

bps – bits per second. Units used for measurement of baud rate.

C

Calculated Load Value – refers to an indication of current airflow divided by (theoretical) peak airflow, where peak airflow is corrected for altitude (when this data is available). A unitless number that provides the technician with an indication of the percentage of engine capacity that is being used.

Catalyst – A substance that can increase or decrease the rate of chemical reaction between substances without being consumed in the process.

Circuit Level Diagnosis – A diagnostic decision, which confirms that a problem exists within a particular circuit. The circuit consists of the sensor, the ECM, and all related wiring.

Closed Loop (Engine) – An operating condition or mode, which enables modification of programmed instructions, based on a feedback system.

Continuous Monitoring – Sampling at a rate no less than two samples per second.

Cursor – The highlighted text or data on the display screen. Same as marker.

D

DLC – Data Link Connector. A connector provided for access to a vehicle's on-board diagnostic data and functions.

Data List – A preprogrammed list of information being transmitted from vehicle to Diagnostic Tester. Depending on the vehicle and system being tested, the Data List could have as few as 10 parameters or as many as 80.

Data Word – One complete parameter or piece of information transmitted on a serial data line.

Default – As it relates to an engine control system, the condition that a device will return to when it is not operation or when it fails. Take a normally closed (N/C) Vacuum Switching valve for example; when this type of VSV is operated by the ECM, it will open; however, in the event that this N/C device becomes disconnected or inoperative, it will revert to the closed position.

Diagnostic Tester – A handheld tester capable of reading and displaying serial data from the vehicle Data Link Connector (DLC).

Diagnositcs – The process of identifying the cause or nature of a condition, situation or problem to determine the corrective action in repair of automotive systems.

Driving Cycle – Engine start-up, vehicle operation beyond the beginning of closed loop operation, and engine shut down.

Duty Ratio – The duty ratio is the percentage of time during one complete cycle that electrical current flows. A high duty ratio, 90% for example, means that current flow is on longer than it is off. A low duty ratio, 10% for example, means that current flow is off longer than it is on. A duty ratio of 50% would be on half of the time and off half of the time.

E

Engine Misfire – Lack of combustion in a cylinder due to the absence or inadequacy of spark, fuel metering compression, or any other cause.

F

Final Injection Quantity – The final delivery calculation after all corrections have been made for variables like temperature and battery voltage.

Frequency – Number of times every second an alternating current goes through a complete cycle. Measured in the unit Hertz (Hz).

Fuel Trim – Feedback adjustments to the base fuel schedule. Short-term fuel trim refers to dynamic or instantaneous adjustments. Long term trim refers to a more gradual adjustment to the fuel calibration schedule. Long-term trim adjustments compensate for differences between vehicles and/or changes in the vehicle, which occur over time.

Freeze Frame – A single frame of stored data, representing data parameters at the moment a fault is stored.

H

Hard Fault – A circuit fault, which is not intermittent, like a broken wire or faulty sensor.

Hz – Hertz. A unit of measurement for frequency.

I

Intermittent Fault – A circuit fault, which only happens occasionally. It sometimes can be duplicated and sometimes it cannot.

Injection Pulse Width – The amount of time the ECM switches a fuel injector to ground, allowing fuel to be delivered to the intake manifold. Pulse width is typically measured in the number of milliseconds that the fuel injector delivers fuel to the intake manifold. Also referred to as injection duration.

Injection Duration – The amount of time a fuel injector is energized or on. With a fixed fuel pressure differential across the injector, increases in injector duration to cause a proportionate amount of additional enrichment.

Instrumentation Port (I/P) – Terminal located on the bottom of the Diagnostic Tester for connection with V-Bob, Autoprobe, and NVH analyzer.

K

Keep Alive Memory – A battery powered memory location in the ECM, which allows the microprocessor to store information about the system-input failures. This information, which is stored during normal operation of the vehicle, is not erased from the ECM memory until the BATT feed to the ECM is disconnected for more than 30 seconds. Also referred to as Non-Volatile Ram (NVRAM).

L

Learned Voltage Feedback (LVF) – Fuel injection correction coefficient which tailors the standard fuel injection duration to minor differences between engines due to manufacturing tolerances, mechanical wear, and minor mixture disturbances like small vacuum leaks. This coefficient is capable of altering the calculated injection duration (before O2 sensor correction) by as much as 20% to prevent O2 sensor corrections from becoming excessive.

Look Up Table – A data table stored in a computer memory, which is used to look up information for an engine control system.

M

Malfunction – The inability of an emission related component or system to remain within design specifications. For OBD II purposes, the deterioration of a component or system to a degree that would likely cause the emissions of the vehicle to exceed 1.5 times its original design standards.

Microprocessor – A set of integrated circuits that can be programmed with stored instructions to perform given functions. Also called a microcomputer, this device consists of a central processing unit (CPU), a read only memory (ROM), and a random access memory (RAM).

O

O2S Response Rate – The delay, measured in milliseconds, between a switch of the sensor from lean to rich or vise versa, in response to a change in A/F Ratio above and below stoichiometric (14.7:1 AFR).

OBD – The first generation of on-board diagnostic capabilities for gasoline powered automobiles and light trucks mandated by the California Air Resources Board (CARB). Phased-in during the 1988 model year.

OBD II – The second generation of on-board diagnostic capabilities for gasoline powered automobiles and light trucks mandated by the California Air Resources Board (CARB). Implemented during the 1994 - 1996 model years.

Open Loop – An operating condition or mode based on programmed instructions and not modified by a feedback system.

Output Actuator – A device, which performs a mechanical action, based upon an electrical signal. See also, actuator.

P

Potentiometer – A three-wire electrical device that can vary the amount of resistance placed in an electrical circuit by sliding an electrical contact along a fixed resistor.

Pounds per Square Inch, Absolute (PSIA) – Pressure readings, which are not corrected for atmospheric pressure. At sea level, a PSIA calibrated gauge would read 14.7 pounds per square inch when sampling ambient pressure. Intake manifold pressure is typically measured on the absolute scale.

Pounds per Square Inch, Gauge (PSIG) – Pressure readings, which are corrected back to zero for atmospheric pressure. At sea level, a PSIG calibrated gauge would read zero pounds per square inch when sampling ambient pressure. Fuel pressure is typically measured on the gauge scale.

Power Transistor – The electronic switch inside an igniter assembly, which turns primary current on, and off. Designed to carry large amounts of current flow and dissipate large quantities of heat.

Programmable Read Only Memory (PROM) – Part of a microprocessor or computer in which instructions or data are semi-permanently located. PROM data can be changed (like RAM) but are not volatile memory (they do not erase when power is removed, but are permanently configured as part of the electronic circuit).

Pull-up Resistor – The first resistor (of fixed value) in a two-resistor series circuit, which creates a voltage, dividing network. As the resistance of the second resistor increases, its voltage drop also increases; therefore the voltage drop across the pull-up resistor decreases.

R

RS232/RC23C – The most standard serial communication interface used in the computer industry.

S

Secondary Air – Air induced into the exhaust system by means of a pump or aspirator valve or other means that is intended to aid in the oxidation of HC and CO contained in the exhaust stream.

Sensor – The generic name for a devise that senses either the absolute value or a change in a physical quantity such as temperature, pressure, or flow rate and converts that change into an electrical quantity signal.

Signal (Electrical/Electronic) – A fluctuating electric quantity, such as voltage or current, whose variations represent information.

Serial Data – Information about a computer system inputs, outputs, and other operating parameters which is transmitted from vehicle to Diagnostic Tester on a single wire in the Data Link Connector (DLC).

Snapshot – A mode of operation where basic diagnostic parameters are stored in the scan tool during a road test and can be examined, printed, or transferred to a computer at the end of the test.

Standard Voltage Values – Normal voltage and resistance values which are established for a given sensor, actuator, or circuit. These standard values can be found in the repair manual.

Stoichiometry – The theoretically ideal air/fuel mixture for combustion in which all oxygen and all fuel will be completely burned.

Square Wave – A digital, electronic signal which is either on or off. There is virtually no time between the on and off states.

T

Trip Cycle – Vehicle operation (following an engine off period) of duration and driving modes, such that all components and systems are monitored at least once by the diagnostic system (except those systems which are steady state monitored).

Two Trip Detection Logic – ECM diagnosis strategy which prevents a diagnostic code or the check engine light from coming on until the problem has duplicated itself twice, with a key off cycle in between.

V

V-BoB – Vehicle Break-out Box.

VIN – Vehicle identification number.

W

Warm-up Cycle – Sufficient vehicle operation such that the coolant temperature has risen at least 40°F from engine starting and/or reaches a minimum temperature of 160°F.