AD100 Key Programmer user manual

Table of Contents

The Product is:

- ☐ Codereader
- ☐ Codereader-Pro
- ☐ Scanner
- ☐ OEM product

Product Features:

	Codereader	Codereader-Pro	Scanner
Displays the DTC definitions on screen unlike previous models	Yes	Yes	Yes
Wider coverage: works with CAN-equipped vehicles	Yes	Yes	Yes
Reads and clears all generic, and some manufacturer, specific DTCs	Yes	Yes	Yes
Resets check engine lights	Yes	Yes	Yes
Views OBD-II Freeze Frame data	Yes	Yes	Yes
Determines the Malfunction Indicator lamp (MIL) status	No	Yes	Yes
Displays I/M readiness status	No	Yes	Yes
Retrieves the Vehicle Identification Number (VIN)	No	Yes	Yes
Scanning live data	No	Yes	Yes
Saves scanning Data	Yes	Yes	Yes

The Product Kit Includes:

Accessories	Codereader	Codereader-Pro	Scanner
CR-PRO Base Tool	Yes	Yes	Yes
OBD-II Cable	Yes	Yes	Yes
Box	Yes	Yes	Yes

Features:

Display: 128x64 pixel LCD with contrast adjustment and backlight
Easy - to - Read screen and also saves up to 38 scans for later viewing.
Operating temperature:-20℃ - 50 ℃(- 4℉ to 122 ℉)
Operation Voltage : DC 9 ~15V provided by vehicle battery

Support Protocol:
1) SAE-J1850 PWM
2) SAE-J1850 VPW
3) ISO-14230
4) ISO-9141
5) ISO-15765-4 (CAN BUS)

Vehicle Service Information

The following is a list of web sites and phone numbers where electronic engine control (EEC) diagnostic information is available.

Some manuals may be available at your local dealer, auto parts stores or local public libraries.

Domestic Vehicles	Web Site	Phone Number
	General Motors	
Chevrolet	www.chevrolet.com	1-800-551-4123
Pontiac	www.pontiac.com	1-800-551-4123
Oldsmobile	www.oldsmobile.com	1-800-551-4123
Buick	www.buick.com	1-800-551-4123
Cadillac	www.cadillac.com	1-800-333-4CAD
Saturn	www.saturn.com	1-800-553-6000
	Ford	
Ford	www.ford.com	1-800-392-3673
Lincoln	www.lincoln.com	1-800-392-3673
Mercury	www.mercury.com	1-800-392-3673
Chrysler	www.chrysler.com	1-800-348-4696
Dodge	www.dodge.com	1-800-348-4696
Plymouth	Not Available	1-800-348-4696
Eagle	Not Available	1-800-348-4696
	European Vehicles	
Audi	www.audi.com	1-800-544-8021
Volkswagon	www.vw.com	1-800-544-8021
BMW	www.bmw.com	1-201-307-4000
MINI	www.mini.com	1-201-307-4000
Jaguar	www.jaguar.com	1-800-4-JAGUAR
Volvo	www.volvo.com	1-800-458-1552
Mercedes-Benz	www.mercedes-benz.com	1-800-367-6372
Land Rover	www.landrover.com	1-800-637-6837
Porsche	www.porsche.com	1-800-PORSCHE
Saab	www.saab.com	1-800-955-9007
Asian Vehicles	Web Site	Phone Number
Acura	www.acura.com	1-800-999-1009
Honda	www.honda.com	1-800-999-1009
Lexus	www.lexus.com	1-800-255-3987
Scion	www.scion.com	1.866.70.SCION
Toyota	www.toyota.com	1-800-GO-TOYOTA
Hyundai	www.hyundai.com	1-800-633-5151
Infiniti	www.infiniti.com	1-800-662-6200
Nissan	www.nissanusa.com	1-800-nissan1
Kia	www.kia.com	1-800-333-4542
Mazda	www.mazda.com	1-800-222-5500
Daewoo	www.daewoo.com	1-822-759-2114
Subaru	www.subaru.com	1-800-SUBARU3
Isuzu	www.isuzu.com	1-800-255-6727
Geo	Not Available	Not Available
Mitsubishi	www.mitsubishi.com	1-888-MITSU2004
Suzuki	www.suzukiauto.com	1-800-934-0934

Introduction to On-Board Diagnostics OBD II

On-board diagnostics version II (OBD II) is a system that the Society of Automotive Engineers (SAE) developed to standardize automotive electronic diagnosis.

Beginning in 1996, most new vehicles sold in the United States were fully OBD II compliant.

Technicians can now use the same tool to test any OBD II compliant vehicle without special adapters. SAE established guidelines that provide:

A universal connector, called the DLC, with dedicated pin assignments.

A standard location for the DLC, visible under the dash on driver's side.

A standard list of diagnostic trouble codes (DTCs) used by all manufacturers.

A standard list of parameter identification (PID) data used by all manufacturers.

Ability for vehicle systems to record operating conditions when a fault occurs.

Expanded diagnostic capabilities that records a code whenever a condition occurs that affects vehicle emissions.

Ability to clear stored codes from the vehicle's memory with a Scan Tool.

SAE Publications

SAE has published hundreds of pages of text defining a standard communication protocol that establishes hardware, software, and circuit parameters of OBD II systems.

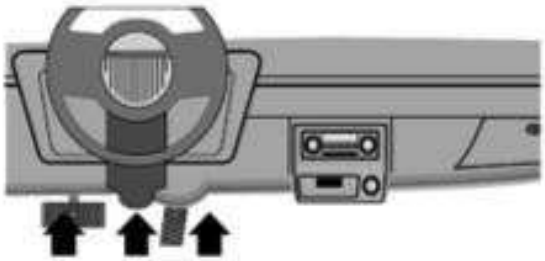
- SAE publishes recommendations, not laws, but the Environmental Protection Agency (EPA) and California Air Resources Board (CARB) made many of SAE's recommendations legal requirements.

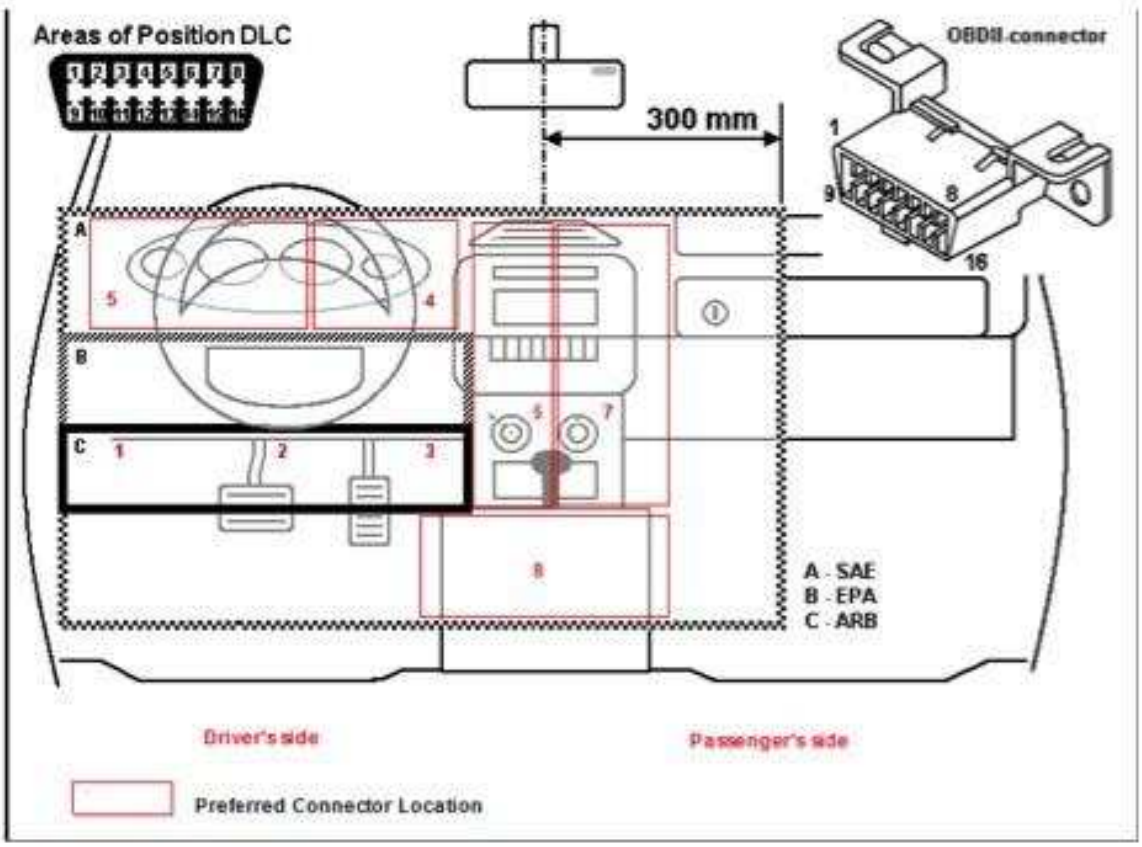
Diagnostic Link Connector (DLC)

The Data Link Connector (DLC) is used with scan tool to communicate with the vehicle's control module.

✓ Data Link Connector Location.

- ❒ Under dashboard on driver side of vehicle.
- ❒ If Data Link Connector is not located under dashboard, a label should be there telling location.



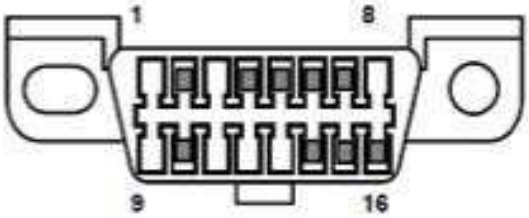


Explanation of Diagram Numbered Locations

Location #	*Description*
1	Driver's side, underneath dasboard, in the area under the steering column, +/- 150 mm (i.e., +/- 6 inches on either side of the steering column)
2	Driver's side, underneath dasboard between the driver-side door and steering column area
3	Driver's side, underneath dasboard, between the steering column area and the center console (also includes connectors on the driver side but connected to the center console)
4	Driver's side, dashboard instrument/gauge area, between the steering column and center console
5	Driver's side, dashboard instrument/gauge area, between the driver-side door and steering column
6	Center console, vertical surface (i.e.,near radio and climate controls), eft of vehicle centerline
6/7	Center console, vertical surface (i.e.,near radio and climate controls), on vehicle centerline
7	Center console, vertical surface right of vehicle centerline or on passenger side of center console
8	Center console, horizontal surface (i.e, armrest, handbrake area), in front passenger area
9	Any location other than locations # 1-8 (i.e., rear passenger area, passenger side glove box, topof dashboard near windshield)

Note:
- Locations #1-3 represent preferable locations, Locations #4-8 represent allowable locations under SAE J1962
- Connectors in location # 6, #6/7, and #7 may be covered by ashtrays, covers, cup holders, coin holders, etc.

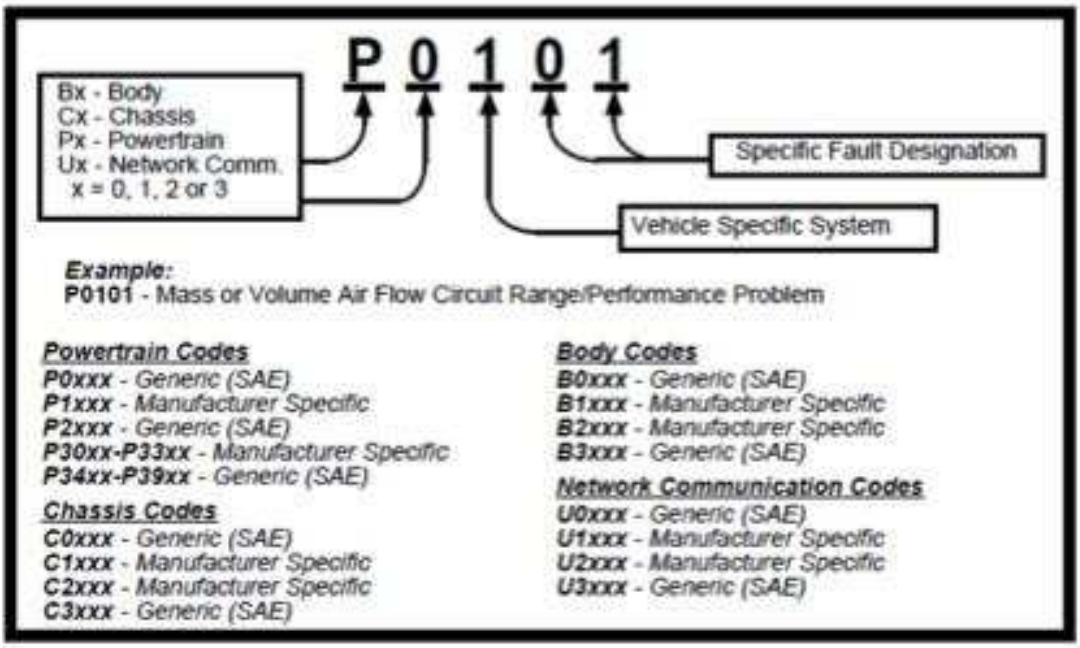
Data Link Connector (DLC) Pins



1 - Manufacturer Reserved
2 - J1850 Bus+
3 - Manufacturer Reserved
4 - Chassis Ground
5 - Signal Ground
6 - CAN High, J-2284
7 - K Line, ISO 9141-2 & ISO/DIS 14230-4
8 - Manufacturer Reserved
9 - Manufacturer Reserved
10 - J1850 Bus-
11 - Manufacturer Reserved
12 - Manufacturer Reserved
13 - Manufacturer Reserved
14 - CAN Low, J-2284
15 - L Line, ISO 9141-2 & ISO/DIS 14230-4
16 - Battery Power

OBD II Diagnostic Trouble Codes (DTCs)

- ✓ DTCs are used to help determine the cause of a problem or problems with a vehicle.
  - ❒ DTCs consist of a five-digit alphanumeric code.
  - ❒ The DTCs format and general code types are shown below.



Within each category (Powertrain, Chassis, Body and Network) of DTCs there are assigned ranges for different vehicle systems.

Lower	Upper	Assigned DTC System
P0000	P00FF	Fuel Air Metering Auxiliary Emission Controls
P0100	P02FF	Fuel Air Metering
P0300	P03FF	Ignition System or Misfire
P0400	P04FF	Auxiliary Emission Controls
P0500	P05FF	Vehicle Speed Idle Control Auxiliary Inputs
P0600	P06FF	Computer and Auxiliary Outputs
P0700	P09FF	Transmission
P0A00	P0AFF	Hybrid Propulsion
P1000	P10FF	Manufacturer Control Fuel & Air Metering, Auxiliary Emission Controls
P1100	P12FF	Manufacturer Control Fuel & Air Metering
P1300	P13FF	Manufacturer Control Ignition System or Misfire
P1400	P14FF	Manufacturer Control Auxiliary emission Controls
P1500	P15FF	Manufacturer Cntrl Veh.Spd. Idle Speed Control Auxiliary Inputs

Lower	Upper	Assigned DTC System
P1600	P16FF	Manufacturer Control Auxiliary Inputs Auxiliary Outputs
P1700	P19FF	Manufacturer Control Transmission
P2000	P22FF	Fuel Air Metering Auxiliary emission Controls
P2300	P23FF	Ignition System or Misfire
P2400	P24FF	Auxiliary Emission Controls
P2500	P25FF	Auxiliary Inputs
P2600	P26FF	Computer and Auxiliary Outputs
P2700	P27FF	Transmission
P2900	P32FF	Fuel Air Metering Auxiliary Emission Controls
P3300	P33FF	Ignition System
P3400	P34FF	Cylinder Deactivation
U0000	U00FF	Network Electrical
U0100	U02FF	Network Communication
U0300	U03FF	Network Software
U0400	U04FF	Network Data

✓ J2012 and ISO 15031-6 are standards for all DTCs, established by the SAE, International Organization for Standardization (ISO) and other governing bodies.

- ❒ Codes and definitions assigned by these specifications are known as Generic OBD II codes.
- ❒ OBD II requires compliance to these standards for all cars, light trucks, APVs, MPVs, and SUVs sold in the United States.
- ❒ Codes not reserved by the SAE are reserved for the manufacturer and referred to as Manufacturer Specific Codes.

Keypad Functions:

Power button, ON or OFF Scan Tool.

Enter button, to perform the selected function of the menu.

NO button, for cancelling the operation or return back by pressing this button.

Help button, explain the abbr letters during operation .
Note: Using the Help button always when you have any doubts of the operation or abbr letters, that would improve your work more efficient.

Page-Up roll button

Page-Down roll button

Display Functions:

① Diagnostic Trouble Codes Display Area.
When the DTC reader found a fault code in the PCM, it will display here. Each fault is assigned a code number that is specific to the fault.

② PENDING Icon:
Indicates the currently display DTC is a "Pending" Code.

③ DTC Definitions:
Information on DTC definitions, Freeze Frame data and test messages are displayed here.

④ DTC Number Sequence:
The DTC reader assigns a code sequence number to each DTC found in the vehicle's PCM. The sequence will start from 1. This number will indicate which code is currently displayed. / DTC Enumerator Indicates the total number of codes retrieved from the vehicle's ECU.

⑤ G/E instruction:
Generic DTC / Enhanced DTC

⑥ Link Icon:
Indicates whether that the DTC Reader is communicating with the vehicle's computer or not.

⑦ LED instruction:
Color changing display to indicate the Scan Tool system status.
RED-SYSTEM Working
YELLO- Establish a communication with the vehicle

Getting Started:

Before you use Scan Tool on the vehicle, please ensure that mechanical problems such as low oil level, damaged hoses, wiring or electrical connections are fixed FIRST. They may cause a fault code to set.

The following Areas need to be checked before starting any test:

- The levels of engine oil, power steering fluid, transmission fluid (if auto transmission), engine coolant and other fluids must be at proper level. Top up if necessary.
- Check the condition of air hoses and the air filter must be cleaned. Replace if necessary.
- Make sure the timing belts are in good condition and properly tensioned.
- Make sure the spark plugs are cleaned and in good condition. Check for loose, damaged, disconnected or missing plug cables.
- Make sure that all mechanical linkages to the engine sensors (throttle, gearshift position, transmission, etc) are secure and properly connected. Refer to Service Manuals for locations.
- Check all electrical wirings and harnesses for proper connections and condition of its insulation.
- Check all rubber hoses (radiator) and steel hoses (vacuum and fuel) for leaks, cracks, blockage or other damages.
- Make sure the engine is mechanically sound. Do a compression check, engine vacuum check, timing check, etc.
- Always refer to the manufacturer's Service Manual if you are not sure of the repair procedures.

Settings & Adjustments

To enter the MENU Mode:

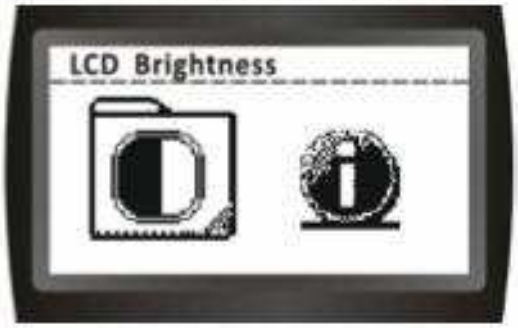
1、 Once the Scan Tool is powered up through the DLC connection,Press . button, the wake up screen will display as below:

2、After a few seconds, it will switch to:

3、Press OR button, the screen will change to:

4 、Press button, the screen will change to:

5、Press  button, the screen will change to:



6、Press  button, the screen will change to:

7、Press  or  button, button to increase or decrease the brightness ranges from 1 to 9.

8、Once the brightness adjustment had been selected to your desired setting, press YES button to exit to the main Menu.

9、To exit totally, press  button, Exit Menu.

About ...

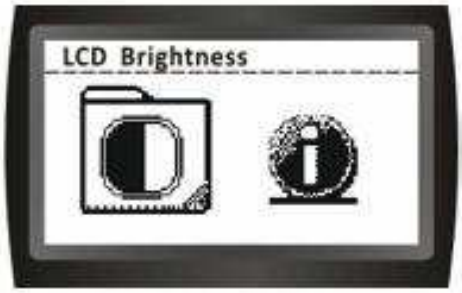
Enter the Setting Menu,

Press button.

The screen will change to:

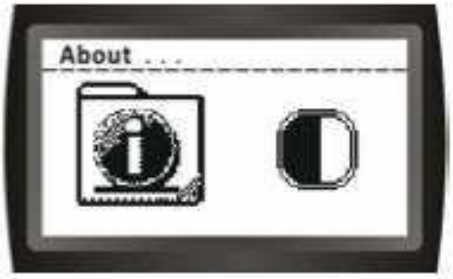
Press or button

:



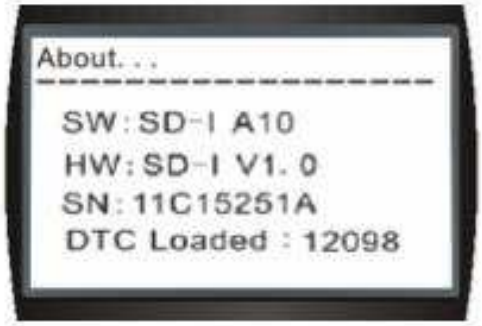
The screen will change to

Press button.



The screen will change to:

SW:Scan tool Software Number
HW:Scan tool Hardware Number
SN: Scan tool Serial Number
DTC Loaded: DTC Loaded quantity



To exit totally, press button, Exit Menu.

Malfunction Indicator Lamp (MIL):

When the vehicle on board computer detects a problem in the emission related systems or components, its diagnostic program will assign a fault code (DTC) and store it in its memory. It also records a "Freeze Frame" of the conditions present when the fault was found and set the malfunction indicator lamp (MIL) alight. Some faults require detection for two trips in a row before the MIL is turned on.

Three typical examples of MIL are shown below:

Definition of Trip

'A Trip' is define as a Key-ON, Key-OFF event in which the powertrain control module (PCM) detects the following:

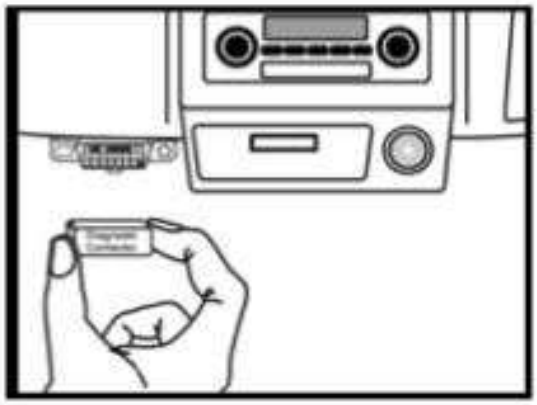
- Engine coolant temperature should exceed 70°C
- Engine coolant temperature should change more than 20°C after starting the engine.
- Engine speed should go over 400 RPM.

When the powertain control module (PCM) detects a fault during the 1st trip, the DTC and the corresponding 'Freeze Frame' data are stored in the PCM's memory. The MIL will not light up until the fault is again detected during the 2nd trip. Certain DTCs are capable of turning the MIL on or blinking during the first trip.

Vehicle Diagnostic

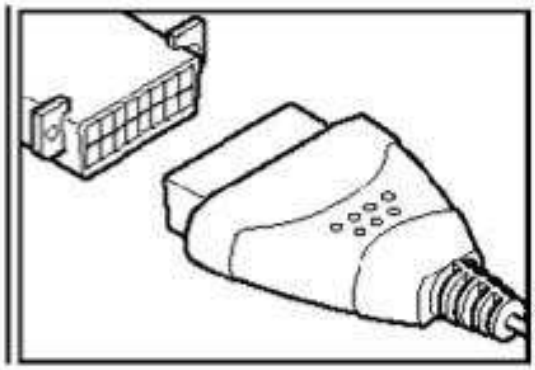
When everything had been confirmed and checked as mentioned in Getting Started, the testing operation can be carried out.

1. Locate the vehicle Diagnostic Link Connector (DLC) and make sure that the ignition switch is in OFF position.

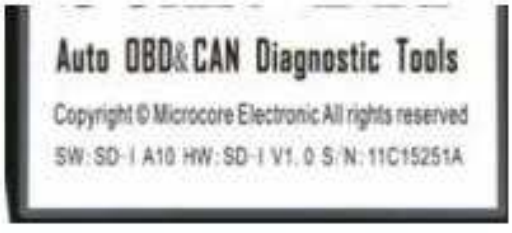


2. Connect the Scan Tool cable connector to the vehicle's DLC.

   • If problem of connecting, rotate it to 180° and try again.



3. When the connection has been established, Press  button, the Scan tool will light up and it will display as below:

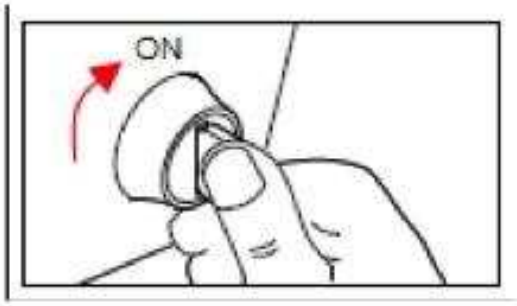


4. After a few seconds, it will switch to:

5. If the vehicle Diagnostic Protocol is OBD-II. But the DTC Code is MANUFACTORY. Please press UP or DN button, then press yes , the screen will change to:

   Or else, Press NO,forget this step and Select MF

6. Turn the ignition on.
   DO NOT start the engine.

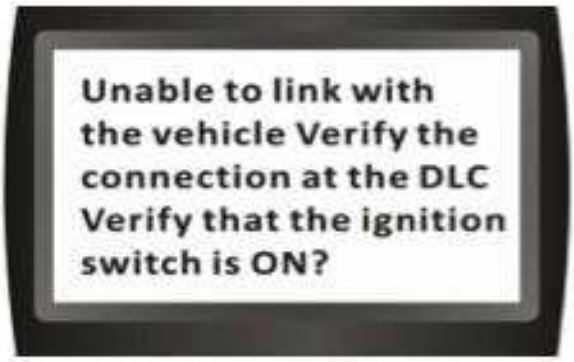


7. Press the  button once, the Scan tool will automatically start to communicate the ECU of vehicle and search which type of communication protocol is using. Once the Scan tool identifies the computer's communications protocol, a communication link is established.

The protocol type will be shown on the LCD display.

8. After a few seconds, the screen will change to: wait the Scan Tool will retrieve and display any Diagnostic Trouble Codes, Freeze Frame data Live Data....from the vehicles computer memory.

9. If the Scan tool fails to link up with the vehicle's ECU, it will show a message as displayed on the LCD screen:



Reason:

1. DLC isn't linked properly.
2. The KEY of the vehicle isn't swithed on.
3. The vehicle's communication protocol is not conform with international standards.

10. Press  or  button the screen will change to:

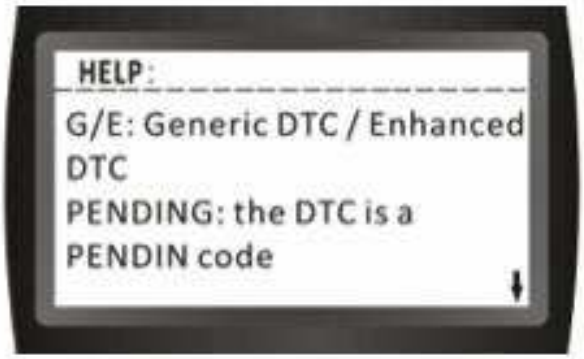
1) READ DTCs

The READ DTCs function allows the Scan Tool to read the DTCs from the vehicle's control modules. DTCs are used to help determine the cause of a problem or problems in the vehicle. These codes cause the control module to illuminate the malfunction indicator lamp (MIL) when emission-related or driveability fault occurs. MIL is also known as service engine soon or check engine light.

READ DTCs can be done with the key on engine off (KOEO) or with the key on engine running (KOER).

Press button the screen will change to:

Press button, View more help information



2) ERASE DTCs

The ERASE DTCs function deletes DTCs and I/M Readiness data from vehicle's control module(s). Perform this function with KOEO. Do not start the engine.

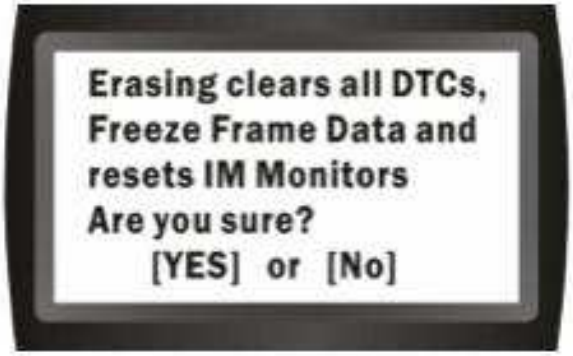
The ERASE DTCs function may also erase View Freeze Data..... results depending on vehicle.

The ERASE DTCs function sets monitors to inc.

Return to Previous Menu,Select Erase DTCs

Press button the screen will change to:

Erase DTC Press YES, Otherwise Press NO

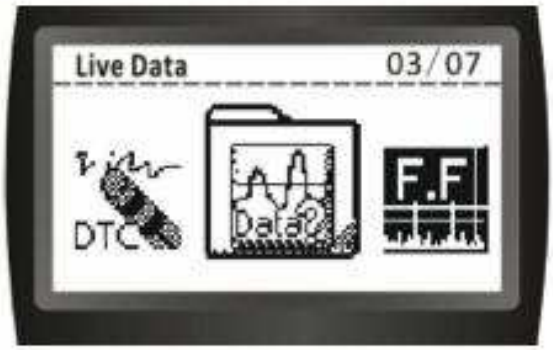


Press button the screen will change to:

3) VIEW LIVE DATA

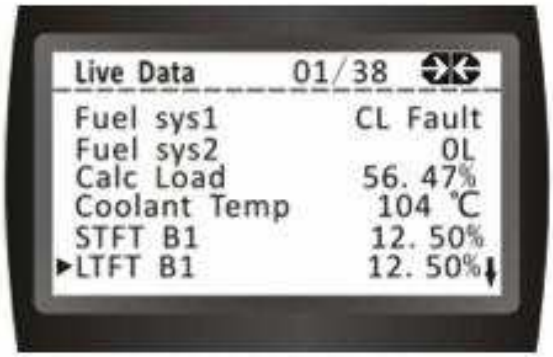
The VIEW LIVE DATA function allows real time viewing of the vehicle's computer module's PID data. As the computer monitors the vehicle, information is simultaneously transmitted to scan tool.

Return to Previous Menu,Select Live Data

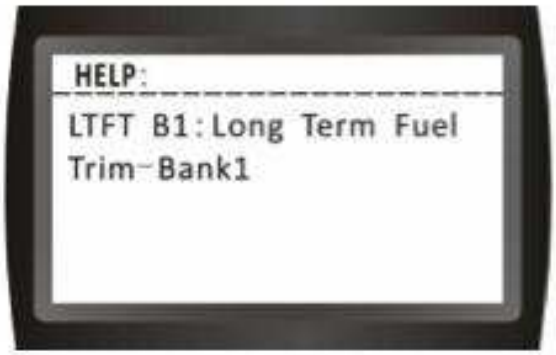


Press button the screen will change to:

Use the and arrow keys to view other sensors.



Press button, View more help information



OBD-II Generic Operational Data Items

Mass Air Flow (Grams/Sec) Range: **0 to 105 gr/sec**
High Perf. Vehicles: 0 to 255 gr/sec
Mass air flow sensor input is used by the ECM to calculate fuel delivery. As the air flow increases, the fuel delivery must also increase. Displayed in grams per second.

Calculated Load Value Range: **0% to 100%**
An indication of the current airflow divided by peak airflow, where peak airflow is corrected for altitude, if available. This value is not engine specific. It gives the service technician an indication of the percent of engine capacity being used (with a full load as 100%).

Commanded Secondary Air Status
Commanded Secondary Air provided to the exhaust system.

Engine Coolant Temperature Range: **-40 C to 215 C**
The temperature of the vehicle coolant is used to determine when to transition into closed loop and to calculate spark advance during cold starts. The PCM converts the voltage from the sensor to a temperature.

Engine RPM - Engine Speed reading displayed in revolutions per minute.

Fuel Pressure (Gage) Range: **0 to 765 kPaG**
Fuel pressure of the fuel delivery system.

Fuel System Status-Information describing the operation of the fuel control.

Open loop - Operating condition during engine warm up/idle in which the fuel mixture isn't being corrected to compensate for a rich/lean condition.

Closed Loop - Operating condition in which the fuel mixture is being corrected for a rich/lean condition.

OL Drive - Vehicle in Open Loop due to driving conditions (power enrichment, deceleration).

OL Fault - Vehicle in Open Loop due to a detected system fault.

CL O2 Fault - Vehicle in Closed Loop, but a fault with at least one oxygen sensor - may be using simple oxygen sensor for fuel control.

Ignition Timing Advance Range: **-64 to 63.5**
The relationship between ignition timing and top dead center, displayed in crankshaft degrees.

OBD-II Generic Operational Data Items (Cont.)

Intake Air Temperature Range: **-40 C to 215 C**
Temperature of the air drawn through a cleaner and distributed to each cylinder for use in combustion.

Intake Manifold Pressure Range: **10 to 105 kPa, or 0 to 5 Volts**
The manifold absolute pressure displayed in kilopascals or volts. A low reading will indicate that the pressure is low (vacuum is high) and a high reading will indicate that the pressure is high (vacuum is low).

Long Term Fuel Trim (Bank 1 / Bank 2)
Long Term adjustments to the Bank 1 fuel calibration schedule which compensate for vehicle differences and gradual changes that occur over time. Range: -100.00% to 99.92% (-100% indicating a maximum lean condition, 99.92% indicating a maximum rich condition, and 0% indicating no adjustment).

OBD-II Require
Requirement level for the On Board Diagnostics designed for the vehicle.

OBD-II (CARB) - Vehicle designed with OBD requirements for California Air Resource Board OBD-II.

OBD (Fed EPA) - Vehicle designed with OBD requirements for Federal EPA OBD.

OBD and OBD-II - Vehicle designed with OBD requirements for OBD and OBD-II.

OBD-I - Vehicle designed with OBD requirements for OBD-I.

Not Intended - Vehicle not intended to meet any OBD requirements.

Oxygen Sensor
The detection of Oxygen (O2) content in the exhaust gases. The sensor readings are used by the ECM to help calculate the air-fuel mixture to maintain proper vehicle performance.

Short Term Fuel Trim (Bank 1/2)
Dynamic or instantaneous adjustments to the Bank 1 base fuel schedule. Range: -100.00% to 99.92% (-100% indicating a maximum lean condition, 99.92% indicating a maximum rich condition, and 0% indicating no adjustment).

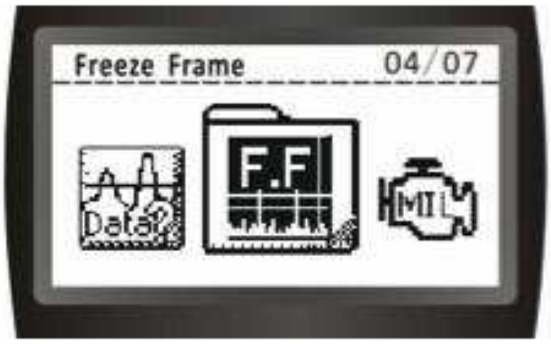
Vehicle Speed (MPH) - Sensor reading displayed in miles per hour.

4) VIEW FREEZE FRAME

When an emission-related fault occurs, certain vehicle conditions are recorded by the on-board computer. This information is referred to as freeze frame data. ***VIEW FREEZE FRAME*** is a snapshot of the operating conditions at the time of an emission-related fault.

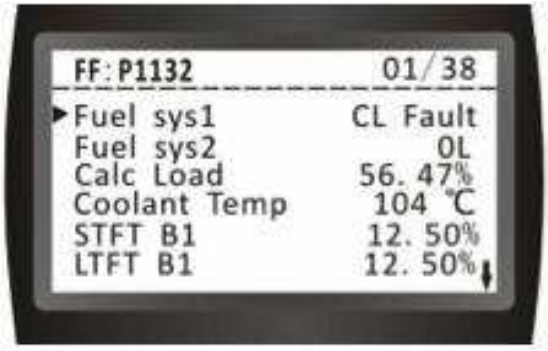
VIEW FREEZE FRAME can be overwritten by faults with a higher priority. If codes were erased, ***VIEW FREEZE FRAME*** may not be stored in vehicle memory depending on vehicle.

Return to Previous Menu,Select Freeze Frame

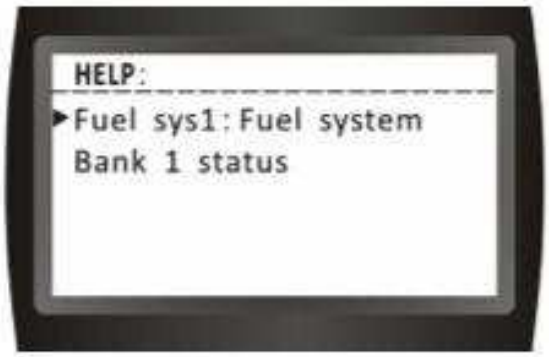


Press button the screen will change to:

Use the and arrow keys to view other sensors.

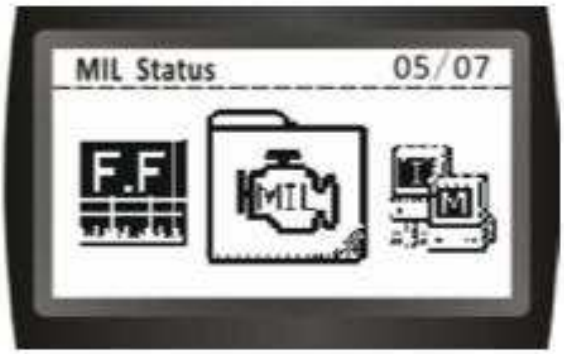


Press button, View more help information



5) MIL STATUS

Return to Previous Menu,Select MIL Status



Press  button the screen will change to:

If the system is normal,the screen will change to:

6) I/M Readiness

The **I/M Readiness** (Inspection / Maintenance) function is used to view a **snapshot** of the operations for the emission system on OBD II vehicles.

I/M Readiness is a very useful function. To guarantee no faults exist make sure all monitors are ok or n/a and no DTC's exist.

Refer to the vehicles service manual for the drive cycle operation.

During normal driving conditions, the vehicle's computer scans the emission system. After a specific amount of drive time (each monitor has specific driving conditions and time required), the computer's monitors decide if the vehicles emission system is working correctly or not as well as detecting out of range values. When the monitor's status is:

- **Has Run** - vehicle was driven enough to complete the monitor.
- **Has Not Run** - vehicle was not driven enough to complete the monitor.
- **Don't support-** vehicle does not support that monitor.

Depending on vehicle, disconnecting or a discharged battery may erase DTCs and clear monitor status.

Monitors may be cleared by:

Erasing codes

Vehicle control modules losing power

I/M Readiness can be done with the KOER or KOEO.

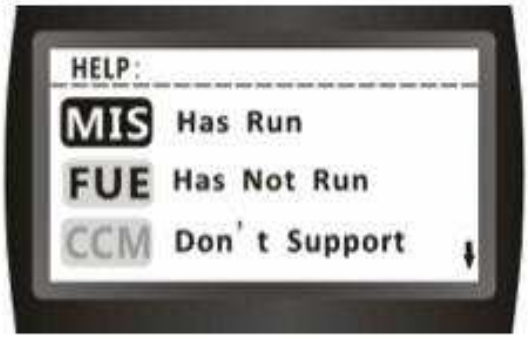
Abbreviations and names for OBD II Monitors supported by the Scan Tool are shown below. They are required by the United States Environmental Protection Agency (EPA). Not all monitors are supported by all vehicles.

• Abbreviated Name	• Expanded Name
- MIS	Misfire Monitor
- FUE	Fuel System Monitor
- CCM	Comprehensive Components Monitor
- CAT	Catalyst Monitor
- HCA	Heated Catalyst Monitor
- EVA	Evaporative System Monitor
- AIR	Secondary Air System Monitor
- ACR	Air Conditioning Refrigerant Monitor
- O2S	Oxygen Sensor Monitor
- HTR	Oxygen Sensor Heater Monitor
- EGR	Exhaust Gas Recirculation System Monitor

Return to Previous Menu,Select I/M Readiness

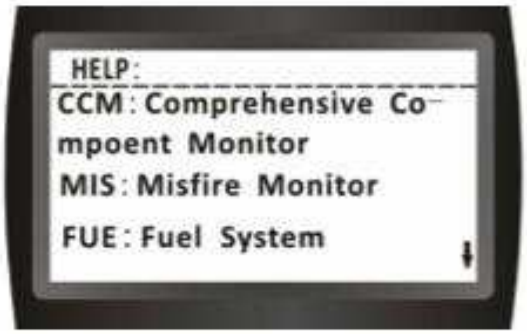
Press button the screen will change to:

Press button, View more help information



Use the and arrow keys

To view more help



7) VIEW VEHICLE INFORMATION

The **Vehicle Info** function allows the Scan Tool to request the vehicle's VIN number, calibration ID(s) which identifies software version in vehicle control module(s), and calibration verification numbers (CVN(s).)

- ✓ **Vehicle Info** function applies to model year 2000 and newer OBD II compliant vehicles.
- ✓ The Scan Tool cannot verify if data is correct for scanned vehicles.
- ✓ CVNs are calculated values required by OBD II regulations.
- ✓ The CVN calculation may take several minutes.
- ✓ CVNs are reported to determine if emission-related calibrations have been changed. Multiple CVNs may be reported for a control module.

Return to Previous Menu,Select Vehicle info

Press  button the screen will change to:

Use the  and  arrow keys

To View more information

LAST SCAN

The scan tool has a record function to track the last testing information, such as the way of communication protocol and the vehicle model. It will begin to diagnose based on previous information when you use it at second time. It's easy for you to operate with this function.

The Scan Tool can store the testing information into the interim ROM untill covered by second testing information. It's useful for you to know the historical fault codes before diagnosing.

The informations can be recorded as below:

Last DTCs
Last Freeze Frame
Last MIL Status
Last Readiness
Last Vehicle info

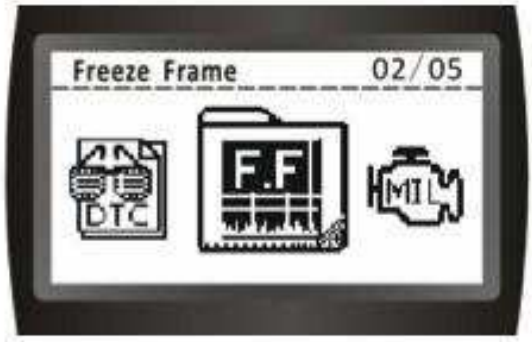
Return to Main Menu,Select LAST SCAN

Press  button the screen will change to:

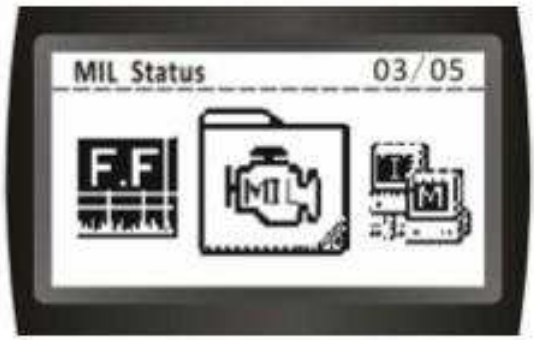
Use the  and  arrow keys

To Select.

Or Last Freeze Frame



Or Last MIL Status



Or Last Readiness

Or Last Vehicle info

To View more information.

Select M.F (SELECT MANUFACTORY)

Manufacturer controlled codes (non-uniform DTCs)
Areas within each alpha designator have been made available for manufacturer-controlled DTCs. These are fault codes that will not generally be used by a majority of the manufacturers due to basic system differences, implementation differences, or diagnostic strategy differences. Each vehicle manufacturer or supplier who designs and specifies diagnostic algorithms, software, and diagnostic trouble codes are strongly encouraged to remain consistent across their product line when assigning codes in the manufacturer controlled area. For powertrain codes, the same groupings should be used as in the ISO /SAE controlled area, i.e. 100's and 200's for fuel and air metering, 300's for ignition system or misfire, etc.
Code groupings for non-powertrain codes will be specified at a later date.
While each manufacturer has the ability to define the controlled DTCs to meet their specific controller algorithms, all DTC words shall meet ISO 15031-2.

Select the correct model of the vehicle would help you to obtain more usefull information.

To enter the MENU Mode:
1.

Once the Scan Tool is powered up through the DLC connection,Press . button, the wake up screen will

display as below:

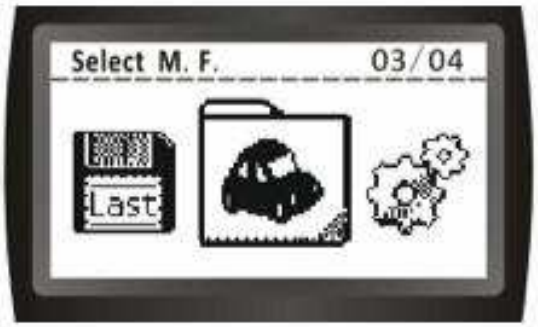
After a few seconds, it will switch to:

Use the and arrow keys

To Select.

2.

Return to Main Menu,Select M.F



Press button the screen will change to:

Use the and arrow keys

To Select.

SUPPORT MANUFACTORY

[0]- Generic	[16]- Land Rover
[1]- Acura	[17]- Lexus
[2]- Alfa Romeo	[18]- Mazda
[3]- Audi	[19]- Mercedes
[4]- BMW	[20]- Mitsubishi
[5]- Chrysler	[21]- Nissan
[6]- Ford	[22]- Porsche
[7]- Ford Diesel	[22]- Porsche
[8]- Geo	[23]- Saab
[9]- GM	[24]- Saturn
[10]- Honda	[25]- Subaru
[11]- Hyundai	[26]- Suzuki
[12]- Infiniti	[27]- Toyota
[13]- Isuzu	
[14]- Jaguar	[28]- Volkswagen
	[29]- Volvo
[15]- Kia	[30]- Others

Appendix A – PID Definitions

Global PID Definitions

All global parameter identification (PID) data listed were verified on actual vehicles to guarantee accuracy. PID definitions were obtained from reliable sources and are accurate at time of printing. It is possible that some newer vehicles may contain data different from what is listed. Always refer to vehicle service manual for manufacturer specific PIDs.

Remember, always refer the applicable service manual for detailed diagnostic procedures when troubleshooting PID values.

Types of Data Parameters

INPUT: These data parameters are obtained from sensor circuit outputs. Sensor circuit outputs are inputs to the vehicles PCM. For example, if oxygen sensor circuit was generating a 400mV signal, then the code reader would read O2S (v).40.

OUTPUT: These data parameters are outputs or commands that come directly from control module(s). For example, the ignition spark advance is controlled by PCM, on most vehicles, monitoring this PID shows spark output from PCM.

CALCULATED VALUE: These data parameters are calculated after analyzing various inputs to the vehicles control module(s). For example, the engine load. The PCM calculates this from sensor inputs and displays in a percentage.

PCM VALUE: Information that is stored in the control module(s) memory and determined to be useful to service technician. An example of this is TROUBLE CODE values, the DTC that caused a freeze frame capture.

NOTE: Several different causes can have the same parameter indication. For information on diagnostics consult applicable service anuals.

NOTE: The Scan Tool **only** displays the PID's the vehicle supports.

Global Data Parameter List:

ABS FRP
Absolute Fuel Rail Pressure

ABS LOAD
Absolute Load Value

ABSLT TPS
Absolute Throttle Position

ACC POS x
Accelerator Position x

BARO PRS
Barometric Pressure

CALC LOAD
Calculated Engine Load

CAT TEMP xy
Cataltic Converter Temperature Bank x, Sensor y

CLR DST
Distance Since Codes Cleared

CLR TIM
Time Since Clear Code

CMD EQ RAT
Commanded Equivalence Ratio

COOLANT
Engine Coolant

EGR CMD
Commanded Exhaust Gas Recirculation

EGR ERR
Exhaust Gas Recirculation Error

ENG RUN
Engine Run Time

ENGINE
Engine Speed

EQ RAT
Oxygen Sensor Equivalence Ratio

EVAP REQ
Commanded Evaporative Emission System Purge (0-100%)

EVAP VP
Evaporative Emission System Vapor Pressure

FUEL LVL
Fuel Level

FUEL PRES
Fuel System Pressure

FUEL SYS x
Fuel System x Loop Status

IAT
Intake Air Temperature

IGN ADV
Ignition Advance

LT FTRM x
Bank x Long Term Air To Fuel Ratio Correction Factor

MAF
Mass Air Flow Sensor

MAP
Manifold Absolute Pressure

MIL DIST
Distance Since Malfunction Indicator Lamp Came On

MIL STATUS
Malfunction Indicator Lamp Light Status

MIL TIM
Distance Travelled Or Time Since Malfunction Indicator Lamp Was Activated

O2S
O2 Sensor Output

OBD2 STAT
On Board Diagnostics 2 System Type

OUTSID AIR
Outside Air Temperature

PTO STATUS
Power Take Off Status

REL FRP
Relative Fuel Rail Pressure or Vacuum

REL TPS
Relative Or Learned Throttle Position

SECOND AIR
Secondary Air Pump Status

ST FTRM
Short Term Fuel Trim

ST FTRM x
Short Term Fuel Trim Bank x
THR POS x
Throttle Position x
THROT CMD
Throttle Actuator Commanded
TRIPS SNC CLR
Warmups Since Erase Codes
TROUB CODE
Diagnostic Trouble Code That Set Freeze Frame
VEH SPEED
Vehicle Speed
VPWR
Vehicle Power

Appendix B – Glossary

A/C:
Air Conditioner
A/D:
Analog to Digital
A/F:
Air/Fuel ratio. The proportion of air and fuel delivered to the cylinder for combustion. For example, an A/F ratio of 14:1 denotes 14 times as much air as fuel in the mixture. Ideally the A/F ratio is 14.7:1.
ABS:
Anti-lock Brake System
A/C Clutch Relay:
The PCM uses this relay to energize the A/C clutch, turning the A/C compressor on or off.
A/C Pressure Sensor:
Measures air conditioning refrigerant pressure and sends a voltage signal to the PCM.
A/C Pressure Switch:
A mechanical switch connected to the A/C refrigerant line. The switch is activated (sending a signal to the PCM) when the A/C refrigerant pressure becomes too low or high.
Actuator:
Actuators such as relays, solenoids, and motors allow the PCM to control the operation of vehicle systems.
Air Injection Reaction (AIR) System:
An emission control system operated by the PCM. During cold starts, an air pump injects outside air into the exhaust manifold to help burn hot exhaust gases. This reduces pollution and speeds warm-up of oxygen sensors and catalytic converters. After the engine is warm, the air will either be dumped back to the atmosphere (or into the air cleaner assembly) or sent to the catalytic converter.
APP:
Acceleration Pedal Position (Sensor)
ASR:
Acceleration Slip Regulation

AFC:
Air Flow Control
ALDL:
Assembly Line Diagnostic Link. Former name for GM (only) Data Link Connector, the connector socket into which the scan tool plug is inserted; sometimes used to refer to any pre-OBD II computer signals

Bank x:
The standard way of referring to the bank of cylinders containing cylinder #x. In-line engines have only one bank of cylinders. Most commonly used to identify the location of oxygen sensors. See **O2S**, **Sensor x**, **Sensor x**.
BARO:
Barometric Pressure Sensor. See **MAP Sensor**.
BBV:
Brake Boost Vacuum (Sensor
BCM:
Body Control Module
Boost Control Solenoid:
A solenoid that is energized by the PCM, in order to control turbo/supercharger boost pressure.
Brake Switch Signal:
An input signal to the PCM indicating that the brake pedal is being pressed. This signal is typically used to disengage Cruise Control systems and Torque Converter Clutch (TCC) solenoids. See also **TCC**.

CAM:
Camshaft Position Sensor. Sends a frequency signal to the PCM in order to synchronize fuel injector and spark plug firing.
Catalytic Converter:
Designed to reduce exhaust emissions.
CAN:
Controller Area Network
CARB:
California Air Resources Board. Governing body for emissions control in California.
CFI:
Central Fuel Injection (a.k.a. Throttle Body Fuel Injection TBI)
CFI:
Continuous Fuel Injection
CKP REF:
Crankshaft Position Reference.
CKP:
Crankshaft Position. See **CPS**.
CKT:

Circuit

Closed Loop (CL):
A feedback system that uses the O2 Sensor(s) to monitor the results of combustion. Based on the signal(s) from the O2 sensor(s), the PCM modifies the air/fuel mixture to maintain optimum performance with lowest emissions. In closed loop mode, the PCM can fine tune control of a system to achieve an exact result.

CMP:
Camshaft Position Sensor

CO:
Carbon Monoxide; odorless gas produced by incomplete combustion.

Code Scanner:
A device that interfaces with and communicates information via a data link.

Continuous Memory Codes:
See **Pending Codes**.

CPS:
Crankshaft Position Sensor. Sends a frequency signal to the PCM. It is used to reference fuel injector operation and synchronize spark plug firing on distributorless ignition systems (DIS).

CTS:
Coolant Temperature Sensor. A resistance sensor that sends a voltage signal to the PCM indicating the temperature of the coolant. This signal tells the PCM whether the engine is cold or warm.

CVRTD:
Continuous Variable Real Time Damping

D/R:
Drive/Reverse

Data Link Connector (DLC):
Connector providing access and/or control of the vehicle information, operating conditions, and diagnostic information. Vehicles with OBD II use a 16-pin connector located in the passenger compartment.

Data Stream:
The actual data communications sent from the vehicle's PCM to the data connector.

DEPS:
Digital Engine Position Sensor.

Detonation:
See **Knock**.

DI/DIS:
Direct Ignition/Distributorless Ignition System. A system that produces the ignition spark without the use of a distributor.

DPFE:
Differential Pressure Feedback – Exhaust Gas Recirculation Sensor

Driving Cycle - A specific sequence of start-up, warm-up and driving tasks that tests all OBD II functions

DTC:
Diagnostic Trouble Code. An alphanumeric identifier for a fault condition identified by the On Board Diagnostic System.

Duty Cycle:
A term applied to signals that switch between on and off. Duty cycle is the percentage of time the signal is on. For example, if the signal is on only one fourth of the time, then the duty cycle is 25%. The PCM uses duty cycle type signals to maintain precise control of an actuator.

EBCM:
Electronic Brake Control Module

EBTCM:
Electronic Brake/Traction Control Module

ECM
Engine Control Module *or* Electronic Control Module

ECT:
Engine Coolant Temperature sensor. See **CTS**.

EEPROM or E^2PROM
Electrically Erasable Programmable Read Only Memory

EFE:
Early Fuel Evaporation

EFI:
Electronic Fuel Injection. Any system where a computer controls fuel delivery to the engine by using fuel injectors.

EGR:
Exhaust Gas Recirculation. The PCM uses the EGR system to recirculate exhaust gases back into the intake manifold to reduce emissions. EGR is used only during warm engine cruise conditions.

EMR:
Electronic Module Retard

EOP:
Engine Oil Pressure (Switch)

EOT
Engine Oil Temperature (Sensor)

EPA:
Environmental Protection Agency.

ESC:
Electronic Spark Control. An ignition system function that warns the PCM when knock is detected. The PCM then retards spark timing to eliminate the knocking condition.

EST:
Electronic Spark Timing. An ignition system that allows the PCM to control spark advance timing. The PCM determines optimum spark timing from sensor information — engine speed, throttle position, coolant temperature, engine load, vehicle speed, Park/Neutral switch position, and knock sensor condition.

EVAP:
Evaporative Emissions System.

FC:
Fan Control
Freeze Frame:
A block of memory containing DTCs of the vehicle operating conditions for a specific time.
FTP:
Federal Test Procedure. Strict test of vehicle's emissions.

Fuel Trim:
Engine computer function that keeps the air/fuel mixture as close to the ideal 14.7:1 stoichiometric ratio as possible

Ground (GND):
An electrical conductor used as a common return for an electric circuit(s) and with a relative zero potential (voltage).

Hall Effect Sensor:
Any of a type of sensor utilizing a permanent magnet and a transistorized Hall Effect switch. Hall Effect type sensors may be used to measure speed and position of the crankshaft or camshaft — for spark timing and fuel injector control.
HC:
Hydrocarbons
HEI:
High Energy Ignition
HO2S:
Heated Oxygen Sensor. See **O2S**.
HVAC:
Heating, Ventilation & Air Conditioning (System)

I/M:
Inspection and Maintenance. An emission control program.
IAC:
Idle Air Control. A device mounted on the throttle body which adjusts the amount of air bypassing a closed throttle so that the PCM can control idle speed.
IAT:
Intake Air Temperature (Sensor)
ICM:
Ignition Control Module.
IMRC:
Intake Manifold Runner Control
IPC:
Instrument Panel Cluster
ISC:
Idle Speed Control. A small electric motor mounted on the throttle body and

controlled by the PCM. The PCM can control idle speed by commanding the ISC to adjust its position.

ISO:
International Organization of Standardization also know as International Standards Organization.

ISO 9141:
International Standards Organization OBDII communication mode, used by Chrysler and most foreign cars. One of three hardware layers defined by OBD II

J1850PWM:
(Pulse Width Modulated) SAE-established OBD II communication standard used by Ford domestic cars and light trucks. One of three hardware layers defined by OBD II

J1850VPW:
(Variable Pulse Width Modulated) SAE-established OBD II communication standard used by GM cars and light trucks. One of three hardware layers defined by OBD II

J1962 – SAE:
established standard for the connector plug layout used for all OBD II scan tools

J1978 – SAE:
established standard for OBD II scan tools

J1979 – SAE:
established standard for diagnostic test modes

J2012 – SAE:
established standard accepted by EPA as the standard test report language for emission tests

KAM:
Keep Alive Memory

Knock Sensor (KS):
Used to detect engine detonation or knock. The sensor contains a piezoelectric element and is threaded into the engine block. Special construction makes the element sensitive only to engine vibrations associated with detonation.

Knock:
Uncontrolled ignition of the air/fuel mixture in the cylinder. Also referred to as detonation or ping. Knock indicates extreme cylinder pressures or "hotspots" which are causing the air/fuel mixture to detonate prematurely.

KOEO:
Key On Engine Off. Turn the ignition key to on, but don't start engine.

KOER:
Key On Engine Running. Start the vehicle.

LCD:
Liquid Crystal Display

LTFT:
Long Term Fuel Trim

M/T:
Manual transmission or manual transaxle.
MAF:
Mass Air Flow (sensor). Measures the amount and density of air entering the engine and sends a frequency or voltage signal to the PCM. The PCM uses this signal in its fuel delivery calculations.
MAP:
Manifold Absolute Pressure (sensor). Measures intake manifold vacuum or pressure and sends a frequency or voltage signal (depending on sensor type) to the PCM. This gives the PCM information on engine load for control of fuel delivery, spark advance, and EGR flow.
MAT:
Manifold Air Temperature (sensor). A resistance sensor in the intake manifold that sends a voltage signal to the PCM indicating the temperature of the incoming air. The PCM uses this signal for fuel delivery calculations.
MIL:
Malfunction Indicator Lamp. The MIL is most commonly known as the Check Engine or Service Engine Soon light. A required on-board indicator to alert the driver of an emission-related malfunction.
Misfire:
Caused by the air fuel ratio being incorrect.
Monitor:
A test performed by the on-board computer to verify proper operation of emission-related systems or components.
MPFI or MFI:
Multi-Port Fuel Injection. MPFI is a fuel injection system using one (or more) injector(s) for each cylinder. The injectors are mounted in the intake manifold, and fired in groups rather than individually.

NOx:
Oxides of Nitrogen. The system EGR and Camshafts injects exhaust gases into the intake manifold to reduce these gases at the tailpipe.

O2S:
Oxygen Sensor. Generates a voltage of 0.6 to 1.1 volts when the exhaust gas is rich (low oxygen content). The voltage changes to 0.4 volts or less when the exhaust gas is lean (high oxygen content). This sensor only operates after it reaches a temperature of approximately 349°C (660°F). O2 sensors are usually found both upstream and downstream of the catalytic converter. The PCM uses these sensors to fine tune the air-fuel ratio and to monitor the efficiency of the catalytic converter. See **Bank 1**, **Bank 2**, **Sensor 1**, **Sensor 2**.
OBD II:
On-Board Diagnostics, Second Generation. OBD II is a U.S. Government-mandated standard requiring all cars and light trucks to have a common data connector, connector location, communication protocol, DTCs

and code definitions. OBD II first appeared on vehicles in late 1994, and is required to be present on all cars sold in the US after January 1, 1996.

ODM:
Output Device Monitor.

Open Loop (OL):
A control system mode that does not monitor the output to verify if the desired results were achieved. A fuel delivery system usually operates in open loop mode during cold engine warm-up because the oxygen sensors are not yet ready to send a signal. Without the oxygen sensor signal, the computer cannot check the actual results of combustion.

PCM:
Powertrain Control Module. The brains of the engine and transmission control systems housed in a metal box with a number of sensors and actuators connected via a wiring harness. Its job is to control fuel delivery, idle speed, spark advance timing, and emission systems. The PCM receives information from sensors, then energizes various actuators to control the engine. The PCM is also known as the ECM (Engine Control Module).

PCV:
Positive Crankcase Ventilation

Pending Codes:
Also referred to as Continuous Memory codes and Maturing Diagnostic Trouble Codes. Pending Codes may be set by emission related powertrain components and systems. If the fault does not occur after a certain number of drive cycles, the code is erased from memory.

PID:
Parameter Identification. Identifies an address in memory which contains vehicle operating information.

PNP:
Park/Neutral Position. A switch that tells the PCM when the gear shift lever is in the Park or Neutral position. When in Park or Neutral, the PCM operates the engine in an idle mode.

PROM:
Programmable Read-Only Memory. The PROM contains programming information the PCM needs to operate a specific vehicle model/engine combination.

Proprietary Readings:
Parameters shown by on-board computers which are not required by OBD II, but included by manufacturer to assist in trouble-shooting specific vehicles.

PSPS:
Power Steering Pressure Switch

Purge Solenoid:
Controls the flow of fuel vapors from the carbon canister to the intake manifold. The canister collects vapors evaporating from the fuel tank, preventing them from escaping to the atmosphere and causing pollution. During warm engine cruise conditions, the PCM energizes the Purge Solenoid so the trapped vapors

are drawn into the engine and burned.

PTC:
Pending Trouble Code

PWM:
Pulse Width Modulated

PZM:
Platform Zone Module

QDM:
Quad Driver Module

RAM:
Random Access Memory

Relay:
An electromechanical device in which connections in one circuit are switched.

Reluctance Sensor:
A type of sensor typically used to measure crankshaft or camshaft speed and/or position, driveshaft speed, and wheel speed.

ROM:
Read-Only Memory. Permanent programming information stored inside the PCM, containing the information the PCM needs to operate a specific vehicle model/engine combination.

RPM:
Revolutions Per Minute

SAE:
Society of Automotive Engineers.

Scan Tool:
A device that interfaces with and communicates information on a data link.

SDM:
Sensing and Diagnostic Module

Sensor x:
A standard term used to identify the location of oxygen sensors. Sensor 1 is located upstream of the catalytic converter. See **O2S**, **Bank 1**, **Bank 2**.

Sensor:
Any device that reports information to the PCM. The job of the sensor is to convert a parameter such as engine temperature into an electrical signal that the PCM can understand.

SES:
Service Engine Soon dash light, now referred to as MIL

SFI or SEFI:
Sequential Fuel Injection or Sequential Electronic Fuel Injection. A fuel injection system that uses one or more injectors for each cylinder. The injectors are mounted in the intake manifold and are fired individually.

Solenoid:
A device consisting of an electrical coil which when energized, produces a

magnetic field in a plunger, which is pulled to a central position. A solenoid may be used as an actuator in a valve or switch.

STFT:
Short Term Fuel Trim.

STS:
Service Throttle Soon

TAC:
Throttle Actuator Control

TBI:
Throttle Body Injection. A fuel injection system having one or more injectors mounted in a centrally located throttle body, as opposed to positioning the injectors close to an intake valve port. TBI is also called Central Fuel Injection (CFI) in some vehicles.

TCC:
Torque Converter Clutch

TCM:
Transmission Control Module

TCS:
Traction Control System for PCM and brakes

TDC:
Top Dead Center. When a piston is at its uppermost position in the cylinder.

TFP:
Transmission Fluid Pressure

TFT:
Transmission Fluid Temperature (Sensor)

Throttle Body:
A device which performs the same function as a carburetor in a fuel injection system. On a throttle body injection (TBI) system, the throttle body is both the air door and the location of the fuel injectors. On port fuel injection systems (PFI, MPFI, SFI, etc.), the throttle body is simply an air door. Fuel is not added until the injectors at each intake port are activated. In each case, the throttle body is attached to the accelerator pedal.

TPS:
Throttle Position Sensor. Potentiometer-type sensor connected to the throttle shaft. Its voltage signal output increases as the throttle is opened. The PCM uses this signal to control many systems such as idle speed, spark advance, fuel delivery, etc.

Traction Assist:
Assist in traction with brakes only.

Trip:
Vehicle operation for a period of time so the systems can be monitored.

TTS:
Transmission Temperature Sensor. A resistance sensor mounted in the transmission housing in contact with the transmission fluid. It sends a voltage signal to the PCM indicating the temperature of the transmission.

VECI:
Vehicle Emission Control Information. A decal located in the engine compartment containing information about the emission control systems found on the vehicle. The VECI is the authoritative source for determining whether a vehicle is OBD II compliant.

VIN:
Vehicle Identification Number. This is the factory-assigned vehicle serial number. This number is stamped on a number of locations throughout the vehicle, but the most prominent location is on top of the dashboard on the driver's side, visible from outside the car. The VIN includes information about the car, including where it was built, body and engine codes, options, and a sequential build number.

VSS:
Vehicle Speed Sensor. Sends a frequency signal to the PCM. The frequency increases as the vehicle moves faster to give the PCM vehicle speed information used to determine shift points, engine load, and cruise control functions.

VTD:
Vehicle Theft Deterrent

Warm-up Cycle:
Warm-up cycle is when the engine coolant temperature rises at least 40 degrees above that at engine start up.

WOT:
Wide-Open Throttle. The vehicle operating condition brought about when the throttle is completely (or nearly) open. The PCM typically delivers extra fuel to the engine and de-energizes the A/C compressor at this time for acceleration purposes. The PCM uses a switch or the TPS to identify the WOT condition.