

# **MST300 AUTO SCANNER**

## **User Manual**

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## The Product is:

- ☐ 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     |
| PC Updata Software   | Yes        | Yes            | Yes     |
| Print Data   | NO         | NO             | Yes     |

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## Features:

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- ☐ Display: 160x105 pixel LCD with contrast adjustment and backlight
- ☐ Easy - to - Read screen and also saves up to 38 scans for later viewing.
- ☐ Operating temperature:-20°C - 50 °C ( - 4°F to 122 °F)
- ☐ Operation Voltage : DC 9 ~15V provided by vehicle battery

### Support Protocol:

- 1) SAE-J1850 PWM
- 2) SAE-J1850 VPW
- 3) ISO-14230 (KWP2000)
- 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   |
|--|-----------------------------|----------------|
| <b>General Motors</b>                    |                             |                |
| Chevrolet                                | www.chevrolet.com           | 1-800-551-4123 |
| Pontiac Oldsmobile                       | www.pontiac.com             | 1-800-551-4123 |
|  | 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 |
| <b>Ford</b>                              |                             |                |
| Ford                                     | www.ford.com                | 1-800-392-3673 |
| Lincoln                                  | www.lincoln.com             | 1-800-392-3673 |
|  |                             | 1-800-392-3673 |
| Mercury                                  | www.mercury.com             | 1-800-348-4696 |
| ChryslerChrysler Dodge<br>Plymouth Eagle | www.chrysler.com            | 1-800-348-4696 |
|  | www.dodge.com Not Available | 1-800-348-4696 |
|  | Not Available               | 1-800-348-4696 |

## European Vehicles

|                             |                              |                  |                 |
|-----------------------------|------------------------------|------------------|-----------------|
| Audi                        | www.audi.com                 | 1-800-544-8021   |                 |
| Volkswagon BMW              | www.vw.com www.bmw.com       | 1-800-544-8021   |                 |
|                             |                              | 1-201-307-4000   |                 |
| MINI                        | www.mini.com                 | 1-201-307-4000   |                 |
| Jaguar Volvo                | www.jaguar.com www.volvo.com | 1-800-4-JAGUAR   |                 |
| Mercedes-Benz<br>Land Rover | www.mercedes-benz.com        | 1-800-458-1552   |                 |
|                             | www.landrover.com            | 1-800-367-6372   |                 |
| Porsche Saab                | www.porsche.com www.saab.com | 1-800-637-6837   |                 |
| Asian Vehicles              |                              | 1-800-PORSCHE    |                 |
|                             |                              | 1-800-955-9007   |                 |
|                             | 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    |                 |

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|            |  |                 |
|------------|--|-----------------|
| Kia        | <a href="http://www.kia.com">www.kia.com</a>               | 1-800-333-4542  |
| Mazda      | <a href="http://www.mazda.com">www.mazda.com</a>           | 1-800-222-5500  |
| Daewoo     | <a href="http://www.daewoo.com">www.daewoo.com</a>         | 1-822-759-2114  |
| Subaru     | <a href="http://www.subaru.com">www.subaru.com</a>         | 1-800-SUBARU3   |
| Isuzu      | <a href="http://www.isuzu.com">www.isuzu.com</a>           | 1-800-255-6727  |
| Geo        | Not Available  | Not Available   |
| Mitsubishi | <a href="http://www.mitsubishi.com">www.mitsubishi.com</a> | 1-888-MITSU2004 |
| Suzuki     | <a href="http://www.suzukiauto.com">www.suzukiauto.com</a> | 1-800-934-0934  |

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## Introduction to On-Board Diagnostics OBD II

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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

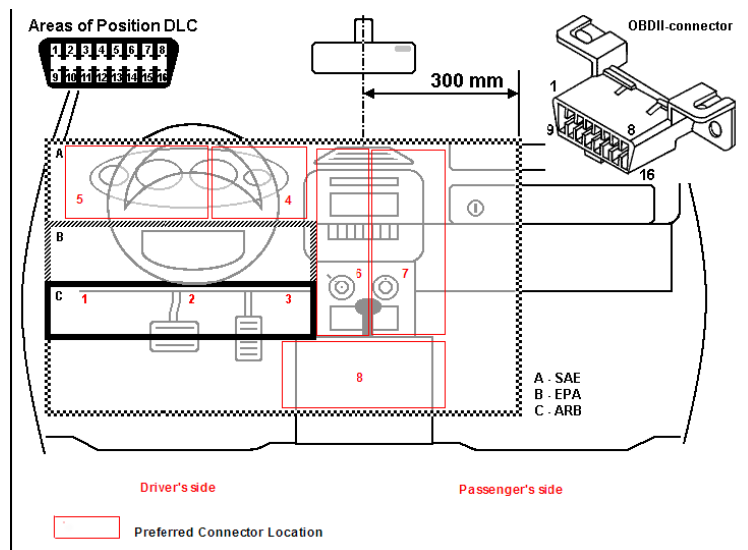
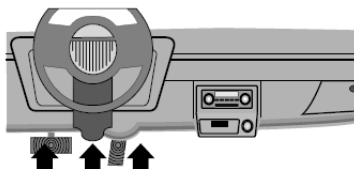
SAE has published hundreds of pages of text defining a standard communication protocol that establishes hardware, software, and circuit parameters of OBD II systems.

- 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 dashboard, 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 dashboard, between the driver-side door and steering column area   |
| 3          | Driver's side, underneath dashboard, 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), left 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, top of 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 &amp; ISO/DIS 14230-4

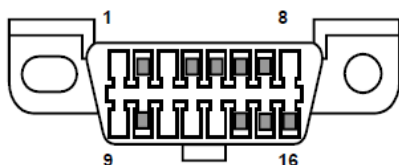
8 - Manufacturer Reserved

9 - Manufacturer Reserved

10 - J1850 Bus-

11 - Manufacturer Reserved

12 - Manufacturer Reserved



13 - Manufacturer Reserved

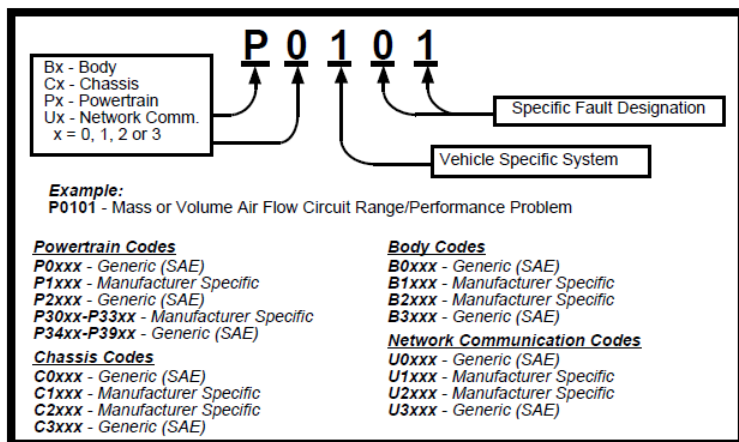
14 - CAN Low, J-2284

15 - L Line, ISO 9141-2 &amp; 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.

**Getting Started**

| 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                      |

| 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                                   |

- ✓ 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:



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



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



Page-Up roll button



Page-Down roll button



Right roll button



Left 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 **LED instruction:**  
Color changing display to indicate the Scan Tool system status.  
RED – Power ON  
Green - Establish a communication with the vehicle



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## Getting Started:

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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.

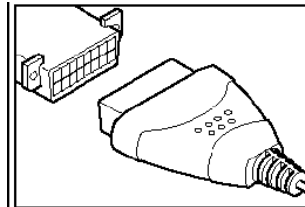
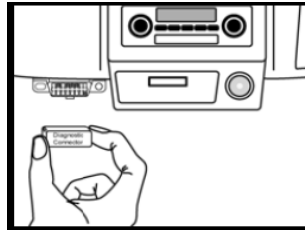
The following Areas need to be checked before starting any test:

- 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:

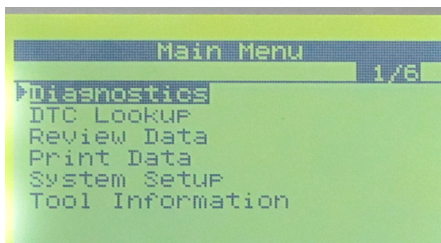
1. Locate the vehicle Diagnostic Link Connector (DLC) and make sure that the ignition switch is in OFF position
2. Connect the Scan Tool 16PIN cable connector to the vehicle's DLC.
  - If problem of connecting, rotate it to 180° and try again.



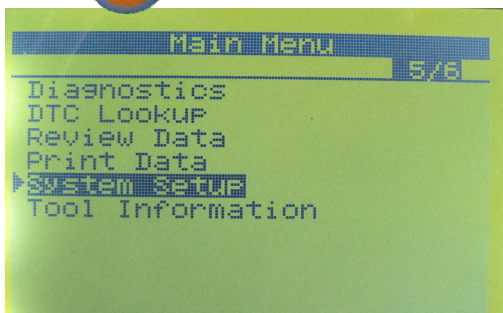
3. Once the Scan Tool is connected to car through the obd2 diagnostic cable, switch ignition ON, the scanner will be powered up and the wake up screen will display as below:




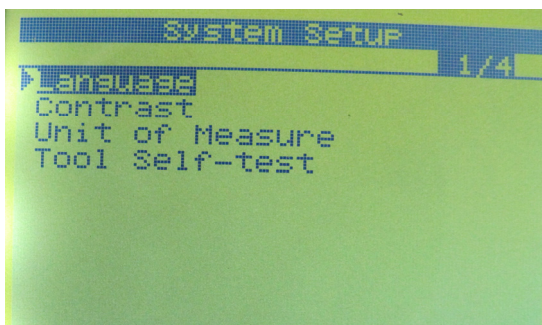
4. Press  button it will switch to Main Menu:



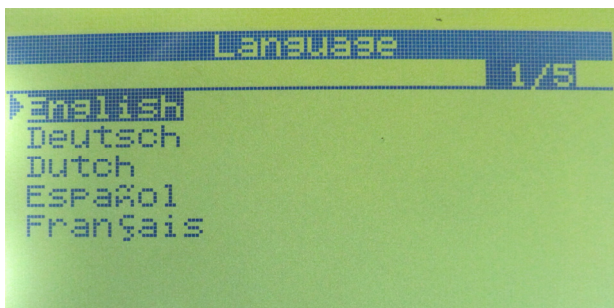
5. Press  button to select System Setup





6. Press  button to enter, the screen will change to:

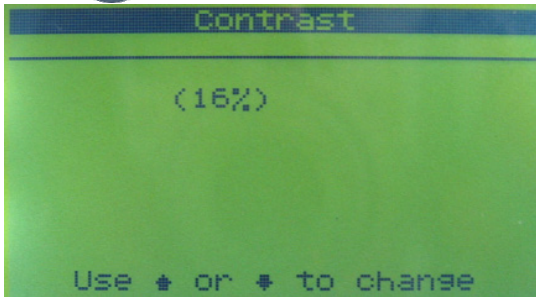





7. Select Language option, press  button to enter, you can select your favorite language then press YES.



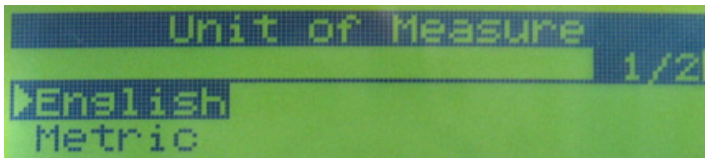


8. Press  button to select Contrast, press , button, will display

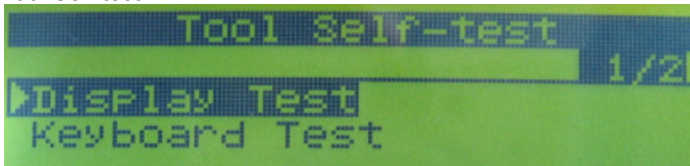


Use  or  to change the Contrast. Then press  to return.

9. Unit of Measure:

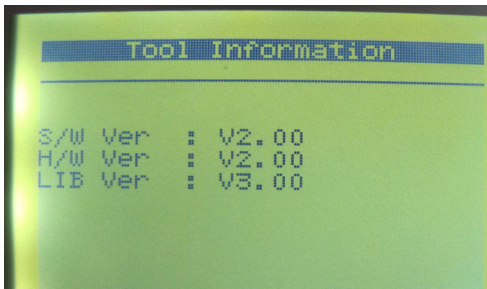


9. Tool Self-test



Once the system has been setted as you desired, press NO button to return to main Menu.

10. Tool Information



## 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 defined as a Key-ON, Key-OFF event in which the powertrain control module (PCM) detects the following:

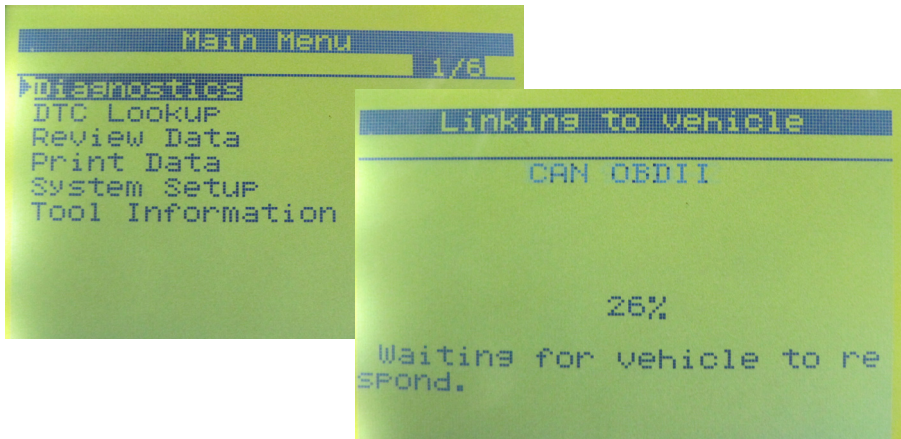
- Engine coolant temperature should exceed 70 °C
- Engine coolant temperature should change more than 20 °C after starting the engine.
- Engine speed should go over 400 RPM.

When the powertrain control module (PCM) detects a fault during the 1<sup>st</sup> 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 2<sup>nd</sup> trip. Certain DTCs are capable of turning the MIL on or blinking during the first trip.

## Vehicle Diagnostics

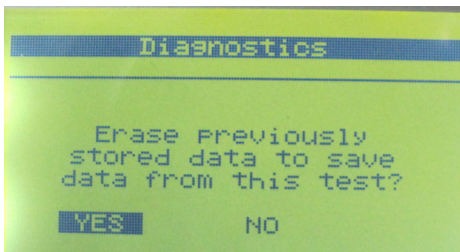
When everything had been confirmed and checked as mentioned in Getting Started, the testing operation can be carried out.

1. Turn the Ignition ON, DO NOT start the engine, select Diagnostics in the Main Menu, press  to enter Diagnostic menu, it will display as follows:

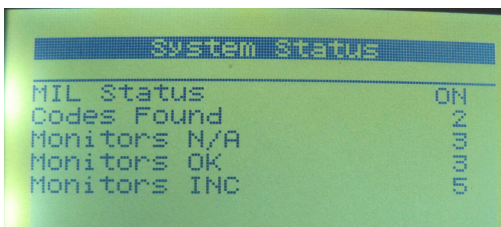


**Note:** During linking and diagnosis, the Ling light will be shining in green.

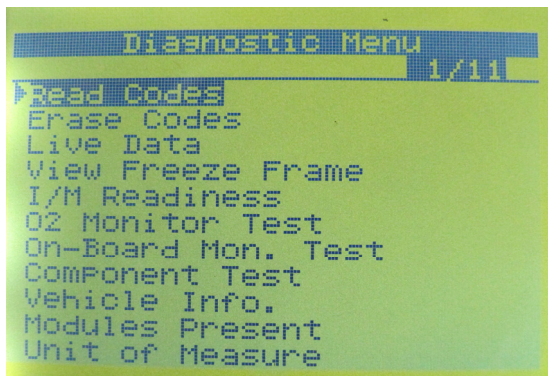
2. Click Yes or No. as you like when asking you whether Erase previous stored data.



### System Satus

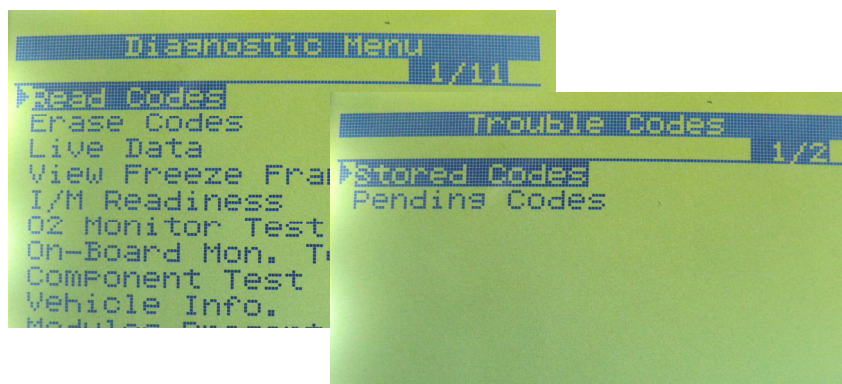


### 3.Diagnostic Menu:



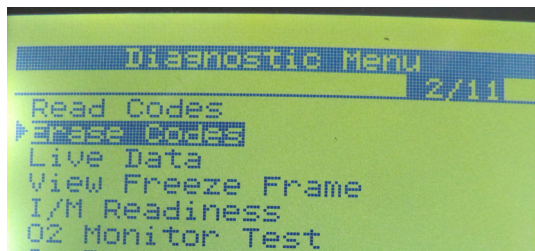
#### 3.1 Read Trouble Codes :

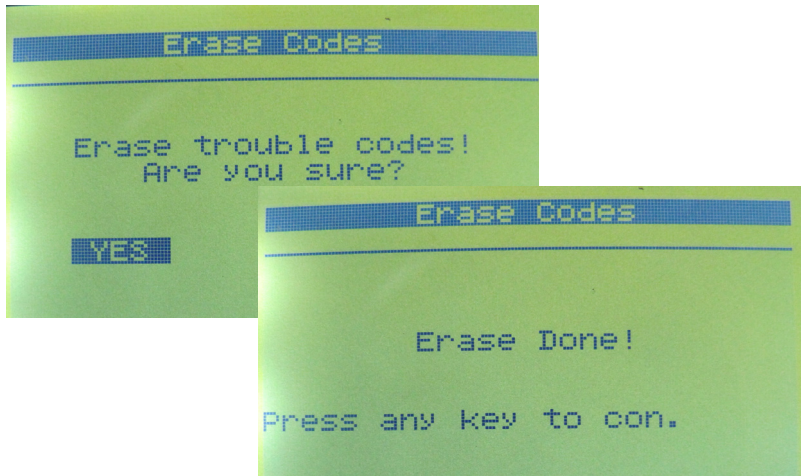
The READ DTCs function allows the Scan Tool to read the DTCs from the vehicle's control modules. DTCs are used to help determine the cause of a problem or problems in the vehicle. These codes cause the control module to illuminate the malfunction indicator lamp (MIL) when emission-related or driveability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



#### 3.2 Erase Trouble Codes

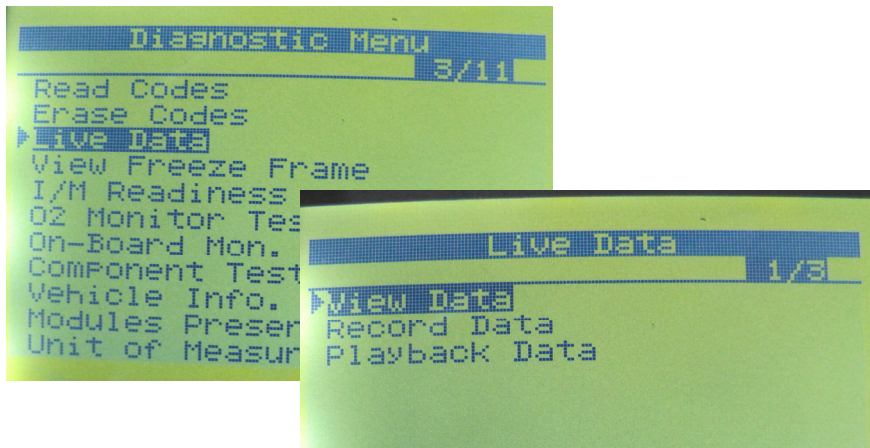
The ERASE DTCs function deletes DTCs and I/M Readiness data from vehicle's control module(s). Perform this function with KOEO. Do not start the engine.





### 3.3 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.





## **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 (O<sub>2</sub>) 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)**

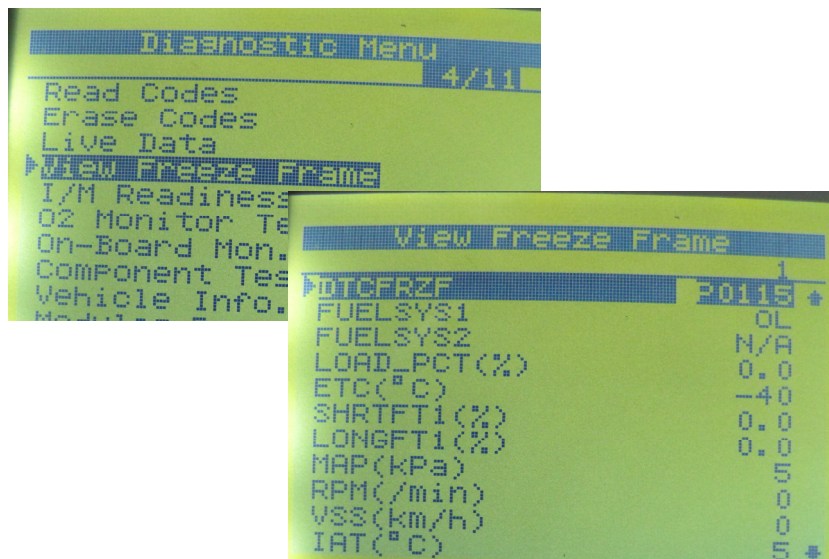
Dynamic or instantaneous adjustments to the Bank 1 base fuel schedule. Range: -100.00% to 99.92% (-100% indicating a maximum lean condition, 99.92% indicating a maximum rich condition, and 0% indicating no adjustment).

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

### 3.4 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.



### 3.5 I/M Readiness

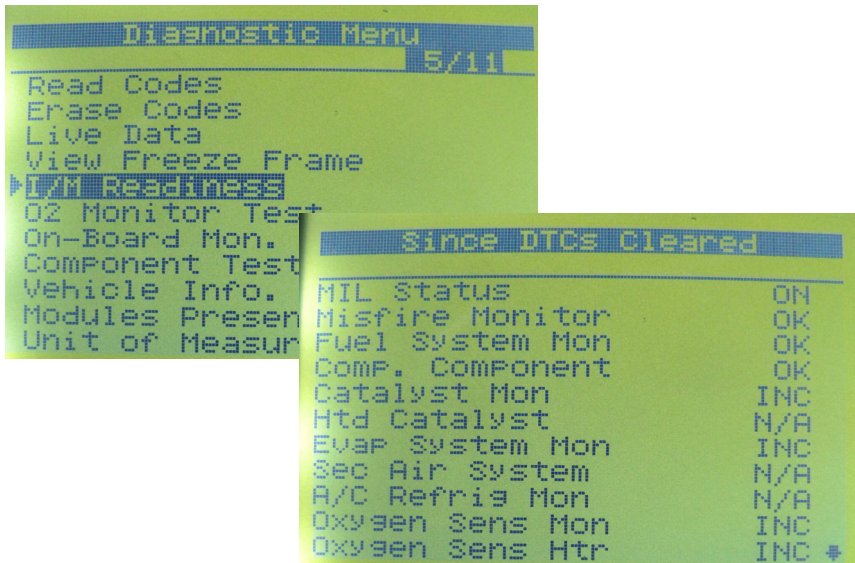
The **I/M Readiness** (Inspection / Maintenance) function is used to view a **snapshot** of the operations for the emission system on OBD II vehicles.

- ❑ 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

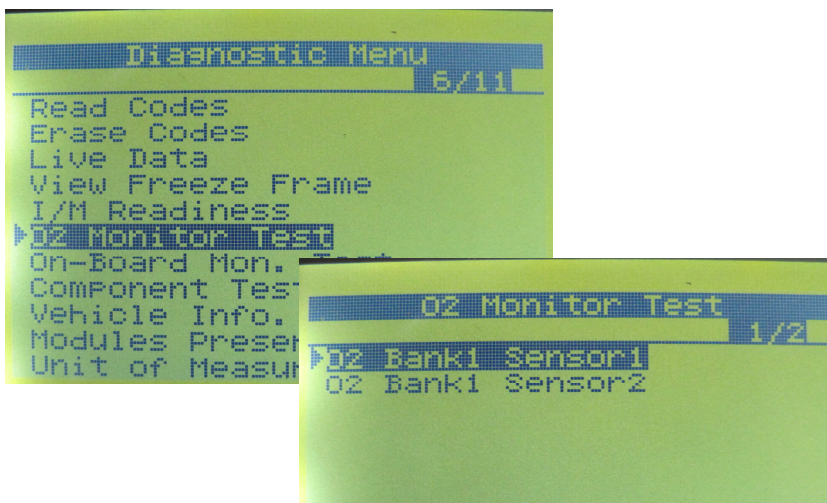


- Vehicle control modules losing power
- **I/M Readiness** can be done with the KOER or KOEO.

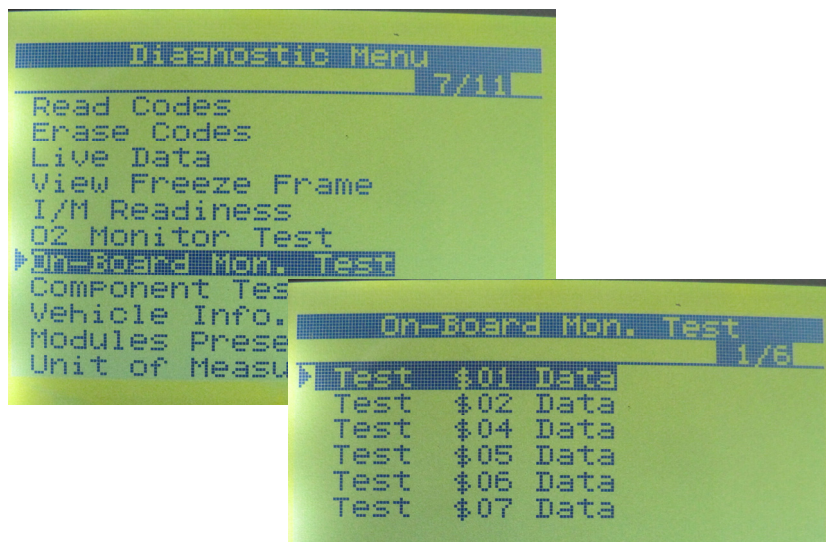
Abbreviations and names for OBD II Monitors supported by the Scan Tool are shown below. They are required by the United States Environmental Protection Agency (EPA). Not all monitors are supported by all vehicles.



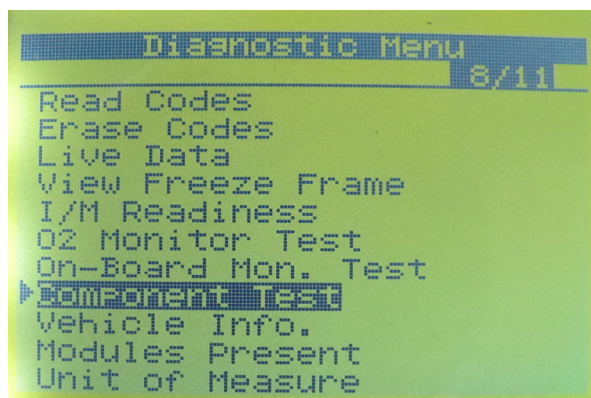
### 3.6 O2 Monitor Test



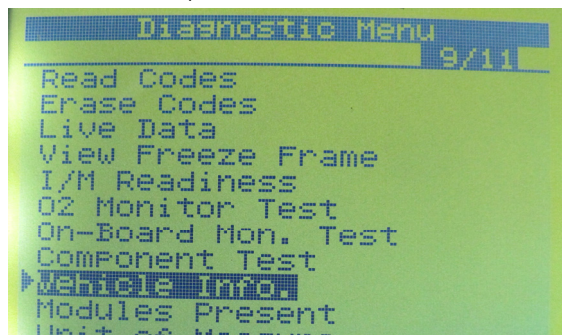
### 3.7 On-Board Mon. Test



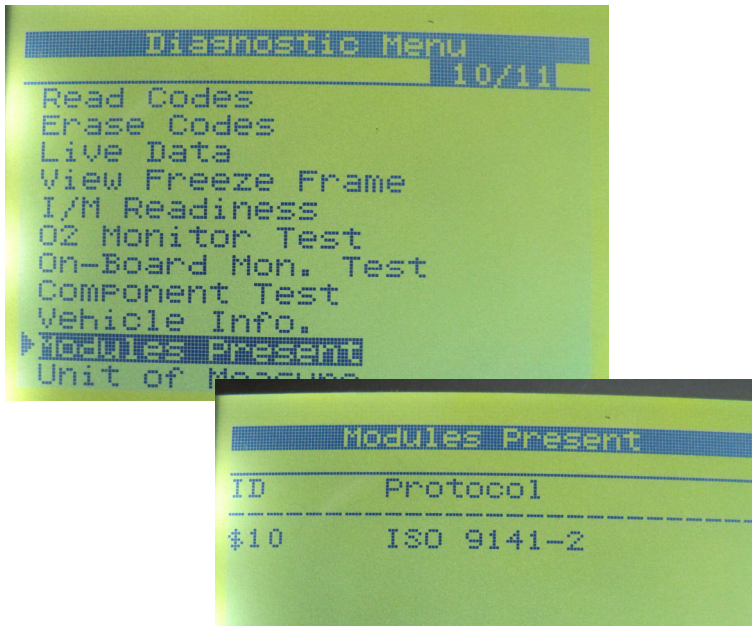
### 3.8 Component Test (not support)



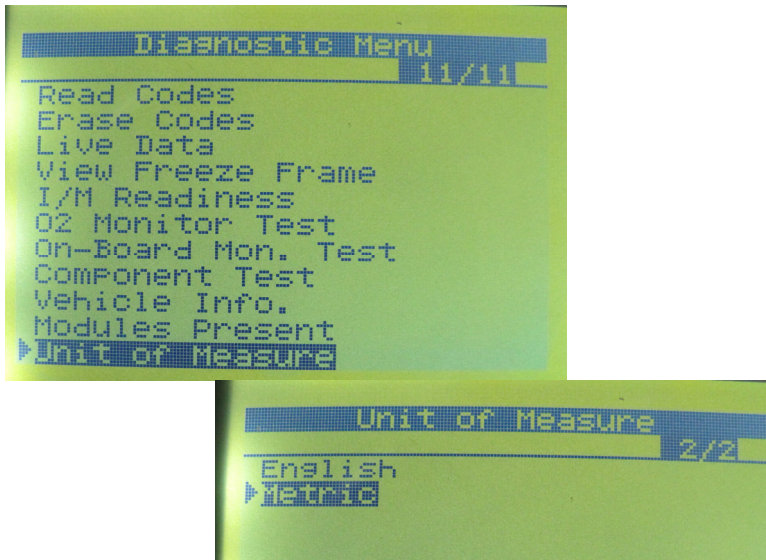
### 3.9 Vehicle Info. (Can read some of the car model's VIN)



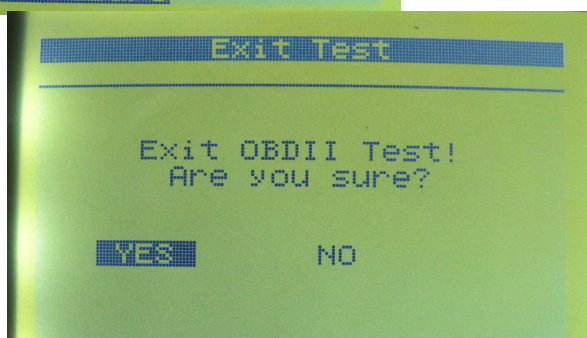
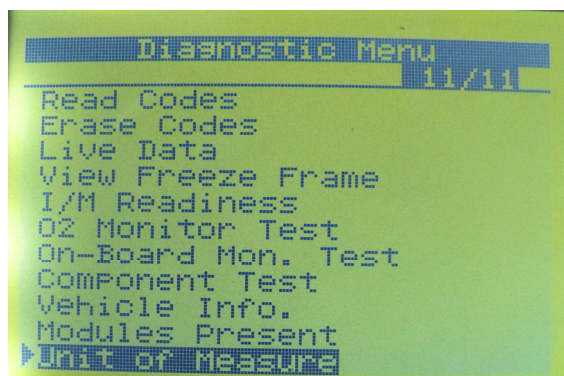
### 3.10 Modules Present: show present Protocol



### 3.11 Unit of Measure



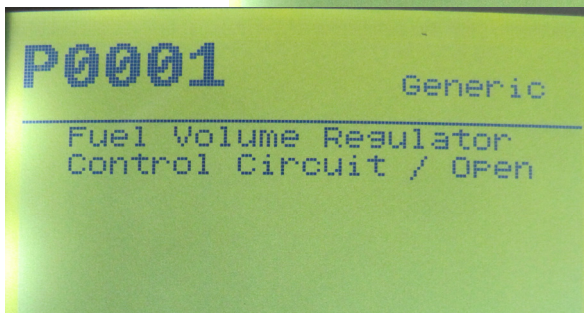
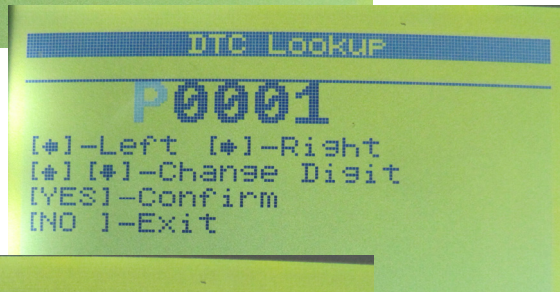
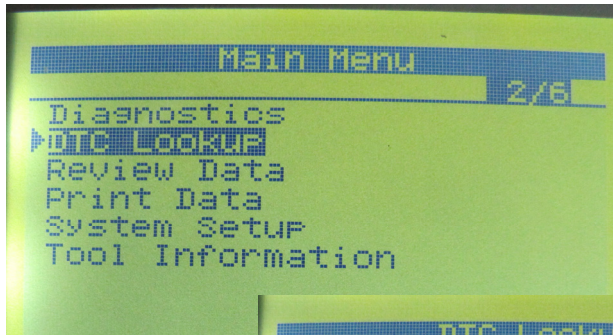
**Note:** When you finish the diagnostics, in the Diagnostic Menu, press NO button, then press YES to exist OBDII Test.





## DTC Lookup

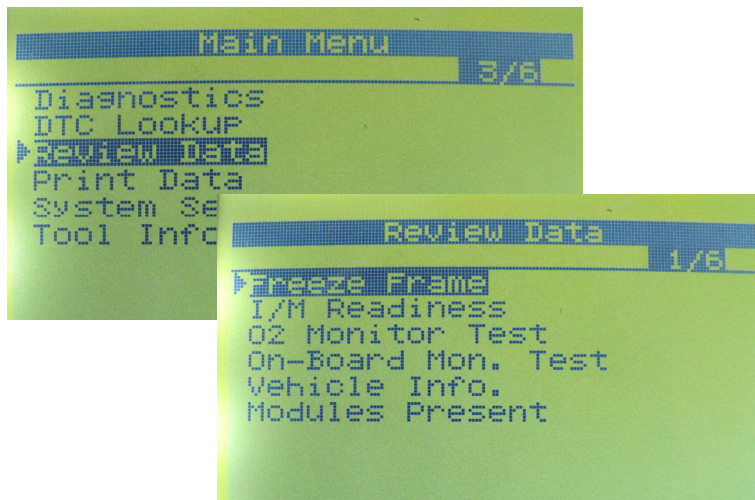
Provide Pxxxx, Uxxxx, Bxxx, Cxxxx DTC's Lookup



## Review Data

The scan tool has a record function to track the last testing information. 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 until covered by second testing information. It's useful for you to know the historical fault codes before diagnosing.

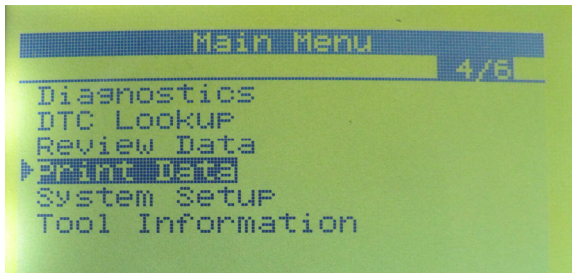


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## Print Data

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This Function allows you you to send the saved data to computer, and print it.



**Note:** once your work finished, just exit the diagnostic mene, and disconnect the diagnostic cable between Vehicle and MST300.

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



**PID Definitions****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**

Catalytic 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

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## **Appendix B – Glossary**

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**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.

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**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<sup>2</sup>PROM**

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:**

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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 known 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.

**Common OBDII DTC Definitions reference (P0xx part):**

P0000 No Diagnostic Trouble Codes Found  
 P0001 Fuel Volume Regulator Control -Circuit Open  
 P0002 Fuel volume Regulator Control -Circuit Range/Performance  
 P0003 Fuel Volume Regulator Control -Circuit Low  
 P0004 Fuel Volume Regulator Control -Circuit High  
 P0005 Fuel Shut-off Valve -Circuit Open  
 P0006 Fuel Shut-off Valve -Circuit Low  
 P0007 Fuel Shut-off Valve -Circuit High  
 P0008 Engine Position System Performance Bank 1  
 P0009 Engine Position System Performance Bank 2  
 P0010 "A" Camshaft Position Actuator Circuit (Bank 1)  
 P0011 "A" Camshaft Position - Timing Over-Advanced or System Performance (Bank 1)  
 P0012 "A" Camshaft Position - Timing Over-Retarded (Bank 1)  
 P0013 "B" Camshaft Position - Actuator Circuit (Bank 1)  
 P0014 "B" Camshaft Position - Timing Over-Advanced or System Performance (Bank 1)  
 P0015 "B" Camshaft Position -Timing Over-Retarded (Bank 1)  
 P0020 "A" Camshaft Position Actuator Circuit (Bank 2)  
 P0021 "A" Camshaft Position - Timing Over-Advanced or System Performance (Bank 2)  
 P0022 "A" Camshaft Position - Timing Over-Retarded (Bank 2)  
 P0023 "B" Camshaft Position - Actuator Circuit (Bank 2)  
 P0024 "B" Camshaft Position - Timing Over-Advanced or System Performance (Bank 2)  
 P0025 "B" Camshaft Position - Timing Over-Retarded (Bank 2)  
 P0030 HO2S Heater Control Circuit (Bank 1 Sensor 1)  
 P0031 HO2S Heater Control Circuit Low (Bank 1 Sensor 1)  
 P0032 HO2S Heater Control Circuit High (Bank 1 Sensor 1)  
 P0033 Turbo Charger Bypass Valve Control Circuit  
 P0034 Turbo Charger Bypass Valve Control Circuit Low  
 P0035 Turbo Charger Bypass Valve Control Circuit High  
 P0036 HO2S Heater Control Circuit (Bank 1 Sensor 2)  
 P0037 HO2S Heater Control Circuit Low (Bank 1 Sensor 2)  
 P0038 HO2S Heater Control Circuit High (Bank 1 Sensor 2)  
 P0042 HO2S Heater Control Circuit (Bank 1 Sensor 3)  
 P0043 HO2S Heater Control Circuit Low (Bank 1 Sensor 3)  
 P0044 HO2S Heater Control Circuit High (Bank 1 Sensor 3)  
 P0050 HO2S Heater Control Circuit (Bank 2 Sensor 1)  
 P0051 HO2S Heater Control Circuit Low (Bank 2 Sensor 1)  
 P0052 HO2S Heater Control Circuit High (Bank 2 Sensor 1)  
 P0056 HO2S Heater Control Circuit (Bank 2 Sensor 2)

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P0057 HO2S Heater Control Circuit Low (Bank 2 Sensor 2)  
P0058 HO2S Heater Control Circuit High (Bank 2 Sensor 2)  
P0062 HO2S Heater Control Circuit (Bank 2 Sensor 3)  
P0063 HO2S Heater Control Circuit Low (Bank 2 Sensor 3)  
P0064 HO2S Heater Control Circuit High (Bank 2 Sensor 3)  
P0065 Air Assisted Injector Control Range/Performance  
P0066 Air Assisted Injector Control Circuit or Circuit Low  
P0067 Air Assisted Injector Control Circuit High  
P0070 Ambient Air Temperature Sensor Circuit  
P0071 Ambient Air Temperature Sensor Range/Performance  
P0072 Ambient Air Temperature Sensor Circuit Low Input  
P0073 Ambient Air Temperature Sensor Circuit High Input  
P0074 Ambient Air Temperature Sensor Circuit Intermittent  
P0075 Intake Valve Control Solenoid Circuit (Bank 1)  
P0076 Intake Valve Control Solenoid Circuit Low (Bank 1)  
P0077 Intake Valve Control Solenoid Circuit High (Bank 1)  
P0078 Exhaust Valve Control Solenoid Circuit (Bank 1)  
P0079 Exhaust Valve Control Solenoid Circuit Low (Bank 1)  
P0080 Exhaust Valve Control Solenoid Circuit High (Bank 1)  
P0081 Intake valve Control Solenoid Circuit (Bank 2)  
P0082 Intake Valve Control Solenoid Circuit Low (Bank 2)  
P0083 Intake Valve Control Solenoid Circuit High (Bank 2)  
P0084 Exhaust Valve Control Solenoid Circuit (Bank 2)  
P0085 Exhaust Valve Control Solenoid Circuit Low (Bank 2)  
P0086 Exhaust Valve Control Solenoid Circuit High (Bank 2)  
P0100 Mass or Volume Air Flow Circuit  
P0101 Mass or Volume Air Flow Circuit Range/Performance Problem  
P0102 Mass or Volume Air Flow Circuit Low Input  
P0103 Mass or Volume Air Flow Circuit High Input  
P0104 Mass or Volume Air Flow Circuit Intermittent  
P0105 Manifold Absolute Pressure/Barometric Pressure Circuit  
P0106 Manifold Absolute Pressure/Barometric Pressure Circuit Range/Performance Problem  
P0107 Manifold Absolute Pressure/Barometric Pressure Circuit Low Input  
P0108 Manifold Absolute Pressure/Barometric Pressure Circuit High Input  
P0109 Manifold Absolute Pressure/Barometric Pressure Circuit Intermittent  
P0110 Intake Air Temperature Circuit  
P0111 Intake Air Temperature Circuit Range/Performance Problem  
P0112 Intake Air Temperature Circuit Low Input  
P0113 Intake Air Temperature Circuit High Input  
P0114 Intake Air Temperature Circuit Intermittent  
P0115 Engine Coolant Temperature Circuit  
P0116 Engine Coolant Temperature Circuit Range/Performance Problem  
P0117 Engine Coolant Temperature Circuit Low Input  
P0118 Engine Coolant Temperature Circuit High Input  
P0119 Engine Coolant Temperature Circuit Intermittent  
P0120 Throttle/Pedal Position Sensor/Switch A Circuit  
P0121 Throttle/Pedal Position Sensor/Switch A Circuit Range/Performance Problem  
P0122 Throttle/Pedal Position Sensor/Switch A Circuit Low Input  
P0123 Throttle/Pedal Position Sensor/Switch A Circuit High Input  
P0124 Throttle/Pedal Position Sensor/Switch A Circuit Intermittent

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P0125 Insufficient Coolant Temperature for Closed Loop Fuel Control  
P0126 Insufficient Coolant Temperature for Stable Operation  
P0127 Intake Air Temperature Too High  
P0128 Coolant Thermostat (Coolant Temperature Below Thermostat Regulating Temperature)  
P0130 O2 Sensor Circuit (Bank 1 Sensor 1)  
P0131 O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1)  
P0132 O2 Sensor Circuit High Voltage (Bank 1 Sensor 1)  
P0133 O2 Sensor Circuit Slow Response (Bank 1 Sensor 1)  
P0134 O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 1)  
P0135 O2 Sensor Heater Circuit (Bank 1 Sensor 1)  
P0136 O2 Sensor Circuit Malfunction (Bank 1 Sensor 2)  
P0137 O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2)  
P0138 O2 Sensor Circuit High Voltage (Bank 1 Sensor 2)  
P0139 O2 Sensor Circuit Slow Response (Bank 1 Sensor 2)  
P0140 O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 2)  
P0141 O2 Sensor Heater Circuit (Bank 1 Sensor 2)  
P0142 O2 Sensor Circuit Malfunction (Bank 1 Sensor 3)  
P0143 O2 Sensor Circuit Low Voltage (Bank 1 Sensor 3)  
P0144 O2 Sensor Circuit High Voltage (Bank 1 Sensor 3)  
P0145 O2 Sensor Circuit Slow Response (Bank 1 Sensor 3)  
P0146 O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 3)  
P0147 O2 Sensor Heater Circuit (Bank 1 Sensor 3)  
P0148 Fuel Delivery Error  
P0149 Fuel Timing Error  
P0150 O2 Sensor Circuit (Bank 2 Sensor 1)  
P0151 O2 Sensor Circuit Low Voltage (Bank 2 Sensor 1)  
P0152 O2 Sensor Circuit High Voltage (Bank 2 Sensor 1)  
P0153 O2 Sensor Circuit Slow Response (Bank 2 Sensor 1)  
P0154 O2 Sensor Circuit No Activity Detected (Bank 2 Sensor 1)  
P0155 O2 Sensor Heater Circuit (Bank 2 Sensor 1)  
P0156 O2 Sensor Circuit Malfunction (Bank 2 Sensor 2)  
P0157 O2 Sensor Circuit Low Voltage (Bank 2 Sensor 2)  
P0158 O2 Sensor Circuit High Voltage (Bank 2 Sensor 2)  
P0159 O2 Sensor Circuit Slow Response (Bank 2 Sensor 2)  
P0160 O2 Sensor Circuit No Activity Detected (Bank 2 Sensor 2)  
P0161 O2 Sensor Heater Circuit (Bank 2 Sensor 2)  
P0162 O2 Sensor Circuit Malfunction (Bank 2 Sensor 3)  
P0163 O2 Sensor Circuit Low Voltage (Bank 2 Sensor 3)  
P0164 O2 Sensor Circuit High Voltage (Bank 2 Sensor 3)  
P0165 O2 Sensor Circuit Slow Response (Bank 2 Sensor 3)  
P0166 O2 Sensor Circuit No Activity Detected (Bank 2 Sensor 3)  
P0167 O2 Sensor Heater Circuit (Bank 2 Sensor 3)  
P0168 Fuel Temperature Too High  
P0169 Incorrect Fuel Composition  
P0170 Fuel Trim (Bank 1)  
P0171 System too Lean (Bank 1)  
P0172 System too Rich (Bank 1)  
P0173 Fuel Trim Malfunction (Bank 2)  
P0174 System too Lean (Bank 2)  
P0175 System too Rich (Bank 2)

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P0176 Fuel Composition Sensor Circuit  
P0177 Fuel Composition Sensor Circuit Range/Performance  
P0178 Fuel Composition Sensor Circuit Low Input  
P0179 Fuel Composition Sensor Circuit High Input  
P0180 Fuel Temperature Sensor A Circuit  
P0181 Fuel Temperature Sensor A Circuit Range/Performance  
P0182 Fuel Temperature Sensor A Circuit Low Input  
P0183 Fuel Temperature Sensor A Circuit High Input  
P0184 Fuel Temperature Sensor A Circuit Intermittent  
P0185 Fuel Temperature Sensor B Circuit  
P0186 Fuel Temperature Sensor B Circuit Range/Performance  
P0187 Fuel Temperature Sensor B Circuit Low Input  
P0188 Fuel Temperature Sensor B Circuit High Input  
P0189 Fuel Temperature Sensor B Circuit Intermittent  
P0190 Fuel Rail Pressure Sensor Circuit  
P0191 Fuel Rail Pressure Sensor Circuit Range/Performance  
P0192 Fuel Rail Pressure Sensor Circuit Low Input  
P0193 Fuel Rail Pressure Sensor Circuit High Input  
P0194 Fuel Rail Pressure Sensor Circuit Intermittent  
P0195 Engine Oil Temperature Sensor  
P0196 Engine Oil Temperature Sensor Range/Performance  
P0197 Engine Oil Temperature Sensor Low  
P0198 Engine Oil Temperature Sensor High  
P0199 Engine Oil Temperature Sensor Intermittent  
P0200 Injector Circuit  
P0201 Injector Circuit - Cylinder 1  
P0202 Injector Circuit - Cylinder 2  
P0203 Injector Circuit - Cylinder 3  
P0204 Injector Circuit - Cylinder 4  
P0205 Injector Circuit - Cylinder 5  
P0206 Injector Circuit - Cylinder 6  
P0207 Injector Circuit - Cylinder 7  
P0208 Injector Circuit - Cylinder 8  
P0209 Injector Circuit - Cylinder 9  
P0210 Injector Circuit - Cylinder 10  
P0211 Injector Circuit - Cylinder 11  
P0212 Injector Circuit - Cylinder 12  
P0213 Cold Start Injector 1  
P0214 Cold Start Injector 2  
P0215 Engine Shutoff Solenoid  
P0216 Injector/Injection Timing Control Circuit  
P0217 Engine Coolant Over Temperature Condition  
P0218 Transmission Fluid Over Temperature Condition  
P0219 Engine Over Speed Condition  
P0220 Throttle/Pedal Position Sensor/Switch "B" Circuit  
P0221 Throttle/Pedal Position Sensor/Switch "B" Circuit Range/Performance  
Problem  
P0222 Throttle/Pedal Position Sensor/Switch "B" Circuit Low Input  
P0223 Throttle/Pedal Position Sensor/Switch "B" Circuit High Input  
P0224 Throttle/Pedal Position Sensor/Switch "B" Circuit Intermittent  
P0225 Throttle/Pedal Position Sensor/Switch "C" Circuit

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## P0226 Throttle/Pedal Position Sensor/Switch "C" Circuit Range/Performance Problem

- P0227 Throttle/Pedal Position Sensor/Switch "C" Circuit Low Input
- P0228 Throttle/Pedal Position Sensor/Switch "C" Circuit High Input
- P0229 Throttle/Pedal Position Sensor/Switch "C" Circuit Intermittent
- P0230 Fuel Pump Primary Circuit
- P0231 Fuel Pump Secondary Circuit Low
- P0232 Fuel Pump Secondary Circuit High
- P0233 Fuel Pump Secondary Circuit Intermittent
- P0234 Turbo/Super Charger Overboost Condition
- P0235 Turbo/Super Charger Boost Sensor "A" Circuit
- P0236 Turbo/Super Charger Boost Sensor "A" Circuit Range/Performance
- P0237 Turbo/Super Charger Boost Sensor "A" Circuit Low
- P0238 Turbo/Super Charger Boost Sensor "A" Circuit High
- P0239 Turbo/Super Charger Boost Sensor "B" Circuit
- P0240 Turbo/Super Charger Boost Sensor "B" Circuit Range/Performance
- P0241 Turbo/Super Charger Boost Sensor "B" Circuit Low
- P0242 Turbo/Super Charger Boost Sensor "B" Circuit High
- P0243 Turbo/Super Charger Wastegate Solenoid "A"
- P0244 Turbo/Super Charger Wastegate Solenoid "A" Range/Performance
- P0245 Turbo/Super Charger Wastegate Solenoid "A" Low
- P0246 Turbo/Super Charger Wastegate Solenoid "A" High
- P0247 Turbo/Super Charger Wastegate Solenoid "B"
- P0248 Turbo/Super Charger Wastegate Solenoid "B" Range/Performance
- P0249 Turbo/Super Charger Wastegate Solenoid "B" Low
- P0250 Turbo/Super Charger Wastegate Solenoid "B" High
- P0251 Injection Pump Fuel Metering Control "A" (Cam/rotor/Injector)
- P0252 Injection Pump Fuel Metering Control "A" Range/Performance (Cam/Rotor/Injector)
- P0253 Injection Pump Fuel Metering Control "A" Low (Cam/Rotor/Injector)
- P0254 Injection Pump Fuel Metering Control "A" High (Cam/Rotor/Injector)
- P0255 Injection Pump Fuel Metering Control "A" Intermittent (Cam/Rotor/Injector)
- P0256 Injection Pump Fuel Metering Control "B" (Cam/Rotor/Injector)
- P0257 Injection Pump Fuel Metering Control "B" Range/Performance (Cam/Rotor/Injector)
- P0258 Injection Pump Fuel Metering Control "B" Low (Cam/Rotor/Injector)
- P0259 Injection Pump Fuel Metering Control "B" High (Cam/Rotor/Injector)
- P0260 Injection Pump Fuel Metering Control "B" Intermittent (Cam/Rotor/Injector)
- P0261 Cylinder 1 Injector Circuit Low
- P0262 Cylinder 1 Injector Circuit High
- P0263 Cylinder 1 Contribution/Balance
- P0264 Cylinder 2 Injector Circuit Low
- P0265 Cylinder 2 Injector Circuit High
- P0266 Cylinder 2 Contribution/Balance
- P0267 Cylinder 3 Injector Circuit Low
- P0268 Cylinder 3 Injector Circuit High
- P0269 Cylinder 4 Contribution/Balance
- P0270 Cylinder 4 Injector Circuit Low
- P0271 Cylinder 4 Injector Circuit High
- P0272 Cylinder 4 Contribution/Balance
- P0273 Cylinder 5 Injector Circuit Low



P0274 Cylinder 5 Injector Circuit High  
P0275 Cylinder 5 Contribution/Balance  
P0276 Cylinder 6 Injector Circuit Low  
P0277 Cylinder 6 Injector Circuit High  
P0278 Cylinder 6 Contribution/Balance  
P0279 Cylinder 7 Injector Circuit Low  
P0280 Cylinder 7 Injector Circuit High  
P0281 Cylinder 7 Contribution/Balance  
P0282 Cylinder 8 Injector Circuit Low  
P0283 Cylinder 8 Injector Circuit High  
P0284 Cylinder 8 Contribution/Balance  
P0285 Cylinder 9 Injector Circuit Low  
P0286 Cylinder 9 Injector Circuit High  
P0287 Cylinder 9 Contribution/Balance  
P0288 Cylinder 10 Injector Circuit Low  
P0289 Cylinder 10 Injector Circuit High  
P0290 Cylinder 10 Contribution/Balance  
P0291 Cylinder 11 Injector Circuit Low  
P0292 Cylinder 11 Injector Circuit High  
P0293 Cylinder 11 Contribution/Balance  
P0294 Cylinder 12 Injector Circuit Low  
P0295 Cylinder 12 Injector Circuit High  
P0296 Cylinder 12 Contribution/Balance  
P0298 Engine Oil Over Temperature  
P0300 Random/Multiple Cylinder Misfire Detected  
P0301 Cylinder 1 Misfire Detected  
P0302 Cylinder 2 Misfire Detected  
P0303 Cylinder 3 Misfire Detected  
P0304 Cylinder 4 Misfire Detected  
P0305 Cylinder 5 Misfire Detected  
P0306 Cylinder 6 Misfire Detected  
P0307 Cylinder 7 Misfire Detected  
P0308 Cylinder 8 Misfire Detected  
P0309 Cylinder 9 Misfire Detected  
P0310 Cylinder 10 Misfire Detected  
P0311 Cylinder 11 Misfire Detected  
P0312 Cylinder 12 Misfire Detected  
P0313 Misfire Detected with Low Fuel  
P0314 Single Cylinder Misfire (Cylinder not Specified)  
P0320 Ignition/Distributor Engine Speed Input Circuit  
P0321 Ignition/Distributor Engine Speed Input Circuit Range/Performance  
P0322 Ignition/Distributor Engine Speed Input Circuit No Signal  
P0323 Ignition/Distributor Engine Speed Input Circuit Intermittent  
P0324 Knock Control System Error  
P0325 Knock Sensor 1 Circuit (Bank 1 or Single Sensor)  
P0326 Knock Sensor 1 Circuit Range/Performance (Bank 1 or Single Sensor)  
P0327 Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)  
P0328 Knock Sensor 1 Circuit High Input (Bank 1 or Single Sensor)  
P0329 Knock Sensor 1 Circuit Input Intermittent (Bank 1 or Single Sensor)  
P0330 Knock Sensor 2 Circuit (Bank 2)  
P0331 Knock Sensor 2 Circuit Range/Performance (Bank 2)

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P0332 Knock Sensor 2 Circuit Low Input (Bank 2)  
P0333 Knock Sensor 2 Circuit High Input (Bank 2)  
P0334 Knock Sensor 2 Circuit Input Intermittent (Bank 2)  
P0335 Crankshaft Position Sensor A Circuit  
P0336 Crankshaft Position Sensor A Circuit Range/Performance  
P0337 Crankshaft Position Sensor A Circuit Low Input  
P0338 Crankshaft Position Sensor A Circuit High Input  
P0339 Crankshaft Position Sensor A Circuit Intermittent  
P0340 Camshaft Position Sensor "A" Circuit (Bank 1 or Single Sensor)  
P0341 Camshaft Position Sensor "A" Circuit Range/Performance (Bank 1 or Single Sensor)  
P0342 Camshaft Position Sensor "A" Circuit Low Input (Bank 1 or Single Sensor)  
P0343 Camshaft Position Sensor "A" Circuit High Input (Bank 1 or Single Sensor)  
P0344 Camshaft Position Sensor "A" Circuit Intermittent (Bank 1 or Single Sensor)  
P0345 Camshaft Position Sensor "A" Circuit (Bank 2)  
P0346 Camshaft Position Sensor "A" Circuit Range/Performance (Bank 2)  
P0347 Camshaft Position Sensor "A" Circuit Low Input (Bank 2)  
P0348 Camshaft Position Sensor "A" Circuit High Input (Bank 2)  
P0349 Camshaft Position Sensor "A" Circuit Intermittent (Bank 2)  
P0350 Ignition Coil Primary/Secondary Circuit  
P0351 Ignition Coil "A" Primary/Secondary Circuit  
P0352 Ignition Coil "B" Primary/Secondary Circuit  
P0353 Ignition Coil "C" Primary/Secondary Circuit  
P0354 Ignition Coil "D" Primary/Secondary Circuit  
P0355 Ignition Coil "F" Primary/Secondary Circuit  
P0356 Ignition Coil "F" Primary/Secondary Circuit  
P0357 Ignition Coil "G" Primary/Secondary Circuit  
P0358 Ignition Coil "H" Primary/Secondary Circuit  
P0359 Ignition Coil "I" Primary/Secondary Circuit  
P0360 Ignition Coil "J" Primary/Secondary Circuit  
P0361 Ignition Coil "K" Primary/Secondary Circuit  
P0362 Ignition Coil "L" Primary/Secondary Circuit  
P0365 Camshaft Position Sensor "B" Circuit (Bank 1)  
P0366 Camshaft Position Sensor "B" Circuit Range/Performance (Bank 1)  
P0367 Camshaft Position Sensor "B" Circuit Low Input (Bank 1)  
P0368 Camshaft Position Sensor "B" Circuit High Input (Bank 1)  
P0369 Camshaft Position Sensor "B" Circuit Intermittent (Bank 1)  
P0370 Timing Reference High Resolution Signal "A"  
P0371 Timing Reference High Resolution Signal "A" Too Many Pulses  
P0372 Timing Reference High Resolution Signal "A" Too Few Pulses  
P0373 Timing Reference High Resolution Signal "A" Intermittent/Erratic Pulses  
P0374 Timing Reference High Resolution Signal "A" No Pulse  
P0375 Timing Reference High Resolution Signal "B"  
P0376 Timing Reference High Resolution Signal "B" Too Many Pulses  
P0377 Timing Reference High Resolution Signal "B" Too Few Pulses  
P0378 Timing Reference High Resolution Signal "B" Intermittent/Erratic Pulses  
P0379 Timing Reference High Resolution Signal "B" No Pulses  
P0380 Glow Plug/Heater Circuit "A"  
P0381 Glow Plug/Heater Indicator Circuit  
P0382 Glow Plug/Heater Circuit "B"  
P0385 Crankshaft Position Sensor "B" Circuit

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P0386 Crankshaft Position Sensor "B" Circuit Range/Performance  
P0387 Crankshaft Position Sensor "B" Circuit Low Input  
P0388 Crankshaft Position Sensor "B" Circuit High Input  
P0389 Crankshaft Position Sensor "B" Circuit Intermittent  
P0390 Camshaft Position Sensor "B" Circuit  
P0391 Camshaft Position Sensor "B" circuit Range/Performance (Bank 2)  
P0392 Camshaft Position Sensor "B" Circuit Low Input (Bank 2)  
P0393 Camshaft Position Sensor "B" Circuit High Input (Bank 2)  
P0394 Camshaft Position Sensor "B" Circuit Intermittent (Bank 2)  
P0400 Exhaust Gas Recirculation Flow  
P0401 Exhaust Gas Recirculation Flow Insufficient Detected  
P0402 Exhaust Gas Recirculation Flow Excessive Detected  
P0403 Exhaust Gas Recirculation Control Circuit  
P0404 Exhaust Gas Recirculation Control Circuit Range/Performance  
P0405 Exhaust Gas Recirculation Sensor "A" Circuit Low  
P0406 Exhaust Gas Recirculation Sensor "A" Circuit High  
P0407 Exhaust Gas Recirculation Sensor "B" Circuit Low  
P0408 Exhaust Gas Recirculation Sensor "B" Circuit High  
P0409 Exhaust Gas Recirculation Sensor "A" Circuit  
P0410 Secondary Air Injection System  
P0411 Secondary Air Injection System Incorrect Flow Detected  
P0412 Secondary Air Injection System Switching Valve "A" Circuit  
P0413 Secondary Air Injection System Switching Valve "A" Circuit Open  
P0414 Secondary Air Injection System Switching Valve "A" Circuit Shorted  
P0415 Secondary Air Injection System Switching Valve "B" Circuit  
P0416 Secondary Air Injection System Switching Valve "B" Circuit Open  
P0417 Secondary Air Injection System Switching Valve "B" Circuit Shorted  
P0418 Secondary Air Injection System Relay "A" Circuit  
P0419 Secondary Air Injection System Relay "B" Circuit  
P0420 Catalyst System Efficiency Below Threshold (Bank 1)  
P0421 Warm Up Catalyst Efficiency Below Threshold (Bank 1)  
P0422 Main Catalyst Efficiency Below Threshold (Bank 1)  
P0423 Heated Catalyst Efficiency Below Threshold (Bank 1)  
P0424 Heated Catalyst Temperature Below Threshold (Bank 1)  
P0425 Catalyst Temperature Sensor (Bank 1)  
P0426 Catalyst Temperature Sensor Range/Performance (Bank 1)  
P0427 Catalyst Temperature Sensor Low Input (Bank 1)  
P0428 Catalyst Temperature Sensor High Input (Bank 1)  
P0429 Catalyst Heater Control Circuit (Bank 1)  
P0430 Catalyst System Efficiency Below Threshold (Bank 2)  
P0431 Warm Up Catalyst Efficiency Below Threshold (Bank 2)  
P0432 Main Catalyst Efficiency Below Threshold (Bank 2)  
P0433 Heated Catalyst Efficiency Below Threshold (Bank 2)  
P0434 Heated Catalyst Temperature Below Threshold (Bank 2)  
P0435 Catalyst Temperature Sensor (Bank 2)  
P0436 Catalyst Temperature Sensor Range/Performance (Bank 2)  
P0437 Catalyst Temperature Sensor Low Input (Bank 2)  
P0438 Catalyst Temperature Sensor High Input (Bank 2)  
P0439 Catalyst Heater Control Circuit (Bank 2)  
P0440 Evaporative Emission Control System  
P0441 Evaporative Emission Control System Incorrect Purge Flow

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P0442 Evaporative Emission Control System Leak Detected (small leak)  
P0443 Evaporative Emission Control System Purge Control Valve Circuit  
P0444 Evaporative Emission Control System Purge Control Valve Circuit Open  
P0445 Evaporative Emission Control System Purge Control Valve Circuit Shorted  
P0446 Evaporative Emission Control System Vent Control Circuit  
P0447 Evaporative Emission Control System Vent Control Circuit Open  
P0448 Evaporative Emission Control System Vent Control Circuit Shorted  
P0449 Evaporative Emission Control System Vent Valve/Solenoid Circuit  
P0450 Evaporative Emission Control System Pressure Sensor  
P0451 Evaporative Emission Control System Pressure Sensor Range/Performance  
P0452 Evaporative Emission Control System Pressure Sensor Low Input  
P0453 Evaporative Emission Control System Pressure Sensor High input  
P0454 Evaporative Emission Control System Pressure Sensor Intermittent  
P0455 Evaporative Emission Control System Leak Detected (gross leak)  
P0456 Evaporative Emission Control System Leak Detected (very small leak)  
P0457 Evaporative Emission Control System Leak Detected (fuel cap loose/off)  
P0460 Fuel Level Sensor Circuit  
P0461 Fuel Level Sensor Circuit Range/Performance  
P0462 Fuel Level Sensor Circuit Low Input  
P0463 Fuel Level Sensor Circuit High Input  
P0464 Fuel Level Sensor Circuit Intermittent  
P0465 EVAP Purge Flow Sensor Circuit  
P0466 EVAP Purge Flow Sensor Circuit Range/Performance  
P0467 EVAP Purge Flow Sensor Circuit Low Input  
P0468 EVAP Purge Flow Sensor Circuit High Input  
P0469 EVAP Purge Flow Sensor Circuit Intermittent  
P0470 Exhaust Pressure Sensor  
P0471 Exhaust Pressure Sensor Range/Performance  
P0472 Exhaust Pressure Sensor Low  
P0473 Exhaust Pressure Sensor High  
P0474 Exhaust Pressure Sensor Intermittent  
P0475 Exhaust Pressure Control Valve  
P0476 Exhaust Pressure Control Valve Range/Performance  
P0477 Exhaust Pressure Control Valve Low  
P0478 Exhaust Pressure Control Valve High  
P0479 Exhaust Pressure Control Valve Intermittent  
P0480 Cooling Fan 1 Control Circuit  
P0481 Cooling Fan 2 Control Circuit  
P0482 Cooling Fan 3 Control Circuit  
P0483 Cooling Fan Rationality Check  
P0484 Cooling Fan Circuit Over Current  
P0485 Cooling Fan Power/Ground Circuit  
P0486 Exhaust Gas Recirculation Sensor "B" Circuit  
P0487 Exhaust Gas Recirculation Throttle Position Control Circuit  
P0488 Exhaust Gas Recirculation Throttle Position Control Range/Performance  
P0491 Secondary Air Injection System (Bank 1)  
P0492 Secondary Air Injection System (Bank 2)  
P0500 Vehicle Speed Sensor  
P0501 Vehicle Speed Sensor Range/Performance  
P0502 Vehicle Speed Sensor Circuit Low Input  
P0503 Vehicle Speed Sensor Intermittent/Erratic/High

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P0505 Idle Control System  
P0506 Idle Control System RPM Lower Than Expected  
P0507 Idle Control System RPM Higher Than Expected  
P0508 Idle Control System Circuit Low  
P0509 Idle Control System Circuit High  
P0510 Closed Throttle Position Switch  
P0512 Starter Request Circuit  
P0513 Incorrect Immobilizer Key ("Immobilizer pending SAE J1930 approval)  
P0515 Battery Temperature Sensor Circuit  
P0516 Battery Temperature Sensor Circuit Low  
P0517 Battery Temperature Sensor Circuit High  
P0520 Engine Oil Pressure Sensor/Switch Circuit  
P0521 Engine Oil Pressure Sensor/Switch Range/Performance  
P0522 Engine Oil Pressure Sensor/Switch Low Voltage  
P0523 Engine Oil Pressure Sensor/Switch High Voltage  
P0524 Engine Oil Pressure Too Low  
P0530 A/C Refrigerant Pressure Sensor Circuit  
P0531 A/C Refrigerant Pressure Sensor Circuit Range/Performance  
P0532 A/C Refrigerant Pressure Sensor Circuit Low Input  
P0533 A/C Refrigerant Pressure Sensor Circuit High Input  
P0534 Air Conditioner Refrigerant Charge Loss  
P0540 Intake Air Heater Circuit  
P0541 Intake Air Heater Circuit Low  
P0542 Intake Air Heater Circuit High  
P0544 Exhaust Gas Temperature Sensor Circuit (Bank 1)  
P0545 Exhaust Gas Temperature Sensor Circuit Low (Bank 1)  
P0546 Exhaust Gas Temperature Sensor Circuit High (Bank 1)  
P0547 Exhaust Gas Temperature Sensor Circuit (Bank 2)  
P0548 Exhaust Gas Temperature Sensor Circuit Low (Bank 2)  
P0549 Exhaust Gas Temperature Sensor Circuit High (Bank 2)  
P0550 Power Steering Pressure Sensor Circuit  
P0551 Power Steering Pressure Sensor Circuit Range/Performance  
P0552 Power Steering Pressure Sensor Circuit Low Input  
P0553 Power Steering Pressure Sensor Circuit High Input  
P0554 Power Steering Pressure Sensor Circuit Intermittent  
P0560 System Voltage  
P0561 System Voltage Unstable  
P0562 System Voltage Low  
P0563 System Voltage High  
P0564 Cruise Control Multi-Function Input Signal  
P0565 Cruise Control On Signal  
P0566 Cruise Control Off Signal  
P0567 Cruise Control Resume Signal  
P0568 Cruise Control Set Signal  
P0569 Cruise Control Coast Signal  
P0570 Cruise Control Acceleration Signal  
P0571 Cruise Control/Brake Switch A Circuit  
P0572 Cruise Control/Brake Switch A Circuit Low  
P0573 Cruise Control/Brake Switch A Circuit High  
P0574 Cruise Control System - Vehicle Speed Too High  
P0575 Cruise Control Input Circuit

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P0576 Cruise Control Input Circuit Low  
 P0577 Cruise Control input Circuit High  
 P0578 Through P0580 Reserved for Cruise Control Codes  
 P0600 Serial Communication Link  
 P0601 Internal Control Module Memory Check Sum Error  
 P0602 Control Module Programming Error  
 P0603 Internal Control Module Keep Alive Memory (KAM) Error  
 P0604 Internal Control Module Random Access Memory (RAM) Error  
 P0605 Internal Control Module Read Only Memory (ROM) Error (Module Identification Defined by SAE J1979)  
 P0606 ECM/PCM Processor  
 P0607 Control Module Performance  
 P0608 Control Module VSS Output "A"  
 P0609 Control Module VSS Output "B"  
 P0610 Control Module Vehicle Options Error  
 P0615 Starter Relay Circuit  
 P0616 Starter Relay Circuit Low  
 P0617 Starter Relay Circuit High  
 P0618 Alternative Fuel Control Module KAM Error  
 P0619 Alternative Fuel Control Module RAM/ROM Error  
 P0620 Generator Control Circuit  
 P0621 Generator Lamp "L" Terminal Control Circuit  
 P0622 Generator Field "F" Terminal Control Circuit  
 P0623 Generator Lamp Control Circuit  
 P0624 Fuel Cap Lamp Control Circuit  
 P0630 VIN Not Programmed or Mismatch - ECM/PCM  
 P0631 VIN Not Programmed or Mismatch - TCM  
 P0635 Power Steering Control Circuit  
 P0836 Power Steering Control Circuit Low  
 P0637 Power Steering Control Circuit High  
 P0638 Throttle Actuator Control Range/Performance (Bank 1)  
 P0639 Throttle Actuator Control Range/Performance (Bank 2)  
 P0640 Intake Air Heater Control Circuit  
 P0645 A/C Clutch Relay Control Circuit  
 P0646 A/C Clutch Relay Control Circuit Low  
 P0647 A/C Clutch Relay Control Circuit High  
 P0648 Immobilizer Lamp Control Circuit ("Immobilizer" pending SAE J1930 approval)  
 P0649 Speed Control Lamp Control Circuit  
 P0650 Malfunction Indicator Lamp (ML) Control Circuit  
 P0654 Engine RPM Output Circuit  
 P0655 Engine Hot Lamp Output Control Circuit  
 P0656 Fuel Level Output Circuit  
 P0660 Intake Manifold Tuning Valve Control Circuit (Bank 1)  
 P0661 Intake Manifold Tuning Valve Control Circuit Low (Bank 1)  
 P0662 Intake Manifold Tuning Valve Control Circuit High (Bank 1)  
 P0663 Intake Manifold Tuning Valve Control Circuit (Bank 2)  
 P0664 Intake Manifold Tuning Valve Control Circuit Low (Bank 2)  
 P0665 Intake Manifold Tuning Valve Control Circuit High (Bank 2)  
 P0700 Transmission Control System (MIL Request)  
 P0701 Transmission Control System Range/Performance

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P0702 Transmission Control System Electrical  
P0703 Torque Converter/Brake Switch B Circuit  
P0704 Clutch Switch In put Circuit Malfunction  
P0705 Transmission Range Sensor Circuit Malfunction (PRNDL Input)  
P0706 Transmission Range Sensor Circuit Range/Performance  
P0707 Transmission Range Sensor Circuit Low Input  
P0708 Transmission Range Sensor Circuit High Input  
P0709 Transmission Range Sensor Circuit intermittent  
P0710 Transmission Fluid Temperature Sensor Circuit  
P0711 Transmission Fluid Temperature Sensor Circuit Range/Performance  
P0712 Transmission Fluid Temperature Sensor Circuit Low Input  
P0713 Transmission Fluid Temperature Sensor Circuit High Input  
P0714 Transmission Fluid Temperature Sensor Circuit Intermittent  
P0715 Input/Turbine Speed Sensor Circuit  
P0716 Input/Turbine Speed Sensor Circuit Range/Performance  
P0717 Input/Turbine Speed Sensor Circuit No Signal  
P0718 Input/Turbine Speed Sensor Circuit Intermittent  
P0719 Torque Converter/Brake Switch B Circuit Low  
P0720 Output Speed Sensor Circuit  
P0721 Output Speed Sensor Circuit Range/Performance  
P0722 Output Speed Sensor Circuit No Signal  
P0723 Output Speed Sensor Circuit Intermittent  
P0724 Torque Converter/Brake Switch B Circuit High  
P0725 Engine Speed Input Circuit  
P0726 Engine Speed Input Circuit Range/Performance  
P0727 Engine Speed Input Circuit No Signal  
P0728 Engine Speed Input Circuit Intermittent  
P0730 Incorrect Gear Ratio  
P0731 Gear 1 Incorrect Ratio  
P0732 Gear 2 Incorrect Ratio  
P0733 Gear 3 Incorrect Ratio  
P0734 Gear 4 Incorrect Ratio  
P0735 Gear 5 Incorrect Ratio  
P0736 Reverse Incorrect Ratio  
P0737 TCM Engine Speed Output Circuit  
P0738 TCM Engine Speed Output Circuit Low  
P0739 TCM Engine Speed Output Circuit High  
P0740 Torque Converter Clutch Circuit  
P0741 Torque Converter Clutch Circuit Performance or Stuck Off  
P0742 Torque Converter Clutch Circuit Stuck On  
P0743 Torque Converter Clutch Circuit Electrical  
P0744 Torque Converter Clutch Circuit Intermittent  
P0745 Pressure Control Solenoid "A"  
P0746 Pressure Control Solenoid "A" Performance or Stuck Off  
P0747 Pressure Control Solenoid "A" Stuck On  
P0748 Pressure Control Solenoid "A" Electrical  
P0749 Pressure Control Solenoid "A" Intermittent  
P0750 Shift Solenoid "A"  
P0751 Shift Solenoid "A" Performance or Stuck Off  
P0752 Shift Solenoid "A" Stuck On  
P0753 Shift Solenoid "A" Electrical



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P0754 Shift Solenoid "A" Intermittent  
 P0755 Shift Solenoid "B"  
 P0756 Shift Solenoid "B" Performance or Stuck Off  
 P0757 Shift Solenoid "B" Stuck On  
 P0758 Shift Solenoid "B" Electrical  
 P0759 Shift Solenoid "B" Intermittent  
 P0760 Shift Solenoid "C"  
 P0761 Shift Solenoid "C" Performance or Stuck Off  
 P0762 Shift Solenoid "C" Stuck On  
 P0763 Shift Solenoid "C" Electrical  
 P0764 Shift Solenoid "C" Intermittent  
 P0765 Shift Solenoid "C"  
 P0766 Shift Solenoid "D" Performance or Stuck Off  
 P0767 Shift Solenoid "D" Stuck On  
 P0768 Shift Solenoid "D" Electrical  
 P0769 Shift Solenoid "D" Intermittent  
 P0770 Shift Solenoid "E"  
 P0771 Shift Solenoid "E" Performance or Stuck Off  
 P0772 Shift Solenoid "E" Stuck On  
 P0773 Shift Solenoid "E" Electrical  
 P0774 Shift Solenoid "E" Intermittent  
 P0775 Pressure Control Solenoid "B"  
 P0776 Pressure Control Solenoid "B" Performance or Stuck Off  
 P0777 Pressure Control Solenoid "B" Stuck On  
 P0778 Pressure Control Solenoid "B" Electrical  
 P0779 Pressure Control Solenoid "B" Intermittent  
 P0780 Shift  
 P0781 1-2 Shift  
 P0782 2-3 Shift  
 P0783 3-4 Shift  
 P0784 4-5 Shift  
 P0785 Shift/Timing Solenoid  
 P0786 Shift/Timing Solenoid Range/Performance  
 P0787 Shift/Timing Solenoid Low  
 P0788 Shift/Timing Solenoid High  
 P0789 Shift/Timing Solenoid Intermittent  
 P0790 Normal/Performance Switch Circuit  
 P0791 Intermediate Shaft Speed Sensor Circuit  
 P0792 Intermediate Shaft Speed Sensor Circuit Range/Performance  
 P0793 Intermediate Shaft Speed Sensor Circuit No Signal  
 P0794 Intermediate Shaft Speed Sensor Circuit Intermittent  
 P0795 Pressure Control Solenoid "C"  
 P0796 Pressure Control Solenoid "C" Performance or Stuck off  
 P0797 Pressure Control Solenoid "C" Stuck On  
 P0798 Pressure Control Solenoid "C" Electrical  
 P0799 Pressure Control Solenoid "C" Intermittent  
 P0801 Reverse Inhibit Control Circuit  
 P0803 1-4 Upshift (Skip Shift) Solenoid Control Circuit  
 P0804 1-4 Upshift (Skip Shift) Lamp Control Circuit  
 P0805 Clutch Position Sensor Circuit  
 P0806 Clutch Position Sensor Circuit Range/Performance

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P0807 Clutch Position Sensor Circuit Low  
P0808 Clutch Position Sensor Circuit High  
P0809 Clutch Position Sensor Circuit Intermittent  
P0810 Clutch Position Control Error  
P0811 Excessive Clutch Slippage  
P0812 Reverse Input Circuit  
P0813 Reverse Output Circuit  
P0814 Transmission Range Display Circuit  
P0815 Upshift Switch Circuit  
P0816 Downshift Switch Circuit  
P0817 Starter Disable Circuit  
P0818 Driveline Disconnect Switch Input Circuit  
P0820 Gear Lever X-Y Position Sensor Circuit  
P0821 Gear Lever X Position Circuit  
P0822 Gear Lever Y Position Circuit  
P0823 Gear Lever X Position Circuit Intermittent  
P0824 Gear Lever Y Position Circuit Intermittent  
P0825 Gear Lever Push-Pull Switch (Shift Anticipate)  
P0830 Clutch Pedal Switch "A" Circuit  
P0831 Clutch Pedal Switch "A" Circuit Low  
P0832 Clutch Pedal Switch "A" Circuit High  
P0833 Clutch Pedal Switch "B" Circuit  
P0834 Clutch Pedal Switch "B" Circuit Low  
P0835 Clutch Pedal Switch "B" Circuit High  
P0836 Four Wheel Drive (4WD) Switch Circuit  
P0837 Four Wheel Drive (4WD) Switch Circuit Range/Performance  
P0838 Four Wheel Drive (4WD) Switch Circuit Low  
P0839 Four Wheel Drive (4WD) Switch Circuit High  
P0840 Transmission Fluid Pressure Sensor/Switch "A" Circuit  
P0841 Transmission Fluid Pressure Sensor/Switch "A" Circuit Range/Performance  
P0842 Transmission Fluid Pressure Sensor/Switch "A" Circuit Low  
P0843 Transmission Fluid Pressure Sensor/Switch "A" Circuit High  
P0844 Transmission Fluid Pressure Sensor/Switch "A" Circuit Intermittent  
P0845 Transmission Fluid Pressure Sensor/Switch "B" Circuit  
P0846 Transmission Fluid Pressure Sensor/Switch "B" Circuit Range/Performance  
P0847 Transmission Fluid Pressure Sensor/Switch "B" Circuit Low  
P0848 Transmission Fluid Pressure Sensor/Switch "B" Circuit High  
P0849 Transmission Fluid Pressure Sensor/Switch "B" Circuit Intermittent  
P0850 Park/Neutral Position Switch Input Circuit  
P0851 Park/Neutral Position Switch Input Circuit Low  
P0852 Park/Neutral Position Switch Input Circuit High  
P0853 Drive Switch Input Circuit  
P0854 Drive Switch Input Circuit Low  
P0855 Drive Switch Input Circuit High  
P0856 Traction Control Input Signal  
P0857 Traction Control Input Signal Range/Performance  
P0858 Traction Control Input Signal Low  
P0859 Traction Control Input Signal High  
P0860 Gear Shift Module Communication Circuit  
P0861 Gear Shift Module Communication Circuit Low  
P0862 Gear Shift Module Communication Circuit High

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P0863 (TCM) Transmission Control Module Communication Circuit  
 P0864 (TCM) Transmission Control Module Communication Circuit  
     Range/Performance  
 P0865 (TCM) Transmission Control Module Communication Circuit Low  
 P0866 (TCM) Transmission Control Module Communication Circuit High  
 P0867 Transmission Fluid Pressure  
 P0868 Transmission Fluid Pressure Low  
 P0869 Transmission Fluid Pressure High  
 P0870 Transmission Fluid Pressure Sensor/Switch C Circuit  
 P0871 Transmission Fluid Pressure Sensor/Switch C Circuit Range/Performance  
 P0872 Transmission Fluid Pressure Sensor/Switch C Circuit Low  
 P0873 Transmission Fluid Pressure Sensor/Switch C Circuit High  
 P0874 Transmission Fluid Pressure Sensor/Switch C Circuit Intermittent  
 P0875 Transmission Fluid Pressure Sensor/Switch D Circuit  
 P0876 Transmission Fluid Pressure Sensor/Switch D Circuit Range/Performance  
 P0877 Transmission Fluid Pressure Sensor/Switch D Circuit Low  
 P0878 Transmission Fluid Pressure Sensor/Switch D Circuit High  
 P0879 Transmission Fluid Pressure Sensor/Switch D Circuit Intermittent  
 P0880 TCM Transmission Control Module Power Input Signal  
 P0881 TCM Transmission Control Module Power Input Signal Range/Performance  
 P0882 TCM Transmission Control Module Power Input Signal Low  
 P0883 TCM Transmission Control Module Power Input Signal High  
 P0884 TCM Transmission Control Module Power Input Signal Intermittent  
 P0885 TCM Transmission Control Module Power Relay Control Circuit/Open  
 P0886 TCM Transmission Control Module Power Relay Control Circuit Low  
 P0887 TCM Transmission Control Module Power Relay Control Circuit High  
 P0888 TCM Transmission Control Module Power Relay Sense Circuit  
 P0889 TCM Transmission Control Module Power Relay Sense Circuit  
     Range/Performance  
 P0890 TCM Transmission Control Module Power Relay Sense Circuit Low  
 P0891 TCM Transmission Control Module Power Relay Sense Circuit High  
 P0892 TCM Transmission Control Module Power Relay Sense Circuit Intermittent  
 P0893 Multiple Gears Engaged  
 P0894 Transmission Component Slipping  
 P0895 Shift Time Too Short  
 P0896 Shift Time Too Long  
 P0897 Transmission Fluid Deteriorated  
 P0898 Transmission Control System MIL Request Circuit Low  
 P0899 Transmission Control System MIL Request Circuit High  
 P0900 Clutch Actuator Circuit/Open  
 P0901 Clutch Actuator Circuit Range/Performance  
 P0902 Clutch Actuator Circuit Low  
 P0903 Clutch Actuator Circuit High  
 P0904 Transmission Gate Select Position Circuit  
 P0905 Transmission Gate Select Position Circuit Range/Performance  
 P0906 Transmission Gate Select Position Circuit Low  
 P0907 Transmission Gate Select Position Circuit High  
 P0908 Transmission Gate Select Position Circuit Intermittent  
 P0909 Transmission Gate Select Control Error  
 P0910 Transmission Gate Select Actuator Circuit/Open  
 P0911 Transmission Gate Select Actuator Circuit Range/Performance

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P0912 Transmission Gate Select Actuator Circuit Low  
P0913 Transmission Gate Select Actuator Circuit High  
P0914 Gear Shift Position Circuit  
P0915 Gear Shift Position Circuit Range/Performance  
P0916 Gear Shift Position Circuit Low  
P0917 Gear Shift Position Circuit High  
P0918 Gear Shift Position Circuit Intermittent  
P0919 Gear Shift Position Control Error  
P0920 Gear Shift Forward Actuator Circuit/Open  
P0921 Gear Shift Forward Actuator Circuit Range/Performance  
P0922 Gear Shift Forward Actuator Circuit Low  
P0923 Gear Shift Forward Actuator Circuit High  
P0924 Gear Shift Reverse Actuator Circuit/Open  
P0925 Gear Shift Reverse Actuator Circuit Range/Performance  
P0926 Gear Shift Reverse Actuator Circuit Low  
P0927 Gear Shift Reverse Actuator Circuit High  
P0928 Gear Shift Lock Solenoid Control Circuit/Open  
P0929 Gear Shift Lock Solenoid Control Circuit Range/Performance  
P0930 Gear Shift Lock Solenoid Control Circuit Low  
P0931 Gear Shift Lock Solenoid Control Circuit High  
P0932 Hydraulic Pressure Sensor Circuit  
P0933 Hydraulic Pressure Sensor Circuit Range/Performance  
P0934 Hydraulic Pressure Sensor Circuit Low  
P0935 Hydraulic Pressure Sensor Circuit High  
P0936 Hydraulic Pressure Sensor Circuit Intermittent  
P0937 Hydraulic Oil Temperature Sensor Circuit  
P0938 Hydraulic Oil Temperature Sensor Circuit Range/Performance  
P0939 Hydraulic Oil Temperature Sensor Circuit Low  
P0940 Hydraulic Oil Temperature Sensor Circuit High  
P0941 Hydraulic Oil Temperature Sensor Circuit Intermittent  
P0942 Hydraulic Pressure Unit  
P0943 Hydraulic Pressure Unit Cycling Period Too Short  
P0944 Hydraulic Pressure Unit Loss of Pressure  
P0945 Hydraulic Pump Relay Circuit/Open  
P0946 Hydraulic Pump Relay Circuit Range/Performance  
P0947 Hydraulic Pump Relay Circuit Low  
P0948 Hydraulic Pump Relay Circuit High  
P0949 ASM Auto Shift Manual Adaptive Learning Not Complete  
P0950 ASM Auto Shift Manual Control Circuit  
P0951 ASM Auto Shift Manual Control Circuit Range/Performance  
P0952 ASM Auto Shift Manual Control Circuit Low  
P0953 ASM Auto Shift Manual Control Circuit High  
P0954 ASM Auto Shift Manual Control Circuit Intermittent  
P0955 ASM Auto Shift Manual Mode Circuit  
P0956 ASM Auto Shift Manual Mode Circuit Range/Performance  
P0957 ASM Auto Shift Manual Mode Circuit Low  
P0958 ASM Auto Shift Manual Mode Circuit High  
P0959 ASM Auto Shift Manual Mode Circuit Intermittent  
P0960 Pressure Control Solenoid A Control Circuit/Open  
P0961 Pressure Control Solenoid A Control Circuit Range/Performance  
P0962 Pressure Control Solenoid A Control Circuit Low

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P0963 Pressure Control Solenoid A Control Circuit High  
P0964 Pressure Control Solenoid B Control Circuit/Open  
P0965 Pressure Control Solenoid B Control Circuit Range/Performance  
P0966 Pressure Control Solenoid B Control Circuit Low  
P0967 Pressure Control Solenoid B Control Circuit High  
P0968 Pressure Control Solenoid C Control Circuit/Open  
P0969 Pressure Control Solenoid C Control Circuit Range/Performance  
P0970 Pressure Control Solenoid C Control Circuit Low  
P0971 Pressure Control Solenoid C Control Circuit High  
P0972 Shift Solenoid A Control Circuit Range/Performance  
P0973 Shift Solenoid A Control Circuit Low  
P0974 Shift Solenoid A Control Circuit High  
P0975 Shift Solenoid B Control Circuit Range/Performance  
P0976 Shift Solenoid B Control Circuit Low  
P0977 Shift Solenoid B Control Circuit High  
P0978 Shift Solenoid C Control Circuit Range/Performance  
P0979 Shift Solenoid C Control Circuit Low  
P0980 Shift Solenoid C Control Circuit High  
P0981 Shift Solenoid D Control Circuit Range/Performance  
P0982 Shift Solenoid D Control Circuit Low  
P0983 Shift Solenoid D Control Circuit High  
P0984 Shift Solenoid E Control Circuit Range/Performance  
P0985 Shift Solenoid E Control Circuit Low  
P0986 Shift Solenoid E Control Circuit High  
P0987 Transmission Fluid Pressure Sensor/Switch E Circuit  
P0988 Transmission Fluid Pressure Sensor/Switch E Circuit Range/Performance  
P0989 Transmission Fluid Pressure Sensor/Switch E Circuit Low  
P0990 Transmission Fluid Pressure Sensor/Switch E Circuit High  
P0991 Transmission Fluid Pressure Sensor/Switch E Circuit Intermittent  
P0992 Transmission Fluid Pressure Sensor/Switch F Circuit  
P0993 Transmission Fluid Pressure Sensor/Switch F Circuit Range/Performance  
P0994 Transmission Fluid Pressure Sensor/Switch F Circuit Low  
P0995 Transmission Fluid Pressure Sensor/Switch F Circuit High  
P0996 Transmission Fluid Pressure Sensor/Switch F Circuit Intermittent  
P0997 Shift Solenoid F Control Circuit Range/Performance  
P0998 Shift Solenoid F Control Circuit Low  
P0999 Shift Solenoid F Control Circuit High