

Smarty

MADS Electronics - Micro Tuner model S-03
1998 – 2002 Dodge Ram
5.9L, 24 Valve, Cummins Diesel Engine

Instruction manual



PLEASE READ THIS ENTIRE INSTRUCTION MANUAL BEFORE PROCEEDING

www.madselectronics.com

THIS IS A HIGH PERFORMANCE PRODUCT USE AT YOUR OWN RISK

**This product is intended for OFF ROAD USE ONLY
This product is not intended to be used to break the law**

Do not use this product until you have read the following agreement.

This agreement sets forth the terms and conditions for the use of this product.

The installation of this product indicates that the buyer has read and understands this agreement and accepts the terms and conditions.

DISCLAIMER OF LIABILITY

MADS Electronics, it's distributors, jobbers and dealers (hereafter Seller) shall be in no way responsible for the product's proper uses and service. **THE BUYER HEREBY WAIVES ALL LIABILITY CLAIMS.**

The buyer acknowledges that he is not relying on the Sellers skill or judgement to select or furnish goods suitable for any particular purpose and that there are no liabilities which extend beyond the description on the face hereof, and the buyer hereby waives all remedies or liabilities expressed or implied, arising by law or otherwise (including without any obligation of the seller with respect fitness, merchantability and consequential damages) whatever or not occasioned by the sellers negligence.

The Seller disclaims any warranty and expressly disclaims any liability for personal injury and damages. The buyer acknowledges and agrees that the disclaimer of any liability for personal injury is a material term for this agreement and the buyer agrees to indemnify the Seller and to hold the Seller harmless from any claim related to the item of the equipment purchased. Under no circumstances will the seller be liable for any damages or expenses by reason of use or sale of any such equipment.

The Seller assumes no liability regarding the improper installation or misapplication of its products. It is the installers responsibility to check for proper installation and in doubt contact the manufacturer.

The buyer is solely responsible for all warranty issues from the manufacturer.

LIMITATION OF WARRANTY

MADS Electronics (Hereafter Seller) gives Limited Warranty as to description, quality, merchantability, and fitness for any particular purpose, productiveness, or any other matter of the Seller's product sold herewith. The Seller shall be in no way responsible for the products proper use and service and the buyer hereby waives all rights other than those expressly written herein. This warranty shall not be extended, altered or varied except to be a written instrument signed by Seller and Buyer.

The warranty is limited to one (1) year from the date of sale and limited solely to the parts contained within the products kit. All products that are in question of warranty must be returned prepaid to the Seller and must be accompanied by a dated proof of purchase receipt. All Warranty claims are subject to approval by MADS Electronics.

Under no circumstances will the Seller be liable for any labour charged or travel time incurred by in diagnosis for defects, removal, or reinstallation of this product or any other contingent expenses.

Under no circumstances will the Seller be liable for any damage or expenses incurred by reason of the use or sale of any such equipment.

In the event that the buyer does not agree with this agreement: **THE BUYER MAY PROMPTLY RETURN THIS PRODUCT, IN A NEW AND UNUSED CONDITION, WITH A DATED PROOF OF PURCHASE TO THE PLACE OF PURCHASE WITHIN TEN (10) DAYS FROM THE DATE OF PURCHASE FOR A FULL REFUND.**

THE INSTALLATION OF THIS PRODUCT INDICATES THAT THE BUYER HAS READ AND UNDERSTANDS THIS AGREEMENT AND ACCEPTS THE TERMS AND CONDITIONS.

CAUTION

This *MADS Electronics* product is intended for use on unmodified stock engines. Remove any performance enhancing electronic devices and make sure the ECM has been returned to STOCK if you have used another manufacturer's programmer before the Smarty Micro Tuner.

The use of this product to change the performance characteristics of your vehicle could invalidate the warranty provided by the vehicle manufacturer. Consult your vehicle warranty before using the product on your vehicle.

NEVER CONNECT BOTH THE SMARTY CONNECTORS AT THE SAME TIME!

This could damage Smarty and the computer USB port.

NEVER UNPLUG SMARTY WHILE IT IS UPDATING YOUR ECM.

Smarty can recover without pulling fuses, or disconnecting batteries, BUT do not intentionally create this situation. When Smarty is DONE with ECM updates, ABS changes, or clearing DTC codes, it may be unplugged, even if Smarty does not display the typical "Unplug Smarty and Turn Key OFF" screen.

It is recommended that you do not store your Smarty Micro Tuner in your vehicle if ambient temperatures in your area fall below 32°F. Excessively low temperatures can cause malfunction or damage to Smarty Micro Tuner that is not covered by the MADS Electronics warranty.

In the case of ECM replacement, restore the ECM back to the STOCK software before the ECM replacement. Smarty works only with one vehicle and one ECM at a time while it is VIN Locked. Under no circumstances we will refund, repair, or warranty units that are send in and result VIN # locked.

RESTORE ECM TO STOCK SOFTWARE BEFORE ANY SERVICE ASSISTANCE.

If you need to return your vehicle to a service center, restore the vehicle ECM to its STOCK program by following the instruction in this manual. The service center might reprogram your vehicle with an updated, STOCK, software ECM reflash **without** your knowledge. If your vehicle has not been returned to its STOCK program prior to a service visit and the ECM is reflashed, the Smarty Micro Tuner will no longer be able to program your vehicle. Such failure is not covered by the *MADS Electronics* warranty. Under no circumstances will we refund, repair, or warranty units that are sent in that are locked.

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1. Before you begin

Your vehicle's STOCK program

Your vehicle's ECM **must** contain the manufacturer's STOCK factory program. If you have used a programmer from another aftermarket company you must use their product to return your ECM back to STOCK condition before proceeding. If you have a performance-enhancing device installed, it must be removed.

Service Centers

If you need to return your vehicle to a service center, restore the vehicle ECM to its STOCK program. The service center might reprogram your vehicle with an updated, STOCK, software ECM reflash **without** your knowledge. If your vehicle has not been returned to its STOCK program prior to a service visit and the ECM is reflashed, the Smarty Micro Tuner will no longer be able to program your vehicle. Such failure is not covered by the MADS Electronics warranty.

Under no circumstances will we refund, repair, or warranty units that are sent in that are locked.

Locking and Unlocking Smarty.

Once Smarty is used on a vehicle, it is VIN # LOCKED to that vehicle AND to that ECM. Smarty can be used only on that vehicle to update ECM software and ABS (speedometer) changes. In order to unlock Smarty, you must use Smarty to return the ECM to the STOCK software, otherwise, Smarty will remain locked. Only Smarty can unlock itself. Follow the instructions in this Manual to return your vehicle to STOCK software. Once unlocked, Smarty may be used on a different vehicle. While Smarty is VIN# Locked, it can still be used to read and clear Diagnostic Trouble Codes (DTCs) on a vehicle and ECM that it is NOT locked to.

Vehicle preparation

Before connecting the Smarty Micro Tuner to your vehicle, make sure that all power-draining accessories are turned off: Radio, headlights, lights, cell phones, etc. All those devices need to be turned off. Please apply the parking brake before you begin a download.

As the Smarty Micro Tuner needs full battery voltage to program, ensure your vehicle battery is fully charged and NOT connected to a battery charger.

Do not disturb or remove the connection cable during the updating operation.

Smarty preparation

During the first use, Smarty reads the identification parameters of your vehicle. After the first use, Smarty can be used only with your vehicle.

Returning the ECM to STOCK software restores Smarty into the original, unlocked condition.

2. Smarty overview

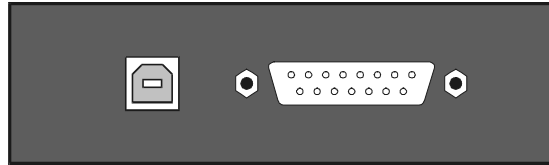
Keyboard operation

Smarty's keyboard is composed of 12 keys:

- Numerical keys from 0 to 9, used to select menu options and enter numerical values
- Right arrow key, used to confirm the selected operation
- Left arrow key, used to go one step back in the operation flow

Connectors

Two connectors are available in Smarty's upper edge:



USB ECM Cable

- **USB Connector:** Used for connecting Smarty to a personal computer for updates. The update softwares can be downloaded from *MADS Electronics* internet site (www.madselectronics.com). A USB cable is not included. Standard USB 1.1 or USB 2.0 cables can be used to connect Smarty to your personal computer.
- **15 pin Connector:** Used to connect Smarty to the vehicle through the vehicle's diagnostic port with an OBD II cable. The OBD II – J1926 diagnostic connector cable is included in Smarty's box. Note: Connecting any other cable to the 15 pin connector invalidates *MADS Electronics* warranty, because it could damage Smarty.

Smarty automatically switches on when one of the two connections described above is made.

NEVER CONNECT BOTH CABLES AT THE SAME TIME. This could damage Smarty and the computer USB port. Such failure is not covered by the *MADS Electronics* warranty

3. Connecting Smarty to your vehicle

- Turn on the ignition key to the RUN position. **DO NOT START THE ENGINE.**
- Plug the furnished OBD II cable into the 15 pin connector in the top edge of Smarty and **GENTLY** tighten the screws by hand. Over tightening these two screws **DOES NOT** make a tighter or better connection. The screws are provided to keep the plug held gently to Smarty.
- Plug the Smarty cable into the diagnostic port on your vehicle. The diagnostic port is located inside the cab, to the passenger side of the steering wheel, at the bottom of the dash panel near the floor.

4. Updating the ECM

First time update.

Turn on the ignition key to the RUN position. **DO NOT START THE ENGINE.**

Plug Smarty's cable into the diagnostic connector of your vehicle. Smarty will display:

```
Smarty
V:1.00A D:2.00A
```

The second line of the display shows the firmware version and the tuning data version.

Both the internal firmware and the tuning data information can be updated connecting a personal computer. (See *MADS Electronics* internet site for more details.) Then the main menu appears:

```
1=ECM Update
2=Read DTC codes
```

From the main menu, press '1' to select *ECM Update*.

Smarty will try to communicate with the ECM. If the connection cannot be established, Smarty asks you to switch off the ignition key:

Turn key OFF
Press '>'

Turn the ignition key to "OFF". Press the '>' key. Smarty will then ask you to switch the ignition key "ON" in order to retry the connection:

Turn key ON
Press '>'

Turn the ignition key to the "RUN" position. DO NOT START THE ENGINE. Press the '>' key. When the connection has been established, Smarty shows the current installed software. During the *first* programming, the following screen will appear which indicates a STOCK ECM program is installed:

Present SW: STOCK
Press '>'

Smarty will read the serial number of your vehicle and the serial number of your ECM, then store them into its onboard memory for future reference. From this moment on, Smarty will work only with your vehicle until your vehicle is restored back to the stock settings by Smarty.

Press the '>' key. Smarty will ask you to select one of the CaTCHER software versions to load into the ECM:

Choose CaTCHER
Press a # key

You can choose one of TEN different CaTCHER versions according to the desired performance. Enter the single digit number (from 0 to 9), that corresponds with the software number to be programmed into your ECM. When you have entered the preferred CaTCHER software number, Smarty asks you to confirm the selection before installing the new software into the ECM: (example software #5 has been entered):

Program SW: 5
Press '>'

Press the '<' key to return back one step and enter a different software number.

Press the '>' key to confirm your selection and to begin the updating session. You will see the following screen:

PROGRAMMING
Please wait

After a few seconds, a numeric counter begins with the percentage of the transmitted software. At the end of the download (when 100% is reached) Smarty will update the functional parameters of the ECM. Typical programming time is two minutes. The following screen will appear:

Updating ECM
Please wait

At the end of the updating session, the following screen appears:

```
UPDATE DONE
```

After a few seconds Smarty displays the following screen:

```
Unplug Smarty  
Turn key OFF
```

Please unplug Smarty from the diagnostic port and turn the Key off for 30 seconds. Remember to restore the STOCK software before returning your vehicle to a service center.

Changing Software

Turn on the ignition key to the RUN position. **DO NOT START THE ENGINE.**

Plug Smarty's cable into the diagnostic connector of your vehicle. Smarty will display:

```
#   Smarty   #  
V:1.00A  D:2.00A
```

When the “#” symbols are displayed on the first line, Smarty is VIN# locked to a vehicle. The second line of the display shows the firmware version and the tuning data version. After a few seconds the main menu will appear:

```
1=ECM/ABS Update  
2=Read DTC codes
```

Once Smarty is VIN# Locked, the ABS control system can be accessed in order to correct the wheel height.

Press the ‘1’ key, and Smarty displays the following screen:

```
1=ECM Update  
2=ABS Update
```

Press the ‘1’ key to select *ECM Update*.

Smarty will try to communicate with the ECM. If the connection cannot be established, Smarty asks you to switch off the ignition key:

```
Turn key OFF  
Press '>'
```

Turn the ignition key to “OFF”. Press the ‘>’ key. Smarty will then ask you to turn on the ignition key in order to retry the connection:

```
Turn key ON  
Press '>'
```

Turn the ignition key to the “RUN” position. **DO NOT START THE ENGINE.** Press the ‘>’ key. When the connection has been established, Smarty shows the currently installed software. After the first update, the following screen will appear displaying the CaTCHER software currently installed in the ECM: (See example below for Smarty software #5).

Present SW: 5
Press '>'

Press the '>' key. Smarty asks you to select either CaTCHER Software Versions (see Change CaTCHER Programs below) or the STOCK software:

1=CaTCHER SWs
2=Stock SW

Return to STOCK program.

Press the '2' key. Smarty asks for confirmation to restore the ECM to STOCK software:

Program STOCK SW
Press '>'

Press the '>' key. The ECM is restored to STOCK software and Smarty is unlocked. Smarty can now be used on another vehicle.

Change CaTCHER programs.

Press the '1' key in the above described menu. Smarty asks you to enter the CaTCHER software number (0 to 9) that is to be loaded into the ECM:

Choose CaTCHER
Press a # key

Enter the single digit number (from 0 to 9) that corresponds with the software number to be programmed into your ECM. When you have entered the preferred CaTCHER software number, Smarty asks you to confirm the selection before installing the new software into the ECM: (example software #9 has been entered):

Program SW: 9
Press '>'

Press the '<' key to return back one step and enter a different software number.

Press the '>' key to confirm your selection and to begin the updating session. You will see the following screen:

PROGRAMMING
Please wait

After a few seconds, a numeric counter begins with the percentage of the transmitted software. At the end of transmission (when 100% is reached), Smarty will update the functional parameters of the ECM. Typical programming time is two minutes. The following screen will appear:

Updating ECM
Please wait

At the end of the updating session, the following screen will appear:

UPDATE DONE

After a few seconds Smarty displays the following screen:

Unplug Smarty
Turn key OFF

Please unplug Smarty from the diagnostic port and turn the key of for 30 seconds.

Recovery of the ECM

If an interruption occurs during an Update or the Update operation is terminated before the normal end for any reason the ECM will not be operational. You must recover the ECM using Smarty to resume the update process.

Attention! The engine will not start before the ECM has been recovered properly!
(The Wait to Start Light will flash continuously)

DON'T PANIC!

MADS Electronics has developed a special boot loader software that is used during all the ECM Updates. Unlike the OEM DRBIII tool, there is no need to pull fuses or disconnect the batteries! No tools are needed! At *MADS Electronics* we've done our homework!

Just follow the directions on Smarty's display.

Smarty will handle the situation for you in a few simple steps.

Unplug Smarty, then, plug it in again. After a few seconds the usual main menu will appear.

1=ECM/ABS Update
2=Read DTC codes

Press the '1' key, and Smarty displays the following screen:

1=ECM Update
2=ABS Update

Press the '1' key to select *ECM Update*.

Smarty will try to establish the communication with the ECM. The connection cannot be established because the last updating session has been interrupted. Smarty knows that the last update has not been performed correctly, and will recognise the not operational ECM condition.

Smarty asks you to switch off the ignition key:

Turn key OFF
Press '>'

Turn the ignition key to "OFF". Press the '>' key. Smarty will then ask you then to turn ON the ignition key in order to retry the communication:

Turn key ON
Press '>'

Turn the ignition key to the "RUN" position. **DO NOT START THE ENGINE.** Press the '>' key. The communication cannot start yet. Smarty shows the following message:

A previous update has been interrupted
Press '>' to restore ECM to Stock

The message is longer than the display, so the message will repeatedly scroll across the screen. Press the '>' key. The recovery operation starts. You will see the following message:

PROGRAMMING
Please wait

After a few seconds, a numeric counter with the percentage of the transmitted software will appear. At the end of the transmission (when 100% is reached), Smarty will update the functional parameters of the ECM. The following screen will appear:

Updating ECM
Please wait

At the end of the recovery operation, the following screen appears:

UPDATE DONE

After a few seconds Smarty displays the following screen:

Unplug Smarty
Turn key OFF

Please, unplug Smarty from the diagnostic port and turn the ignition key off for 30 seconds. The job is done. The ECM has been returned to the STOCK software and Smarty is no longer VIN# Locked. You're ready to start from the beginning again.

5. Reading DTC's

Reading Diagnostic Trouble Codes

From the main menu, press the '2' key to select this function.

1=ECM/ABS Update
2=Read DTC codes

Smarty will try to establish communication with the ECM.

If the Key was not turned into the on position Smarty will display this message:

Turn key OFF
Press '>'

Pressing the '>' key, Smarty asks you to turn on the ignition key to retry the connection:

Turn key ON
Press '>'

When the connection has been established, if no DTC codes are present, the following screen appears:

No DTC stored
Press '>'

If one or more DTC's are stored, Smarty shows the number of DTC's present with the following screen:

```
8 DTC present
Press '>'
```

With the keys '<' and '>' all the present DTC codes can be displayed, one code at a time with the following screen:

```
DTC #1 - P0237
MAP sensor volta
```

The first line of display shows the DTC “P” code. The second line shows the DTC code description. If the DTC code description is longer than the physical dimension of the display, the description will scroll across the screen.

Some DTC codes do not have a description. In that case, the message “*See documentat.*” Appears. See appendix B of this manual for a complete listing of the DTC codes.

Clearing DTC codes

At the end of the DTC code list, Smarty can either clear all the stored DTC codes from the ECM memory or exit:

```
1=Clear DTC
2=Exit
```

Press the ‘1’ key, to clear all the DTC codes stored in the ECM.

Press the ‘2’ key, the DTC codes will not be erased and **Smarty will return to the main screen??**.

When the erasing operation has been completed, the following screen appears:

```
DTC Cleared
Press '>'
```

6. ABS Update

Tire height update

Once Smarty is VIN# Locked (i.e. a CaTCHER software has been loaded in the ECM) the speedometer of the vehicle can be adjusted according to the tire height.

From the main menu, shown below, press the ‘1’ key.

```
1=ECM/ABS Update
2=Read DTC codes
```

To change the tire height, choose the ABS update function:

Press the ‘2’ key, in the second menu as shown below:

```
1=ECM Update
2=ABS Update
```

Smarty will try to establish the communication with the ABS.

If the ignition key was not turned to the “RUN” position Smarty will display this message:

```
Turn key OFF
Press '>'
```

Press the '>' key, then Smarty will prompt you to turn on the ignition key to retry the connection:

Turn key ON
Press '>'

When the connection has been established, Smarty shows the current tire height (Curr Tire:) in the top line of the screen:

Curr.Tire:40.00"
New Tire: . "

Type in the correct tire height with the numerical keys, entering a decimal point is not required. Any tire height from 25.00" to 45.00" can be chosen in 0.25" increments. If you enter an increment other than 0.25", Smarty will round it to the next correct increment. The '<' key can be used to change entries.

After you have entered the correct tire height, press the '>' key. Smarty will prompt you for confirmation to proceed:

New Tire:42.25"
Press '>' to start

The '<' key can be used return to the previous screen to change the New Tire size.

Press the '>' key, to start updating the ABS unit with the new tire height.

A typical ABS change will take only a couple of seconds.

When the operation has been successfully completed, the following screen appears:

PROGRAM DONE

The ABS unit does not always change, so Smarty will re-read the tire height from the ABS unit and display the results as shown in the following screen:

Curr.Tire:42.25"
Press '>'

If the ABS unit did not change to the new tire height, Press the '<' key to return to the previous screen, and re-enter the correct tire height.

When the tire height change is completed, press the '>' key. Smarty will display the following screen:

Unplug Smarty
Turn key OFF

Please, unplug Smarty from the diagnostic port and turn the ignition key off for 30 seconds.

Notes: To increase the speedometer reading, increase the tire size.

To decrease the speedometer reading, decrease the tire size.

The ABS accuracy is questionable. Verify the speedometer reading with a GPS or by pacing a vehicle with a speedometer know to be accurate.

7. Updating Smarty

Both the internal firmware and the tuning data information can be updated through USB connector.

Please see *MADS Electronics* internet site (www.madselectronics.com) for more details and software download.

Appendix A: Error messages description

This section contains all the possible error messages shown by Smarty:

| Error message | Cause | Solution |
|------------------------------|---|---|
| CCD ERROR # | The communication with ABS unit doesn't work | Check connection cable or check ABS unit |
| COMM. TIME OUT | The ECM of the vehicle doesn't answer to Smarty | Turn the ignition key on (DO NOT START ENGINE) or Check the connection cable |
| ECM Changed | The ECM unit of the vehicle has been changed | Restore the original ECM back to STOCK before changing ECM |
| Empty Memory, Please Update | The last Update operation (through USB port) has been unsuccessfully completed. Smarty memory has been corrupted. | Repeat the Update operation. The data files are available on the <i>MADS electronics</i> internet site. |
| INTERNAL ERROR # | Smarty internal malfunction | Call MADS Electronics assistance |
| Memory Error | A malfunction in the Smarty's memory | Call MADS Electronics assistance |
| PROGRAM ABORTED | The ECM update function has been interrupted | Restore the ECM to STOCK with the recovery procedure. |
| S/N Verify Error | The serial number of your vehicle has not been verified | Check connection cable |
| SW Version doesn't Match S/N | The ECM software version doesn't match with the serial number | Please contact MADS Electronics or the seller. |
| UNKNOWN SOFTWARE | Your vehicle contains a software version unknown to Smarty | Please contact MADS Electronics or the seller. |
| VIN# Locked | Smarty has been connected to a different vehicle | Restore the original vehicle back to STOCK before connecting Smarty to a new vehicle |
| WRONG COMMUNIC. | The communication between Smarty and the ECM unit is disturbed | Check the connection cable or the battery charge level |
| WRONG VIN# | The serial number of your vehicle is not valid | Wait 30 seconds with the ignition key on and try again |

Appendix B: DTC codes Interpretation

The DTC (Diagnostic Trouble Code) reader function present in Smarty Micro Tuner is for convenience purpose only. Industry standard interpretation tables are supplied below. MADS Electronics makes no warranty to the accuracy of the interpretations.

Regarding DTC Interpretation

SAE Code Sections:

- P00xx Fuel & Air metering, Auxiliary emission controls
- P01xx Fuel & Air metering
- P02xx Fuel & Air metering
- P03xx Ignition & Firing systems
- P04xx Auxiliary emission controls
- P05xx Vehicle speed, Idle control & Auxiliary inputs
- P06xx Computer & Auxiliary outputs
- P07xx Transmission
- P08xx Transmission
- P09xx Transmission

Manufacturer Code Sections:

- P10xx Fuel & Air metering, Auxiliary emission controls
- P11xx Fuel & Air metering
- P12xx Fuel & Air metering
- P13xx Ignition & Firing systems
- P14xx Auxiliary emission controls
- P15xx Vehicle speed, Idle control & Auxiliary inputs
- P16xx Computer & Auxiliary outputs
- P17xx Transmission
- P18xx Transmission
- P19xx Transmission

Many logged codes are transitory, they are automatically reset.

DTC P1000 is an indication that the vehicle needs to be driven for a period so that the vehicle can learn certain operating characteristics and it will reset automatically. This code cannot be cleared externally.

DTC Interpretation listing

| | |
|--|---|
| P0016-CRANKSHAFT / CAMSHAFT TIMING MISALIGNMENT | P0193-FUEL RAIL PRESSURE SENSOR VOLTAGE TOO HIGH |
| P0030-1/1 O2 SENSOR HEATER RELAY MALFUNCTION | P0201-INJECTOR #1 CONTROL CIRCUIT |
| P0036-1/1 O2 SENSOR HEATER RELAY MALFUNCTION | P0202-INJECTOR #2 CONTROL CIRCUIT |
| P0071-AMBIENT AIR TEMPERATURE SENSOR PERFORMANCE | P0203-INJECTOR #3 CONTROL CIRCUIT |
| P0072-AMBIENT AIR TEMPERATURE SENSOR CIRCUIT LOW | P0204-INJECTOR #4 CONTROL CIRCUIT |
| P0088-FUEL RAIL PRESSURE SIGNAL IS ABOVE MAX LIMIT | P0205-INJECTOR #5 CONTROL CIRCUIT |
| P0101-MAF SENSOR PERFORMANCE | P0206-INJECTOR #6 CONTROL CIRCUIT |
| P0102-MAF SENSOR LOW FREQUENCY | P0207-FUEL INJECTOR 7 CIRCUIT |
| P0103-MAF SENSOR HIGH FREQUENCY | P0208-FUEL INJECTOR 8 CIRCUIT |
| P0106-BAROMETRIC PRESSURE OUT OF RANGE | P0209-FUEL INJECTOR 9 CIRCUIT |
| P0107-MAP SENSOR VOLTAGE TOO LOW | P0210-FUEL INJECTOR 10 CIRCUIT |
| P0108-MAP SENSOR VOLTAGE TOO HIGH | P0215-FUEL INJECTOR PUMP CONTROL CIRCUIT |
| P0111-INTAKE AIR TEMP PERFORMANCE | P0216-FUEL INJECTOR PUMP TIMING FAILURE |
| P0112-INTAKE AIR TEMP SENSOR VOLTAGE TOO LOW | P0217-DECREASED ENGINE PERFORMANCE DUE TO ENGINE OVERHEAT CONDITION |
| P0113-INTAKE AIR TEMP SENSOR VOLTAGE TOO HIGH | P0219-CRANKSHAFT POSITION SENSOR OVER SPEED SIGNAL |
| P0116-ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT PERFORMANCE | P0220-APP SENSOR 2 CIRCUIT |
| P0117-ENGINE COOLANT TEMPERATURE (ECT) SENSOR VOLTAGE TOO LOW | P0221-APP SENSOR 2 PERFORMANCE |
| P0118-ENGINE COOLANT TEMPERATURE (ECT) SENSOR VOLTAGE TOO HIGH | P0222-APP SENSOR 2 CIRCUIT LOW |
| P0121-TP SENSOR VOLTAGE DOES NOT AGREE WITH MAP | P0222-IDLE VALIDATION SIGNALS BOTH LOW |
| P0122-THROTTLE POSITION SENSOR VOLTAGE TOO LOW | P0223-INJECTION PULSE WIDTH ERROR (RISE TIME LONG) |
| P0123-THROTTLE POSITION SENSOR VOLTAGE TOO HIGH | P0223-IDLE VALIDATION SIGNALS BOTH HIGH (ABOVE 5V) |
| P0125-INSUFFICIENT COOLANT TEMP FOR CLOSED-LOOP FUEL CONTROL | P0225-APP SENSOR 3 CIRCUIT |
| P0128-THERMOSTAT RATIONALITY | P0226-APP SENSOR 3 CIRCUIT PERFORMANCE |
| P0130-1/1 O2 SENSOR HEATER RELAY MALFUNCTION | P0227-APP SENSOR 2 CIRCUIT LOW VOLTAGE |
| P0131-O2 SENSOR 1/1 CIRCUIT VOLTAGE TOO LOW | P0228-APP SENSOR 2 CIRCUIT HIGH VOLTAGE |
| P0132-O2 SENSOR 1/1 CIRCUIT VOLTAGE TOO HIGH | P0230-TRANSFER PUMP (LIFT PUMP) CIRCUIT OUT OF RANGE |
| P0133-O2 SENSOR 1/1 SLOW RESPONSE | P0231-FUEL PUMP FEEDBACK CIRCUIT LOW VOLTAGE |
| P0134-O2 SENSOR 1/1 STAYS AT CENTER | P0232-FUEL SHUT-OFF SIGNAL VOLTAGE TOO HIGH |
| P0135-O2 SENSOR 1/1 HEATER PERFORMANCE | P0234-TURBOCHARGER OVERBOOST CONDITION |
| P0136-O2 SENSOR 1/2 HEATER CIRCUIT MALFUNCTION | P0236-MAP SENSOR TOO HIGH TOO LONG |
| P0137-O2 SENSOR 1/2 CIRCUIT LOW | P0237-MAP SENSOR VOLTAGE TOO LOW |
| P0138-O2 SENSOR 1/2 CIRCUIT HIGH | P0238-MAP SENSOR VOLTAGE TOO HIGH |
| P0139-O2 SENSOR 1/2 SLOW RESPONSE | P0243-OPEN OR SHORTED CONDITION DETECTED IN THE TURBOCHARGER WASTEGATE SOLENOID CONTROL |
| P0140-O2 SENSOR 1/2 STAYS AT CENTER | P0251-FUEL INJECTION PUMP FUEL VALVE FEEDBACK CIRCUIT |
| P0141-O2 SENSOR 1/2 RELAY | P0252-FUEL INJECTION PUMP FUEL VALVE STUCK |
| P0143-O2 SENSOR 1/3 SHORTED TO GROUND | P0253-FUEL INJECTION PUMP FUEL VALVE OPEN CIRCUIT |
| P0144-O2 SENSOR 1/3 SHORTED TO VOLTAGE | P0254-FUEL INJECTION PUMP FUEL VALVE CURRENT TOO HIGH |
| P0145-O2 SENSOR 1/3 SLOW RESPONSE | P0263-CYLINDER 1 BALANCE SYSTEM |
| P0146-O2 SENSOR 1/3 STAYS AT CENTER | P0266-CYLINDER 2 BALANCE SYSTEM |
| P0147-O2 SENSOR 1/3 HEATER FAILURE | P0269-CYLINDER 3 BALANCE SYSTEM |
| P0148-FUEL DELIVERY ERROR | P0272-CYLINDER 4 BALANCE SYSTEM |
| P0151-O2 SENSOR 2/1 CIRCUIT LOW | P0275-CYLINDER 5 BALANCE SYSTEM |
| P0152-O2 SENSOR 2/1 CIRCUIT HIGH | P0278-CYLINDER 6 BALANCE SYSTEM |
| P0153-O2 SENSOR 2/1 SLOW RESPONSE | P0281-CYLINDER 7 BALANCE SYSTEM |
| P0154-O2 SENSOR 2/1 STAYS AT CENTER | P0284-CYLINDER 8 BALANCE SYSTEM |
| P0155-O2 SENSOR 2/1 HEATER PERFORMANCE | P0300-MULTIPLE CYLINDER MISFIRE |
| P0157-O2 SENSOR 2/2 CIRCUIT VOLTAGE TOO LOW | P0301-CYLINDER # 1 MISFIRE |
| P0158-O2 SENSOR 2/2 CIRCUIT VOLTAGE TOO HIGH | P0302-CYLINDER # 2 MISFIRE |
| P0159-O2 SENSOR 2/2 SLOW RESPONSE | P0303-CYLINDER # 3 MISFIRE |
| P0160-O2 SENSOR 2/2 STAYS AT CENTER | P0304-CYLINDER # 4 MISFIRE |
| P0161-O2 SENSOR 2/2 HEATER PERFORMANCE | P0305-CYLINDER # 5 MISFIRE |
| P0168-DECREASED ENGINE PERFORMANCE DUE TO HIGH INJECTION PUMP FUEL TEMPERATURE | P0306-CYLINDER # 6 MISFIRE |
| P0169-WATER IN FUEL (WIF) LIGHT ON TOO LONG | P0307-CYLINDER #7 MISFIRE |
| P0171-FUEL SYSTEM 1/1 LEAN | P0308-CYLINDER #8 MISFIRE |
| P0172-FUEL SYSTEM 1/1 RICH | P0309-CYLINDER #9 MISFIRE |
| P0174-FUEL SYSTEM 2/1 LEAN | P0310-CYLINDER #10 MISFIRE |
| P0175-FUEL SYSTEM 2/1 RICH | P0320-NO CRANK REFERENCE SIGNAL AT PCM |
| P0176-LOSS OF FLEX FUEL CALIBRATION SIGNAL | P0325-KNOCK SENSOR 1 CIRCUIT . |
| P0177-WATER IN FUEL | P0327-KNOCK SENSOR NOISE CHANNEL LOW VOLTAGE |
| P0178-WATER IN FUEL SENSOR VOLTAGE TOO LOW | P0330-KNOCK SENSOR 2 CIRCUIT |
| P0178-FLEX FUEL SENSOR VOLTAGE TOO LOW | P0335-CRANKSHAFT POSITION SENSOR CIRCUIT |
| P0180-CNG TEMP SENSOR VOLTAGE FAIL | P0336-CRANKSHAFT POSITION (CKP) SENSOR SIGNAL |
| P0181-FUEL PUMP INJECTION PUMP FAILURE | P0337-CRANKSHAFT POSITION (CKP) SENSOR VOLTAGE TOO LOW |
| P0182-CNG TEMP SENSOR VOLTAGE TOO LOW | P0338-CRANKSHAFT POSITION (CKP) SENSOR VOLTAGE TOO HIGH |
| P0183-CNG TEMP SENSOR VOLTAGE TOO HIGH | |
| P0192-FUEL RAIL PRESSURE SENSOR VOLTAGE TOO LOW | |

P0339-CRANKSHAFT POSITION SENSOR INTERMITTENT
 P0340-CAMSHAFT POSITION (CMP) LOST
 P0341-CAMSHAFT POSITION (CMP) SENSOR SIGNAL
 P0342-ESS VOLTAGE SUPPLY LOW
 P0343-ESS VOLTAGE SUPPLY HIGH
 P0350-IGNITION COIL DRAWN TOO MUCH CURRENT
 P0351-IGNITION COIL #1 PRIMARY CIRCUIT
 P0352-IGNITION COIL #2 PRIMARY CIRCUIT
 P0353-IGNITION COIL #3 PRIMARY CIRCUIT
 P0354-IGNITION COIL #4 PRIMARY CIRCUIT
 P0355-IGNITION COIL #5 PRIMARY CIRCUIT
 P0356-IGNITION COIL #6 PRIMARY CIRCUIT
 P0357-IGNITION COIL #7 PRIMARY CIRCUIT
 P0358-IGNITION COIL #8 PRIMARY CIRCUIT
 P0370-FUEL INJECTION PUMP SPEED/POSITION SENSOR
 SIGNAL LOST
 P0380-INTAKE AIR HEATER RELAY NO.1 CONTROL CIRCUIT
 P0380-GLOW PLUG CIRCUIT PERFORMANCE
 P0381-WAIT TO START LAMP INOPERATIVE
 P0382-INTAKE AIR HEATER RELAY NO.2 CONTROL CIRCUIT
 P0387-CKP SENSOR SUPPLY VOLTAGE TOO LOW
 P0388-CKP SENSOR SUPPLY VOLTAGE TOO HIGH
 P0400-EXHAUST GAS RECIRCULATION (EGR) FLOW
 MALFUNCTION
 P0401-EGR SYSTEM PERFORMANCE
 P0403-EGR SOLENOID CIRCUIT
 P0404-EGR POSITION SENSOR RATIONALITY OPEN
 P0405-EGR POSITION SENSOR CIRCUIT LOW
 P0406-EGR POSITION SENSOR CIRCUIT HIGH
 P0410-AIR SYSTEM
 P0412-SECONDARY AIR SOLENOID CIRCUIT
 P0420-1/1 CATALYTIC CONVERTER EFFICIENCY
 P0430-1/2 CATALYTIC CONVERTER EFFICIENCY
 P0432-1/2 CATALYTIC CONVERTER EFFICIENCY
 P0440-GENERAL EVAP SYSTEM FAILURE
 P0441-EVAP PURGE FLOW MONITOR
 P0442-EVAP LEAK MONITOR MEDIUM (0.040) LEAK DETECTED
 P0443-EVAP PURGE SOLENOID CIRCUIT
 P0446-EVAP EMISSION VENT VALVE PERFORMANCE
 P0452-EVAP EMISSION PRESSURE SENSOR CIRCUIT LOW
 VOLTAGE
 P0453- EVAP EMISSION PRESSURE SENSOR CIRCUIT HIGH
 VOLTAGE
 P0455-EVAP LEAK MONITOR LARGE LEAK DETECTED
 P0456-EVAP LEAK MONITOR SMALL (0.020) LEAK DETECTED
 P0460-FUEL LEVEL SENDING UNIT NO CHANGE OVER MILES
 P0461-FUEL LEVEL UNIT NO CHANGE OVER TIME
 P0462-FUEL LEVEL SENDING UNIT VOLTS TOO LOW
 P0463-HIGH VOLTAGE DETECTED AT THE FUEL LEVEL
 SENSOR
 P0475-EPR SOLENOID CIRCUIT
 P0477-EXHAUST PRESSURE CONTROL RELAY LOW
 P0478- EXHAUST PRESSURE CONTROL RELAY HIGH
 P0480-COOLING FAN 1 CONTROL CIRCUIT OPEN (LOW SPEED
 FAN)
 P0483-FAN SPEED
 P0500-NO VEHICLE SPEED SENSOR SIGNAL
 P0501-VEHICLE SPEED SENSOR PERFORMANCE
 P0505-IDLE AIR CONTROL MOTOR CIRCUITS
 P0506-IDLE SPEED PERFORMANCE LOWER THAN EXPECTED
 P0507-IDLE SPEED PERFORMANCE HIGHER THAN EXPECTED
 P0508-UNDERCURRENT CONDITION DETECTED IN LINEAR
 IDLE AIR CONTROL MOTOR FEEDBACK SENSE CIRCUIT
 P0509-OVER CURRENT CONDITION DETECTED IN LINEAR
 IDLE AIR CONTROL MOTOR FEEDBACK SENSE CIRCUIT
 P0514-BAT TEMPERATURE SENSOR RATIONALITY
 P0516-BATTERY TEMPERATURE SENSOR CIRCUIT LOW
 P0517-BATTERY TEMPERATURE SENSOR CIRCUIT HIGH
 P0520-ENGINE OIL PRESSURE SENSOR CIRCUIT
 P0521-ENGINE OIL PRESSURE SENSOR PERFORMANCE
 P0522-OIL PRESSURE CIRCUIT LOW
 P0523-OIL PRESSURE CIRCUIT HIGH
 P0524-OIL PRESSURE TOO LOW
 P0532-A/C PRESSURE SENSOR CIRCUIT LOW
 P0533-A/C PRESSURE SENSOR CIRCUIT HIGH
 P0541-LOW VOLTAGE ON THE #1 INTAKE AIR HEATER RELAY
 P0542-HIGH VOLTAGE ON THE #1 INTAKE AIR HEATER RELAY
 P0545-A/C CLUTCH RELAY CIRCUIT
 P0551-POWER STEERING PRESSURE SWITCH FAILURE
 P0560-SYSTEM VOLTAGE
 P0562-CHARGING SYSTEM VOLTAGE TOO LOW
 P0563- CHARGING SYSTEM VOLTAGE TOO LOW
 P0567-CRUISE RESUME CIRCUIT
 P0568-CRUISE SET CIRCUIT
 P0571-CRUISE BRAKE SWITCH 1 PERFORMANCE
 P0572-BRAKE SWITCH 1 LOW
 P0573-BRAKE SWITCH 1 HIGH
 P0575-CRUISE SWITCH FAILURE (SHORTED)
 P0577-CRUISE SWITCH FAILURE (OPEN)
 P0579-SPEED CONTROL SWITCH 1 PERFORMANCE (5.7L)
 P0580-LOW VOLTAGE DETECTED AT THE SPEED CONTROL
 MULTIPLEXED SWITCH
 P0581-HIGH VOLTAGE DETECTED AT THE SPEED CONTROL
 MULTIPLEXED SWITCH
 P0600-PCM FAILURE SERIAL COMMUNICATION LINK
 P0601-PCM INTERNAL CONTROLLER FAILURE
 P0602-ECM FUELING CALIBRATION ERROR
 P0603-VCM MEMORY RESET
 P0604-ECM RAM CHECK FAILURE
 P0605-ECM ROM CHECK FAILURE
 P0606-ECM HARDWARE ERROR
 P0607-ECU INTERNAL FAILURE
 P0615-STARTER RELAY CONTROL CIRCUIT
 P0621-GENERATOR L TERMINAL CIRCUIT
 P0622-GENERATOR FIELD NOT SWITCHING PROPERLY
 P0628-FUEL PUMP RELAY CIRCUIT LOW
 P0628-LOW VOLTAGE DETECTED AT THE FUEL LIFT PUMP
 P0629-FUEL PUMP RELAY CIRCUIT HIGH
 P0629-HIGH VOLTAGE DETECTED AT THE FUEL LIFT PUMP
 P0630-VIN NOT PROGRAMMED IN PCM
 P0633-SKIM KEY NOT PROGRAMMED IN PCM
 P0642-SENSOR REFERENCE VOLTAGE 1 CIRCUIT LOW
 P0643- SENSOR REFERENCE VOLTAGE 1 CIRCUIT HIGH
 P0645-A/C CLUTCH CONTROL CIRCUIT
 P0646-LOW VOLTAGE DETECTED AT THE A/C CLUTCH RELAY
 P0647-HIGH VOLTAGE DETECTED AT THE A/C CLUTCH RELAY
 P0650-MALFUNCTION INDICATOR LAMP (MIL) CIRCUIT
 P0652-SENSOR REFERENCE VOLTAGE 2 CIRCUIT LOW
 P0653-SENSOR REFERENCE VOLTAGE 2 CIRCUIT HIGH
 P0654-ENGINE SPEED OUTPUT CIRCUIT
 P0698-SENSOR REF VOLTAGE 3 CIRCUIT LOW
 P0699- SENSOR REF VOLTAGE 3 CIRCUIT HIGH
 P0700-EATX CONTROLLER DTC PRESENT
 P0703-BRAKE SWITCH PERFORMANCE
 P0704-CLUTCH SWITCH CIRCUIT (M/T)
 P0711-TRANS TEMP SENSOR, NO TEMP RISE AFTER START
 P0712-TRANS TEMP SENSOR TOO LOW
 P0713-TRANS TEMP SENSOR TOO HIGH
 P0720-LOW OUTPUT SPEED SENSOR RPM, ABOVE 15MPH
 P0740-TORQUE CONVERTER CLUTCH, NO RPM DROP AT
 LOCKUP
 P0743-TORQUE CONVERTER CLUTCH SOLENOID/TRANS
 RELAY CIRCUIT
 P0748-GOVERNOR PRESSURE SOL CONTROL/TRANS RELAY
 CIRCUIT
 P0751-O/D SWITCH PRESSED (LOW) MORE THAN 5 MINUTES
 P0753-TRANS 3-4 SHIFT SOL/TRANS RELAY CIRCUIT
 P0756-AW4 SHIFT SOL B (2-3) FUNCTIONAL FAILURE
 P0783-(3-4) SHIFT SOL, NO RPM DROP AT LOCKUP
 P0801-REVERSE GEAR LOCKOUT CIRCUIT OPEN OR
 SHORTED
 P0830-CLUTCH DEPRESSED SWITCH CIRCUIT
 P0833-CLUTCH RELEASED SWITCH CIRCUIT
 P0837-4WD SWITCH PERFORMANCE
 P0838-4WD SWITCH CIRCUIT LOW
 P0839-4WD SWITCH CIRCUIT HIGH

P1000-IGNITION CIRCUIT LOW
P1001-IGNITION CIRCUIT HIGH
P1004-ECU BATTERY FEED & POWER GROUNDS
P1005-SYSTEM GROUND CIRCUIT
P1006-EGR/EVAP SOLENOID CIRCUIT LOW
P1007-EGR/EVAP SOLENOID CIRCUIT HIGH
P1008-POWER STEERING CIRCUIT LOW
P1009-POWER STEERING CIRCUIT HIGH
P1012-MPA CIRCUIT LOW
P1013-MPA CIRCUIT HIGH
P1014-FUEL PUMP CIRCUIT LOW
P1015-FUEL PUMP CIRCUIT HIGH
P1016-CHARGE AIR TEMPERATURE CIRCUIT LOW
P1017-CHARGE AIR TEMPERATURE CIRCUIT HIGH
P1018-SERIAL DATA CIRCUIT
P1019-POWER LATCH NOT SET
P1021-ENGINE FAILED TO START DUE TO MECHANICAL, FUEL OR IGNITION CONDITIONS
P1022-STARTER RELAY CIRCUIT LOW
P1024-ECU START CIRCUIT LOW
P1025-WOT CIRCUIT LOW
P1026-WOT CIRCUIT HIGH
P1027-ECU SEES WIDE OPEN THROTTLE
P1028-ECU DOES NOT SEE WIDE OPEN THROTTLE
P1029-ISA CLOSED THROTTLE CIRCUIT LOW
P1030-ISA CLOSED THROTTLE CIRCUIT HIGH
P1031-ECU SEES CLOSED THROTTLE
P1032-ECU DOES NOT SEES CLOSED THROTTLE
P1033-.36-ISA CIRCUIT
P1037-TP SENSOR CIRCUIT READS LOW
P1038-PARK/NEUTRAL LINE HIGH
P1039- PARK/NEUTRAL LINE LOW
P1040-LATCHED B+ LINE LOW
P1041-LATCHED B+ LINE HIGH
P1042-NO LATCHED B+ ½ VOLT DROP
P1043-SHIFT LAMP CIRCUIT GROUNDED
P1044-D2-1 CIRCUIT LOW (A/T)
P1044-UPSHIFT LAMP CIRCUIT (M/T)
P1044-SHIFT LAMP CIRCUIT HIGH
P1045-SHIFT LAMP CIRCUIT OPEN
P1047-WRONG ECU
P1048-M/T VEHICLE CONFIGURATION
P1049-A/T VEHICLE CONFIGURATION
P1050-IDLE RPM LOW
P1051-IDLE RPM HIGH
P1052-MAP SENSOR OUT OF LIMITS
P1053-CHANGE IN MAP READING OUT OF LIMITS
P1054-COOLANT SENSOR & 5V SUPPLY FOR TP SENSOR / MAP CIRCUIT LOW
P1055-COOLANT SENSOR CIRCUIT HIGH
P1065-INACTIVE COOLANT TEMPERATURE SENSOR
P1059-A/C REQUEST CIRCUIT LOW
P1060-A/C REQUEST CIRCUIT HIGH
P1061-A/C SELECT CIRCUIT LOW
P1062-A/C SELECT CIRCUIT HIGH
P1063-A/C CLUTCH CIRCUIT LOW
P1064-A/C CLUTCH CIRCUIT HIGH & POWER STEERING INPUT
P1065-RICH OXYGEN SENSOR INPUT
P1066-LEAN OXYGEN SENSOR INPUT
P1067-LATCH RELAY CIRCUIT LOW
P1068-LATCH RELAY CIRCUIT HIGH
P1069-NO TACH
P1074-ECU DOES NOT SEE SPEED SENSOR
P1106-MAP SENSOR CIRCUIT INTERMITTENT HIGH VOLTAGE
P1107-MAP SENSOR CIRCUIT INTERMITTENT LOW VOLTAGE
P1110-DECREASED ENGINE PERFORMANCE DUE TO HIGH INTAKE AIR TEMPERATURE
P1111-IAT SENSOR CIRCUIT INTERMITTENT HIGH VOLTAGE
P1111-IAT SENSOR CIRCUIT INTERMITTENT LOW VOLTAGE
P1114-ECT SENSOR CIRCUIT INTERMITTENT LOW VOLTAGE
P1115-ECT SENSOR CIRCUIT INTERMITTENT HIGH VOLTAGE
P1121-TPS CIRCUIT INTERMITTENT HIGH VOLTAGE
P1122-TPS CIRCUIT INTERMITTENT HIGH VOLTAGE
P1125-ACCELERATOR PEDAL POSITION SYSTEM
P1133-HO2S INSUFFICIENT SWITCHING BANK 1 SENSOR 1
P1134-HO2S INSUFFICIENT TRANSITION TIME RATIO BANK 1 SENSOR 1
P1153-HO2S INSUFFICIENT SWITCHING BANK 2 SENSOR 1
P1154-HO2S INSUFFICIENT TRANSITION TIME RATIO BANK 2 SENSOR 1
P1180-DECREASED ENGINE PERFORMANCE DUE TO HIGH INJECTION PUMP FUEL TEMPERATURE
P1191-INTAKE AIR DUCT LEAK
P1192-INLET AIR TEMP SENSOR VOLTAGE LOW
P1193-INLET AIR TEMP SENSOR VOLTAGE HIGH
P1194-O2 HEATER PERFORMANCE
P1195-O2 SENSOR 1/1 SLOW DURING CATALYST MONITOR
P1196-O2 SENSOR 2/1 SLOW DURING CATALYST MONITOR
P1197- O2 SENSOR 1/2 SLOW DURING CATALYST MONITOR
P1198-RADIATOR TEMPERATURE SENSOR VOLTS TOO HIGH
P1198-RADIATOR TEMPERATURE SENSOR VOLTS TOO LOW
P1214-INJECTION PUMP TIMING OFFSET
P1216-FUEL SOLENOID RESPONSE TIME TOO SHORT
P1217-FUEL SOLENOID RESPONSE TIME TOO LONG
P1218-INJECTION PUMP CALIBRATION CIRCUIT
P1271-ACCELERATOR PEDAL POSITION SENSOR 1-2 CORRELATION
P1272- ACCELERATOR PEDAL POSITION SENSOR 2-3 CORRELATION
P1273- ACCELERATOR PEDAL POSITION SENSOR 1-3 CORRELATION
P1275-ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT
P1277-ACCELERATOR PEDAL POSITION SENSOR 1 LOW VOLTAGE
P1278-ACCELERATOR PEDAL POSITION SENSOR 1 HIGH VOLTAGE
P1280-ACCELATOR PEDAL POSITION SENSOR 2 CIRCUIT
P1281-ENGINE IS COLD TOO LONG
P1282-FUEL PUMP/SYSTEM RELAY CONTROL CIRCUIT
P1282-ACCELERATOR PEDAL POSITION SENSOR 2 LOW VOLTAGE
P1283-IDLE SELECT SIGNAL INVALID
P1283-ACCELERATOR PEDAL POSITION SENSOR 2 HIGH VOLTAGE
P1284-FUEL INJECTION PUMP BATTERY VOLTAGE OUT OF RANGE
P1285-FUEL INJECTION PUMP CONTROLLER ALWAYS ON
P1285-ACCELERATOR PEDAL POSITION SENSOR 3 CIRCUIT
P1286-ACCELERATOR POSITION SENSOR SUPPLY VOLTAGE TOO HIGH
P1287-FUEL INJECTION PUMP CONTROL SUPPLY VOLTAGE LOW
P1287-ACCELERATOR PEDAL POSITION SENSOR 3 LOW VOLTAGE
P1288-INTAKE MANIFOLD SHORT RUNNER SOLENOID CIRCUIT
P1288-ACCELERATOR PEDAL POSITION SENSOR 3 LOW VOLTAGE
P1289-MANIFOLD TUNE VALVE SOLENOID CIRCUIT
P1290-CNG FUEL SYSTEM PRESSURE TOO HIGH
P1291-NO TEMP RISE SEEN FROM INTAKE HEATERS
P1292-CNG PRESSURE SENSOR VOLTAGE TOO HIGH
P1293-CNG PRESSURE SENSOR VOLTAGE TOO LOW
P1294-TARGET IDLE NOT REACHED
P1295-NO 5-VOLTS TO THROTTLE POSITION SENSOR
P1296-NO 5-VOLTS TO MAP SENSOR
P1297-NO CHANGE IN MAP FROM START TO RUN
P1298-LEAN OPERATION AT WIDE OPEN THROTTLE
P1299-VACUUM LEAK FOUND (IAC FULLY SEATED)
P1336-CRANKSHAFT POSITION SYSTEM VARIATION NOT LEARNED
P1345-CRANKSHAFT POSITION/CAMSHAFT POSITION CORRELATION
P1351-IGNITION CONTROL CIRCUIT HIGH VOLTAGE
P1361-IGNITION CONTROL CIRCUIT LOW VOLTAGE

P1380-ELECTRONIC BRAKE CONTROL ROUGH ROAD DATA UNUSABLE
P1381-MISFIRE DETECTED-NO ELECTRONIC BRAKE CONTROL DATA
P1388-AUTO SHUTDOWN RELAY CONTROL CIRCUIT
P1389-NO ASD RELAY OUTPUT VOLTAGE AT PCM
P1390-TIMING BELT SKIPPED 1 TOOTH OR MORE
P1391-INTERMITTENT LOSS OF CMP OR CKP
P1398-MIS-FIRE ADAPTIVE NUMERATOR AT LIMIT
P1399-WAIT TO START LAMP CIRCUIT
P1403-NO 5 VOLTS TO EGR SENSOR
P1404-EGR VALVE CLOSED PINTLE POSITION
P1406-EGR VALVE POSITION
P1409-EGR VALVE SYSTEM LEAK
P1415-AIR SYSTEM BANK 1
P1416-AIR SYSTEM BANK 1
P1441-EVAP EMISSION FLOW DURING NON-PURGE
P1475-AUXILIARY 5 VOLT SUPPLY VOLTAGE HIGH
P1476-TOO LITTLE SECONDARY AIR
P1477-TOO MUCH SECONDARY AIR
P1478-BATTERY TEMP SENSOR VOLTS OUT OF LIMITS
P1479-TRANSMISSION FAN RELAY CIRCUIT
P1480-PCV SOLENOID CIRCUIT
P1481-EATX MISFIRE RPM SIGNAL OUT OF RANGE
P1482-CATALYST TEMPERATURE SENSOR CIRCUIT SHORTED LOW
P1483-CATALYST TEMPERATURE SENSOR CIRCUIT SHORTED HIGH
P1484-CATALYTIC CONVERTER OVERHEAT DETECTION
P1485-AIR INJECTION SOLENOID CIRCUIT
P1486-EVAP LEAK MONITOR PINCHED HOSE FOUND
P1487-HIGH SPEED RADIATION FAN CTRL RELAY CIRCUIT
P1488-AUXILIARY 5 VOLT SUPPLY OUTPUT TOO LOW
P1489-HIGH SPEED FAN CTRL RELAY CIRCUIT
P1490-LOW SPEED FAN CTRL RELAY CIRCUIT
P1491-RADIATOR FAN CONTROL RELAY CIRCUIT
P1492-AMBIENT/BATTERY TEMPERATURE SENSOR VOLTAGE TOO HIGH
P1493-AMBIENT/BATTERY TEMPERATURE SENSOR VOLTAGE TOO LOW
P1494-LEAK DETECTION PUMP SWITCH OR MECHANICAL FAULT
P1495-LEAK DETECTION PUMP SOLENOID CIRCUIT
P1496-5 VOLT SUPPLY, OUTPUT TOO LOW
P1498-HIGH SPEED RADIATOR FAN GROUND DTRL RELAY CIRCUIT
P1508-IAC SYSTEM LOW RPM
P1509-IAC SYSTEM HIGH RPM
P1594-CHARGING SYSTEM VOLTAGE TOO HIGH
P1595-SPEED CONTROL SOLENOID CIRCUIT
P1596-SPEED CONTROL SWITCH ALWAYS HIGH
P1597-SPEED CONTROL SWITCH ALWAYS LOW
P1598-A/C PRESSURE SENSOR VOLTAGE TOO HIGH
P1599-A/C PRESSURE SENSOR VOLTAGE TOO LOW
P1602-PCM NOT PROGRAMMED
P1621-PCM MEMORY PERFORMANCE OR WRITE
P1626-VEHICLE THEFT SYSTEM CONTROL LOSS OF DATA
P1627-A/D PERFORMANCE
P1630-VEHICLE THEFT SYSTEM PCM IN LEARNING MODE
P1631-VEHICLE THEFT SYSTEM IMPROPER PASSWORD
P1635-5 VOLT REFERENCE (A) CIRCUIT
P1639-5 VOLT REFERENCE (B) CIRCUIT
P1641-MIL CONTROL CIRCUIT
P1643-WAIT TO START LAMP CONTROL CIRCUIT
P1646-5 VOLT REFERENCE (C) CIRCUIT
P1652-J1850 SHORT TO GROUND
P1653-EGR VENT SOLENOID CONTROL CIRCUIT
P1654-SERVICE THROTTLE SOON LAMP CONTROL CIRCUIT
P1655-EGR SOLENOID CONTROL CIRCUIT
P1656-WASTEGATE SOLENOID CONTROL CIRCUIT
P1680-CLUTCH RELEASED SWITCH CIRCUIT
P1681-NO I/P CLUSTER CCD/J1850 MESSAGES RECEIVED
P1682-CHARGING SYSTEM VOLTAGE TOO LOW
P1683-SPEED CONTROL POWER RELAY
P1683-S/C 12V DRIVER CKT
P1684-BATTERY DISCONNECTED IN THE LAST 50 STARTS
P1685-SKIM INVALID KEY
P1686-NO SKIM BUS MESSAGES RECEIVED
P1687-NO CLUSTER BUS MESSAGE
P1688-INTERNAL FUEL INJECTION PUMP CONTROLLER FAILURE
P1689-NO COMM BETWEEN ECM & INJECTION PUMP MODULE
P1690-CKP SENSOR DOES NOT AGREE WITH ECM CKP SENSOR
P1691-FUEL SYSTEM ESS RPM ERROR
P1692-DTC SET IN ECM
P1693-DTC CLEARED IN COMPANION JTEC MODULE
P1694-NO BUS MESSAGES RECEIVED FROM ECM MODULE
P1695-NO CCD/J1850 MESSAGE FROM BODY CONTROL MODULE
P1696-PCM FAILURE EEPROM WRITE DENIED
P1697-EMR (SRI) MILEAGE NOT STORED
P1698-NO CCD/J1850 MESSAGE FROM TCM/PCM
P1719-SKIP SHIFT SOLENOID CIRCUIT
P1740-TCC OR O/D SOLENOID PERFORMANCE
P1756-GOV PRESS NOT EQUAL TO TARGET @ NOT 12-20 PSI
P1757-GOV PRESS ABOVE 3 PSI IN GEAR WITH 0 MPH
P1762-GOV PRESS SENSOR OFFSET VOLTS TOO LOW OR HIGH
P1763-GOV PRESS SENSOR VOLTS TOO HIGH
P1764-GOV PRESS SENSOR VOLTS TOO LOW
P1765-TRANS 12V SUPPLY RELAY CTRL CIRCUIT
P1899-P/N SWITCH STUCK IN PARK OR IN GEAR
P2121-PEDAL POSITION SENSOR 1 CONFORMANCE ERROR
P2122-PEDAL POSITION SENSOR 1 VOLTAGE TOO LOW
P2123-PEDAL POSITION SENSOR 1 VOLTAGE TOO HIGH
P2127-PEDAL POSITION VALIDATION SWITCH 2 LOW
P2128-PEDAL POSITION VALIDATION SWITCH 2 LOW
P2146-FUEL INJECTOR GROUP 1 SUPPLY VOLTAGE CIRCUIT
P2147-FUEL INJECTOR GROUP 1 SUPPLY VOLTAGE LOW
P2148-FUEL INJECTOR GROUP 1 SUPPLY VOLTAGE HIGH
P2149-FUEL INJECTOR GROUP 2 SUPPLY VOLTAGE CIRCUIT
P2150-FUEL INJECTOR GROUP 2 SUPPLY VOLTAGE LOW
P2151-FUEL INJECTOR GROUP 2 SUPPLY VOLTAGE HIGH
P2266-WATER IN FUEL (WIF) SENSOR VOLTAGE TOO LOW
P2269-WATER IN FUEL (WIF)
P2502-CHARGING SYSTEM ERROR
P2503-CHARGING SYSTEM OUTPUT LOW
P2504-CHARGING SYSTEM OUTPUT HIGH
P2509-ECM/PCM POWER INPUT SIGNAL INTERMITTENT
P2607-LOW VOLTAGE AT THE #2 INTAKE AIR HEATER RELAY
P2608-HIGH VOLTAGE AT THE #2 INTAKE AIR HEATER RELAY
P2609-NO VOLTAGE DROP SEEN FROM INTAKE AIR HEATER

Warranty

How Do You Get Service?

If something goes wrong with your Product during the warranty period, use the following procedure to return the Product to *MAD Electronics*.

1. Restore the STOCK software to your vehicle ECM. DO NOT RETURN A VIN # LOCKED SMARTY.
2. Download and fill out the Assistance Request Module available from *MADS Electronics* internet site or send an e-mail to *MADS Electronics* (e-mail information is available from *MADS Electronics* internet site) Include the following:
 - Information from your sales receipt (electronic copy would be appreciated). The sales receipt must be from the location where you purchased your Product and must include the name of the business where you purchased the Product and the address of the business.
 - Serial number of the product
 - A brief written description of the problem
 - Your *address and other personal information to contact you*
3. *Contact MADS Electronics* distributors for immediate assistance