



BD X-TUNER POWER PROGRAMMER

2003-06 Dodge Cummins 5.9L Installation Instructions

BD P/N#	Application	Year
1054750	Dodge 5.9L Cummins (All except 325hp 600 Series)	2003-04½
1054755	Dodge 5.9L Cummins (All but 6 speed)	2004½-05
1054756	Dodge 5.9L Cummins (6 Speed)	2005
1054757	Dodge 5.9L Cummins (All)	2006

***** DO NOT USE The 1054750 on the 325HP 600 Series Motor. Do verify which motor you have, look on the driver's side valve cover.**

BD Engine Brake Inc
 A10 – 33733 King Rd, Abbotsford, BC, Canada V2S 7M9
 Ship: #88 – 446 Harrison St, Sumas, WA 98295 Mail: PO Box 231, Sumas, WA 98295
 Ph: 604.853.6096 Fax: 604.853.8749 Internet: www.bd-power.com

TABLE OF CONTENTS

Power Settings Chart.....	3
Package Contents.....	3
Pre-Installation	4
Keypad Layout	4
Installation	5
Main Screen.....	6
Download Function	6
DTC Function (Diagnostic Trouble Code)	8
PTO (Power Take Off) Function	8
Returning To Stock.....	9
Recovery Mode	10
Updating Your X-Tuner.....	11
Downloading the X-Tuner Update.....	12
Running the Update Program	14
Questions/Technical Support.....	15
DTC Reference Listing	16
LIMITED WARRANTY STATEMENT.....	23

Power Settings Chart

Power Level	Approx. HP Gain	Recommended Use
STOCK	N/A	Select this option to return your truck to stock after having a previous download.
TOW	50-70hp	This option is a towing specific program. Use this program to add a sizeable increase in power to get your loaded truck up those hills effortlessly. Use of a pyrometer and boost gauge is recommended.
PERFORMANCE	90	Add a huge amount of horse power with this option for a fast but comfortable ride. Use of a pyrometer and boost gauge is highly recommended.
EXTREME	130	Add an extreme amount of horsepower with this program for a race only situation. NEVER TOW ON THIS POWER PROGRAM. Must use pyrometer and boost gauge. May incur damage to stock transmissions if used improperly.

Package Contents



- 1 - X-Tuner Module
- 1 - OBDII X-Tuner Communications Cable
- 1 - Instruction Manual

Pre-Installation

The BD X-Tuner Power Programmer is for 2003-2005 Dodge Ram trucks equipped with a 5.9L Common Rail Cummins turbo diesel engine. The X-Tuner is a very simple instrument to operate. All procedures take place in the comfort of your cab with the downloader hooked up to the OBD II (On Board Diagnostics) port. Operating this downloader does not require any mechanical background.

Once you have downloaded a power program into your vehicle, always remember to keep the downloader in the vehicle. You may wish to change the power program or check and erase Diagnostic Trouble Codes (DTC's), or use the PTO function on the road. A good place to keep it would be the glove compartment of your vehicle.

*The power program must always be removed before taking the vehicle in for any kind of service, as it may interfere with diagnostic tools used by your dealer. **Never use the "Extreme" horsepower setting while towing.***

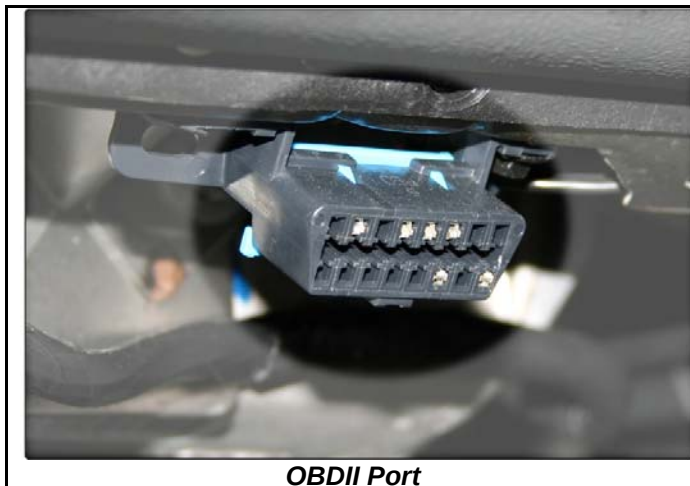
Keypad Layout



Installation

Make sure that your vehicle is in the key off/engine off position before you plug in the X-Tuner.

Connect the communications cable that came with the downloader into the top of the X-Tuner and the other end into the OBD II port (see diagram to the right). The OBD II port is the diagnostic port located underneath the dash on the driver's side of the vehicle.



The downloader will boot up and show a logo of BD Power. At that point it will bring up a screen asking you to put your key to the RUN position. Turn your ignition key forward to the run position, with the engine off (**KOEO**).

Press “Y” to continue to the main screen.



Main Screen

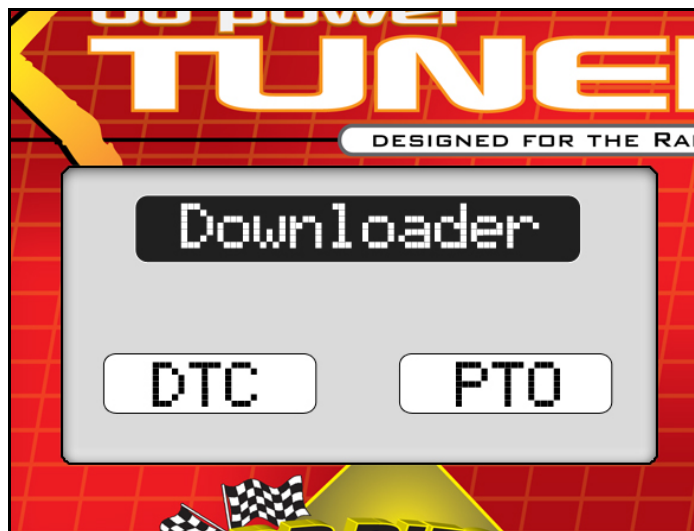
The main screen will give you three options to choose from:

DOWNLOADER – Select this option to download a power program.

DTC – Select this option to view and erase diagnostic trouble codes.

PTO – Select this option to run an external device and run your truck at higher RPMs than stock.

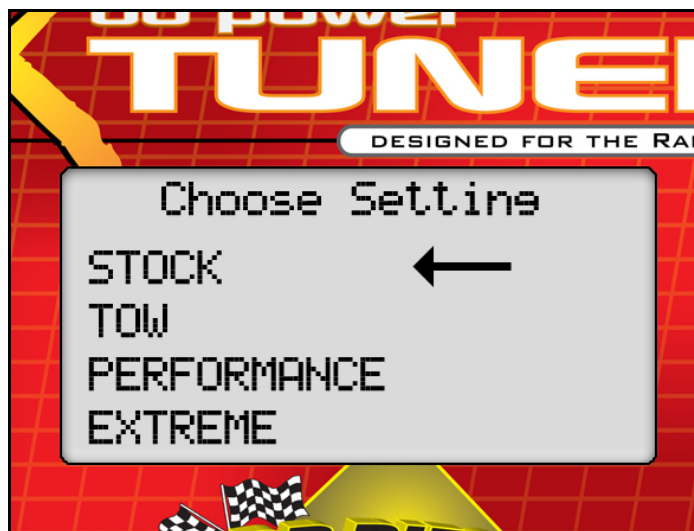
If you wish to select DTC or PTO, use the down arrow key to scroll down to the bottom line, and then use the left and right arrow keys to select between DTC and PTO.



Download Function

Select the **downloader** option from the main menu. The downloader will then read the truck's stock information. It will then briefly display the part number of the programmed ECU HEX file and the VIN number of your truck. Once the read is complete, the downloader will display a list of available power settings. Use the up/down arrows to move through and select a power program.

Refer to the Power Settings chart on page 3 for more information on available power levels.

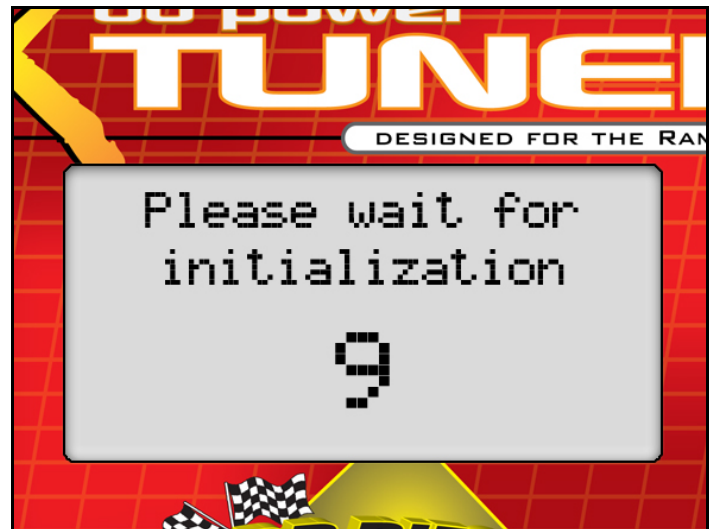


Once you have selected your power program that you wish to use, press "Y". It will then begin to upload the specified program into your trucks computer.

Typically, it takes about 4-8 minutes to complete a power program. **DO NOT DISTURB THE MODULE OR THE TRUCK DURING THIS PROCESS.**



After the tune has finished being loaded into the ECU, it will count down from 9 to allow the computer to initialize the new program. **DO NOT DISTURB THE MODULE OR THE TRUCK DURING THIS PROCESS.**

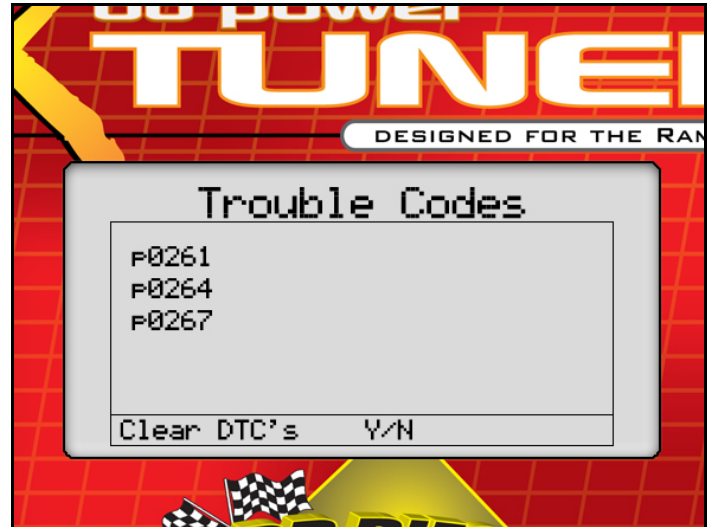


When the process has completed successfully, you will receive a message to unplug the tuner. Congratulations! You have just completed the easiest horsepower increase possible, and you didn't even have to get your hands dirty!



DTC Function (Diagnostic Trouble Code)

The DTC function will display all diagnostic trouble codes set on your vehicle. This function will also allow you to erase trouble codes from your vehicle's ECU. To erase DTC codes, simply press "Y" and all DTC codes will be erased.



If no DTC's are displayed, then simply unplug the X-Tuner and cycle the key.



PTO (Power Take Off) Function

Most trucks are equipped with a **Power Take Off (PTO)** unit and is used for running external devices like pumps, wenchers or generators. The PTO controller controls the speed of your idling motor to better run such accessory machinery. It is also beneficial in colder temperatures where it is possible to warm your truck up faster than when idling at a normal speed.

This function can only be used with the truck running and with the X-Tuner attached. Once the X-Tuner has been unplugged, the motor will return to its usual idle speed.

To enter the PTO menu, select "PTO" from the main menu.

Once inside the PTO menu, press "Y" to bring up the RPM value.



Use the up arrow and down arrow to select between RPM values.

RPM values are selectable between 900-2000RPM, in 100RPM increments.

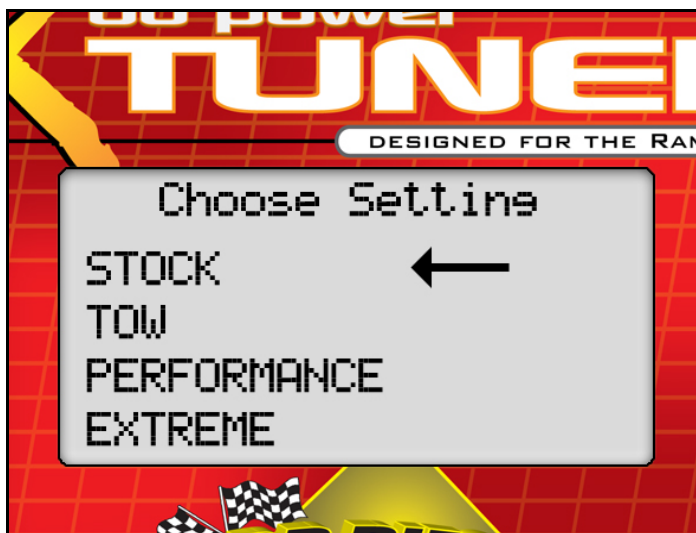
Pressing "N" will reset the value and bring your truck back to the stock idling speed. Pressing "N" again will exit the PTO screen.



Be sure to recycle the key before performing any other functions on the vehicle.

Returning To Stock

This option is for when you are taking your vehicle in for a diagnostic service, or just want your settings to be back to the OEM specifications. Plug in the X-Tuner and select the **Download** option from the main menu. Once you have entered the power level selection screen, select "Stock" and then press "Y". Follow the instructions set out on the downloader. When you are finished, the X-Tuner will have returned the vehicle to the stock power level.



Recovery Mode

In the event that a downloader aborts or causes an error in the middle of a tuning upload, do not panic. Take the following steps to recover:

1. Unplug the ground terminals on both batteries for at least two minutes. Re-connect them after two minutes has passed.
2. Go back inside the cab and plug the X-Tuner back into the OBD II port.
3. Turn the ignition to the run position without starting the vehicle to power the downloader.
4. Press “Y” when the X-Tuner prompts you to do so, and then let the X-Tuner go to work. The X-Tuner will automatically recover the vehicle back to stock.
5. When the downloader is finished recovering your vehicle, unplug the X-Tuner and recycle the key before performing any other functions with the X-Tuner.

WARNING: The vehicle will not start if you do not properly recover it after the event of an interrupted download.

Updating Your X-Tuner

Requirements:

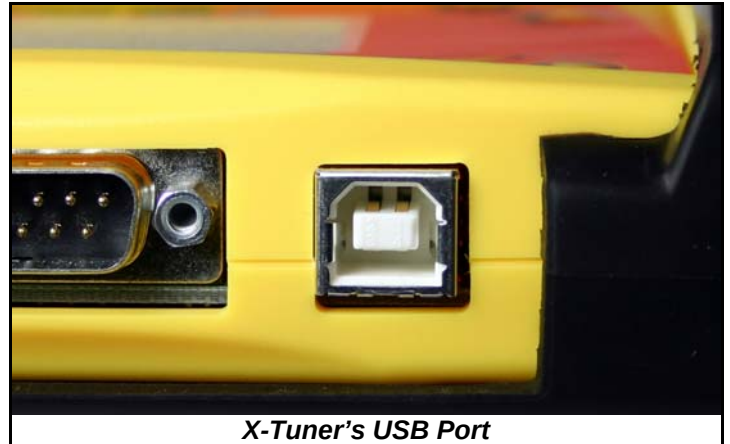
- Microsoft .NET Framework v1.1 or v2.0
- Windows XP
- WinZIP, WinRAR or equivalent

The X-Tuner has the ability to update via a USB connection. The port is located on the top of the X-Tuner module, beside the serial port that the OBDII port cable attaches to.

Updates can be downloaded via BD's website. If it is the first time you are updating your module, you will have to register and create a user profile.

The X-Tuner update program is a small and easy to use application. This program can be used with Windows XP. It is **mandatory** to download and install the **Microsoft .NET Framework v1.1** or **v2.0** package from the Microsoft Downloads website (<http://www.microsoft.com/downloads/>) or the program **will not run**.

A USB A-B cable (see photo to the right) will have to be purchased separately in order to use this function. This is a widely used cable in the computer market (used mostly in newer style printers & scanners) and can easily be picked up at any retail store that sells computer parts. An example would be Best Buy, Circuit City or Future Shop.



Downloading the X-Tuner Update

Log into the X-Tuner update site by typing <http://xtuner.bd-power.com/> into your preferred internet browser.



Click on the "Enter X-Tuner Upgrade Portal" button to enter the website.



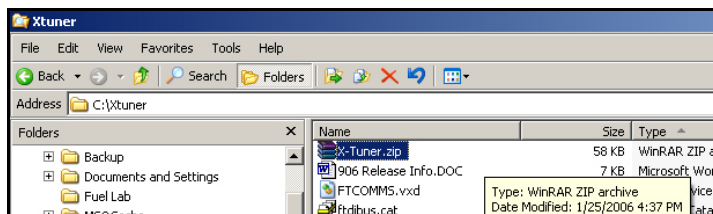
If this is your first time updating your X-Tuner, then click the respective link. You will be asked to create a user profile. Don't forget to have your X-Tuner serial number handy, as it is a required field.



Once you have logged in, browse the page to find the proper link for your application. Right-click on the update link and select "Save Target as" (In Internet Explorer) or "Save Link as" (In Mozilla/Firefox). Browse through your hard drive to find the XTuner folder that you created earlier, and then hit OK to begin the downloading process.



Open Windows Explorer (Windows Key + E). Browse to your hard drive and find the XTuner folder that you created earlier. Double click on the ZIP file that you downloaded through the update site. A good program to use to extract these files would be WinZIP (www.winzip.com) or WinRAR (www.rarlabs.com). Extract the files from the archive.



Running the Update Program

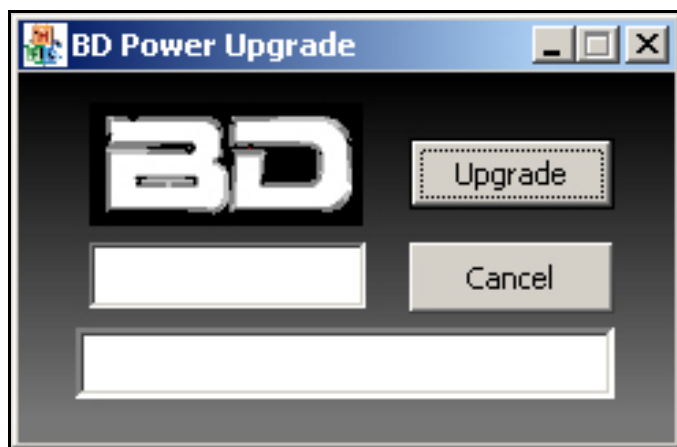
Open Windows Explorer (Windows Key + E), browse to your hard drive and find the **XTuner** file folder that you created earlier. Double click on the **XTuner-Upgrade.exe** file.

XTuner-Upgrade.exe	52 KB	Application
Ford.hex	163 KB	HEX File

This will open up the main X-Tuner update program window. **You may now plug your X-Tuner into your computer.**

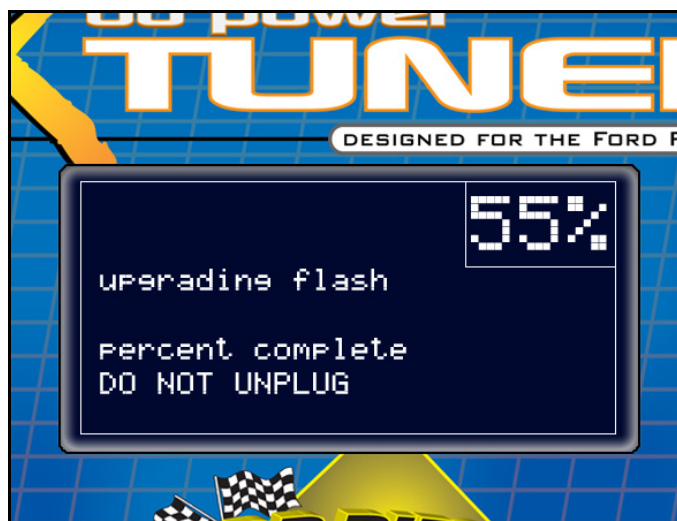
The X-Tuner should light up and display the BD Power logo on its screen. Do not push any buttons on the X-Tuner at this time.

Press the **Upgrade** button on the X-Tuner update program on your computer. It will begin the updating process.



While the update program is progressing on the computer, you should see the display on the X-Tuner running the flash upgrade program at the same time, as shown on the diagram to the right.

DO NOT DISTURB THE X-TUNER DURING THIS PROCESS.



Once the flash is complete, the X-Tuner will run a keypad test. You will be asked to press each button on the X-Tuner keypad to make sure that they are working correctly. If it is successful, It will then re-load the BD logo screen. You can now exit the Update program on your PC and unplug the X-Tuner. The update is now complete!

Questions/Technical Support

If you encounter any problems with this product, or have technical questions about it, please phone the BD Diesel Performance Technical Hotline at (800) 887-5030 between 8:00am – 5:00pm, Monday to Friday, Pacific Standard Time (PST). As an alternative, you can also post on our discussion forum located at <http://bd-power.com/forum> .



DTC Reference Listing

P0046	Turbo/Super Charger Boost Control Solenoid Circuit Range/Performance
P0069	MAP/BARO Correlation
P0071	Inlet Air Temperature Sensor Rationality
P0072	Inlet Air Temperature Sensor Voltage Too Low
P0073	Inlet Air Temperature Sensor Voltage Too High
P0088	Fuel Rail Pressure Signal Is Above Max Limit
P0096	Intake Air Temperature Sensor 2 Circuit Range/Performance
P0097	Intake Air Temperature Sensor 2 Circuit Low Input
P0098	Intake Air Temperature Sensor 2 Circuit High Input
P0101	Mass or Volume Air Flow Circuit Range/Performance
P0103	Mass or Volume Air Flow Circuit High Input
P0106	Air Pressure Sensor Rationality
P0107	Manifold Absolute Pressure/BARO Sensor Low Input
P0108	Manifold Absolute Pressure/BARO Sensor High Input
P0111	Intake Air Temperature (IAT) Sensor Rationality
P0112	Intake Air Temperature (IAT) Circuit Low Input
P0113	Intake Air Temperature (IAT) Circuit High Input
P0116	Engine Coolant Temperature (ECT) Sensor Rationality
P0117	Engine Coolant Temperature (ECT) Circuit Low Input
P0118	Engine Coolant Temperature (ECT) High Input
P0128	Thermostat Rationality
P0148	High Pressure Common Rail (HPCR) Fueling Error Checksum
P0169	Water In Fuel (WIF) Light On Too Long
P0191	Fuel Rail Pressure Sensor Performance
P0192	Fuel Pressure Sensor Voltage Too Low
P0193	Fuel Pressure Sensor Voltage Too High
P0196	Engine Oil Temperature Sensor Circuit Range/Performance
P0197	Engine Oil Temperature Sensor Circuit Low Input
P0198	Engine Oil Temperature Sensor Circuit High Input
P0201	Injector #1 Control Circuit
P0202	Injector #2 Control Circuit
P0203	Injector #3 Control Circuit
P0204	Injector #4 Control Circuit
P0205	Injector #5 Control Circuit
P0206	Injector #6 Control Circuit
P0217	Decreased Engine Performance Due To Engine Overheat Condition
P0219	Engine Overspeed Condition

P0230	Fuel Pump Primary Circuit
P0231	Fuel Pump Secondary Circuit Low
P0232	Fuel Pump Secondary Circuit High
P0234	Turbocharger Over-boost Condition
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
P0243	Wastegate Pressure Control PWM
P0251	CP3 Pump Regulator Control
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 #3 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
P0297	Vehicle Overspeed Condition
P0298	Engine Oil Overtemperature Condition
P0299	Turbo/Supercharger Under Boost
P0300	Random Misfire Detected
P0301	Cylinder #1 Misfire Detected
P0302	Cylinder #2 Misfire Detected
P0303	Cylinder #3 Misfire Detected

BD Engine Brake Inc

A10 – 33733 King Rd, Abbotsford, BC, Canada V2S 7M9

Ship: #88 – 446 Harrison St, Sumas, WA 98295 Mail: PO Box 231, Sumas, WA 98295

Ph: 604.853.6096 Fax: 604.853.8749 Internet: www.bd-power.com

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
P0335	Crankshaft Position (CKP) Sensor A Circuit
P0336	Crankshaft Position (CKP) Sensor A Circuit Range/Performance
P0337	Crankshaft Position (CKP) Sensor Voltage Too Low
P0338	Crankshaft Position (CKP) Sensor Voltage Too High
P0340	Camshaft Position (CMP) Sensor A Circuit (Bank 1 or single sensor)
P0341	Camshaft Position (CMP) Sensor A Circuit Range/Performance (Bank 1 or single sensor)
P0381	Glow Plug/Heater Indicator Circuit (Wait To Start Lamp Inoperative)
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
P0460	Fuel Level Sensor A Circuit
P0461	Fuel Level Unit No Change Over Time
P0462	Fuel Level Sensor A Circuit Low Input
P0463	Fuel Level Sensor A Circuit High Input
P0470	Exhaust Pressure Sensor
P0471	Exhaust Pressure Sensor Range/Performance
P0472	Exhaust Pressure Sensor Low Input
P0473	Exhaust Pressure Sensor High Input
P0477	Low Voltage On The Engine Brake Driver
P0478	High Voltage On The Engine Brake Driver
P0480	Fan 1 Control Circuit
P0483	Fan Speed
P0500	Vehicle Speed Sensor A
P0514	BAT Temperature Sensor Rationality
P0516	Low Voltage At The BAT Temp Sensor
P0517	High Voltage At The BAT Temp Sensor
P0521	Oil Pressure Switch Rationality
P0524	Oil Pressure Too Low
P0528	Fan Speed Sensor Circuit No Signal
P0532	A/C Sending Unit Volts Too Low
P0533	A/C Sending Unit Volts Too High
P0541	Low Voltage On The #1 Intake Air Heater Relay

P0542	High Voltage On The #1 Intake Air Heater Relay
P0562	System Voltage Low
P0563	System Voltage High
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
P0572	Low Voltage Detected At The Brake Switch
P0573	High Voltage Detected At The Brake Switch
P0580	Low Voltage Detected At The Speed Control Switch
P0581	Low Voltage Detected At The Speed Control Switch
P0602	Checksum Error
P0603	Internal Control Module CAM Error
P0604	ECM Software Error
P0605	Powertrain Control Module Read Only Memory (ROM) Error
P0606	ECU/PCM Processor
P0607	ECM Internal Failure
P0611	Fuel Injector Control Module Performance
P0620	Generator 1 Control Circuit
P0622	Generator Field Not Switching Properly
P0623	Generator Lamp Control Circuit
P0628	Low Voltage Detected At The Fuel Lift Pump Relay
P0629	High Voltage Detected At The Fuel Lift Pump
P0630	VIN Not Entered Error
P0633	SKIM Secret Key Not Entered
P0642	Low Voltage At The #2 Sensor Supply Circuit
P0643	High Voltage At The #2 Sensor Supply Circuit
P0645	A/C Clutch Relay Control Circuit
P0646	Low Voltage Detected At The A/C Clutch Relay
P0647	Voltage Detected At The A/C Clutch Relay
P0649	Cruise Control Lamp Control Circuit
P0652	Low Voltage At The #1 Sensor Supply Circuit
P0653	High Voltage At The #1 Sensor Supply Circuit
P0657	Actuator Supply Voltage A Circuit Open
P0670	Glow Plug Module Control Circuit
P0671	Cylinder 1 Glow Plug Circuit
P0672	Cylinder 2 Glow Plug Circuit
P0673	Cylinder 3 Glow Plug Circuit
P0674	Cylinder 4 Glow Plug Circuit

BD Engine Brake Inc

A10 – 33733 King Rd, Abbotsford, BC, Canada V2S 7M9

Ship: #88 – 446 Harrison St, Sumas, WA 98295 Mail: PO Box 231, Sumas, WA 98295

Ph: 604.853.6096 Fax: 604.853.8749 Internet: www.bd-power.com

P0675	Cylinder 5 Glow Plug Circuit
P0676	Cylinder 6 Glow Plug Circuit
P0677	Cylinder 7 Glow Plug Circuit
P0678	Cylinder 8 Glow Plug Circuit
P0683	Glow Plug Control Module to PCM Communication Circuit
P0698	Accelerator Pedal Position Sensor (APPS) Supply Voltage Too Low
P0699	Accelerator Pedal Position Sensor (APPS) Supply Voltage Too High
P0700	Transmission Control System (MIL Request)
P0703	Brake Switch B Input Circuit
P0711	Trans Temp Sensor, No Temp Rise After Start
P0712	Trans Temp Sensor, Voltage Too Low
P0713	Trans Temp Sensor, Voltage Too High
P0720	Low Output Speed Sensor – RPM Above 15MPH
P0748	Pressure Solenoid Control/Trans Relay Circuits
P0830	Clutch Pedal Switch A Circuit
P0833	Clutch Pedal Switch B Circuit
P0850	P/N Switch Performance
P0868	Governor Pressure Sensor Volts Too High
P0869	Governor Pressure Sensor Volts Too Low
P0882	Trans 12 Volt Supply Relay Control Circuit Too Low
P0883	Trans 12 Volt Supply Relay Control Circuit Too High
P0973	Transmission Overdrive Circuit Voltage Too Low
P0974	Transmission Overdrive Circuit Voltage Too High
P1000	OBD Systems Readiness Test Not Complete
P1001	KOER Not Able To Complete, KOER Aborted
P1102	Mass Air Flow Sensor In Range But Lower Than Expected
P1148	Generator 2 Control Circuit
P1149	Generator 2 Control Circuit High
P115A	Low Fuel Level - Forced Limited Power
P1184	Engine Oil Temperature Sensor Out Of Self-Test Range
P1260	Theft Detected, Vehicle Immobilized
P1284	Aborted KOER — Injector Control Pressure Regulator
P1335	EGR Position Sensor Minimum Stop Performance
P1378	FICM Supply Voltage Circuit Low
P1379	FICM Supply Voltage Circuit High
P1397	System Voltage Out Of Self-Test Range
P1408	Exhaust Gas Recirculation Flow Out Of Self-Test Range
P1464	A/C Demand Out Of Self-Test Range
P1501	Vehicle Speed Sensor Out Of Self-Test Range
P1502	Invalid Test — Auxiliary Power Control Functioning

P1531	Invalid Test — Accelerator Pedal Movement
P1536	Parking Brake Switch Circuit
P1610	Interactive Reprogramming Code — Replace PCM module
P1611	Interactive Reprogramming Code — Diagnose Further
P1615	Interactive Reprogramming Code — Flash Erase Error
P1616	Interactive Reprogramming Code — Flash Erase Error, Low Voltage
P1617	Interactive Reprogramming Code — Block Programming Error
P1618	Interactive Reprogramming Code — Block Programming Error, Low Voltage
P1633	Keep Alive Power Voltage Too Low
P1635	Tire/Axle Out Of Acceptable Range
P1639	Vehicle ID Block Corrupted, Not Programmed
P1652	Short To Ground
P1703	Brake Switch Out Of Self-Test Range
P1705	Transmission Range Circuit Not Indicating Park/Neutral During Self-Test
P1725	Insufficient Engine Speed Increase During Self-Test
P1726	Insufficient Engine Speed Decrease During Self-Test
P1740	TCC Overdrive Solenoid Performance
P1756	Governor Pressure Not Equal To Target @ 35-40psi
P1757	Governor Pressure Above 3psi In Gear With 0MPH
P1762	Governor Pressure Sensor Offset Volts Too Low or High
P2067	Fuel Level Sensor B Circuit Low Input
P2068	Fuel Level Sensor B Circuit High Input
P2104	Throttle Actuator Control System Forced Idle
P2121	APPS Conformance Error
P2122	Throttle/Pedal Position Sensor/Switch D Circuit Low Input
P2123	Throttle/Pedal Position Sensor/Switch D Circuit High Input
P2127	Throttle/Pedal Position Sensor/Switch E Circuit Low Input
P2128	Throttle/Pedal Position Sensor/Switch E Circuit High Input
P2132	Throttle/Pedal Position Sensor/Switch F Circuit Low Input
P2133	Throttle/Pedal Position Sensor/Switch F Circuit High Input
P2138	Throttle/Pedal Position Sensor/Switch D/E Voltage Correlation
P2139	Throttle/Pedal Position Sensor/Switch D/F Voltage Correlation
P2140	Throttle/Pedal Position Sensor/Switch E/F Voltage Correlation
P2146	Bank 1 (Cylinders 1-3) Shorted High Or Low
P2149	Bank 2 (Cylinders 4-6) Shorted High Or Low
P2199	Intake Air Temperature 1/2 Correlation
P2262	Turbo/Super Charger Boost Pressure Not Detected — Mechanical
P2263	Turbo/Super Charger System Performance
P2266	Water In Fuel (WIF) Sensor Voltage Too Low
P2269	Water in Fuel Condition

P2284	Injector Control Pressure Sensor Circuit Range/Performance
P2285	Injector Control Pressure Sensor Circuit Low
P2286	Injector Control Pressure Sensor Circuit High
P2287	Injector Control Pressure Sensor Circuit Intermittent
P2288	Injector Control Pressure Too High
P2289	Injector Control Pressure Too High — Engine Off
P2290	Injector Control Pressure Too Low
P2291	Injector Control Pressure Too Low — Engine Cranking
P2457	EGR Cooler Range/Performance
P2502	Charging System Error
P2503	Charging System Output Low
P2504	Charging System Output High
P2509	Powerdown Data Lost Error
P2552	FICMM Circuit — Throttle/Fuel Inhibit Circuit
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 Heaters
P2614	Camshaft Position Output Circuit
P2617	Crankshaft Position Output Circuit
P2623	Injector Control Pressure Regulator Circuit
P2769	Transmission TCC Control Circuit Low
P2770	Transmission TCC Control Circuit High
U0100	Lost Communication With ECU/PCM A
U0101	Lost Communication With TCM
U0105	Lost Communication with FICM
U0155	Lost Communication with Instrument Cluster
U0306	Software Incompatibility with Fuel Injector Control Module
B1213	Less than two keys programmed to the system
B1342	ECU damaged (EEPROM in PCM not working, replace PCM)
B1600	PATS Ignition Key Transponder Signal Is Not Received
B1601	PATS Received Incorrect Key-Code From Ignition Key Transponder
B1602	PATS Received Invalid Format Of Key-Code From Ignition Key Transponder
B1681	PATS Transceiver Module Signal Is Not Received
B2103	Antenna Not Connected
B2431	Transponder Programming Failed

BD ENGINE BRAKE, Inc.

LIMITED WARRANTY STATEMENT

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

DISCLAIMER OF LIABILITY

BD Engine Brake Inc., its successors, distributors, jobbers, and dealers (hereafter "**BD**") shall in no way be responsible for the product's proper use and service. THE BUYER HEREBY WAIVES ALL LIABILITY CLAIMS.

BD disclaims any warranty and expressly disclaims any liability for personal injury or damages. **BD** also disclaims any liability for incidental or consequential damages including, but not limited to, repair labor, rental vehicles, hotel costs, or any other inconvenience costs by reason of use or sale of any such equipment. 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 **BD** and to hold **BD** harmless from any claim related to the item of any equipment purchased.

This warranty shall not apply to any unit that has been improperly stored or installed, or to misapplication, improper operation conditions, accidents, neglect, or which has been improperly repaired or altered or otherwise mistreated by the **BUYER** or his agent. **BD** also assumes no liability regarding the improper installation or misapplication of its products. It is the installer's responsibility to check for proper installation and if in doubt, contact the manufacturer.

LIMITATION OF WARRANTY

BD Engine Brake Inc. (hereafter "**BD**") warrants to the **BUYER** that any parts purchased shall be free from defects in material workmanship. A defect is defined as a condition within the product that would render the product inoperable. **BD** gives Limited Warranty as to description, quality, merchantability, fitness for any product's purpose, productiveness, or any other matter of **BD's** product sold herewith. **BD** shall be in no way responsible for the product's open use and service and the **BUYER** hereby waives all rights other than those expressly written herein. This Warranty shall not be extended or varied except by a written instrument signed by **BD** and the **BUYER**.

The Warranty is Limited to one (1) year from the date of sale and labor costs incurred by the removal and replacement of the BD product, while performing warranty work, will be covered for 1 (one) year, payable at BD rates, at authorized centers and with prior approval. Until BD has approved the claim, the consumer may be responsible for these costs.

A Return Authorization (WA) number, obtained in advance from **BD**, must accompany all products returned for warranty consideration. All products must be returned, shipping prepaid, to **BD** and must be accompanied by a dated proof of purchase receipt. All Warranty claims are subject to approval by **BD** and repaired or replaced product will be returned to the customer freight collect. Accepted warranty units, which have been replaced, become the sole property of **BD**.

This warranty is in lieu of all other warranties or guaranties, either expressed or implied, and shall not extend to any consumer or to any person other than the original purchaser residing within the boundaries of the continental U.S. or Canada.

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 THIRTY (30) DAYS FROM DATE OF PURCHASE FOR A FULL REFUND.