



# ***BD X-MONITOR***

## **Digital Pyro & Boost Pressure Monitor**

### **Installation Manual**

<b>Part #</b>	<b>Application</b>	<b>Part #</b>	<b>Application</b>
<b>1085002</b>	Dodge Cummins (1994-1997)	<b>1086001</b>	Duramax (LB7/LLY/LBZ)
<b>1085000</b>	Dodge Cummins (1998-2002)	<b>1087000</b>	Ford 7.3L P/Stroke (1999-2002)
<b>1085001</b>	Dodge Cummins (2003-2007)	<b>1087001</b>	Ford 6.0L P/Stroke (2003-2007)

Date Purchased \_\_\_\_\_

Purchased from \_\_\_\_\_

Installed by \_\_\_\_\_

**READ THIS MANUAL COMPLETELY BEFORE INSTALLING THIS PRODUCT.**

**OWNER'S MANUAL - LEAVE IN GLOVE BOX**

Installation Manual Part # I1085000

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## Kit Contents



**1830030**

### Universal Installation Kit

(Includes thermocouple, bushing, control module vacuum tube boost connection, 6ft of 1/8" air tubing, & fused power wire with ground wire)



**1300837**

Boost Fitting (*Dodge Style*)



**1820210**

Control Module



**1300838**

Boost Fitting (*Ford/Chevy Style*)



Side Mount Display Kit

## Welcome

Thank you for purchasing the BD X-Monitor. Your kit should have the above-mentioned items for your installation. This manual is divided into different areas to assist you with your installation and operation of your unit.

This X Monitor comes with all the programming to measure turbo boost pressure ("TURBO") and exhaust gas temperature ("PYRO").

If you have existing gauges installed, you may have to determine where to reposition them to accommodate the X-Monitor.

## Installation

### Pyrometer Sending Unit (Thermocouple)

If your aftermarket exhaust piping does not have a 1/4" NPT fitting installed for a thermocouple or do not have a turbo mount exhaust brake with the 1/4" NPT port to facilitate the thermocouple, you will have to install the bushing supplied in this kit.

The best place to locate the thermocouple is in the turbo charger down pipe. You will have to drill a hole and then weld the bushing that is supplied with this kit in place. It is recommended that you remove the existing down pipe for ease of drilling and welding but it is possible to install with pipe in place. **NOTE: The ground terminals of the vehicle's batteries should be disconnected before performing any welding.**

**For turbo mount exhaust brakes or aftermarket down pipes with the 1/4" NPT thermocouple provision, remove any plugs.**

Install the thermocouple into the 1/4" NPT bushing or port and tighten with an open-ended wrench. We recommend using an anti-seize compound on the threads of the thermocouple.

**Pre-Turbo:** The thermocouple can be installed before the turbo by drilling and tapping a 1/4" NPT port in the exhaust manifold. Special attention is required with these installations to make sure drilling and tapping are not being done on points that could cause cracking of the manifold or that debris does not enter the turbo or engine. It is recommended that the manifold be removed to perform this work. Age and condition of the manifold should be taken into consideration before performing this type of installation.

## Thermocouple Wiring

Route the thermocouple wire towards the firewall, taking precaution to keep it away from hot and moving parts, and then pass it through the firewall by piercing a large rubber grommet in the firewall beside the brake booster canister.

**NOTE: Do NOT cut or splice the thermocouple lead wire, as it is special wire that provides correct reading to the gauge. Simply coil any excess wire out of the way.**

From under the dash, route the thermocouple to the X-Monitor Control Module. Install the wires onto the control module as shown in the diagram.

**CAUTION: DO NOT MIX UP THESE WIRES, ENSURE YELLOW TO YELLOW AND RED TO RED OR DAMAGE WILL RESULT AND WARRANTY WILL BE VOIDED.**

## Boost Pressure Sender

### Duramax (Non LLY)

#### DURAMAX BOOST PRESSURE FITTING



Locate the turbo wastegate hose and follow it along to the plenum.

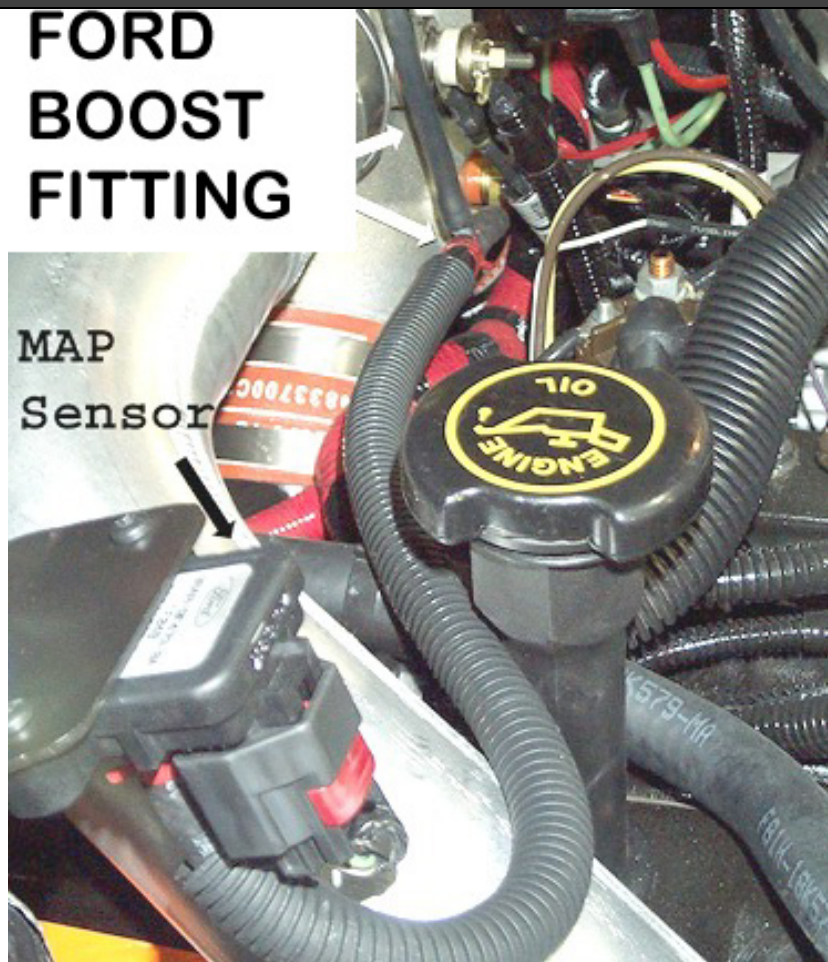
Remove the turbo wastegate from the barb fitting on the plenum and install the rubber hose end of the supplied boost fitting assembly onto the barb.

Install the turbo wastegate onto the barb of the supplied boost fitting assembly.



*Dodge*

Locate and remove one of the intake plenum-to-manifold bolts and install the supplied boost fitting assembly with this kit and tighten to proper specifications. (These bolt holes all open into the intake manifold).

*Ford*

Locate the MAP Sensor hose and follow it along to the intake plenum.

Remove the MAP Sensor hose from the barb fitting on the plenum and install the rubber hose end of the supplied boost fitting assembly onto the barb.

Install the MAP Sensor hose onto the barb of the supplied boost fitting assembly.

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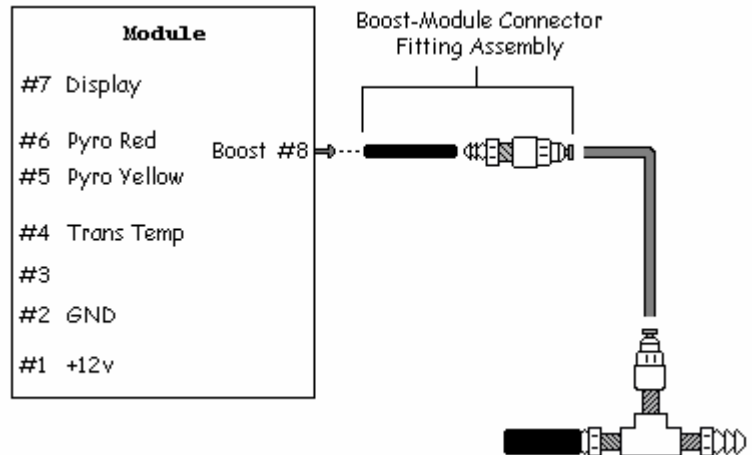
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## Boost Pressure Hose

Attach one end of the supplied 6 ft piece of hose onto the open port on the supplied Boost Fitting Assembly and route it through the firewall by piercing a large rubber grommet.

Route the hose into the cab under the dash taking care not to kink the tubing and to keep it away from hot and moving parts.

Push this end of the hose into the supplied Boost-Module Connector Fitting Assembly (see diagram to the right) and connect rubber hose of the supplies fitting onto the pressure sensor barb on the back of control box. **The module should be mounted with the barb pointed downward to prevent any condensation in the boost line from collecting in the module.**



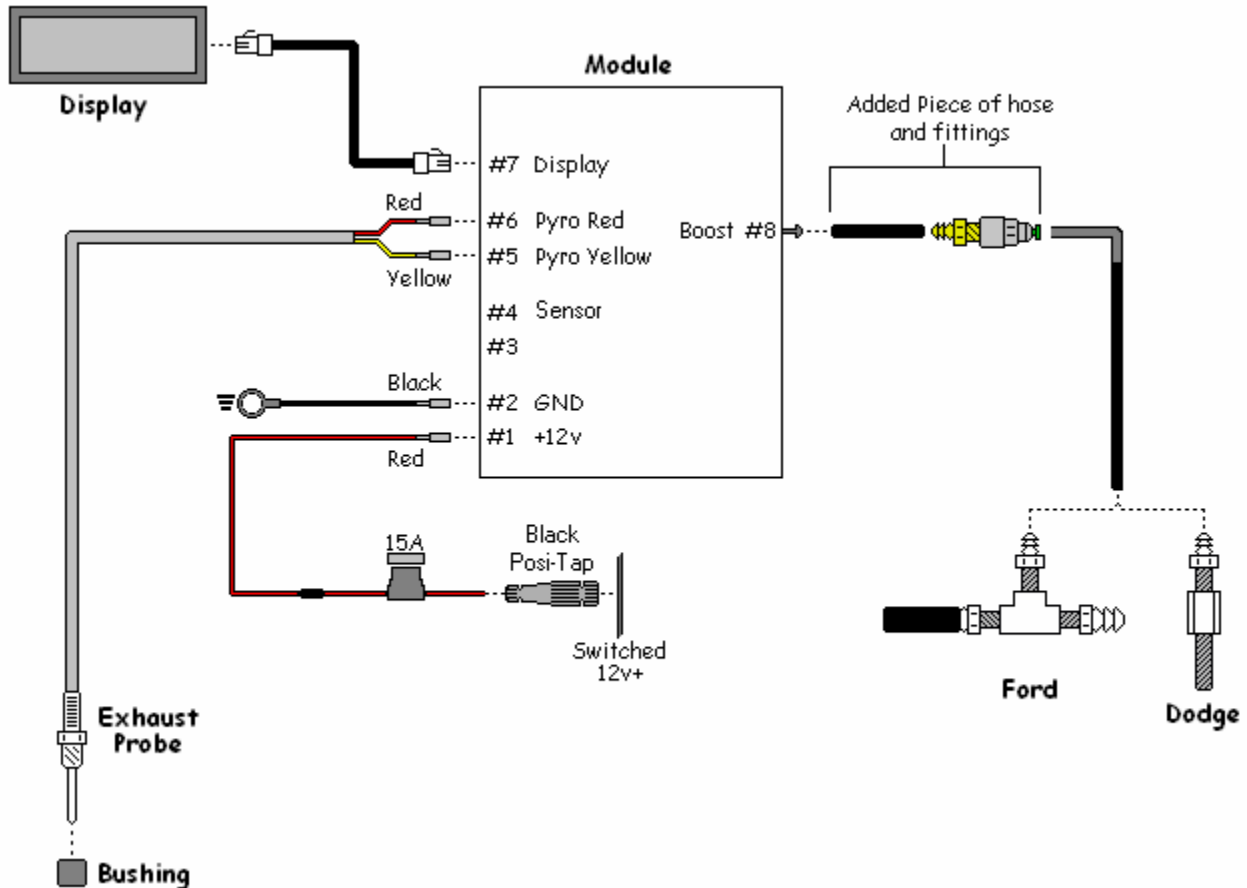
## Power & Ground connections

Locate a switched 12-volt power source under the dash and install the fused Red wire to it. Plug the Red wire into the “+12v” terminal on the module.

Install the ground loop of the Black wire to a good ground and plug into the “GND” Terminal on the module.

**NOTE:** A good power and grounding sources are paramount to proper operation of the X Monitor. Improper sources and can cause faulty or erroneous readings or component failure. This will void warranty.

## Wiring Diagram



## Display Installation

**EXTREME CAUTION:** The display is very fragile and is installed and tested at the manufacturer. If you must remove the display in order to paint the plastic mount, take extreme care when reinstalling. Do not over tighten mounting screws or the display will be damaged and warranty will be voided.

Install the telephone type communication wiring into the back of the display circuit board. Apply Velcro or two-sided tape to the mounting surface and/or the tabs on the bottom of the mount and put into place.

Run cable to the module under the dash and plug the communication cable into the socket of the module. Once all connections are made, secure the box and any loose wiring under the dash and away from moving or heated parts.



# Programming Chart

Application	Pyro	Turbo Boost	Trans Temp	Remote Temp	Brake Press	Oil Press	Fuel Press	Fuel Level	Program #
All Years	•	•							1085000
1996-1998 12V	•	•	•						1085015
1998½-2002 24V	•	•	•						1085010
Late 1999*	•	•	•						1085012
2003	•	•	•						1085011
2004 (305hp)	•	•	•						1085013
2004½-07 (325hp)	•	•	•						1085014
All Years	•	•		•					1085020
All Years	•	•			•				1085030
All Years	•	•					•		1085050
All Years**	•	•						•	1085060
All Years	•	•							1087000
1999-2002	•	•	•						1087010
2003 (7.3L)	•	•	•						1087011
2003-2007 (6.0L)	•	•	•						1087012
All Years	•	•		•					1087020
1999-2007	•	•			•				1087033
All Years**	•	•						•	1087060
All Years	•	•							1086000
All Years	•	•		•					1086020
All Years	•	•			•				1086030
2001-2002	•	•				•			1086040
2003-2007	•	•				•			1086041
All Years*	•	•						•	1086060
Universal	•	•							1080000
Universal	•	•		•					1080020
Universal	•	•			•				1080030
Universal	•	•					•		1080050
Universal**	•	•						•	1080060

\*\* Connects to an aftermarket fuel level sender with a ranger of 240 ohms at empty and 33 ohms at full; optional senders are available.

\* Late 1999 Dodge with 1-1.75V on sensor wire at 40-100°F transmission temperature (Ref. TB#30803)

## Operation

**CAUTION:** Do not run the engine at higher than 900°F (1050°F if the pyrometer is mounted pre-turbo) temperatures (“PYRO”) as indicated on the display for extended periods or serious engine damage may result. The suggested limits for boost pressure (“TURBO”) on stock trucks are 32psi on Dodge/Fords and 25psi on Duramax trucks. These limits will vary depending on vehicle condition, performance enhancements and driving techniques.

Once the display has gone through the startup cycle, you will see the readings for “PYRO” and “TURBO”. The “PYRO” temperature reading is in Fahrenheit (°F) and the “TURBO” pressure reading is in pounds-per-square-inch (PSI). All readings are approximate and may vary due to characteristics of the probe and certain conditions can cause interference or swaying of readings.



This X Monitor comes with alarm, peak memory, memory clearing and brightness functions that can be accessed and set by the two buttons on the side of the display.

To change the settings and set alarm values there are 2 buttons on the side of the display: the bottom (**MENU**) button cycles through the different modes and the upper (**MODIFY**) button controls the setting of the values.

If you press the bottom button once, you will be in the “PYRO” function screen. Here you will see three readings being displayed:

PYRO	MAX	ALARM
xxxxF	xxxx	xxxx

**NOTE:** The “xxxx” in the above example denotes current reading or setting.

The first set of numbers with the heading “**PYRO**” is the current thermocouple temperature as you would see on the initial main screen. The “**MAX**” number is the historical peak temperature achieved since the last time memory was cleared.

The “ALARM” number is the temperature for which the display will display an alarm at with this temperature setting is achieved. The “ALARM” setting can be changed by pressing on the upper MODIFY button. It will increase the value upwards in increments of 10 until “1500” then will jump back down to “700”.

By pressing the MENU (bottom) button again, the screen will change to the “TURBO” screen. As with the “PYRO” screen mentioned above, the “TURBO” numbers is the current reading and “MAX” is the historical peak pressure. Changing the “ALARM” setting is the same as “PYRO” but the value increase in increments of 1 then will jump to “10” once you surpass “92” on the setting.

Pressing the MENU button again will put you in the “**PUSH TO CLEAR MAX VALUES**” function screen. To clear the historical peak values, press the MODIFY (top) button once. ***NOTE:** The historical peak memory is constantly working so when you clear values and scroll through the screens again, the “MAX” may not be zero (0).*

Pressing the MENU (bottom) button will now put you in the “**BRIGHTNESS**” function screen. There is four (4) different levels of brightness to choose from and by pressing the MODIFY (top) button, it will cycle through the settings “1” through “4”, and then jump back to “1” again.

Pressing the MENU (bottom) button will bring you to the “**DISPLAY OFF**” function screen. When you enter this screen a countdown will begin from “9” until it reaches “0”, then the display will shut off. While in this sleep mode, the screen will still display any alarms that occur. To bypass this function or to bring the display out of the sleep mode, press the MENU button and you will be back at the main screen.

**NOTE:** It is not recommended to make any screen selections or setting changes while driving. Doing so could take your attention away from the road, or, may interfere with your steering or driving ability, which could cause an accident, serious injury or death.

## *Maintenance & Troubleshooting*

**NOTE:** The display used in the X Monitor when exposed to sunlight or other strong light sources will cause the numbers on the display to not be clearly readable. This condition, commonly referred to as “wash out” is a natural characteristic of vacuum florescent display.

Following the diagrams in this manual, tracing hoses and wiring, checking continuity through electric components or checking for any lines that are disconnected, should solve any problems that may arise.

If the **“PYRO”** reading on the display is showing **“----”** then there is a short circuit with the thermocouple or the wiring. If the display is showing **“2213”** then the module is not showing the connection to the thermocouple or the thermocouple is faulty.

If the **“TURBO”** reading on the display stays at **“0”** then the module is not reading any boost pressure.

The X-Monitor is calibrated to the thermocouple that is supplied with the kit and will not register accurately if an existing or different thermocouple is used.

Analog signals are naturally affected by RF (radio frequency) noise. To eliminate any possible chance of an erratic signal please choose a clean ground signal for the X Monitor, that is clearly mounted away from the alternator wires or any other voltage sources (positive battery cables, etc.). If for some reason you still have erratic sensor readings try a direct ground connection to the battery.

Thermocouple wires should also be clear from any RF noise sources as well (i.e. alternator, positive battery cables, etc). If the thermocouple signal is erratic then the copper ground wire that is contained inside of the thermocouple wire can be connected to ground to reduce a small amount of noise. Be sure to connect only one end of this copper wire to eliminate any ground loops from forming.

If you have any problems or need replacement parts, call us at 1-800-887-5030, between 8:30am and 4:30pm Pacific Time.



## **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.