

TST POWERMAX™ for the DURAMAX®

Thank you for purchasing the **PowerMax™** computer for the Chevy/GMC Duramax®. When installed correctly, this unit is designed to give years of trouble free power enhancement to your Chevy Duramax® engine. Let's begin with a list of tools needed to install the base **PowerMax™** computer unit:

1. Duramax® diesel engine
2. Work light.
3. 8mm wrench or socket
4. Fender covers

1. Open kit to insure you have all the correct components. You should have a **TST POWERMAX™** computer box ,a wiring harness assembly with four large, and two small connector type plugs attached to them, and one remote control.

2. Park vehicle in a safe, level work area with the parking brake engaged. Open the hood and put the work light and fender covers in place.

3. Disconnect **both** negative battery cables using an 8mm wrench or socket. Do not reconnect until installation is complete.

4. Locate quick disconnects found under hood on drivers side of the engine as shown in **figure1**. Unplug the large and the small connectors as shown. Squeeze the black keepers on both sides of the connector then pull the gray lever back to release. The connectors should come apart easily at this point.



figure 1

5. Place the large male connector from the **TST** harness into the female connector on the truck. The connector will only go in one way. Do not force it in. Notice the molded tabs on the connectors, as shown in **figures 3 and 4**. After connector is installed, pull the gray lever until you hear the click.

6. Place the small connector from the **TST** harness into the small female connector, just above the large one in step 5. Again, do not force the connector in. Pull the gray lever until you hear the click.

7. Connect the two remaining connectors into the trucks harness as shown in **figure 2**. Pull the gray lever in until you hear the click to complete the connection. Make sure there are no wires in the path of any moving parts, such as belts, fans, or the power steering pump.

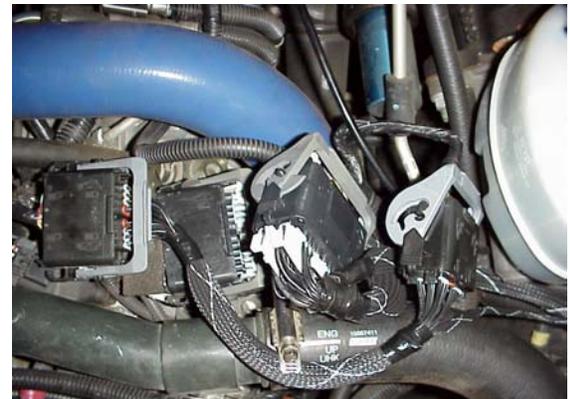


figure 2

8. Mount the **TST** computer box on the fuse box cover as shown in **figure 5** using the Velcro® provided. Note that the location of the box is near the edge of the fuse box cover. This is so the hood will not hit the computer box when it is closed.

9. Plug the two remaining connectors into the back of the **TST** computer box. The gray connector goes into the gray port, and the black connector goes into the black port. See **figure 5**.

10. Do not remove the bolt between the red and yellow wire at this time. Reconnect the negative battery cable using the 8mm wrench or socket.

11. Slowly close the hood to check for correct placement of the **POWERMAX™** box. The truck should be ready to start at this time. It should start and idle just like the stock truck. If it fails to start, check all connections under the hood. If truck still fails to start, remove harness and inspect pins for damage. Please Contact your **TST** dealer for further instructions.

12. If truck starts and runs ok, proceed to the next page for installation of the thermocouple and remote control.



figure 5

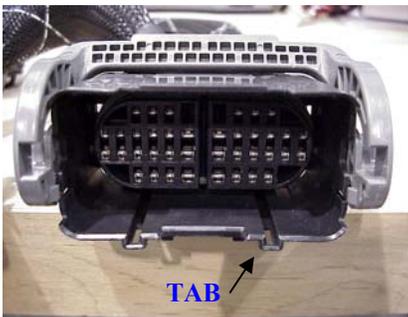


figure 3



figure 4

TST POWERMAX™ for the DURAMAX®

REMOTE CONTROL AND THERMOCOUPLE INSTRUCTIONS

The following is a list of tools needed to install the **TST POWERMAX™** FR47 Remote Control and thermocouple or the Chevy/GMC Duramax®:

- | | | |
|--------------------------------|----------------------------|---------------------------------------|
| 1. 1/2 or 13mm open end wrench | 4. center punch and hammer | 7. a drill capable of 5/16 bit |
| 2. 5/16 in. drill bit | 5. small mechanics magnet | 8. 1/8 in. tapered NPT tap and holder |
| 3. 5/16 in. wrench or socket | 6. 3/8 in. Or 10mm wrench | 9. electrical tape |

13. Determine a good mounting location for the remote control inside the cab of the truck. Take caution to choose a location that will provide easy visibility while driving, without blocking the drivers forward view of the road. A good example would be on top of the dash to the far left.

14. Attach the remote to the desired location using the Velcro® provided.

15. With the hood open, route the remote control wire thru the door hinge area as shown in **figure 6**.

16. Make sure that the remote wires are not routed thru the hinge of the hood. Use the tie wraps provided to secure remote wires from any contact with the hoods hinges when closed.

17. Plug the remote connector into the gray 4-pin connector on the **POWERMAX™** computer box. Again, make sure all wires are secured under hood and out of the way of any moving parts that may damage wires if contact is made.



figure 6

Thermocouple Installation

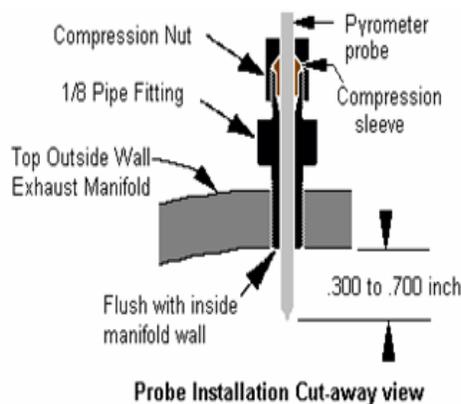
18. Locate the point to install the thermocouple. The best place is in the exhaust manifold about 1-3/4 inches before the exhaust manifold flange, in the inner fender well on the passenger side of the engine. Drill 5/16 inch diameter hole straight through the side of one wall. Tap threads using an 1/8 inch tapered pipe tap. Tap depth is important. The bottom of the thermocouple 1/8 pipe fitting should be flush with inside of the exhaust manifold.

19. Use a mechanics magnet that will pass through the taped hole to the bottom wall of the manifold to retrieve drill and tap shaving. Clean shavings from magnet, and search for more shavings until the magnet comes back clean.

20. Install the thermocouple 1/8 pipe fitting in hole and tighten with a 1/2 inch or 13mm wrench. Using a 3/8 or 10mm wrench, insure the thermocouple is securely attached to the pipe fitting.

21. Remove the terminal locknuts from the red and yellow wires of the thermocouple and attach the matching color to the end of the long thermocouple wire that has the red wire longer than the yellow wire. Slide the shrink-wrap tubing over the exposed terminals so they cannot short against other metal under the hood.

22. Route the lead wire toward the firewall up and over the engine taking precaution to keep it away from hot and moving parts. Go over top of the brake booster, and then run directly to the **POWERMAX™** computer on top of the fuse box. NOTE: do not cut the extra wire to make it shorter. Simply coil any extra out of the way.



23. Again, attach the lead wire to the red and yellow wire coming out of the **POWERMAX™** computer box using terminals provided. Use a #2 Phillips and a 5/16 wrench or socket to tighten the connection. Using electrical tape, tape both wires individually so they do not short out with each other or any other metal parts.

24. Plug the remote connector in at the **POWERMAX™** box. Double check to make sure all the connections are made. Start the truck to check the remote control display. If everything is hooked up correctly, the temperature and the boost read out should work at this time. The boost will be at '0' until the truck is under load. The temperature will be between 200 to 300 degrees on a cold start. See page 4 for remote control settings instructions.

INSTALLING THE BOOST TUBE

25. Remove the black plastic cover with the 6.6 liter logo on it. Locate the stock boost tube as shown in **figure 7**. Pinch the clamps together on both ends to remove the stock hose from the turbos waste gate.. **DO NOT THROW THIS HOSE AWAY!!** Reuse this if the truck needs to be returned to the dealer for any type of service, or if going back to stock power.

26. Install the new boost tube with the 90 degree elbow facing towards the waste gate canister. The other end of the tube goes on the fitting coming out of the turbos compressor housing. See **figure 8**. Tighten the hose clamps on both ends using a 1/4 nut driver or socket. **DO NOT** adjust the allen screw on the brass elbow. This has been preset on a flow bench to ensure safe operating pressure for the turbo.



figure 7



figure 8

R47 REMOTE INSTRUCTIONS

The R47 remote control has several functions. When installed correctly it will display exhaust temperature, turbo boost pressure, and power level setting any time the key is on as shown in **figure 9** below . The following is brief description of other R47 functions.

EXHAUST TEMP The R47 remote displays the trucks exhaust gas temperatures (shown as **1186** in **figure 9**) as it comes out of the manifold. (probe provided must be installed to read temperature on remote) When the probe is installed in the exhaust manifold, you will see reading from 250 to 300 degrees while at idle. Normal driving at a steady speed will vary between 600 to 800 degrees. While accelerating, temperatures can vary between 800 to 1200 degrees. These temperatures are normal for most trucks. While towing heavy loads, an increase in over-all temperatures can be expected. Exceeding exhaust temperatures over 1300 degrees is not recommended. The driver can set the maximum exhaust temperature by pressing the gray button between the green arrows one time. The remote would then appear like **figure 10** (showing **1300** and **Hi** below) The maximum temperature can then be raised or lowered in 10 degree increments by pressing the up or down green arrow. Once you see the temperature you want, press and hold the gray button until the words **SAVE** and **Hi** appear as shown in **figure 11**.

TURBO BOOST The R47 remote displays the amount of boost in P.S.I. being created by the turbocharger (shown as **25** in **figure 9**). At idle, no boost pressure will be present. You only get boost pressure while accelerating or under a load. Normal driving at a steady speed, pressure will vary between 2 to 5 P.S.I. Under a load or accelerating, boost can go as high as 20 to 30 P.S.I. Low boost pressure can indicate a loose charge air cooler hose, or possibly a dirty air filter.

POWER The remote displays what power level setting the **POWERMAX™** is currently on (shown as **4** in **figure 9**). This setting will equally split the power levels up in to nine different positions "0" being stock power and "9" the highest setting. Towing on the higher power level setting is not recommended due to stress on the vehicles drive train. The power level can be changed any time the key is on (even under power) by pressing the green up or down arrow.

TORQUE ENHANCEMENT The remote displays the current torque enhancement level by pressing the gray button twice to get to a view (shown as level **3** and **tE** in **figure 12**). The "tE" Level is best described as an adjustment for adding additional torque in the lower rpm range(1300-2000). Again this is a "0" to "9" level setting similar to the Power Level setting. The higher the "tE" number, the higher the mid-range torque will be without increasing horsepower at top rpm. While viewing the remote as shown in **figure 12** press the up or down green arrow to change the "tE" level.



figure 9



figure 10



figure 11



figure 12

POWERMAX™ R47 REMOTE CONTROL SETTINGS

1. The **POWERMAX™** has 9 different power levels that can be adjusted while driving down the road without stopping the vehicle. With the key on, the single digit display is the power level setting with “0” being stock and “9” being the highest power level. Use the green up and down arrows to change power levels.

2. Pushing the gray button on the remote once will display the current exhaust temperature “Hi” setting. Adjust this setting by using the green up and down arrows. Once the desired setting is reached, push and hold the gray button until the word (SAVE) appears in the exhaust temperature read out. This will save the temperature setting. If the probe is installed in the manifold, the maximum temperature setting should not exceed 1300 degrees. If the probe is installed after the turbo, exhaust temperature limit should be set at 1000 degrees. If the maximum exhaust temperature is exceeded, the **POWERMAX™** will automatically decrease the additional power. Once a safe temperature is reached, the added power will be restored automatically. When power is being decreased due to high exhaust temperatures, four green LED dots will begin to flash on the remote where the exhaust temperature reading is displayed.

3. With the R47 in its normal state, pushing the gray button two times will display the current “tE” (torque enhancement) setting. The “tE” setting adjust the torque in the 1300 to 2000 rpm range without changing the maximum horsepower at 3000 rpm. “tE” (as described in the remote instructions on the previous page) is a 0 to 9 adjustable setting that allows additional torque to be added in the lower rpm ranges on top of the torque already being added by the **POWERMAX™**. To adjust this setting, use the green up and down arrows to the desired number, press and hold the gray button in the middle until the word (SAVE) is displayed where exhaust temperature is normally read. Note: the higher the “tE” is set, the higher the mid-range torque and stress on transmission and drive train.

SUGGESTED SETTINGS

Power Level 0-4 “tE” Level 0-4 Good for everyday driving, and when towing heavier loads, stock automatic and manual transmissions.

Power Level 5-9 “tE” Level 0-4 Empty automatics, and when towing lighter loads with manuals.

Use of “tE” level above 4 with stock automatics may cause transmission slippage, use a lower “tE” setting if you feel the transmission slip or shift erratically. Aftermarket transmission parts are available that will allow operation at higher torque settings.

Power Level 5-9 “tE” Level 5-9 Good for driving when you really want a big increase in power.
Not recommended for towing applications due to stress on the drivetrain.

Stock manual clutches may slip if Power Level 7 (or above) and “tE” Level 7 (or above) are used at the same time. Aftermarket manual clutches are available that will allow operation at higher settings.

Cruise control may be unstable if the sum of Power Level plus “tE” level exceed a total of 7.
If cruise control continues to surge in speed, reduce either Power Level or “tE” Level.

A good rule of thumb to go by is to keep the sum of the Power Level and “tE” Level under a total of (8).
For example: if the Power Level setting is on (4), then the “tE” Level should be set no higher than level (4), which equals a total of (8). These are only suggested setting. Driver ability, road conditions, and amount of weight should all be a factor when choosing a power level.

WARRANTY AND DISCLAIMER

TST PRODUCTS INC. WARRANTS THAT ITS PRODUCT WILL BE FREE OF FUNCTIONAL DEFECTS AND WILL PROVIDE THE ADVERTISED POWER INCREASE FOR TWO YEARS FROM PURCHASE DATE, PROVIDED THEY ARE USED IN ENGINES THAT ARE IN MECHANICALLY GOOD CONDITION.

TST HIGHLY RECOMMENDS THE USE OF BOOST AND PYROMETER GAUGES WHEN INCREASING ENGINE POWER.

TST DOES NOT WARRANT THE ENGINE, DRIVETRAIN OR BALANCE OF THE VEHICLE IN ANY WAY.

TST SHALL NOT BE RESPONSIBLE FOR ANY MISUSE OR UNSAFE ACTS PERFORMED BY CUSTOMER, WHETHER DIRECTLY OR INDIRECTLY RESULTING FROM THE INCREASE IN ENGINE POWER.

CAUTION: THE INCREASE IN ENGINE POWER MAY EXCEED THE CAPABILITY OF THE STOCK TRANSMISSION/CLUTCH AND/OR OTHER PARTS IN THE VEHICLE DRIVE TRAIN. THE ORIGINAL VEHICLE MANUFACTURER MAY VOID ITS WARRANTY ON THE ENGINE AND/OR DRIVETRAIN WHEN STOCK POWER IS ALTERED.

CAUTION: WHILE THE ADDITIONAL POWER WILL MAKE IT POSSIBLE TO CLIMB HILLS AND PULL GREATER LOADS FASTER, IT DOES NOT IN ANY WAY IMPROVE OR AFFECT BRAKING ABILITY. USE EXTREME CAUTION WHEN PULLING HEAVY LOADS AND/OR TOPPING HILLS AT HIGH SPEEDS