

“Pittsburgh Powerbox”

Caterpillar

Installation instructions
By: Pittsburgh Power Inc.



Congratulations on the purchase of your “**Pittsburgh Powerbox**”. The only product of its kind! These installation instructions will guide you through the process required to make your engine perform like a winner. **Be sure to read these instructions in their entirety prior to installing your Powerbox.** Aside from basic hand tools you will need the following:

1 3/8" hole saw 1/4" pipe tap

1/2" drill 1/8" & 15/32" drill bit.

Note: It is not necessary to disconnect the battery during the installation process. However, do not turn the key on. This may result in trouble codes being logged to the ECM. Keep all wires and connections free from dirt and grease. Any contamination on the connectors or terminals could affect the operation of the unit. Also, we have found many instances of charge air coolers/intake plumbing, leaking manifold pressure to atmosphere. This causes low boost, high pyrometer heat, lack of power and engine damage. It is recommended to pressure test your intake system and charge air cooler prior to installing the “**Pittsburgh Powerbox**”. We also suggest that you make sure your computer system is not generating any trouble codes.

1). Mounting the “**Pittsburgh Powerbox**”. Find a suitable location **inside the cab** around the dash area for the computer. It can be mounted in any orientation making sure you will have access to the connections on the one end and the on-off switch on the other. The computer can be securely mounted to any flat surface with screws inserted through the two holes provided on the ends of the unit or it can be held in place with Velcro or wire ties as the situation permits.

2). Preparing to install the new harness. Inspect the firewall for accessibility and, using a hole saw, drill a 1 3/8" hole (see figure 1) in a location that will allow you to pass the wiring harness through. This harness will be attached to the injector connector on the drivers side of the engine and the “**Pittsburgh Powerbox**” that is located inside the vehicle. After drilling the hole remove any burrs from the area with sandpaper or a small file.

3). Installing the new harness. Being careful not to damage the connectors, feed the main wiring harness (double round black connector end figure 6) through the hole in the firewall from the engine side, towards the inside of the vehicle. Pull enough through the firewall so the yellow lead wire for the EGT sensor breaks out of the new harness at the left rear corner of the engine (figure 2&7) and the injector plug, on the forward most part of the harness, align with the factory injector connector located on the front of the valve cover spacer (see figure 4). Carefully insert the supplied grommet into the pass-through hole in the firewall and around the harness (see figure 3).



Figure 1



Figure 2



Figure 3

4.) Attach the new harness to the computer. Push each black connector (small & large) on to the receptacles of the “**Pittsburgh Powerbox**” computer. Turn the lock nut till you feel it "click". Do not over tighten.

5.) Connect the new harness to the injector connector. Remove the plug of the factory wiring harness from the connector on the valve cover. It is located on the driver side of the engine in the valve cover spacer. (see figure 4). To remove the male connector, push in on the release mechanisms and gently pull the plug from the female connector. Insert the male plug of the new harness into the original female connector at the valve cover and insert the original male plug (removed at the beginning of this step) into the connector on the new harness.

6.) Connect the power leads (**12V only**). There is a wire with a 3/8" eyelet connector that breaks out of the new harness towards the back of the engine. Connect the eyelet to the mounting stud that is located towards the rear of the cylinder head on the driver side. (See figure 2) Make certain that there is no paint or rust on the stud, nut or threads as a good ground connection is very important. The positive terminal connection is the RED wire with a 1/4" eyelet that breaks out of the new harness at the two black computer connectors. (see figure6) Run this wire to the **switched** side of the ignition switch or fuse box. It must supply power only when the key is on.



Figure 4



Figure 5



Figure 6



Figure 7

7.) Connect the new harness to the boost sensor that is located on the left side of the engine. This sensor screws into a **90 degree fitting** in the side of the cylinder head and has a **pigtail lead** with a triangular shaped connector (do not remove the wire at the sensor itself) Figures 5 and 8 show where it may be located. Disconnect the original harness from the pigtail lead. Find the wires that brake out of the **new** harness in the same area the injector connector is located. Plug the male connector from the new harness into the boost sensor pigtail lead. Next, plug the **original** male connector, removed previously, into the female connector of the new harness (see figure 9).



Figure 8



Figure 9

8.) Install the EGT sensor. Remove your old, existing exhaust gas temperature sensor from the exhaust pipe and install the supplied sensor into the same hole. Your existing sensor should be located approx. 3-6" back from where the exhaust pipe bolts onto the exhaust outlet of the turbocharger. Connect the yellow and red wires from the new harness to the new sensor. If you would also like to have your original EGT gauge function, hook the wires that were originally connected to the old sensor to our new sensor also. The color codes should be the same. Yellow to yellow and red to red. If your truck is not equipped with an EGT gauge, look for a 1/4" pipe plug in the exhaust pipe just behind the turbo. Remove the plug, install our sensor and hook up the red and yellow wires from the new harness to the new sensor. If there is no plug to remove, you will need to drill and tap the pipe for the sensor. Measure approx. 3" back the pipe from where it connects to the turbo and drill a 1/8" inch pilot hole. Then drill it to 7/16" and tap it out for a 1/4" pipe thread. Install the sensor as outlined above. Slide the protective cover over the connectors and tape or heat shrink it closed on the end.

10.) Using the supplied wire ties, fasten the EGT lead wire **and** the "**Pittsburgh Powerbox**" harness at several locations under the hood and under the dash to prevent vibration. Be sure to route all wiring away from any heat source.

11.) Install the remote control unit. Using the supplied Velcro, attach the remote to a convenient location. Route the wire from the remote unit to the "**Pittsburgh Powerbox**" and plug it into the jack on the side of the computer. Use wire ties were necessary to hold the lead in place. When routing the lead from the remote, do not run it near any other electrical wires and keep it separated from the new harness that plugs into the back of the "**Pittsburgh Powerbox**". If the cable is near any other electrical wires or devices, electrical interference may cause the remote to display erroneous characters. If this occurs, reroute the lead and cycle the key on and off and the remote will reset.

“Pittsburgh Powerbox” operating instructions

All driver interaction will be done through the remote unit. You will have eight different power level settings starting at level zero. Each level above zero will add approximately 30 horsepower (C-12 engines are 17HP) to your stock setting for a total of 210* additional flywheel ponies (C-12 engines are 125HP). The level setting can be changed at any time under any type of driving condition.

The remote also displays important monitoring information. It will show, in real time, exhaust gas temperature and manifold pressure. If the exhaust gas temperature (EGT) rises above 1100 degrees the “Pittsburgh Powerbox” will start to cut the power back in order to maintain a safe operating condition. When using power levels 6 and 7 a red warning light will blink on the remote indicating you are using high power. (NOTE: **Some 3406E, C-12 and C-15 engines have a boost limit of 32lbs on the display.** If the boost rises over that point an H will appear in front of the boost reading on the display. This is normal.)

PLEASE NOTE : If you turn the key on and the remote displays more than a few pounds of manifold pressure **do not start the engine.** Check to make sure you are plugged into the correct boost sensor described above. If you are sure you are plugged into the correct sensor, call tech support.

On the side of the computer there are 6 GREEN LED's and an on-off switch. The LED's indicate when cylinders 1 through 6 are firing with **enhanced power** and will blink with every power stroke of the engine **ONLY WHILE UNDER LOAD** . They will also get brighter as more power is applied. If you have a miss that is ECM or “Pittsburgh Powerbox” related you may be able to tell what cylinder it is. The corresponding light for the problem cylinder will not light while under load. If the miss is downstream from the ECM or “Pittsburgh Powerbox” the light will still blink. This could indicate a possible problem with an injector or an internal engine malfunction.

The yellow MAP light is an indicator that the “Pittsburgh Powerbox” is seeing a signal from the boost sensor and will get brighter with higher manifold pressure readings. The red power light indicates whether or not the switch is turned on.

Use the on-off switch to enable or disable the unit. With the switch turned off, no power will be added regardless of where the remote is set. The display on the remote will continue to function normally in both modes.

At power levels 6 and 7 a red LED on the remote will blink indicating a high power level setting. This is to warn the operator of the potential power he is capable of developing.

TROUBLESHOOTING

99% of all problems with the “**Pittsburgh Powerbox**” are caused by bad connections. Prior to calling for technical support, please unplug all weather pack connectors from our harness, spray them out with brake clean, blow dry with compressed air and reassemble. If this does not correct the problem, disconnect the positive and negative feed wires for the “**Pittsburgh Powerbox**” and run them directly to the battery. If this corrects the problem, find a better ground source and a different switched power source. If you do need to call for support, **please monitor all the lights** on the “**Pittsburgh Powerbox**” prior to calling so you can tell the support team what they are doing. This also includes knowing what the green lights are doing along with the yellow and red. As mentioned above.

PLEASE NOTE: If you turn the key on and the remote displays more than a pound or two of manifold pressure **do not start the engine**. Check to make sure you plugged into the correct boost sensor described above. If you are sure you are plugged into the correct sensor, call tech support. **Do not use the unit**. Also, if you need tech support or have a problem with the unit call us **PRIOR TO REMOVING THE UNIT FROM THE TRUCK**. Once the unit is removed, we may not be able to diagnose the issue properly.

High Performance Driving Tips A word from our CEO Bruce Mallinson

The “**Pittsburgh Powerbox**” begins to add fuel to the engine at two pounds of turbo boost. With power levels of three or above the engine will be very responsive. Please observe the turbo boost gauge and accelerate slowly with your right foot. Keep in mind that it takes eight pounds of turbo boost to burn fuel. Mashing the throttle when the turbo boost is below eight pounds will result in black smoke out of the exhaust stacks. Using excessive power to accelerate the rig to your cruising speed will result in excessive drive train wear. Drive as though you have an egg between your foot and the throttle. Don't see how fast the turbo boost gauge can be pegged. Between shifts roll your foot into the throttle. Don't jab your right foot to the floor. Be smooth. Never use full power to pull the grade of a mountain. Your engine was designed at ten percent more power than it was released to you. Always be in a gear where you can accelerate. Most “**Pittsburgh Powerbox**” owners are running their engines on power level two or three and are seeing anywhere from .2 to 1 full mile to the gallon improvement in fuel economy.

Metal fatigue is a truck drivers worst enemy. Anything can break at any given time. Treat your equipment with respect. Especially with awesome power. It's up to you, the driver, to keep your engine alive.

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WARRANTY AND DISCLAIMER

Diesel Injection of Pittsburgh Inc. warrants that its “Pittsburgh Power” computer will be free of functional defects for a period of one year unlimited mileage and will perform as advertised provided they are used on engines that are in good mechanical condition. It is mandatory that the pyrometer sending unit be properly connected to the “Pittsburgh Power” or severe engine damage may result.

Diesel Injection of Pittsburgh does not warrant the engine, drivetrain or balance of the vehicle in any way. The operator is solely responsible for the proper use of this product. Use of power levels 4 and above on a regular daily basis may shorten engine life.

Diesel Injection of Pittsburgh shall not be held responsible for any misuse or unsafe acts performed by the customer, whether directly or indirectly resulting from the increase in engine power.

The original manufacturer may void its warranty on the engine and/or drivetrain when stock power is altered.

Any repair/alteration of the “Pittsburgh Power”, unless conducted by Diesel Injection of Pittsburgh or one of its factory trained and authorized dealers, will void any and all warranties of the product. A copy of the original sales receipt from Diesel Injection of Pittsburgh or one of its authorized dealers must accompany all products submitted for warranty consideration.

For all technical support related issues call 724-360-4080

***Horsepower ratings vary depending on the individual's current engine rating.**

Fuel Mileage With The Pittsburgh Powerbox:

Please keep in mind when thinking about fuel mileage: This unit is a **performance enhancement**. Generally, when you improve performance, fuel mileage is also improved. Fuel mileage can be increased when using this unit if you are an average owner operator pulling 60-80K lbs. across country. Under these conditions an average improvement of 3 tenths MPG is very common. Some of our customers have seen over one MPG improvement in mileage. There are also situations where there may be no improvement in mileage. These are:

Running around empty

Pulling very light loads

Running on flat level terrain

Pulling oversize or over weight loads

Running high power levels

Using the unit to gain enough power to run at excessive speeds.