“Pittsburgh Powerbox”

Cummins Celect 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" & 7/16" 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. 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 connectors 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) through the hole from the engine side towards the inside of the vehicle. Pull enough through so the forward most part of the harness, align with the factory injector connectors. 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**". Turn the lock nut till you feel it "click". Do not over tighten.

5.) Connect the new harness to the injector connectors. Remove the male plug of the factory wiring harness from the #6 (rear) female injector connector. It is located on the drivers side of the engine towards the top-rear. To remove the male connector, push down on the release mechanism (see figure 4) and gently pull the plug from the female connector. Insert the male plug on the new harness into the original connector and insert the original male plug (removed at the beginning of this step) into the connector on the new harness (see figure 5). Repeat this procedure with the remaining 5 connectors. (**NOTE:** If your engine is a **Celect Plus** you will need to install the supplied isolators into the **injector connector between the original harness and the new Pittsburgh Power harness**. First unplug the factory original harness from the injector connector at the cylinder head. Then plug the female plug of the new Pittsburgh Power harness into the injector connector at the head. Next, plug the female end of the isolator into the remaining male connector of the Pittsburgh Power harness and plug the male end of the isolator into the female end of the original harness.

6.) Connect the power leads (12V only) . Attach the wire marked 12V hot, located near the two black round computer connectors, to the **ignition side of the ignition switch terminal. Not the shut down solenoid.** Connect the ground wire connector (black wires with yellow connector located between two of the injector harness wires) to one of the intake manifold bolts.

Figure 4

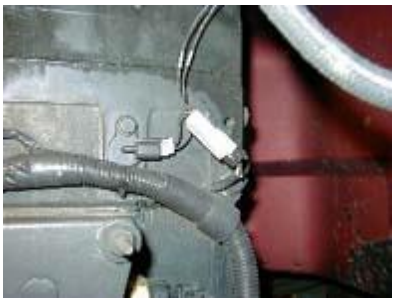

Figure 5 (Celect only, not Plus)

7.) Connect the new harness to the boost sensor. (Note: If your engine is an early Celect, you will need to replace the boost sensor with the supplied sensor that came with your "**Pittsburgh Powerbox**" The sensor is located at the rear of the intake manifold (see figure 7). Remove the male plug from the sensor. Find the wires that brake out of the new harness at the #6 injector area. Plug the male connector from the new harness into the boost sensor. Next, plug the **original** male connector, removed previously, into the female connector of the new harness (see figure 8).

Figure 7

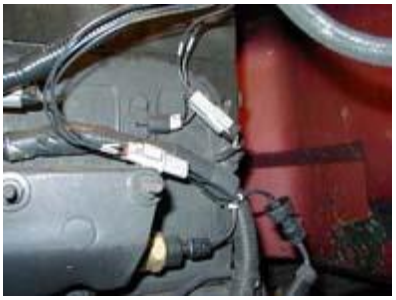

Figure 8

8.) Drill and tap the exhaust manifold and install the EGT sensor (thermocouple). Note: The thermocouple **must** be located in the exhaust manifold in order for proper temperature monitoring. If you purchased our turbo upgrade this is best done after the old turbo is removed. However, if you are not removing the turbo, you can still drill and tap without concern. Drill a 1/8" pilot hole approximately 1" towards the engine from the edge of the turbo mounting flange. Referring to figures 9&10, notice there is a divider in the center of the exhaust opening. (**NOTE:** If your engine is a **Celect Plus** refer to figure 11) The EGT sensor should be located in the center of the rear port opening. After the pilot hole is drilled re-drill with a 7/16" bit to open the hole to accept a 1/4" pipe tap. Run the tap in and thread the hole. Use caution not to turn the tap in to deep as this will open the hole beyond specifications. Use the EGT sensor as a guideline by removing the tap and checking for a proper fit. After the hole is tapped, install the sensor into the manifold. It is recommended to use anti-seize on the sensors threaded areas.

Figure 9

Figure 10

Figure 11

9.) Connect the yellow EGT sensor lead wire to the EGT sensor. Attach the longer red lead wire to the shorter red wire on the EGT sensor and the shorter yellow lead wire to the longer yellow wire on the EGT sensor.

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**" computer 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 does occur, 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 25 horsepower to your stock setting for a total of 175* additional ponies. 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 1300 degrees the “**Pittsburgh Powerbox**” will start to cut the power back in order to maintain a safe operating condition (NOTE: this feature is **not in effect** when using power levels 6&7. This being indicated by the blinking red light on the remote. Therefore, use extreme caution while using the higher power levels.) If there is a problem with the signal coming from the EGT sensor/wiring, no power will be added.

On the side of the computer there are 6 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 and no EGT safety feature. 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 weatherpack 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.

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 Powerbox" 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 my 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 Powerbox", 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 individuals 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.