

Installation Manual

PH3 POWERHALT
AIR INTAKE EMERGENCY SHUT-OFF VALVE



C50254A PH3 AIR INTAKE SHUT-OFF VALVE

WITH POWERGUARD SMART OVERSPEED LIMITER

2013-2017 DODGE 6.7L CUMMINS

800.663.0096

www.powerhalt.com



INSTALLATION REQUIREMENTS & RECOMMENDATIONS:

Prior to the installation, please read through the requirements and recommendations listed below so you have a clear understanding of your system and the location which you plan to install the shut-off valve.

If you cannot meet these requirements, or are unsure of your system, contact your dealer or PowerHalt representative and we can work with you to overcome your installation constraints and challenges.

A PowerHalt Technical Representative can be reached Monday-Friday 6:00-4:30 (PST) at 800.663.0096

- A 1" clearance is required from the valve to any other components. The valve can be in any orientation.
- Maximum ambient air temperature at the valve should not exceed 120°C.
- All hoses, adapters, and fittings must be suitable for the vibration* of the engine application.

***If unsure of your vibration requirement, contact Pacbrake.**

- Flexible hose gaps should be kept to a minimum and the overall pipe quality and integrity from the shut-off valve to the intake manifold should be confirmed.

NOTE: Failure to ensure this may result in hose collapse during valve activation and possible system leaks, preventing engine shutdown.

For excessive vibration applications, and installations with long pipe runs, additional support brackets may be required.

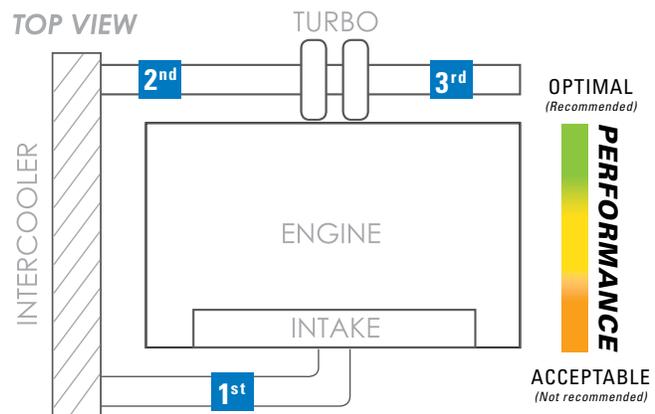
- If an air intake flame trap is used, the valve must be installed upstream of the trap.
- Crankcase breather connections to the intake system must be sealed and replaced by an external breather.
- If you need to cut the existing intake piping to allow for the shut-off valve installation, remove the pipe off of the engine and thoroughly clean it to ensure no shavings are present prior to the installation.

NOTE: Failure to do so may result in engine damage caused by foreign debris ingesting into the engine.

- It is highly recommended that the pipe is rolled with a bead to ensure hose fitting retention on both the inlet and outlet sides of the shut-off valve.
- If more than one shut-off valve is installed on one engine it is imperative that the control method is consistent with this requirement, ensuring valve activation is simultaneous for both valves.

In order of preferred location to least preferred

1st	POST INTERCOOLER	<ul style="list-style-type: none"> ■ Low Plumbing Leakage Risk ■ Moderate Charge Air Temperature ■ Fast Shutdown Response Time
2nd	POST TURBO	<ul style="list-style-type: none"> ■ Moderate Plumbing Leakage Risk ■ High Charge Air Temperature ■ Moderate Shutdown Response Time
3rd	PRE TURBO	<ul style="list-style-type: none"> ■ High Plumbing Leakage Risk ■ Low Charge Air Temperature ■ Slow Shutdown Response Time



Please ensure that you have all the parts listed in this kit **before** you start the installation.



KIT CONTENTS

- A** Shut-Off Valve (1)
- B** Charge Air Cooler (CAC) Pipe (1)
- C** 2.75" Clamps (3)
- D** 3.5" Clamps (3)
- E** 2.75" - 3.5" Silicone Hose (1)
- F** 3.5" Silicone Hose
- G** 45° Elbow Silicone Hose (1)
- H** Tie Straps (8)
- I** Crank Sensor Jumper Harness (1)
- J** PowerGuard Controller
- K** Wiring Harness
- L** Membrane Switch

REQUIRED TOOLS

- Drill
- 1/2" Unibit
- Ratchet with 7/16", 1/2" & 10mm Sockets
(a 14" extension is ideal)
- Torque wrench capable of 0-80 in-lbs
- Wire Strippers & Crimpers
- Electrical Tape

1 Open the hood. Disconnect the batteries.

2 CONTROLLER, SWITCH & WIRING HARNESS INSTALLATION:

Use self tapping screws or tie straps to secure the PowerGuard controller to the desired location.

CAUTION: Please ensure the PowerGuard controller box is mounted in a location where it is not exposed to high pressure water contact or where it can reach ambient temperatures that exceed 80°C.

3 Connect the harness connector to the PowerGuard.

NOTE: Secure the wiring harness with the provided tie straps away from any moving parts or high heat sources.

4 Route the section of wire to the Pacbrake harness with the 3 pin weather pack connector to the crankshaft speed sensor, located below the harmonic balancer on the driver's side of the engine.

Unlock and unplug the factory harness connector.

Obtain the supplied crankshaft sensor jumper harness, connect the female connector to the crankshaft sensor and lock. See photo 4A of lock/unlocked positions.

Connect the factory female connector to the male connector of the jumper harness, and lock.

Route this wire to the 3 wire female weather pack connector of the jumper harness and connect.

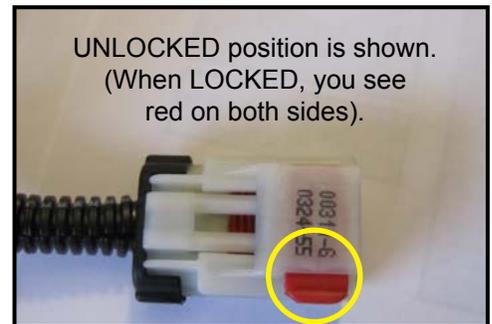
Secure the harness with the provided tie straps away from any moving parts or high heat sources,



2

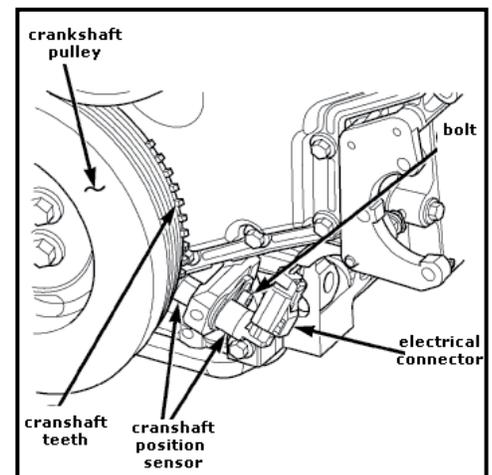


3



UNLOCKED position is shown.
(When LOCKED, you see red on both sides).

4A



4B

5 SWITCH INSTALLATION

Locate the desired location for the PH3 switch taking into consideration the below points.

NOTE:

- The switch must be accessible from the ground outside of the driver's door. Ideally the switch should be to the left of the steering column.
- A flat 2" x 4" location that is accessible from the backside of the panel is required
- Dash thickness and construction needs to be understood, ensuring the bolts can extend through the dash.

CAUTION: Ensure vehicle control wiring is clear of switch drill location prior to drilling dash.



5B

INSTALLATION STEPS

A Take out Layout Template* provided (5C).

Cut out and mark drill locations for the switch to ensure accuracy..

B Remove dash panels accordingly in order to access the backside of the dash switch location.

C Drill 1 1/8" hole using uni-bit and 2 - 1/4" holes for fasteners (as per drill template, see picture 5C).

D De-burr holes.

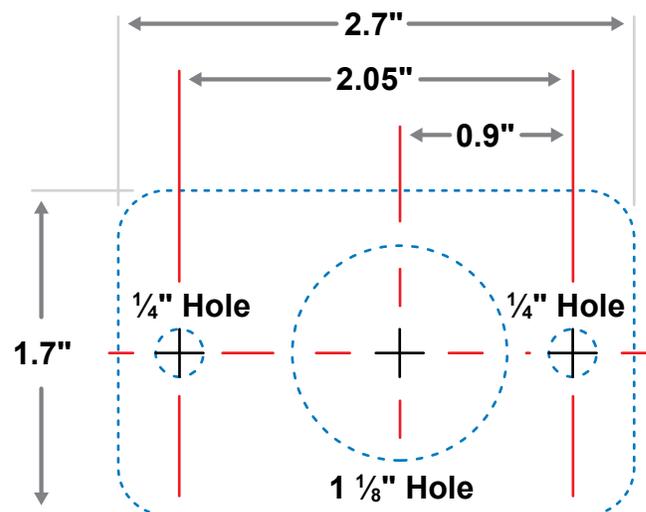
E Install the switch with the supplied hardware.

F Torque the nuts on both bolts to 15-25 in-lbf (1.7-2.8) N•m.

CAUTION: Do not over-torque nuts.

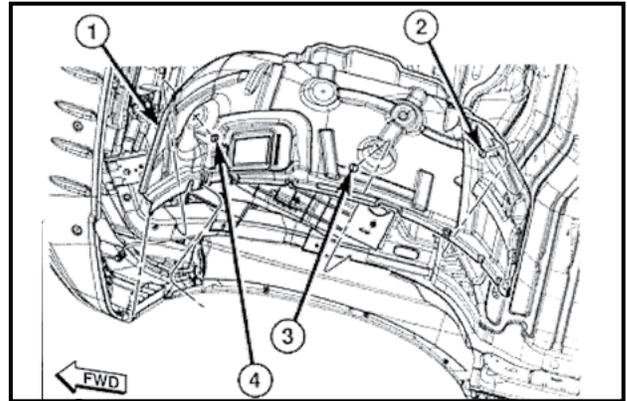
***NOTE:** When printing out the drill template online make sure your printer is not scaling the image or stretching it. Open your print dialogue box and select print at 100% scale.

PH3 DRILL TEMPLATE

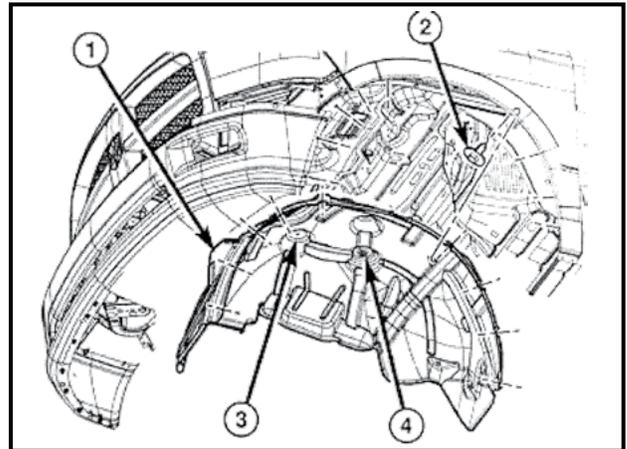


5C

- 6** Remove the driver side inner fender well.
- Release the ABS harness push pin from the inner shield - if applicable.
 - Remove the push pins (# 2, 3, and 4 from image 6A).
 - Remove the inner screws (#3 and #4 from image 6B)
 - Remove the screws securing the shield to the fascia and the outer fender flange (#2 from image 6B)
 - Release the outboard edge of the shield (#1 from image 6B) from the fender flange and remove the inner shield (#1 from image 6B).



6A



6B

- 7** Remove the driver side charge air cooler (CAC) pipe and upper silicone hose using a 7/16" deep well socket with ratchet.

NOTE: Factory clamps are not to be re-used.



7

- 8** Using a non-oily cleaner (such as iso-propyl alcohol) and a lint-free cloth, clean the outside of the intercooler and the outside of the intake plenum.



8



9

9 Attach the 3.5" silicone hose provided in the kit onto the end of the valve, as shown in image 9. Install the clamp and hand-tight.



10

10 Attach the 3.5"-2.75" silicone hose provided in the kit onto the opposite end of the valve and install the clamp hand-tight.



11

11 Install the longer leg of the provided stainless CAC pipe into the 2.75" end of the silicone hose, as seen in photo (image 11).



12

12 Attach the 45 degree elbow loosely onto the opposite end (short leg) of the stainless CAC pipe provided.

- 13** Loosely install the remaining clamps and snug them up, but leaving them loose enough for the valve to be rotated into a proper position after assembly is in place.
- Place one clamp onto the intercooler outlet and the other remaining clamp onto the silicone hose that will be attached to the air intake plenum.
- Install the valve and CAC pipe assembly in between the intercooler and the intake plenum.
- Rotate the valve to provide adequate clearance, and torque all clamps to 75 in-lbs, 8 N•m.



13

- 14** Reinstall the inner fender well, in opposite steps as described in step 6.

- 15** Connect the connector of the harness to the mating connector on the PowerHalt valve.

Note: Ensure the wiring harness routing is secured with provided tie straps and away from any moving parts or high heat sources.



15

16 BATTERY CONNECTION

Connect the red positive wire and the black ground wire of the PowerGuard controller to the vehicle battery post using the ring terminal. Ensure a good clean battery connection is provided.

NOTE: Ensure the wiring harness is secured appropriately with the provided tie straps and is not exposed to extreme temperatures or moving parts.

17 VALVE OPERATION

POWERGUARD CONTROLLER FUNCTIONAL STATES

The PowerGuard is a smart controller and has the following three states:

STATE 1 – Pre Set-Up: When you first purchase your kit the controller does not have an RPM threshold set within its memory.

- The red and green LEDs alternately flash

STATE 2 – Normal Operation: When the controller has a stored RPM threshold, it will behave in the following way:

- When the engine is running: the green LED will flash every 5 seconds indicating the system is active and RPM is being monitored
- When the engine is not running: no LED lights will flash
- When RPM drops to zero (during normal key-off engine shutdown), the valve will perform an anti-foul cycle (closing 0.25 sec then opening) which keeps the valve free of debris and corrosion. This results in an extended valve life.
- If the valve is tripped manually or automatically, the valve will close and the red LED will illuminate. When 0 RPM is detected and 30 seconds has elapsed, the valve will automatically re-open and the red LED light will go out.

STATE 3 – System Error: If there is a system error detected during the initial power-up of the PowerGuard controller or during daily operation, the LEDs will flash an error code as per the below sequence;

1. Rapid alternating illumination of the red and green LED lights indicates a system error
2. A one second pause is followed by a flash code where the number of flashes is the error code as per Flash Error Codes, as shown on page 9.
3. This cycle repeats until the error is fixed and the power to the controller is cycled.
4. To clear error codes disconnect battery fuse and re-install.

FLASH ERROR CODES:

1. Valve failed to close or motor position is not read

- Ensure all connectors are fully installed and latched, then cycle power
- If this fails, ensure continuity from the five pin connector at the shut-off valve to the controller, then cycle power

2. Valve failed to open or motor position is not read

- Ensure the shut-off valve connector is fully installed and latched, then cycle power

3. Valve closes too slowly or not all the way

- Inspect the shut-off valve for obstructions, and attempt to manually press the flap closed and open (feeling for any binding). If the valve does not operate smoothly, contact Pacbrake support at 800.663.0096.

4. Valve opens too slowly or not all the way

- Inspect the shut-off valve for obstructions, and attempt to manually press the flap closed and open (feeling for any binding). If the valve does not operate smoothly, contact Pacbrake support at 800.663.0096.

5. Shut-off valve pulls too much current

- Ensure continuity from the five-pin connector at the shut-off valve to the controller on the two large power wires (red and black). Check for damage to the wires causing shorts, then cycle power.

6-9. Internal controller error

- Contact Pacbrake support at 800.663.0096



SWITCH FEATURES

- RESET** Used during the setup procedure. (Has a red LED indicator above the button)
- TRIP** Used for a manual activation (override).
- TEST** Used to test the automatic function and during the setup procedures. (Has a green LED indicator above the button)

18 POWERGUARD SET-UP & TEST PROCEDURE

TO SETUP RPM:

With the engine running, hold the reset and test buttons together for 5 seconds until both LED lights start flashing, and then release both buttons

The controller is now in the set/test mode with 2 options (see below)

FIRST: If your controller is already set for a specific RPM, and you want to change the RPM trip point, press and hold reset for 5 seconds to remove the RPM limit, then the controller will revert to Functional State 1 (from step 17)

SECOND: if your controller has not been set up you will need to do the following steps;

1. Confirm your engine rated RPM value.
2. Determine your desired RPM over speed shutdown RPM value.

NOTE: Pacbrake manufacturing recommends a 20% (min) and 30% (max) over rated Engine RPM setting for shutdown.

EXAMPLE: Engine RPM = 2150 + 20% over speed value = 430 RPM over max rated.

(2150 + 430 = 2580 then take 50% of this value = 1290 RPM.)

3. Increase the truck RPM to 50% of your over speed shutdown value determined in Step 2
4. While at this RPM press the reset button on your PowerHalt switch located in the vehicle cab 4 times.

NOTE:

- There must be less than 2 seconds between presses for the controller to read inputs.
- After presses are complete, the red LED will flash 4 times to confirm programming has been accepted.
- If there was no RPM detected when pressing the reset button, the controller will remove the existing RPM threshold and change to functional state 1 (from step 17)
- If no action is taken while in the set/test mode, after 60 seconds the controller will time out and return to normal function and its most recent RPM threshold.

19 POWERGUARD TEST PROCEDURE

TO ENTER TEST MODE:

With the engine running, hold the reset and test buttons together for 5 seconds until both LED lights start flashing, and then release both buttons

Press and release the TEST button to enter into test mode, where the threshold will be reduced to 100% of original RPM, or 50% of threshold

The controller will wait for 60 seconds before reverting back if threshold is not reached.

Increase the RPM to 50% of the threshold, the valve will close and the red LED will illuminate until 0 RPM is detected and either 30 seconds elapses or the TEST button is pressed

Next, the valve will automatically re-open and the red LED will extinguish

20 POST INSTALLATION TESTING

Once the installation is complete, ensuring all steps, schematics and recommendations have been followed, it is now time to test your system

1. Press the red TRIP button and confirm the red LED is illuminated. Wait 30 seconds for the valve to auto reset
2. Start the engine
3. Press the red TRIP button and ensure:
 - The engine stops within a few seconds
 - Hose collapse is not severe
 - No excessive leaks are present in the system

NOTE: *if the engine does not fully shut down check all intake piping and hoses for leaks between the valve and intake system. If the system is sealed and the valve still fails to shut down the engine consult your Pacbrake service representative for support*

4. Once the engine stops wait 30 seconds until the valve automatically re-opens and the red LED turns off
5. Utilize the test mode (in step 8) as per PowerGuard Test Procedure to ensure that the automatic overspeed is functioning properly

21 NORMAL VALVE OPERATION

Automatic function or manual override can be used to shut down the engine during an over speed event

CAUTION: *Do not attempt to start the engine after an over speed condition occurs until the cause is understood and shared with the necessary safety parties.*

NOTE: *Please reference your organizations specific operation procedures and ensure they are in line with the PowerHalt operating instructions and requirements. If there is a discrepancy always follow your site requirements first.*

NOTE: *Please reference your operators pocket guide for operation/test and troubleshooting specifics.*

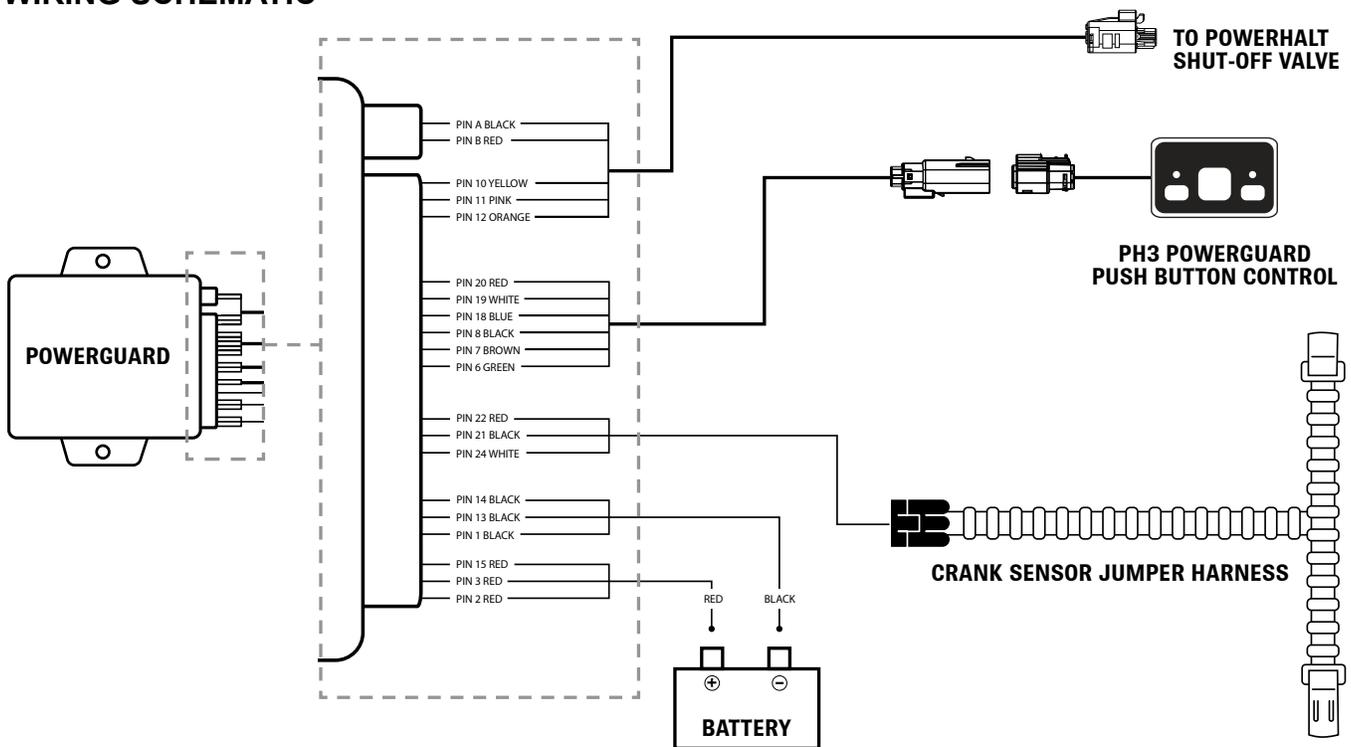
22 VALVE MAINTENANCE REQUIREMENTS

As the PH3 is a maintenance free and self-checking valve, it does not require any specific operator involvement. The PH3 performs an anti-foul cycle every time the engine comes to a stop after a period of running. However if the unit is stored for extended periods, or run for extended periods without pause, it is imperative that the engine run and shut down monthly so that the PH3 valve can perform its anti-foul cycle.

23 MONTHLY INSPECTION REQUIREMENTS

- Inspect all fasteners and clamps to ensure proper torque.
- Inspect all hoses and pipes for signs of wear or vibration related issues.
- Inspect all wiring connections and routing to ensure correct strapping.
- Inspect the membrane switch while the unit is running to ensure the green LED light is flashing every 5 seconds.

WIRING SCHEMATIC



Customer Service Hours

Monday to Friday from 6:00 am to 4:30 pm PST

Business Hours of Operation

Monday to Friday from 7:30 am to 4:00 pm PST

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