

# Programming Manual

**PH3 POWERHALT**  
AIR INTAKE EMERGENCY SHUT-OFF VALVES by PACBRAKE



**POWERGUARD**  
SMART OVERSPEED LIMITER



**PLEASE NOTE:**

Store this document in your vehicle glove box or with your important engine documents for future reference.

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## 1 Operation

- When the controller is unprogrammed, both lights will flash alternately
- When the engine is not running, neither light will flash
- When the engine is running, the green light should flash every 5 seconds to indicate the system is active and the engine speed is being monitored
- When the engine is running with the Secondary Set-Point active, the green light should exhibit a double flash every 5 seconds to indicate the system is active and the engine speed is being monitored
- When an emergency condition arises and an engine shutdown is needed, press **TRIP** (or activate the toggle switch if applicable) and the valve will close
- In an overspeed runaway condition, the PowerGuard controller will automatically close the valve and shut down the engine
- When the valve is closed, the red light will become lit
- When Auto Reset Mode is selected, the red light will extinguish and the valve will automatically reset itself to the open position 30 seconds after closing
- When Manual Reset Mode is selected, the red light will remain lit as long as the valve is closed. The red light will begin flashing after the engine shuts down to indicate it is safe to manually reset the valve. The valve will reset itself to the open position once the operator presses **RESET**.

## 2 Maintenance

To ensure a trouble-free long life of your PowerHalt Shut-Off Valve, a scheduled monthly maintenance procedure is mandatory:

- Inspect all fasteners, clamps, and support brackets for tightness and the required torque
  - Inspect all wiring / cable runs for corrosion, vibration wear, and loose connections
  - Inspect all hoses for cracks, damage, and leaks
  - Inspect the PowerGuard controller for damage, dirt, and poor connections
  - Ensure there are no error codes present on the membrane switch
  - Confirm the green light flashes every 5 seconds when the engine is running
  - Activate the valve to ensure it remains functional and free moving
- ⚠** Seizing due to lack of use is the #1 failure mode of any shut-off valve in the market. As this is a safety device, activation testing must be employed at a minimum of once per month.

### 3 PowerGuard Controller Set-Up Procedure

Set-up is required for emergency shut-off system to function. Controller uses input engine speed and user defined safety margin to program system trip speed.

- ⚠** Perform a Calibration upon installation of replacement components. See Section 5.2 for details.

#### 3.1 For On-Highway Vehicles with Variable Engine Speed:

- Determine desired Trip Speed
  - Pacbrake recommends 30% above Rated Engine RPM
- With engine running at idle, enter SET Mode:
  - Hold **RESET** & **TEST** until both lights begin to flash
- Raise engine speed to Input Speed – **half of desired Trip Speed** – and hold constant
- Press & release **RESET** 4 times to set Trip Speed to double Input Speed
- If successful, red light will blink 4 times and you may then return to idle. Green light should then flash every 5 seconds.
- Document Trip Speed for future reference

#### 3.2 For Stationary Engines with Constant Operating Speed:

- With engine running at constant operating speed, enter SET Mode:
  - Hold **RESET** & **TEST** until both lights begin to flash
- Choose desired Overspeed Margin from below to set your Trip Speed:
  - Press & release **RESET** 1 time – Operating Speed + 10%
  - Press & release **RESET** 2 times – Operating Speed + 20%
  - Press & release **RESET** 3 times – Operating Speed + 30%
- If successful, red light will blink the same number of times **RESET** was pressed. Green light should then flash every 5 seconds.
- Document Trip Speed for future reference.

**NOTE:** Table below demonstrates a simple example of programming your system:

Input Speed	<b>RESET</b> Presses	Overspeed Margin		Trip Speed
		Margin	RPM	
1000	1	+ 10%	+ 100	1100
1000	2	+ 20%	+ 200	1200
1000	3	+ 30%	+ 300	1300
1000	4	Double	+ 1000	2000

**Secondary Set-Point:** To set secondary trip speed, activate latching switch to connect the Purple Wire (Pin 9) from wiring harness to a suitable ground and re-follow above procedure.

## 4 PowerGuard Controller Test Procedure

After following Set-Up Procedure, system must be tested to ensure Trip Speed was programmed correctly. Entering TEST Mode causes system to trip at 'Input Speed' from Set-Up Procedure – raising engine speed to actual 'Trip Speed' is unsafe and unnecessary.

1. With engine running at idle, enter TEST Mode:
  - Hold **RESET** & **TEST** until both lights begin to flash and then press & release **TEST**
2. Increase engine speed to 'Input Speed.'
3. Valve will close and red light will illuminate until 0 RPM is detected and 30 seconds elapses
  - Pressing **TEST** will bypass 30 second timer
4. When red light extinguishes valve will re-open itself automatically.
5. If valve did not close, controller was not successfully programmed. Confirm installation and re-follow steps indicated on previous page.

**Secondary Set-Point:** To test secondary trip speed, activate latching switch to connect the Purple Wire (Pin 9) from wiring harness to a suitable ground and re-follow above procedure.

## 5 Additional Functions

### 5.1 Factory Reset


This function clears any existing programming and restores controller to its original factory condition. When performed, both lights will begin to flash alternately. To perform Factory Reset:

- Hold **RESET** & **TEST** until both lights begin to flash and then press & hold **RESET**

### 5.2 Calibration

This function calibrates controller to travel limits of PH3 valve butterfly. When performed, valve will cycle open and closed to identify limits. To perform Calibration:

- Ensure engine is off. **Never** perform Calibration while engine is running.
- Hold **RESET** & **TEST** until both lights begin to flash and then press & hold **TEST** until valve cycles

 System must be re-calibrated upon installation of replacement components.

### 5.3 Manual Trip


This function closes PH3 Valve and causes engine (if running) to shut down. To perform Manual Trip:

- Press and release **TRIP**

### 5.4 Reset Options: Auto / Manual (Serial Numbers CPZ001673 & CPB000386 and beyond ONLY)

This function changes the valve behaviour to either automatically reset itself 30 seconds after closing or to require user input to reset itself. To change the valve behaviour between Auto/Manual Reset:

- Hold **RESET** & **TEST** until both lights begin to flash and then choose your desired behaviour:
  - Automatic Reset – Press **RESET** & **TEST** together 1 time
  - Manual Reset – Press **RESET** & **TEST** together 2 times
- If successful, both lights will confirm input by blinking the same number of times **RESET** & **TEST** were pressed.

 Manual Reset must be chosen to comply with CSA B621-14 & B622-14.