Programming Manual

PH3 POWERHALT
AIR INTAKE EMERGENCY SHUT-OFF VALVES by PACBRAKE

POWERGUARD
SMART OVERSPEED LIMITER

L6493 • ECN 1-3189

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

800.663.0096 www.powerhalt.com

1 Operation

- When controller is unprogrammed, light will exhibit continuous rapid flash
- When controller is programmed and in normal operating mode, light will remain off
- When valve is closed, light will become solidly lit
- When emergency condition arises and engine shutdown is needed, push toggle switch and valve will close
- In overspeed runaway condition, controller will automatically close valve and shut down engine
- When Auto Reset Mode is selected, valve will remain closed for a minimum of 15 seconds and then automatically reset itself to open position. If switch is held closed, valve will remain closed until switch is released.
- When Manual Reset Mode is selected, valve will remain closed for a minimum of 15 seconds. Valve will only reset itself to open position once operator activates toggle switch again.
- Valve is able to remain closed for a maximum time of 18 minutes after which point it will begin to de-rate in order to protect itself.

2 Maintenance

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

⚠ As this is a safety device, activation testing must be employed at a minimum of once per month to ensure system remains functional and valve is free moving. Daily activations are recommended to ensure proper function of the system.

- Inspect all fasteners, clamps, and support brackets for tightness and required torque
- Inspect all wiring / cable runs for corrosion, vibration wear, and loose connections
- Inspect all hoses for cracks, damage, and leaks
- Inspect controller for damage, dirt, and poor connections

3 System Basics

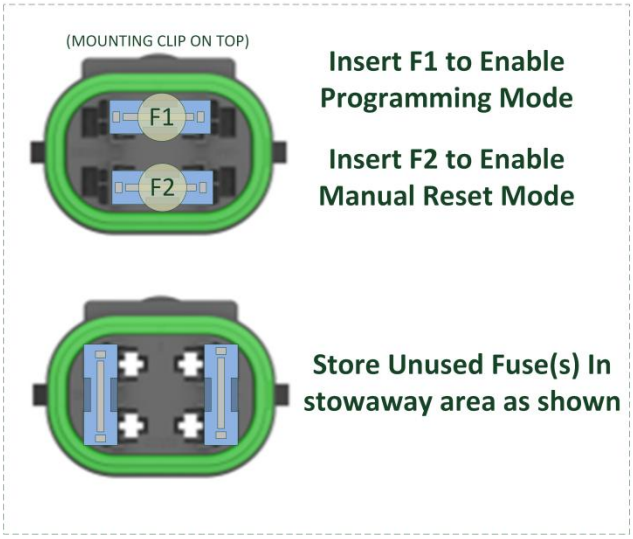
Controller settings are accessed and configured using toggle switch and Mode Selection Box.

- Mode Selection Box is located within harness. See Figure 3-A for summary of fuse positions.
- Fuses F1 & F2 are inserted or removed to access different modes.

⚠ Mode Selection Box cap must be re-installed after use.

⚠ Fuses F1 & F2 are used only for configuring modes and are not connected to main system power.

Mode Selection Box Guide



3-A

4 Quick Functions

4.1 Manual Trip

Manual Trip closes valve and causes engine (if running) to shut down. To perform Manual Trip:

- Push and release toggle switch

4.2 Automatic / Manual Reset Mode

To change valve behaviour between Auto/Manual Reset Mode access Mode Selection Box and:

- Remove fuse from F2 on Mode Selection Box to select Auto Reset Mode **OR**
- Insert fuse into F2 on Mode Selection Box to select Manual Reset Mode

4.3 Secondary Trip Speed

System can force engine shutdown at 2 different engine speeds. Secondary Trip Speed can be used for protection of auxiliary equipment powered by Power Take-Off (PTO) system or as anti-theft mechanism when set near idle speed. To Activate, Program, or Test Secondary Trip Speed,

- Provide 6 to 36 VDC to Pink Wire (Pin 7 on Connector B). This can be done via existing PTO activation device or via latching switch (not provided).

NOTE: To prevent accidental shut down while enabling/disabling Secondary Trip Speed, a 5 second grace period is applied when switching to a lower trip speed, to allow for engine speed to reduce. Change is applied immediately when switching to a higher trip speed.

5 Trip Speed Programming 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.

⚠ Before Programming:

- IF valve is synchronized with shut-off system on same engine:
  Leave all controllers connected to ensure engine shuts down
- IF valve is synchronized with shut-off system on secondary engine:
  Disconnect secondary controller to prevent accidental shut-down of secondary engine

5.1 For On-Highway Vehicles with Variable Engine Speed:

1. Determine desired Trip Speed
   - Pacbrake recommends 30% above Rated Engine RPM
2. Insert fuse into F1 on Mode Selection Box. Light will exhibit constant rapid flash interrupted by single pulse*
3. Start engine and raise engine speed to Input Speed – **half of desired Trip Speed** – hold constant
4. Push and release switch to shut down engine† and save Input Speed, light will become solidly lit
5. When light extinguishes, push & release switch 4 times to set Trip Speed to double Input Speed
6. Light will indicate programming has been saved correctly by flashing 4 times
7. Remove fuse from F1 on fuse box and document Trip Speed for future reference

5.2 For Stationary Engines with Constant Operating Speed:

1. Determine desired Trip Speed
2. Insert fuse into F1 on Mode Selection Box. Light will exhibit constant rapid flash interrupted by single pulse*
3. Start engine and allow it to run at constant operating speed
4. Push and release switch to shut down engine† and save Input Speed, light will become solidly lit
5. When light extinguishes, choose desired Overspeed Margin from below to set your Trip Speed:
   - Push & release switch 1 time – Operating Speed + 10%
   - Push & release switch 2 times – Operating Speed + 20%
   - Push & release switch 3 times – Operating Speed + 30%
6. Light will indicate programming has been saved correctly by flashing the same number of times that the switch was pressed
7. Remove fuse from F1 on Mode Selection Box to exit Programming Mode. Document Trip Speed for future reference

NOTE: Table below demonstrates a simple example of programming set points for your system:

Input Speed	Switch Pushes	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

*Light will exhibit 'double pulse' if Secondary Trip Speed is active

† Automatic overspeed protection is disabled during Programming Mode therefore engine shut down is forced on switch push as precautionary measure to guard against possible emergency situation.

6 Trip Speed Test Procedure

After following Trip Speed Programming Procedure, system must be tested to ensure Trip Speed was programmed correctly. Entering TEST Mode causes system to trip at a lesser value than the actual 'Trip Speed' – raising engine speed to actual 'Trip Speed' is unsafe and unnecessary. Please use the table below which illustrates how the 'Test Speed' is defined:

NOTE: Table below demonstrates how 'Test Speed' is defined based on setup method:

Input Speed	Switch Pushes	Overspeed Margin		Trip Speed	Test Speed	Test Speed Logic
		Margin	RPM			
1000	1	+ 10%	+ 100	1100	900	90% of Input Speed
1000	2	+ 20%	+ 200	1200	900	90% of Input Speed
1000	3	+ 30%	+ 300	1300	900	90% of Input Speed
1000	4	Double	+ 1000	2000	1000	Equal to Input Speed

⚠ Before Testing:

- IF valve is synchronized with shut-off system on same engine:
  Leave all controllers connected to ensure engine shuts down
- IF valve is synchronized with shut-off system on secondary engine:
  Disconnect secondary controller to prevent accidental shut-down of secondary engine

1. Ensure fuse is removed from F1 on Mode Selection Box
2. With engine off, push switch to close valve and hold switch for 5 seconds until light begins flashing rapidly
3. Release switch to re-open valve. Light will exhibit continuous rapid flash interrupted by single pulse*
4. Start engine and slowly raise engine speed to 'Test Speed'
5. Valve will close and red light will illuminate until valve resets itself to open (In Manual Reset Mode, light will stay illuminated until valve is manually reset by pushing toggle switch)
6. If valve did not close when expected, trip speed may not be correctly programmed. Confirm installation and re-follow steps indicated on previous page

*Light will exhibit 'double pulse' if Secondary Trip Speed is active

7 Installation Troubleshooting

For C20745-8 controllers with CAN Bus connections:

If the controller does not acknowledge the CAN Bus signal during programming:

1. Verify toggle switch light activity is normal.
2. Verify manual trip and reset functions operate correctly.
3. Disconnect the CAN Bus connector, then reconnect.

The controller should then acknowledge the CAN Bus signal during programming.