

INSTALLATION  
INSTRUCTIONS

**SMARTSHOT: ZEROSTART  
STARTING FLUID CONTROL SYSTEM**

**INSTALLATION PROCEDURE**

1. There are two parts other than the measured shot ether valve itself that make the system automatic: *the Controller, and the Thermo-Switch*. The Controller can be mounted in the cab or on the firewall. It is mounted on the firewall, it should be mounted with the reset button in the down position, or the end with the wires down.
2. The Controller includes a Cylinder Contents Gauge feature that provides a warning when the ether cylinder is within a few shots of empty. A lamp check feature is included. The indicator lamp is "ON" whenever the switch is in the "CRANK" position. The lamp will go out when the switch is returned to the "RUN" position, unless it is indicating that the cylinder should be replaced. The gauge feature can be reset when a new cylinder is installed by pressing the small button on the side of the controller.



**NOTE**

The system will reset whenever the button is pressed, regardless of contents of cylinder.

3. The Thermo-Switch used to prevent operation of the ether valve when the engine is warm enough to start unaided. It should be installed in contact with the engine block on the water jacket side of engine, preferably at a high point in the system. The indicator lamp can be mounted in any convenient location in the cab. It installs in a 1/2" diameter hole.
4. To Install the starting fluid system components, refer to the separate Instruction sheet provided.

**WIRING INSTRUCTIONS**



**CAUTION**

BEFORE WIRING THE SYSTEM, DISCONNECT THE GROUND LEAD FROM THE BATTERY TO PREVENT A POSSIBLE SHORT CIRCUIT. IF ADDITIONAL WIRE IS NEEDED, USE #16 AWG AUTOMOTIVE PRIMARY WIRE.

**Controller**

1. Connect the BLACK wire to a good ground.
2. The BLUE (or BROWN) wire connects to one of the ether valve leads. The other ether valve lead connects to the magnetic switch terminal on your vehicle that is connected to the small starter solenoid terminal. It may be necessary to add a length of wire in order to connect to the magnetic switch.
3. Connect the GREEN wire to one terminal of the Thermo-Switch.
4. The RED wire attaches to a connection that leads to the positive (+) terminal of the battery. Make sure the positive (+) connection is secure and is a constant source of power. **If the SmartShot unit loses power, it will cause data loss; resulting in erroneous cylinder contents gauge indications.**
5. Connect the WHITE wire to one of the wires from the lamp socket.

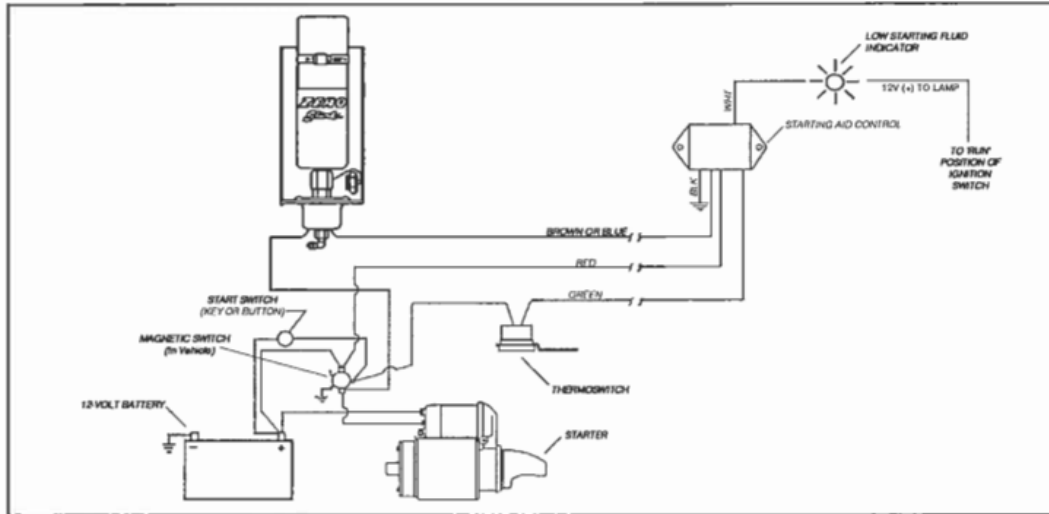
**Thermo-Switch**

Connect one wire to the MAG SWITCH side of the starter button, or to the small terminal on the magnetic switch. The other wire connects to the green wire of the controller.

**Indicator lamp**

One wire connects to the WHITE wire of the controller. The other wire connects to the "RUN" position of the ignition switch, or to a connection that is connected to the "RUN" position.

**Wiring Diagram**



**Testing the system electrically**

1. Deactivate the fuel system (electrically or manually) so the engine can be cranked without starting. Testing should be done without a cylinder installed in the valve. It may be necessary to temporarily bypass the Thermo-Switch, since it opens the circuit at less than room temperature. This will prevent valve operation.
2. Remove the dust cap from the valve so the drive rod can be seen.
3. Engage the starter to crank the engine. As soon as the starter engages, the drive rod of the valve should move up. After 2 or 3 seconds, the drive rod will drop back to a de-energized position. Continue to crank the engine. The valve will stay de-energized for 6 to 8 seconds, at which time the 2 to 3 second "ON" cycle will repeat. This on/off cycling will continue until the starter is disengaged.

<b>TROUBLE SHOOTING</b>	
Valve does not work	Test valve per valve installation sheet. Check wiring. Connect test lamp or meter between brown wire to valve and ground. Crank engine as above. If test lamp cycles as indicated above, controller is OK. If test lamp does not illuminate, check wiring. If these tests are OK, replace the controller.
Valve stays energized	Check wiring. If OK, replace the controller.
No valve operation, engine temperature above 50° F	Bypass Thermo-Switch with jumper wire for testing. Check wiring and ground connections. If OK, replace controller.
No valve operation, engine temperature below 50° F	Bypass Thermo-Switch. If system is OK, replace Thermo-Switch. Check wiring and ground connections. If not OK, replace controller.
Indicator lamp stays on in "RUN" position of ignition switch	Push reset button. If lamp is still on, check wiring. If OK, replace controller.
Indicator lamp does not illuminate during cranking	Check/replace bulb.

**WARRANTY**

The Phillips & Temro Industries warranty statement is located on the website at [phillipsandtemro.com/terms](http://phillipsandtemro.com/terms).