

## PENNTEX HIGH IDLER Cummins 5.9L diesel 6BT, Push Type Solenoid Applications Installation & Testing

PI-1009

### INSTALLATION:

**NOTE:** The Cummins 5.9L diesel (6BT) is used by several manufacturers in various chassis. This kit is intended to be used in any chassis that uses a throttle cable to pull the throttle lever toward the front of the engine. This kit uses a push type solenoid that mounts behind the throttle lever to push the throttle lever toward the front of the engine. This arrangement is usually found on forward control chassis.

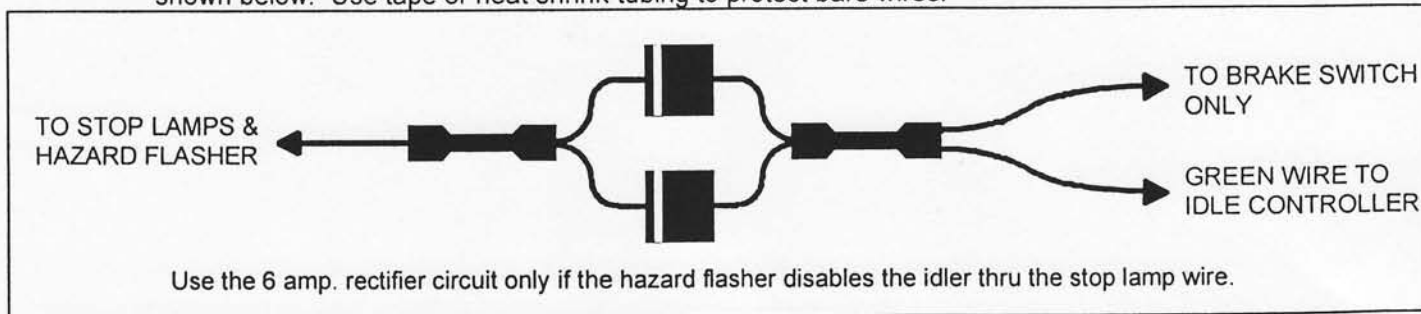
This kit is not specific to any certain chassis therefore modifications to the engine, idler kit and electrical system may be necessary for installation.

The push type solenoid may not work with some applications such as rear engines (6BTA) or any application that pulls the throttle from the rear of the engine. For applications that pull the throttle from the rear of the engine use the Universal kit no. PI-1015.

**\*\*\*\*\* DISCONNECT THE GROUND CABLE FROM ALL BATTERIES. \*\*\*\*\***

1. Mount the idle controller (inside vehicle) in a location that is both easily accessible to driver and within wiring harnesses reach.
2. Connect the red wire from the idler to a source that provides +12 volts when the ignition switch is in the "RUN" position. This source should be as close to the fuse panel as possible to minimize voltage drop. The idle controller senses the system voltage on this wire.
3. Connect the green wire from the idler to the wire from the main brake switch that feeds the stop lamps. This wire should be +12 volts only when the main brake pedal is pressed. The idler uses the green wire to disengage the high idle mode when the main brake pedal is pressed.

**NOTE:** Some vehicles have the hazard flasher tied directly to this circuit and intermittently pull this wire to +12 volts when the hazard switch is turned on (ex. Some Chevy chassis prior to '95). If this is the case then use the two 6 amp. rectifiers in parallel (included in this kit) to isolate the green wire from the hazard circuit as shown below. Use tape or heat shrink tubing to protect bare wires.



4. The idle controller senses when the vehicle is in "PARK" or "NEUTRAL" through the orange wire. This wire must be connected to a source that is grounded only when the gear selector is in "PARK" or "NEUTRAL" so that the idler can not engage when in gear. This part of the installation will vary between manufacturers and chassis. Listed below are some suggestions and guidelines:
  - a. Some chassis use a "PARK/NEUTRAL" switch to prevent the starter from being engaged when in gear. This switch is usually in series between the ignition switch and the starter relay. The orange wire from the idler may be connected in between the ignition switch and the "PARK/NEUTRAL" switch. This will allow the idler to ground through the "PARK/NEUTRAL" switch and the coil of the starter relay. The idler draws approximately 0.2 amps. through the orange wire when engaged. As long as the resistance in the starter relay's coil is less than 10 ohms, this method will work. If the resistance in the coil is higher, the idler may not engage reliably and the starter could be engaged when the idler engages. Do not confuse the "REVERSE" lamp switch with the "PARK/NEUTRAL" switch. Some chassis may have a mechanical starter lockout or clutch switch or none at all.

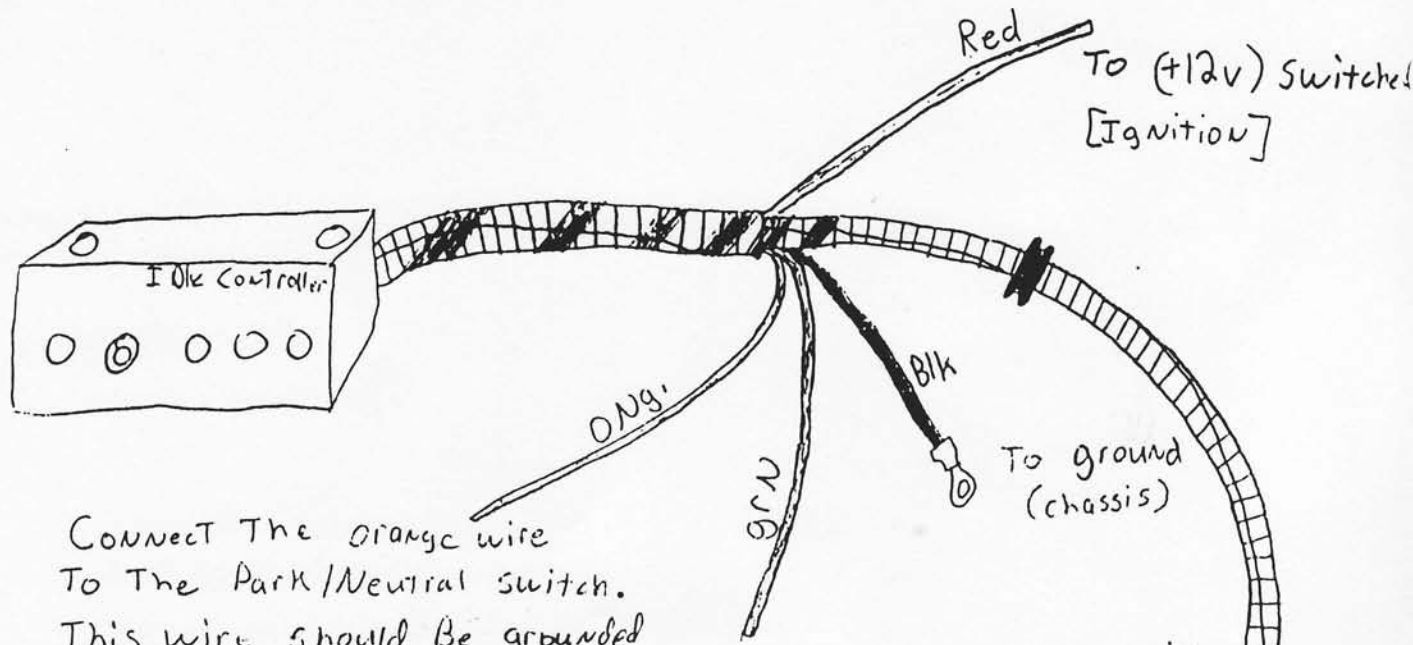
- b. Some chassis may have a digital transmission selector switch that sends information to the ECM. Do not attempt to tie into this switch because this could damage the ECM.
  - c. Some chassis may not have a usable OEM switch. If this is the case then check to see if a switch and bracket can be added that will ground the orange wire only when the vehicle is in "PARK" or "NEUTRAL". If this switch is outside the vehicle then use a sealed switch to prevent failure due to corrosion.
  - d. If no OEM switch is available and one can not be added, then connect the orange wire to the "PARK" brake switch wire that goes to the instrument panel's "BRAKE" warning lamp. This wire should be grounded only when the "PARK" brake is set. If the vehicle has air "PARK" brakes then there may be a pressure switch that activates the "BRAKE" warning lamp when the brakes are set and the air pressure is released. If not then add a pressure switch that is closed with less than 4-6 psi.
  - e. Do not connect the orange wire directly to ground. This defeats the interlock function and the engine could high idle when in gear without the brakes being set!
5. Connect the black wire from the idler to chassis ground.
  6. Drill a ½ inch hole through the fire wall or floor and feed the harness (blue & gray wires) through to the grommet. Install the grommet into the hole to protect the harness.
  7. Secure any loose wire and harness away from heat sources, sharp edges and moving parts.
  8. Mount the circuit breaker and relay close to a source for +12 volts (>30 amps), and away from heat sources or exposure to water spray from tires. It should also be within reach of the red wire from the solenoid pulse module.
  9. Route the idler harness over to relay. Secure harness away from heat sources, sharp edges and moving parts.
  10. Connect the blue wire to relay terminal #85.
  11. Connect the gray wire to relay terminal #86.
  12. Connect the circuit breaker's "BAT" terminal to a +12 volt source that can supply >30 amps.
  13. The type of solenoid used to mechanically push the throttle is a dual-coil push type solenoid. This type of solenoid uses a high current coil to pull the plunger into position and then a low current coil to hold it in place. This configuration has the advantage of being able to pull or push with great force but operate at a low holding current, thus size and cost can be kept to a minimum. Because the pull coil draws up to 30 amps it can not stay energized for more than 1 second before it burns up. Some dual coil solenoids have an internal switch that disconnects the pull coil when the plunger bottoms out. Since this solenoid is a push model, a threaded shaft protrudes from the point where this switch would normally be located. For this reason an electronic module is used to pulse the pull coil (white wire) when 12 volts is applied. Before installation check to make certain that the wires are correctly connected to the pulse module or solenoid failure may result. Refer to the wiring diagram.
  14. Temporarily remove the pulse module from the solenoid bracket to facilitate installation. Using the two 12mm bolts and lock washers, mount the solenoid and bracket assembly to the engine between the throttle and filter. The 12mm holes used to mount the bracket are located on the side of the head between the fuel injection unit and the filter. These holes may have paint in the threads that must be cleaned with a wire brush. Re-attach the pulse module to the bracket using one of the screws to ground the module. Some modification and adjustment to the throttle, springs, cable may be necessary for installation.
  15. Loosen the solenoid's position adjustment bolts and slide solenoid to the back of the tracks.
  16. Connect the red 10 AWG. wire from the pulse module to the Bosch type relay's terminal #87.
  17. Secure any loose wires or harness away from heat sources, sharp edges and moving parts.
  18. Operate throttle manually to ensure proper throttle operation.

## TESTING AND ADJUSTMENT

1. Set the "PARK" brake. Turn the ignition switch to the "RUN" position, but **DO NOT START ENGINE**. The "LOW" battery indicator (red) should be lit. After 10 sec. the "HIGH IDLE" indicator (yellow) should light up.
2. Press the brake pedal. The "HIGH IDLE" indicator should turn off. Release the brake and it should come back on with no delay.
3. If the vehicle has an automatic transmission and the idler's orange wire was connected to the "PARK/NEUTRAL" switch follow these instructions:  
Make certain that the emergency (park) brake is set. Press the brake pedal and move the gear selector to "DRIVE". Release the brake pedal. The "HIGH IDLE" indicator should be off. Return the gear selector to the "PARK" position and the "HIGH IDLE" indicator should come back on with no delay.  
  
If the vehicle has a manual transmission or it is an automatic without a "PARK" position and the idler's orange wire was connected to the parking brake, follow these instructions:  
Make certain that the vehicle can not roll by blocking the wheels. Release the parking brake. The "HIGH IDLE" indicator should be off. Re-engage the parking brake and the "HIGH IDLE" indicator should come back on with no delay.
4. Start the engine and press the "MANUAL ENGAGE" button. Allow the engine to fully warm up. Turn on all possible engine and electrical loads. Adjust the position of the solenoid to raise the engine RPM to a level adequate to maintain battery voltage above 12.85 volts (1000-1500 RPM). This is the voltage that the idler turns on the "OK" indicator (green). Tighten the solenoid mounting bolts after final adjustment. The alternator may take a few minutes to recharge the batteries before the voltage can rise. The alternator must also be capable of putting out more current at a given RPM than the vehicle draws.
5. Press the brake to insure that the idle RPM returns to normal.

## INSTALLATION COMPLETED

# Idle Installation Diagram.



Connect The orange wire To The Park/Neutral switch. This wire should Be grounded ONLY when shifter is in Park or Neutral Position & open when in Reverse or Drive.

CONNECT The green wire To The Brake Lamp Switch. This wire should Be (+12) ONLY when The Brake is pressed.

+12v Bat.

