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# 30717

## JEEP MANIFOLD HEATER RELAY INSTALLATION INSTRUCTIONS

The job of the manifold heater is to help vaporize fuel in the intake manifold when the engine is cold. This will help with cold starts and idling until the engine is up to operating temperature. This kit allows a manifold heater to be used if you are rewiring your Jeep using a Painless chassis harness, using a later style manifold on an older Jeep, or if the factory relay was cut from your Jeep at some point in time by you or a previous owner.

### **How the manifold heater relay works:**

The manifold heater relay is provided a direct battery power source through the supplied 30 amp circuit breaker, to pin 30 of the relay, the large red wire in the schematic on the last page. This will be what is referred to as the “*INPUT*”. This battery power is switched through activation or closing of the relay to pin 87 of the relay and out to the manifold heater, the large orange wire in the schematic. This will be what is referred to as the “*OUTPUT*”. The manifold heater “*ACTIVATION*” is controlled by two separate wires:

A wire coming from the 86 pin will connect to the switched 12v choke power circuit, the small red wire in the schematic. This will allow the relay to close only when the ignition switch is in the *ON/RUN* position.

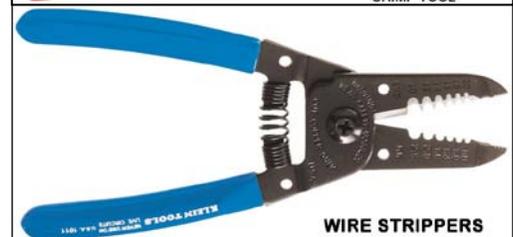
A wire coming from the 85 pin and going to the temperature switch will provide a ground signal to the relay, the small green wire in the schematic. The temperature switch is normally closed to ground, but as soon as it sees operating temperature, about 160 °F, the switch opens. This will disconnect the ground going to the relay, causing the relay to open. This “opening” of the relay, disrupts the power going to the manifold heater since it is no longer needed because the intake manifold is at operating temperature.

### **Tools needed:**

#### **Wire Crimping and Stripping Tools:**

You will need a simple pair of crimpers to crimp the heat shrinkable and non-heat shrinkable insulated terminals included in the small parts kit, seen in the top photo. A good set of wire strippers are also required to strip wire properly. There are also 2 in 1 tools which are a stripper/crimper combo in one tool.

Another style of crimpers is “Jaw Crimpers” or “Roll Over Crimpers”. These crimpers will crimp factory style, un-insulated terminals. If none can be found locally, these crimpers can be found using Painless part # **70900**.



### Electric Drill & Bits:

A drill and a ¼ nut driver are needed in order to use the self tapping screws provided to mount the relay and circuit breaker.

### Heat Gun:

Very useful to shrink the heat shrink and heat-shrinkable terminals found in the parts kit.



### Installation:

- As you should do with all electrical installs, the first step is to **DISCONNECT THE NEGATIVE BATTERY CABLE from the battery.**
- The install begins with mounting the relay. This can be accomplished by using one of the self tapping screws provided in the kit. This screw will require a ¼” nut driver and an electric drill.

Ensure the relay is mounted in a location that allows all wires of the relay to reach their connection points as outlined in these instructions.

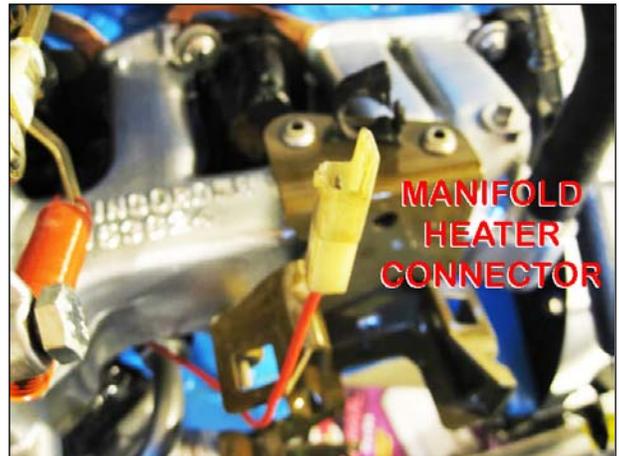
- Mount the circuit breaker in a location close to the battery or starter solenoid using 2 self tapping screws provided in the kit. This screw will require a ¼” nut driver and an electric drill.
- Once the circuit breaker has been mounted, place the red rubber cover on to the circuit breaker. This will help insulate the threaded posts from accidental shorts. This cover is held in place by the ring terminal mounting outlined below.
- Neatly Route the 14 gauge red wire, printed “**INPUT- BATTERY POWER**” to one side of the circuit breaker and cut to length, strip ¼” insulation, and install one of the supplied yellow #10 ring terminals. The ring terminals provided in this kit are shrinkable, once crimped on; apply heat with a heat gun to help seal the connection. Attach this ring terminal to one side of the circuit breaker.
- Strip ¼” insulation and install a yellow #10 ring terminal to one end of the 14 gauge red “**INPUT...**” wire you cut from first side of the circuit breaker connection, apply heat once it has been crimped on. Attach this wire to the other side of the circuit breaker as shown in the schematic.
- Route this 14 gauge red wire to the positive terminal of the battery or to the battery side of the starter solenoid. Use the supplied 3/8” ring terminal to make this connection.
- Route the smaller 18 red wire, printed “**ACTIVATION- SWITCHED 12V POWER FROM CHOKE**”, to the electric choke on the carburetor and cut to length. Strip ¼” insulation and install the 2 way push on terminal from the parts kit. A cleaner alternative install can be found on the following page.



For a cleaner install, install the piece of supplied heat shrink onto the red “**ACTIVATION...**” wire and before installing and crimping, remove the red nylon insulation from the terminal. Once crimped, pull the heat shrink over the crimp and apply heat to shrink.

Once the terminal has been crimped, unplug the wire from the factory chassis harness currently going to the electric choke and plug the 2 way terminal onto the electric choke. Reconnect the wire from the factory chassis harness to the electric choke by plugging the factory wire into the tab on the 2 way terminal, as seen in the schematic.

- Neatly Route the 14 gauge orange wire, printed “**OUTPUT- POWER TO MANIFOLD HEATER**” to the connector for the manifold heater and cut to length, strip ¼” insulation, and install one of the un-insulated female terminals. These terminals will require the use of a pair of roll over crimpers. Once the terminal has been installed, insert the terminal into the supplied single pin black connector. This wire can now connect to the factory connector on the manifold heater.

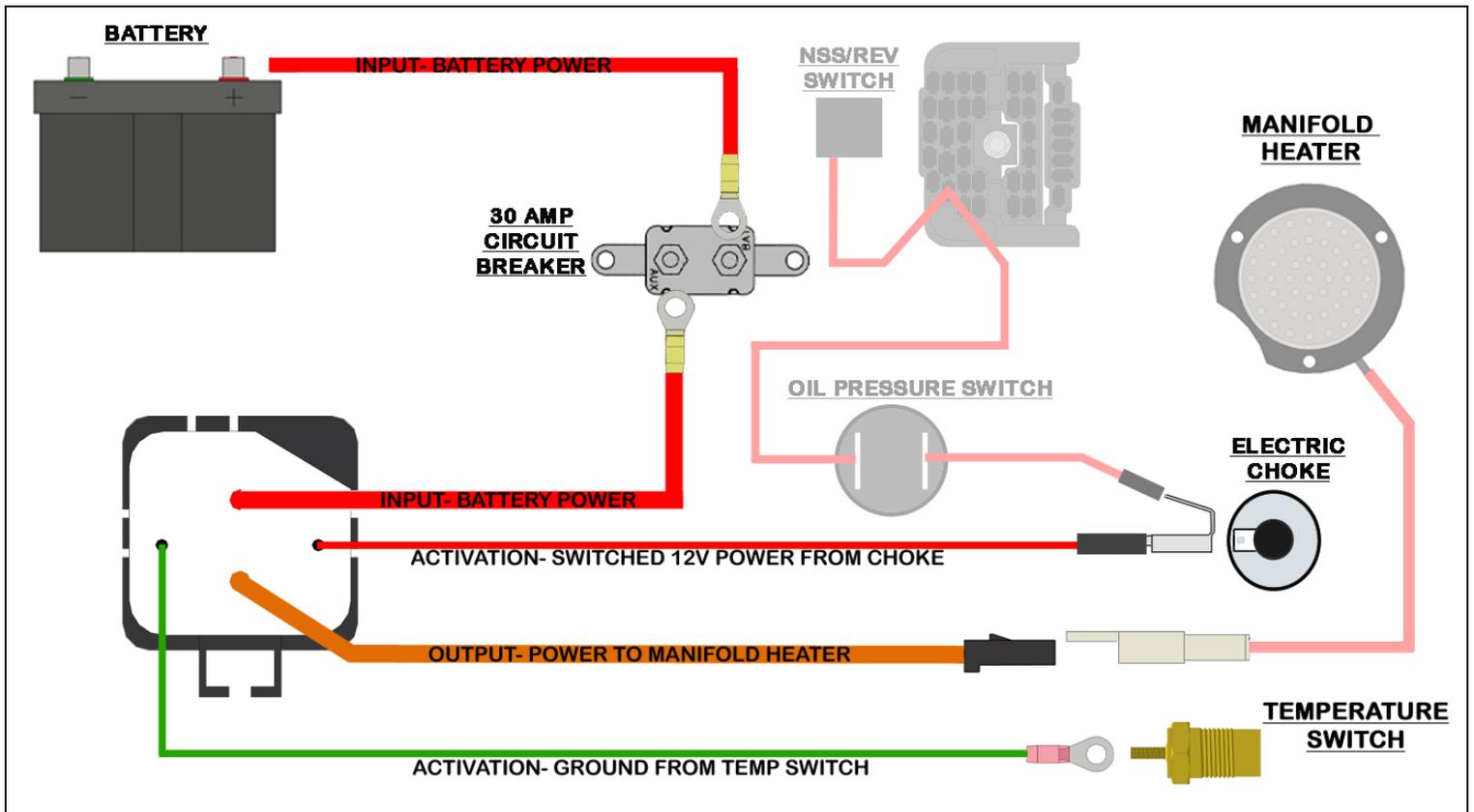


If you do not have roll over crimpers, heat shrinkable insulated push on terminals have been provided. These will allow for a good connection to the manifold heater connector, however, it will not be as attractive as the factory style terminal/connector connection the roll over crimpers will allow.

- Neatly Route the 18 gauge green wire, printed “**ACTIVATION- GROUND FROM TEMP SWITCH**” to the temperature switch. Make sure it is the temperature switch and not the sending unit for the temperature gauge. Cut to length, strip ¼” insulation, and install one of the supplied pink #10 ring terminals. The ring terminals provided in this kit are shrinkable, once crimped on; apply heat with a heat gun to help seal the connection. A small 10x32 nut and lock washer have been provided to make a connection to the temperature switch.



- At this point all four wires of the 30717 relay have been installed. Using the supplied zip ties, secure the wires so they do not come into contact with any sharp edges, moving components, or exhaust components.
- At this time the battery may be reconnected, your install is complete.



## Painless Performance Limited Warranty and Return Policy

Chassis harnesses and fuel injection harnesses are covered under a lifetime warranty. All other products manufactured and/or sold by Painless Performance are warranted to the original purchaser to be free from defects in material and workmanship under normal use. Painless Performance will repair or replace defective products without charge during the first 12 months from the purchase date. No products will be considered for warranty without a copy of the purchase receipt showing the seller's name, address and date of purchase. You must return the product to the dealer you purchased it from to initiate warranty procedures.