

The following tech article explains how to make your own headlamp wiring relay upgrade kit. The factory wiring, because of its length and smaller gauge, causes a voltage drop before it reaches the bulbs. This reduces light output considerably. By upgraded to thicker gauge wiring with relays, you can provide your headlamps full available power for maximum output 😊

It directly applies to 1992-1997 CV/GM, however it can be used as a guide for virtually any vehicle (substitute the bulb connector types for your vehicle (\*98-05 panther = 9007 (exc 03+ TC))

For those feeling less ambitious, Painless (among others) makes a direct fit relay upgrade kit for various bulb types.

The following article was authored by [Dextrovic](#), and was excerpted from [this thread](#)

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\*\*\*ALL\*\*\* years will benefit from a headlight circuit rewire regardless of headlight switch type. The factory headlight wiring is a pitiful joke: too small wire gauge and too long at that.

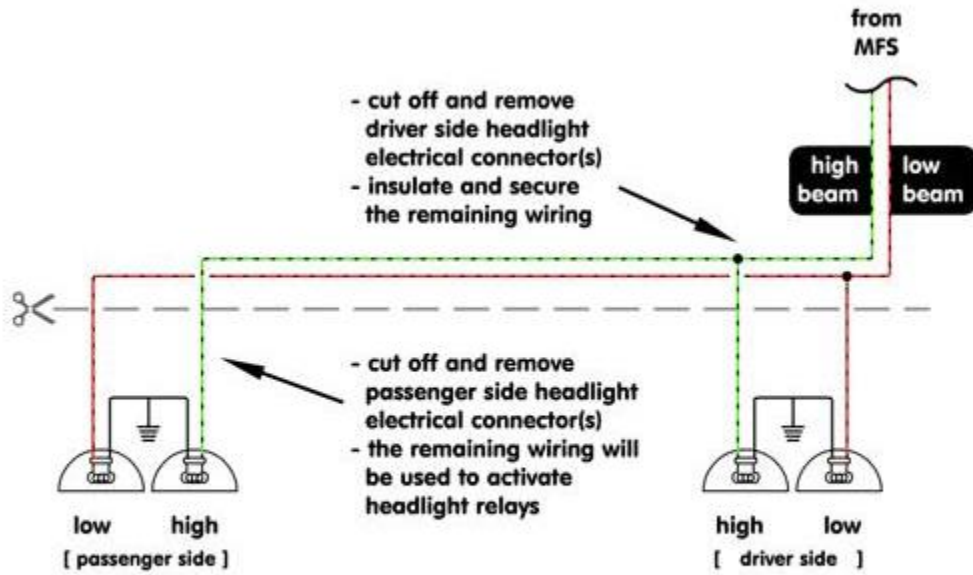
For fuses, I used 2x 20A ATO blade-style fuses. This ensures that both low- and high-beam circuits are 100% completely independent for fault tolerance. With stock 51W 9006s low-beam and 60W 9005s high-beam bulbs this is ample protection.

Be sure to use 30A Bosch-style power relays, preferably with matching harnesses and 12 or 10 AWG wiring for best effect. Keep all wires as short as possible. Use heatshrink tubing for wire insulation and split loom (convoluted tubing) to protect said wires.

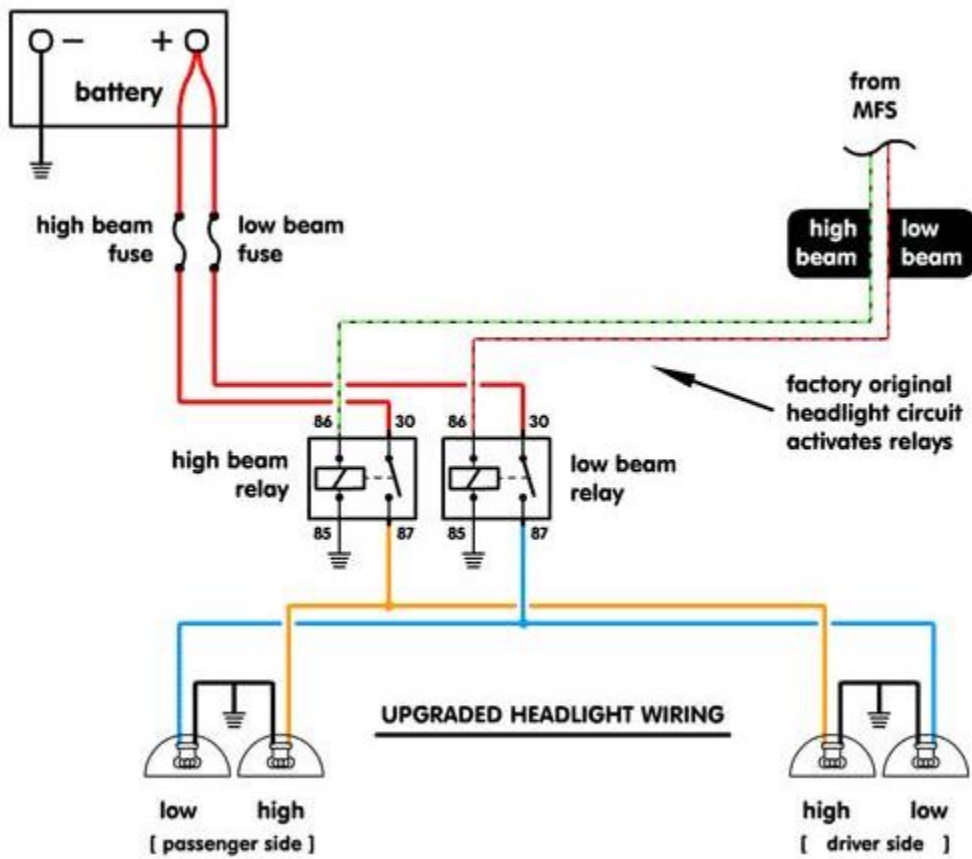
Use Packard Electric (General Motors) Metri-Pak 280 connectors to match the wire gauge that will be used when replacing the headlight socket metal terminals. If that isn't possible, a less preferable method is to reuse the old sockets, cut the wiring down to form a pigtail and solder the new wires on.

Personal note: I exclusively solder each and every connection and use black heat shrink tubing, black split loom, and black nylon zip ties in all my electrical work...electrical performance is nothing without style 😊

Schematics:



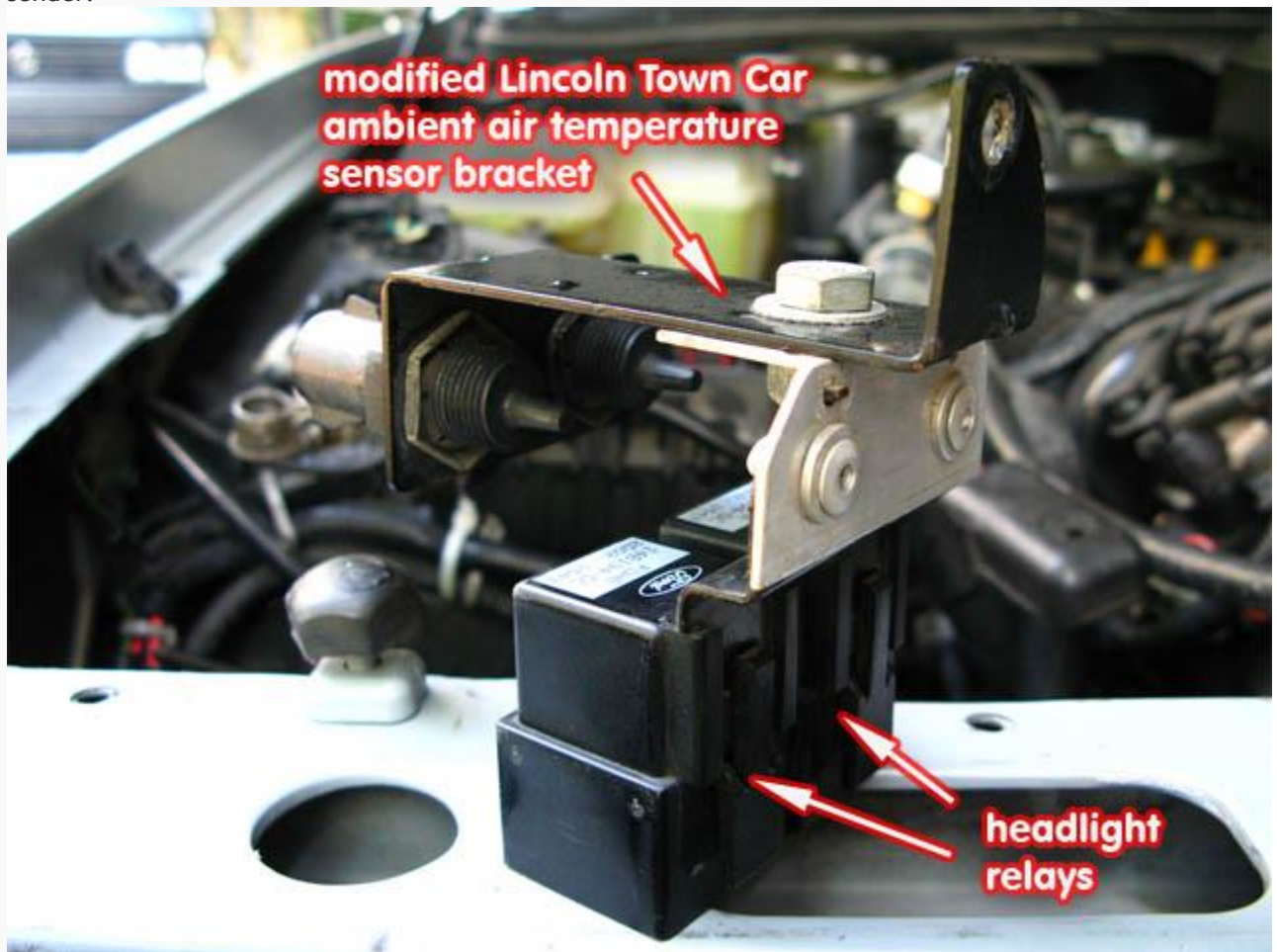
FACTORY ORIGINAL HEADLIGHT WIRING



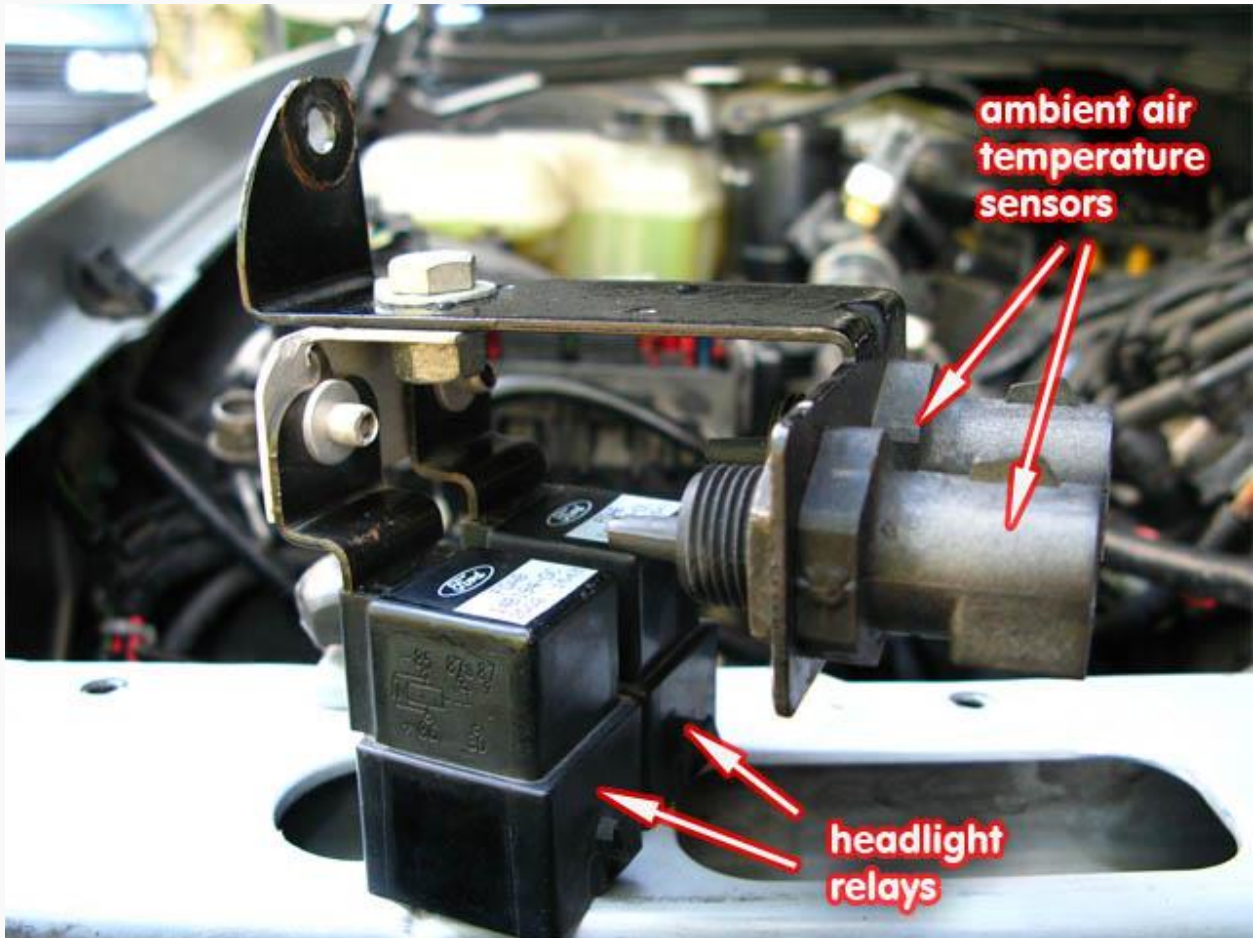
The procedure:

Be aware that there are two (2) air bag crash sensors bolted to the upper radiator support behind the header panel near each headlight respectively, so exercise caution at all times.

- Disconnect the battery.
- Choose a dominant side to work with. The passenger side would be preferable as that's the side where the battery resides naturally.
- Find a wholesome locale for both relays and use it. I chose the bracket that both the ambient and outside temperature senders call home on the pass. side header bracket, as I have the digi-dash. There isn't much clearance to allow for drilling anyway (do mind the airbag crash sensors in the general vicinity). Folks with the analog cluster and without ATC/EATC won't have this bracket or the sensors--so improvise ;)). Be extra mindful not to impede airflow to said temperature senders if you have them. Also, newer Panthers will only have one temperature sender.



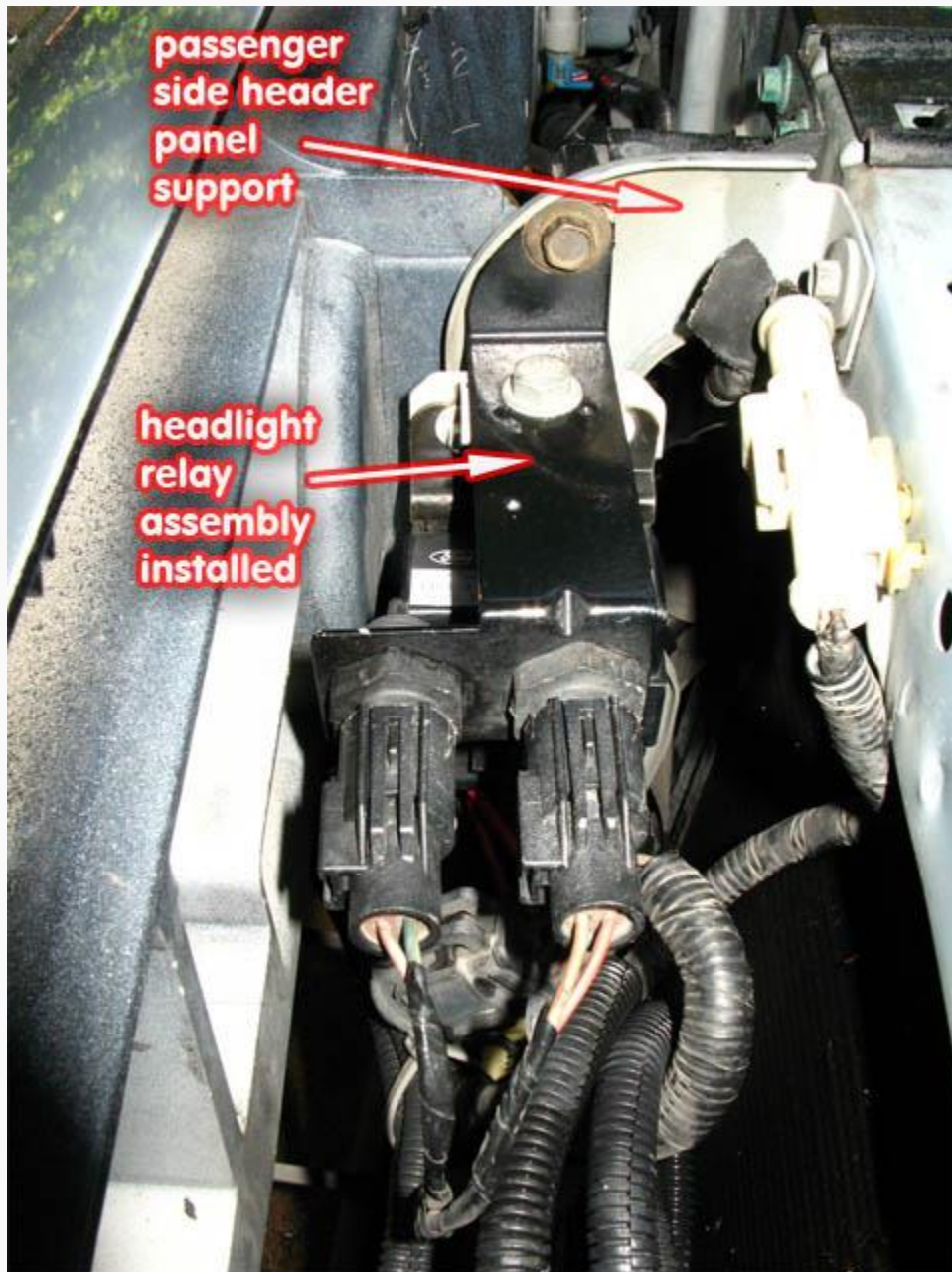
Another view:



Header panel support with bracket removed (will vary between body styles):

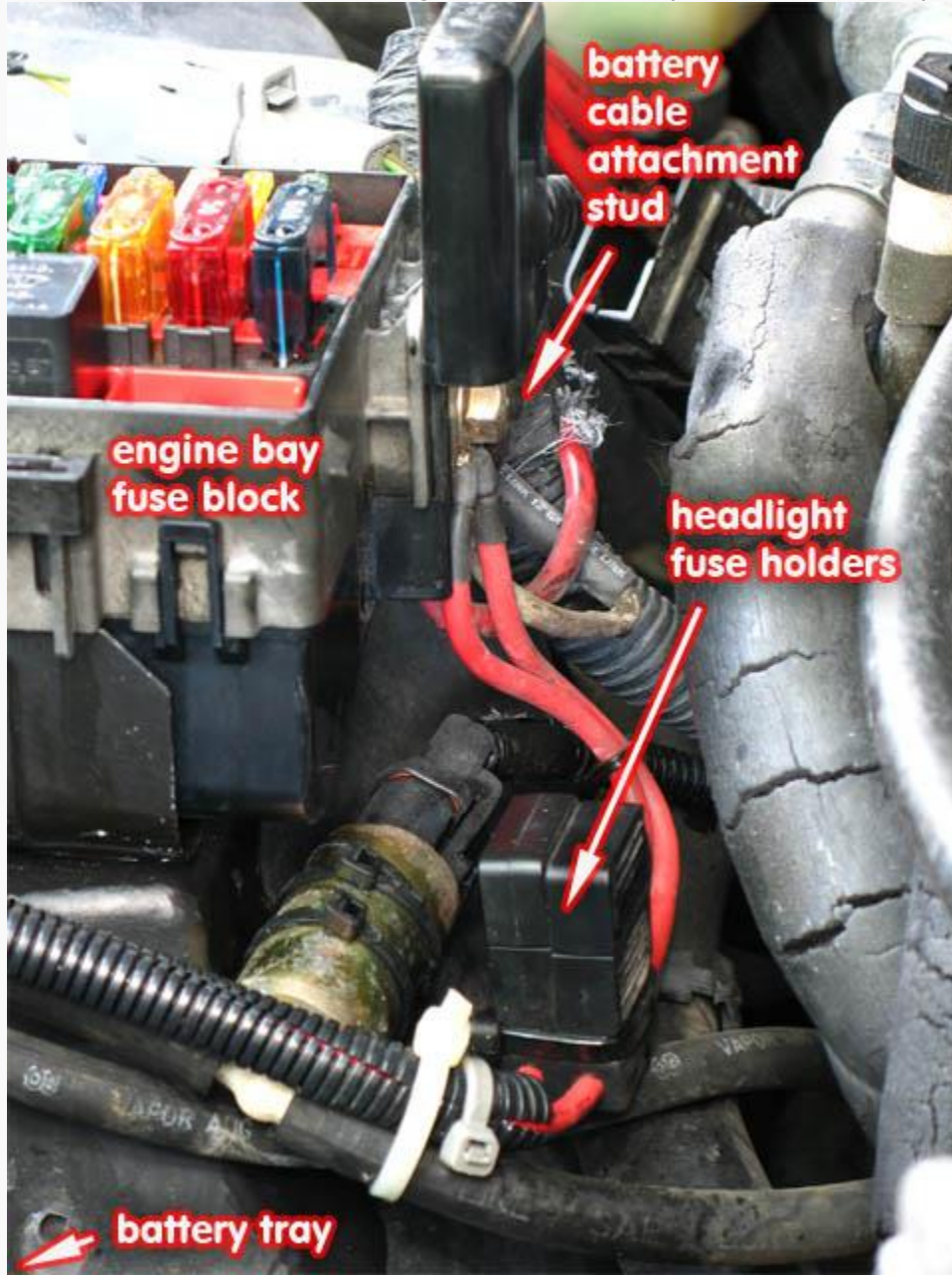


Bracket installed (will vary between body styles):



- Cut off ALL existing headlight connectors (saving them) thusly: The driver's side connectors will not be used at all so cut them short and cap them off/tie them to the existing harness. The passenger side wires can be left long as they will be used for activating the relays.
- Using the headlight wiring on the passenger side, do the following:
  - Designate one relay to serve the low-beam circuit and the other the high-beam circuit.
  - Each relay will have the following terminals: 85 (coil ground), 86 (coil +12V), 30 (hot power input), and 87 (normally open power output). Note that the relay coil (at terminals 85 and 86) is not polarity dependent.
  - Ground out each relay at terminal 85 using the ground wire of each respective headlight wire pair.

- Connect switched +12V power from the headlight switch/LCM to terminal 86 of each relay.
- Mind the remaining terminals 30 (hot power from the battery) and 87 (switched power to the headlights), these will be wired up in a bit
- Grab a pair of 20A fuses and weather-resistant fuse holders to match (use whatever fuse type your interior and/or main fuse block is equipped with so there are fewer spares to keep on hand).
- Pop off the cover of the engine bay's main fuse block and note the large bolt on the engine side that serves as its power input from the battery. This bolt may have to be replaced with a slightly longer bolt due to the added thickness of the two (2) eyelet terminals needed for the relay power wires. Note that doing so will require fuse block disassembly. I chose to strive for full fault tolerance, so both headlight circuits can be replaced/serviced independently.



NOTE: optionally, the battery +12V post itself can be used as a power point...improvise at will.

- With each fuse holder (don't put the fuse in...yet) in turn, choose a target relay and solder an eyelet terminal (sufficiently sized to fit the bolt of the fuse block) to one end and solder a length of 10 AWG wire (that will terminate at terminal 30 of the chosen relay) to the other end.
- Repeat for the other fuse holder and the other relay.
- Using all of the original headlight connectors, disassemble them completely using the correct disassembly tool (or a long pick may work--wear eye protection). The terminals inside are essentially Metri-Pak 280's. Acquire new terminals (and matching weather seals) correctly sized for the new wiring.
- For the headlights' +12V feed, correctly size four (4) lengths of 10 AWG wire to go from each relay to its matching circuit pair. One relay will serve two headlights (low- or high-beam). The resulting wiring will resemble a "Y" originating at a relay and terminating at each headlight (one on the driver's side and the other on the pass. side). FYI: the weather seals must be installed on the wires before the connector terminals.
- Solder the new headlight terminals on to one end of each wire, join the matching circuit wire pairs together, and solder to the respective relay harness (terminal 87).
- For the headlights' ground, correctly size ample lengths of 10 AWG wire to go from each headlight ground on one side of the vehicle to a central ground point in close proximity.
- Solder the new headlight terminals on to one end of each wire and solder an eyelet terminal to the other end. Bolt the eyelet terminals together to the vehicle.
- Reassemble all headlight connectors and plug them into to their respective headlight bulbs.
- Verify for correct wiring and use copious amounts of split loom and nylon zip ties to taste.
- Insert fuses into fuse holders.
- Reconnect battery.
- Test.
- Verify correct headlight aim and adjust if necessary.

Optional: replace headlight bulbs with new equivalents (filament luminous output does degrade with time).