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Let There be Light!

Our Cougar's headlights are becoming obsolete, and make driving at night a scary adventure. Bill Basore tells you how to make a simple modification using halogen replacements to have you safely on the road at night again.

Driving a classic Cougar is a lot of fun, but at night it can be down right scary. By the time the first Cougar was built, sealed beam incandescent headlights had been the mandated standard for 37 years. About the only change would be the 1957 change to allow four smaller 5 3/4-inch diameter lamps. Incandescent sealed beams would continue to be the only type of headlamp permissible in the US until finally in 1978 Federal Motor Vehicle Safety Standard 108 would become effective allowing the use of halogen technology. Amazingly, the US auto manufacturers failed to fully embrace the possibilities that halogen technology could provide. Instead of capitalizing on the greater light output, they developed lower wattage halogen lights that would be no more powerful than existing sealed beam incandescent lights, and pocketed the reduction in cost of cheaper switches and smaller gauge wires. American drivers were still in the dark.

The rest of world was apparently getting tired of driving around in the dark and had allowed technology to light the way. The first halogen headlights were introduced in Europe in 1962. They were more powerful, efficient and compact than the obsolete incandescent lights they replaced. The Europeans were also able to better control the beam pattern reducing glare to oncoming traffic. The downside was that the European cars imported into the US had to be dumbed down to meet the US specification.

The good news is that FMVSS 108 would allow for much higher performing headlights even though it did not require them. The maximum allowable candelas in the US had been capped at 37,500 on each side of the car. The new standard would allow a maximum of 75,000, a very significant improvement. While still a long way behind the European standard of 140,000

candelas, things were finally looking up.

It would not be until 1984 that Ford finally got permission to install aerodynamic composite headlights in the Lincoln Mark VII. These new headlights would finally begin to bring the benefits of better lighting to the American road. Acceptance of the composite design, with a separate reflector and replaceable lamp, would make it possible, if not entirely legal, for American drivers to use the same headlights that had been available for several decades in Europe.

Finally, the headlights required for safer night driving were available. But unfortunately you couldn't just run out and install a set of these new lamps. In fact even the most basic set of halogen replacements posed a problem for Cougar owners.



Let's begin with the most critical problem--the circuit that feeds the headlights includes a circuit breaker that is incorporated inside the headlight switch. The breaker is rated at just 15 amps. That means the maximum amount of power your headlights can consume before triggering the breaker is about 180 watts total. The lowest

power consumption low beam halogen replacement pair (H5006) consume 70 watts. So far so good. Turn on the high beams and the trouble begins. The (H5001) high beams check in at another 100 watts. This puts us dangerously close to the 180 watt limit. The result, turn on the high beams, and chances are, your entire headlight array will shut down until the circuit breaker cools down and resets. Or, you drive into a parked car which ever comes first.

Halogen bulbs are very sensitive to operating at optimum voltage. A slight drop in voltage can produce a very large drop in output. The recommended voltage for halogen headlights is 12.8 volts, and the maximum is 14.6 volts. The 12.8 volts is higher than the output

of a fully charged battery. This means that your alternator and voltage regulator must be operating properly.

Our Cougars route the power for the headlights from the starter solenoid through the main harness to the inside of the car, and then through the headlight

switch and then back through the firewall to the headlights. This long path results in a drop in voltage. Modern cars do not route power this way to avoid the voltage drop. Instead they use relays, sort of remote controlled switches, to enable much more direct wiring paths.

Here's How to Do It!

This article is based on the 1967 /1968 Cougar, other years are similar. The electrical connections are the same, but you may need to chose a different mounting location for your car. Refer to the factory service manual for specifics for your Cougar. Although this is an easy project, if you are not familiar with basic mechanical procedures, you may wish to have this done by a professional. Always disconnect the

negative battery terminal before starting any electrical project and wear proper protective gear, in particular eye wear.

Start by disconnecting the negative battery cable. Remove the lower valance panel. It may be helpful to use some penetrating oil on the fasteners since they are exposed to the elements. Unplug the parking lights and note the location of the connectors.



1. Select a good location for the supplied circuit breaker. I chose to mount it under the battery tray. Disconnect the positive battery cable and remove the battery. Remove the battery tray. When selecting the location, be sure that the posts on the circuit breaker will not come into contact with anything metal. In this picture you can see the circuit breaker test fitted through the window in the battery tray brace.



2. Connect the power wire to the battery side post of the starter solenoid. As you can see we have several other accessories already powered here. I ran the power wire along side the factory harness that runs under the battery tray and used zip ties to hold it in place.



3. (left) Select the location for the relay packs. They will need to be close to the location where the headlights plug into the wiring harness. I wanted to keep things looking stock and uncluttered so I chose to mount the relay packs under the head lights in this area (red arrow). You can see the harness connector to the right (still plugged in, the parking light disconnected next to it).



5. (left) Run the supplied power wire between the two relay packs and plug in the bullet connectors. You can follow the factory harness across the front of the radiator opening using the factory wiring clips to hold the wire in place. Follow the factory harness to the circuit breaker location and terminate the wire with the supplied ring terminals. I used some vinyl caps to cover the posts. Be certain that there is no contact between the posts and any metal surface.



4. (right) Mount the two relay packs. I used a 1/8" drill bit and self tapping screws to mount the relay packs. Unplug the factory harness, and mate the connectors up with the relay pack. I use a small dab of lithium grease on the bullets to reduce corrosion. Be careful to not mix up the parking light connector with the head light connectors. If you get confused, just look for matching wire colors.



6. Bonus! Since you have followed along this far we have a bonus feature. Since I was already in the neighborhood I installed Rocketman's Horn Relay kit. If your horn is sounding anemic, it is probably suffering from voltage drop and this is the fix.



7. First find a good location for the relay. I chose to put it under the horn on the passenger side. You will need to remove all paint under the mounting location for the relay so the relay will ground properly. I used a sanding drum attachment in my rechargeable drill.



8. Mount the relay, unplug the horns from the factory harness, and plug one leg of the factory horn wire into the bottom of the relay. Run the new supplied harness to the horns, and plug it into the bottom of the relay. Finally, run the power lead to the circuit breaker that you installed for the headlight relays.

Where to Buy

Rocketman's Classic
Cougar Innovations
325-451-0454
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