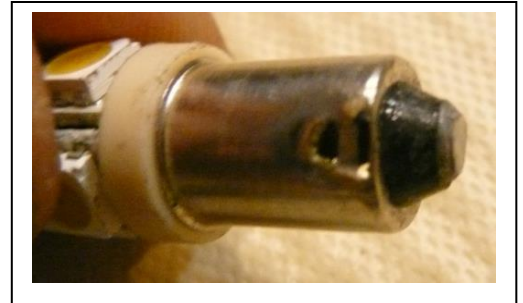


Replace the Late Model (LM) Corsatack bulb sockets with the Early Model (EM) version.



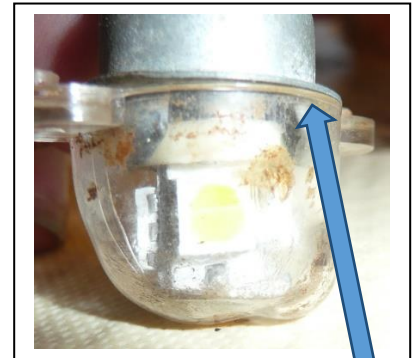
LED is too long and will not fit in Tack with plastic diffuser installed.



Grind the posts off the lamp to keep the bulb from bottoming out.



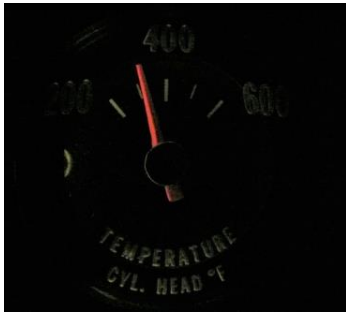
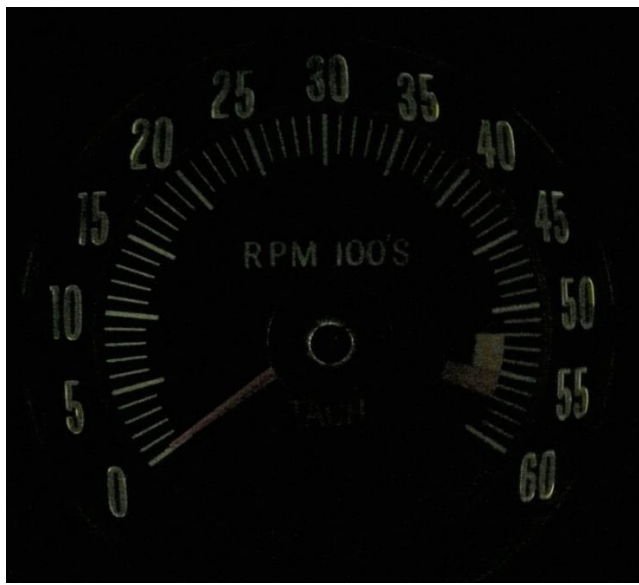
Insert the bulb in the socket with the flats aligned with the tab in the socket. The bulb should slide past the original stop position.



Bulb installed past stop, will fit in tack.

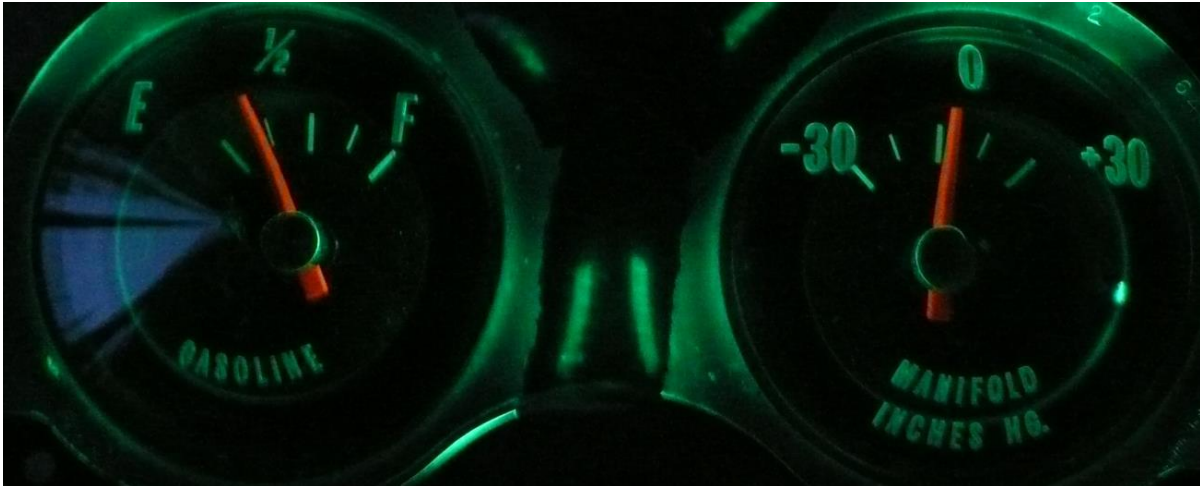
Comparison of stock lightbulbs and Instruments illuminated with Green LED's

Stock Lightbulbs



Dash Instruments with Green LED's Installed





Current draw is .05 amps per bulb. Bulb life is forever.

The advantage to this method is the car is not modified only the bulbs. The sockets are replaced but functionally all is the same including wiring

EM Spyder dash can be updated with LED bulbs except for the GEN and Oil Pressure lights, these lights have polarity problems as in the polarity reverses. There are some LEDs available with built in diode bridges that make them work with reversed polarity but I have not tried any. The bright head light indicator can be replaced however it may be too bright for night driving. The turn signal lights can be replaced also. The glove box light can only be replaced if it is modified to reverse the polarity.



EM standard dashes can be updated also; all is the same as above. Remember the dash lights have a grey wire running to each bulb socket. The dimmer switch will not work with the LED's they will remain bright and turn off as the dimmer is turned.

There is a solution to the dimmer problem. A device called a Pulse Width Modulator (PWM) can be used to dim both LED's and incandescent lamps however; the electrical noise it makes may interfere with the radio. I have a few coming to try out. The downside is a second dimmer control will need to be mounted.

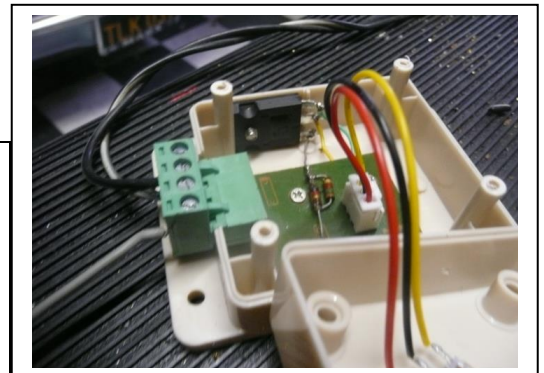
You can use either green or white LED's the choice is yours. The bulbs you want are BA9 base style. The cost about \$1.00 each when bought in packs of ten.



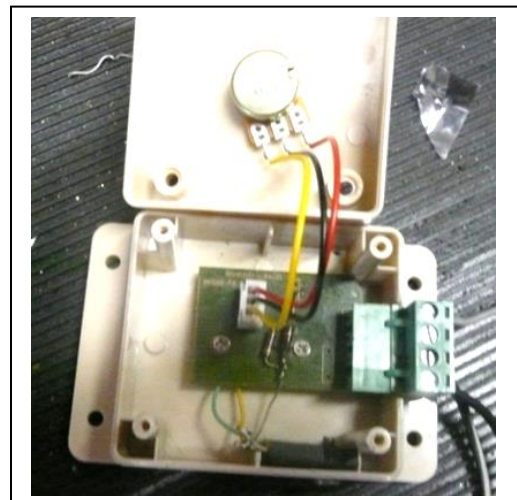
This is a Pulse Width Modulator type dimmer. It dims by sending pulses of varying width to the light source. It is efficient but may cause some noise in an AM or FM radio.

The dimmer as it comes from the manufacturer requires a modification as it sources to ground and must be converted to source to 12 Volts to work in our cars.

Important note: Installing this PWM requires a separate dimmer control in place of using the dimmer on the headlight switch. The dimmer potentiometer shown above/below is mounted on the cover of the housing. It may be removed from the cover and the wires may be extended and mounted wherever you think it looks good.



Load Resistor



Alternative to PWM

There is an alternative to installing a PWM and that is installing a load resistor to make the current draw through the dimmer on the headlight switch the same as with all incandescent bulbs. This is not an elegant solution, as it requires wasting the power saved by installing LED bulbs.

The power wasted produces unwanted heat. The positive is it uses the existing dimmer and is inexpensive, about \$2.00. The resistor must be 25 Watts or greater, the resistor will get **hot up to 220°F (degrees Fahrenheit)**. The resistor must be mounted in an elevated position so as not to touch anything. The value of the resistor depends on the number of bulbs you replaced on the grey wire in your dash. Corsa and Spyder dashes require 6 LED's therefore the resistor required is 10 ohms at 25 watts. EM and LM dashes only require two LED's so a 40 ohm resistor will work.

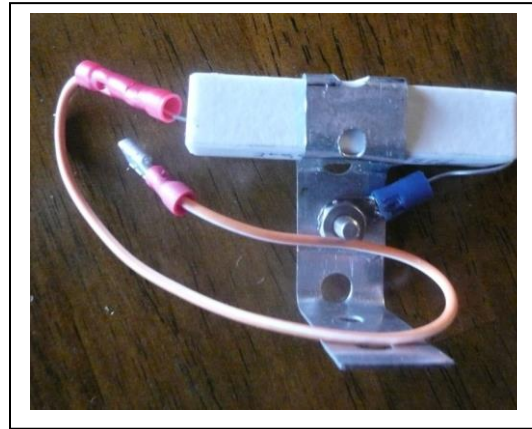
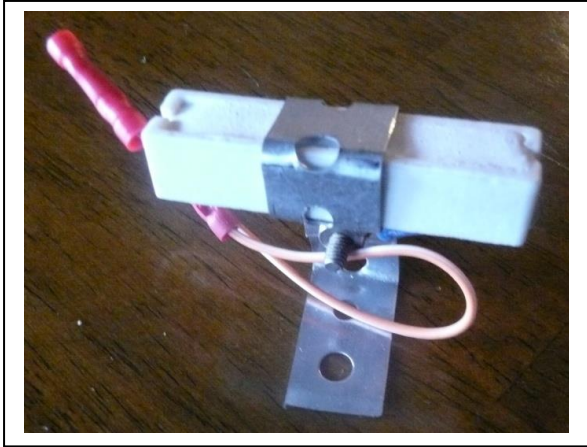
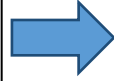
The resistor will require you make a metal mount to suspend it above the surface of the mounting location. I made mine from plumbers tape wrapped around the resistor and held together with a screw and nut. You can drill a hole and screw the other end to the underside of the dash. Use the same mounting screw to ground one end of the resistor. The other end of the resistor is connected to the spade lug at the bottom end of the fuse labeled Panel.

I have installed the load resistor on both the Corsa and Spyder dashes in both of my cars. They work well on the Corsa and with one anomaly on the Spyder dash; the tachometer and speedometer lights turn off before the three separate gauges at the low end of the dimmer setting. I believe this is due to the bulbs I used not the dimmer.

My Corsa installation showing the wire from the resistor to the fuse block, second from the right fuse. On the EM the fuse is the farthest right with the same type of connection.

Remember the resistor will get "**hot**" just like the bulbs it replaced. Do not let it touch any wires or carpet. Increasing the wattage of the resistor will lower the temperature when in operation. Higher wattage resistors cost more and the tradeoff is up to the installer. Take into account the amount of night driving with the lights on; if it is insignificant then the lower wattage may be OK. If night driving is often then the PWM will work well.

The resistor with plumbers tape wrapped around and held together with a screw and nut



Modifications to PWM Circuit Board

Cut the trace to the (-V) pad.

Connect a wire from the (-V) pad to the (Collector), center leg of the TIP 2955 transistor.

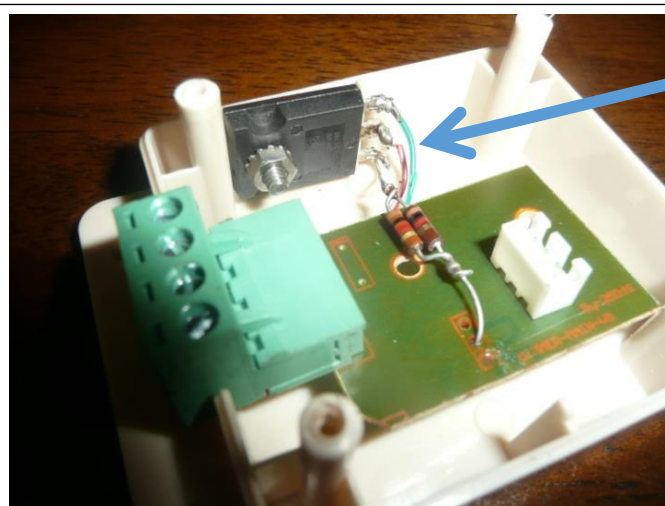
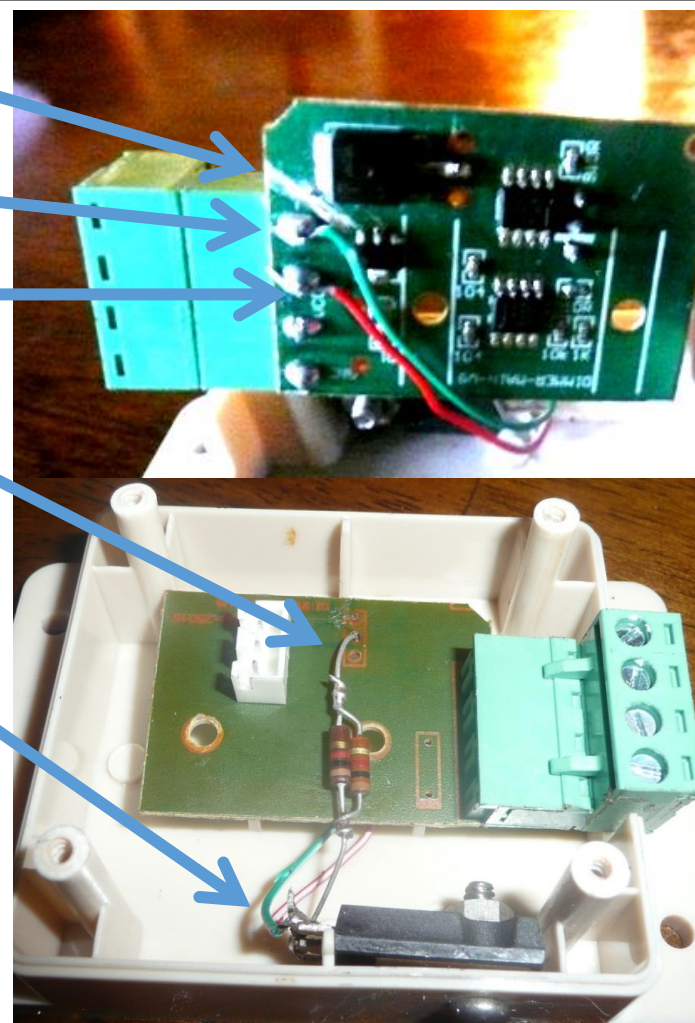
Connect a wire from the (+V) to the (Emitter), top transistor lead.

Solder one end of the resistor to the center hole in the circuit board.

Connect the other end of the two parallel 1K ohm resistors to the (Base), bottom lead of the transistor.

Drill a 1/8" hole in the side of the housing and secure the transistor with a #6 screw and nut.

Be careful not to short the output (-V) to ground as it is not short circuit protected.



Caution red and green wires are reversed in this photo. Red wire should have been on the top.