

**ELECTRICAL,  
ALTERNATOR,  
SWITCHES,  
INSTRUMENTS,  
AND RADIO**

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## ONE OF JOE LUCAS' MOST INSIDIOUS INVENTIONS

### All Skill Levels

Picture yourself in the worst situation imaginable in your TR 6-- dark rainy night, on a country road, etc. and your car dies. The first thing you do is hit the 4-way flashers. Surprise! They don't work. If you ever took apart one of those hazard flasher switches on a car prior to \*CC75,000 you'd see why. Inside is a loose little piece of copper, a little roller that looks sort of like a weight lifters dumbbell, and a good imitation of a ball point pen spring. If you look at a wiring diagram you'll see that in the normal position the dumbbell connects two terminals for the turn signal circuit. When you flick the switch, the ball point pen spring is supposed to flex in an arc and roll the dumbbell down to contact the two hazard flasher terminals. The neat thing is that it don't! Aside from the ridiculous \$16 plus shipping for this \$1.29 item, this damn thing can get your bacon cashed in. Pardon my emotions, but I'd like to put the President of Lucas in an electric chair with one of these switches in the circuit so he could use it to turn off the chair when the power comes on.

Anyhow to fix it is a simple job requiring less than an hour. You will need about 2 feet of #12 or #14 copper auto wire, 5 male spade connectors, 2 female connectors, and a Radio Shack #275-704A 12 volt, 20 amp switch panel (or equal part of your choice). The old switch is removed by depressing spring tabs on the top and bottom rear. It is much easier with the tach out; but then, it ain't all that easy to get the tach out. Assuming you have accomplished removal with most of the dash still in place, use about 4" of the #12 or #14 wire and two male spade connectors to join the green wires formerly connected to the top terminals. This puts your turn signals back in operation (check them). Tape the connectors to insure any bare part of the spades can't short out. Select the location for your replacement switch and mount it connecting a ground wire from the ground terminal to one of the mounting screws or any good ground. Using the other connectors and your wire extend the two purple wires to your switch. That's it, just test it and you're in business. If you have a '72, you'll find you have four wires on the flasher side of the Lucas switch.

## EMERGENCY WIPER SWITCH FOR EARLY (ROCKER SWITCH) CARS

Skill Level D

There is only one thing I think is inferior to Lucas products and that is Clear Hooter junk. This stuff isn't even worthy of a "Made in Taiwan" label. It was bad enough back in the days when your car was new, and the wiper and washer switches went bad after 10 uses, and you had to go to your TR dealer for a new one at a ridiculous price. Now you have to wait to get one from the Roadster Factory, and even they can't keep it from raining on your parade until the thing arrives.

For you guys (and gals) who enjoy driving your TR 6 every day there is a way to make do until your new defective switch arrives. Remove the old switch by pressing on the spring metal tab at the bottom of the switch and the back face of the dash with a screwdriver or your 8" long fingers until the bottom moves outward. Then, gently yanking the bastard the rest of the way out, disconnect the wire, throw it to the ground, and stomp the living hell out of it. Now you feel better don't you? Use any decent 12 volt rated on/off toggle switch from an auto parts store or Radio Shack (incidentally, I don't own stock in R.S.. It is just that their Taiwanese junk is so much better than Clear Hooters imitation of Taiwanese junk, and that they are always nearby), a few inches of 16 or 14 gauge wire, and two male spade connectors to make up your temporary switch. Plug your switch into the wires removed from terminals 2 and 3 of the Clear Fruiter switch and you're in business. In your zeal to stomp the living stuffin's out of the C.H. switch you may not have noticed which wires were where. These are supposed to be green and light green but then again they might not be. Live it up and play around until you hit a winning combination. In any case you are going to have to switch the wipers off when they are in a suitable location. Hey, for \$3 worth of Radio Shack stuff we don't offer automatic wiper parking.

## THE STUDEBAKER ANSWER

Skill level C

Now for you guys with principals, who just won't crack open the old wallet for a piece of do-do like Clear Hooter, there is the complete conversion including 2 speeds and automatic wiper parking, to a Studebaker switch that has a life expectancy in the range of 17 times the life of the average Studebaker. Ask my daughter, Shirl, the one in her car has surpassed the life expectancy of 17,378 Clear Fruiterers. Write me, I'll tell you how to smuggle one out of South Bend, Indiana for \$8 or a junkyard for \$14.

## EARLY WINDSHIELD WASHER SWITCH REPLACEMENT

Skill Level C

You've no doubt read my rantings about Lucas and Clear Hooter electrics for years if you have belonged to 6-PACK for more than one issue of the newsletter. Here is a perfect example of why I find them so intolerable. I bought a new washer switch and used it probably no more than ten times when it hung up. When you look at the innards you can understand why. They have a little piece of brass bent like a rocker and a tiny ball point pen spring that is supposed to bend when you push the button and thus push the rocker against a contact. If it was a \$2 item available at the local BAP-GEON I wouldn't get too upset. However, to pay the going rate plus shipping and wait for another defective switch is enough to make one buy a VW Beetle or a Studebaker.

The fix: You will need a soldering iron (or a hot nail- *seriously you can solder with a hot nail*), solder, about 2' of 18 gauge wire, two male terminals (the size with the red ends), about 2' of electrical tape or heat shrink tubing that is a little bigger than the wire, and one of two switches available at Radio Shack. The switches are #275-609 (2 to a pack, one red and one black, round button, \$1.69) and #275-618 (1 with square red button, \$1.49). These are rated 3 amps at 250 volts but if you don't tell them your car is 12 volt they will work anyhow (those Tlwanese products never were too smart).

Take the nut and washer off the Taiwanese switch. Cut one piece of 18 gauge wire about 1" and the other about 1/2" longer. The reason for the different length is to make them easier to feed through the nut. Bare about 1/4" on the end of each wire and solder them to the switch terminals. Be careful to keep your soldering neat because the nut has to go over them when the switch is installed. Cover the soldered terminals with the heat shrink tubing or tape. Install the male terminals on the other end of the wires.

Remove the old switch and bezel (the flanged piece). Keep the bezel. Push your new switch through the bezel at the top, middle, or wherever you choose. It will be a little tight but it will go. If you're fussy about appearance put some electrical tape on the back side of the bezel to cover the voids and then another like piece of tape inside the bezel on the front. Put the switch wires through the dash and thread the nut over them. Tighten the nut (not too much, it is a plastic switch) and connect the wires to the original wires (it makes no difference which is connected to which). You may be able to use a thin washer under the nut, and if so, this will make it easier to tighten.

I've been using one of these set ups for about 5 years without trouble and another for 3 years.

### BEFORE YOU REPLACE THAT ALTERNATOR

#### All Skill Levels

Since most of us don't have the skills or equipment to rebuild an alternator we usually assume any trouble means exchange time to the tune of big bucks. Before you make your contribution to the perpetuation of the Prince of Darkness, take a few minutes and a couple of bucks to try two easy jobs. One is described below and the other in the following article.

The first one applies especially to early cars with two connector blocks plugging into the alternator. However, it can

happen to any unit. The problem lies in the female spade connectors inside the plastic block. They don't always make contact with the male spades on the alternator. A sure sign of this is an ammeter needle that flicks a lot. The cure is one of the replacement connector blocks mentioned in the factory notice on this problem (except you can't get them). The next best thing doesn't look too good, but then I never promised you a concours winner.

In order to not mix up the wires (instant bingo for the diodes), do the following. Working on one wire at a time, cut the wires just behind the plastic block. Using screwdrivers, pliers, nuclear fission, or any other means required remove the old female spade. Use a crimp type splice or whatever splicing method turns you on to add about 2" of the same gauge wire to the bare end. Slip this extension thru the hole in the connector block and attach a proper size female spade connector to the wire. Repeat this for the other wires. Anyone smarter than the average bear can then use the connector block as a guide to get the right wires on the right alternator spades.

### ALTERNATOR BRUSHES - PREVENTIVE MEDICINE FOR THE HIGH MILE CAR

Skill Level C/D

I despise solid state electronics - not because they are complicated but because they require all kinds of exotic test equipment and because they are so fragile. With a generator you can do all kinds of stupid things and still not ruin it. With an alternator, the slightest wrong connection and it is instant diodes up. Therefore, when I say any of you can do this, believe me.

The brush set is available from the Roadster Factory for a few bucks. You will need a 1/4" drive ratchet, extension, and sockets, and a small phillips screwdriver. You will also need a shop manual or a parts manual with an exploded view of the alterator because life's too short for me to try to draw one.

When you remove the alternator from the car use caution on two things: (1) The plastic wiring connector blocks were faulty on some early cars and care must be used to make sure the wires inside them don't come loose and that they really contact the spades on the alternator on reinstallation. (2) There are two cylindrical spacers on the alternator mount. All too often the rear one is lost in the removal. If either is left out on reinstallation you will break the alternator casing.

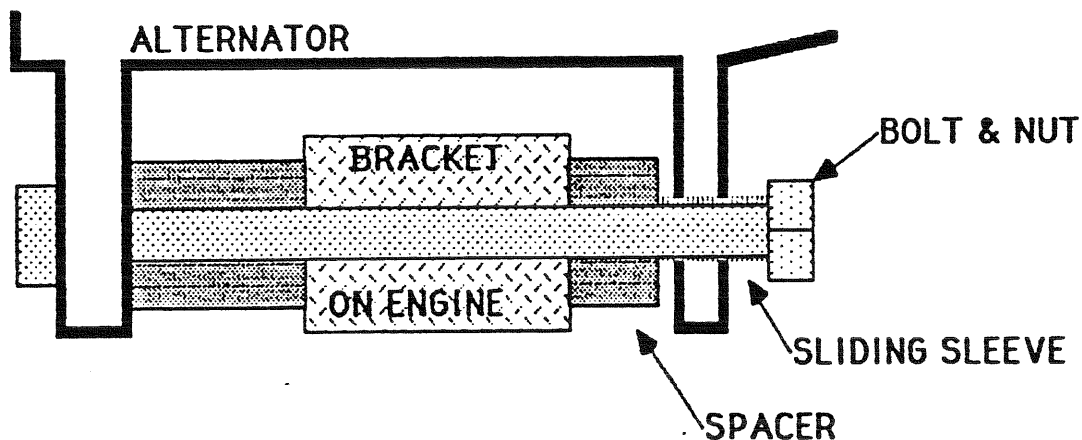
To change the brushes requires less than ten minutes. Use a 1/4" socket to remove the 2 retaining screws for the plastic rear cover. This exposes the rectifier pack and the brushbox assembly. Notice the two small metal straps across the rear of the brushbox. These are the brush holders and are an integral part of the brush set. Make sure you note the wiring connections to them. Depending on which alternator you have (15, 16, or 17 ACR) you may have to snip a male spade off the new brush holders. Bear down hard on your small phillips screwdriver when removing the screws retaining the old brush holder. Simply remove the old brushes and install the new. I recommend some anti-sieze on the screws. That's all there is to it You're done unless you want to spend a few more minutes on the cleaning operation described below.

There isn't much more you can do except clean the slip ring that the brushes contact and clean the inside of the brushbox. To do this requires a small degree of caution. Use a 5/16" socket to remove the 3 bolts which hold the alternator sections together. Low on the left side you will find a small slot in the drive end bracket where it meet the stator windings. Twist a large screwdriver in this slot to seperate the two. Be careful you do not pull the stator windings from the rear bracket. Use spray carb cleaner (lacquer thinner) or any solvent that does not leave a film to clean the inside of the brushbox and the slipring. Blow dry or let set until dry and then reassemble the unit.

## ALTERNATOR MOUNTING WOES (or) DON'T LET A REDNECK MECHANIC TOUCH YOUR ALTERNATOR

### Skill Level D

When my daughter Shirli's '72 was discovered by Andy it had been sitting in a body shop for 5 years or more. This body shop was one of those places that specializes in Macco type work and an occasional Mustang for a kid. They mentioned they had put on a new master cylinder and an alternator. It was easy to tell they hadn't had enough sense to bleed the brakes (there weren't any) but we never thought about the alternator. Sure enough about a month later the adjustment bracket broke. The problem was the packing piece (see illustration ) between the mount on the engine and the front alternator bracket was missing.



When the long mounting bolt for the alternator is removed this piece can fall out without being noticed because it is below the alternator and out of sight. Two things can then happen. First the mounting bolt/nut can be tightened until the rear, front, or both mounts on the alternator break off. Or, the alternator moves fore and aft until something gives (the belt catches and breaks, the adjustment mount breaks, etc. ).

Another thing that can happen is that the sleeve in the rear alternator bracket freezes in place (it is supposed to slide to allow for variation in the length of the mounting spacer and packing). It is to be worked rearward for this purpose when removing the alternator. Always put some WD-40 or other penetrating oil on both ends of this sleeve before removing an alternator. Ideally it should be kept oiled at all times and moved periodically because the dissimilar metals (aluminum alternator housing and steel sleeve) cause an expansive corrosion where they meet. This corrosion can lock the sleeve up tight.

The front spacer is still available, 147472, from Roadster Factory. The rear is no longer available but in a pinch a whole bunch of washers will do.

Alternator exchange requires only a 3/8" drive ratchet, a 3" extension for same, a 1/2" socket, a 1/2" open or box end wrench and a lever to pry the alternator sideways when tensioning (not too much) the belt. Either do it yourself or make sure the redneck knows about the spacer and packing.

### EASY ALTERNATOR PULLEY REMOVAL

Skill level D

One of the problems of trading your Lucas, "Prince of Darkness", alternator on a rebuilt one (aside from the megabucks price) is the necessity of removing the pulley for reuse.

The usual method is to stick a screw driver between the cooling blades (bending them all to hell) or grabbing the pulley with a pipe wrench (bending it all to hell also plus chewing it up).

A better mouse trap idea is to use a spin-on oil filter wrench to hold the pulley. Filter wrenches come in several sizes and cost all the way to \$1.98 at the drug store or El Cheapo Auto Supply.