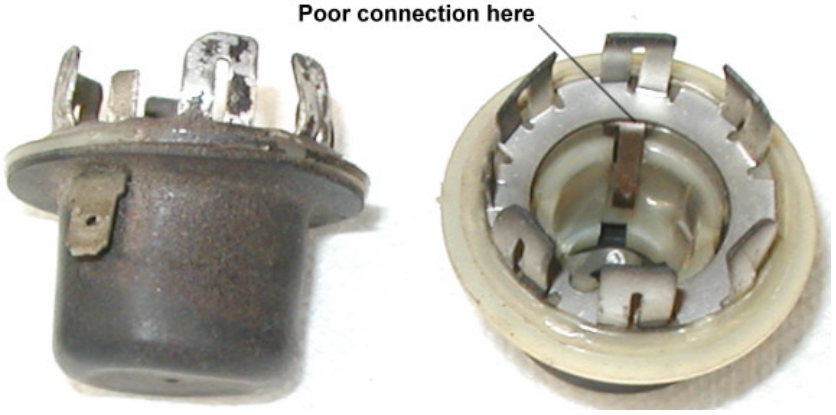
Repairing TR6 Taillight Sockets

Prince of Darkness? Many take great joy in bad mouthing Lucas Electric parts. Being an electrical engineer, the electrical part of the car holds little mystery for me. The real mystery is why the POs did some of the things to the electrical parts of my poor LBCs. For the most part, the Lucas stuff is of similar quality to that supplied by other auto electrical manufacturers of the era. My son went through the VW phase when younger so I had a chance to take a good look at their electrical system. They could learn a lot from Lucas--- and the damn things leaked more fluids than my TRs.

The major problem I've found with the TR250 & TR6 electrical system is poor connections due to age and corrosion. The flat blade terminals seem to cause the most problems. I clean the male part and then take pliers and squeeze the female part closed a bit so that it's a tight fit over the male part. The round bullet connectors seem to be less of a problem so I just clean the male ends. I also include the exterior lamp sockets and bulbs in the contact cleaning. This together with connecting all the wires (to the correct terminals) fixes 99% of the problems. Dan Masters' Triumph TR250- TR6 Electrical Maintenance Handbook is a great help in understanding where the wires go. See http://members.aol.com/danmas6/.

When someone has taillight problems, most folks comment that it's a grounding problem. It frequently shows up as one dim taillight and one of normal brightness. When the brakes are applied, the light that was dim goes out and the brake light comes on in the other lamp that had normal brightness. The problem is a poor or no ground connection in the light that was dim. When just the parking lights are on, a high resistance ground path is provided to the dim light through the brake light filament part of that bulb and then though the brake light filament in the other bulb. This ground path is removed when the brake petal is pressed, operating the brake light switch that then supplies 12 volts to the brake light filaments. Dan Masters explains this phenomena in detail on page 13 of his text.

In most cases the grounding problem is caused by corrosion in the socket. Typical sockets are shown the photo below. The little strip on the inside of the socket is a bronze spring that makes the ground contact to the side of the lamp. The top of the strip is bent under the steel ring with the prongs. The ground current flows from the lamp though the bronze strip and then the steel ring and prongs to the tail lamp housing. The problem point is the connection between the bronze strip and the steel ring. The two pieces just rest against each other. After many years, the surfaces between the dissimilar metals corrode. Replacement at ~$10 a pop isn't much of a remedy since the last new ones I saw are the same design.



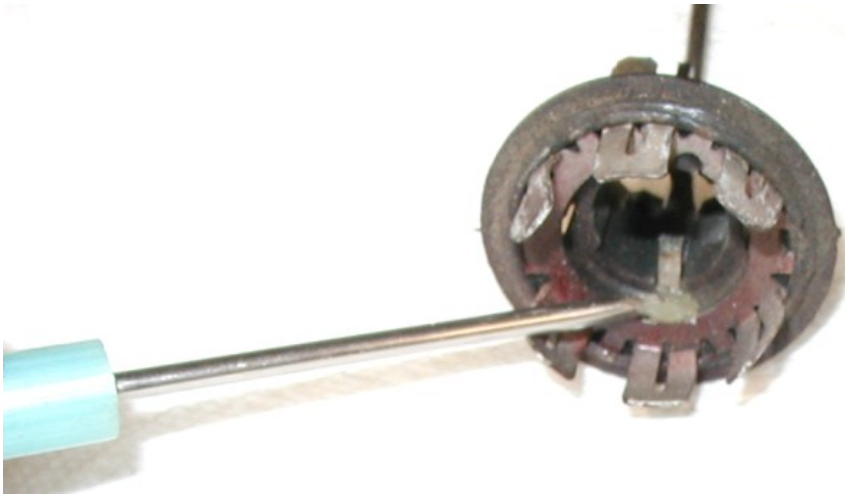
The permanent solution is to solder the bronze strip to the steel ring. This is not so easy since it's pretty hard to solder steel, the ring is pretty big so a lot of heat is required, but not too much or the plastic will melt. And, we can't get too much solder on the bronze strip or it will no longer be springy.

The first thing is to clean the two surfaces. We want solder to flow in the crack between the bronze strip and the steel ring. The edges on each side must be cleaned. (In soldering, cleanliness is next to godliness.) I use the point of a small file as shown in photo. I take some time with this and make sure I get the surfaces really clean. The left photo below shows the file in action. Note that this is a different socket, one that has paint over spray on it. I can tell from the color that this socket is from the pile of parts that will some day be a fully restored '71 TR6.

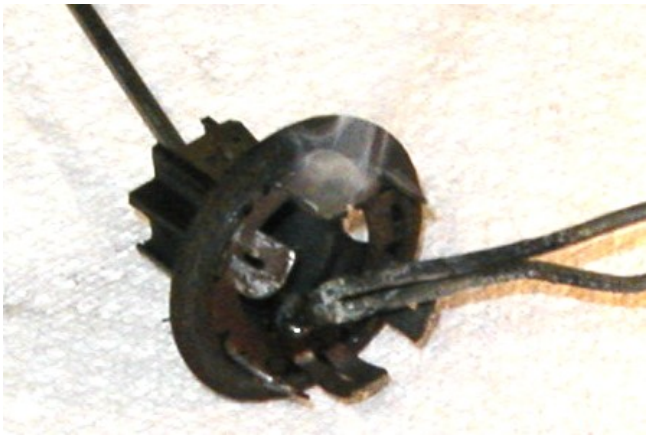
The rubber cover is removed and a small screwdriver blade is slipped under the bronze strip from the bottom of the socket so the strip wouldn't be smashed down in the soldering process (right photo).

The tools I use for the actual soldering are shown in next photo. If a soldering gun is used, a minimum of 100 watts is required. If you are lucky enough to have one of the big old irons with the large copper tip, great! The copper tip stores the heat so a smaller heating element, like 30 or 50 watts is adequate. You just have to wait a while for the tip to reach operating temperature. Don't use a propane torch; you'll melt the plastic parts of the socket. Rosin core electrical solder is used. The solder diameter shown here is larger than recommended; I normally use a much finer diameter solder but couldn't find that roll when taking these pictures.

The flux in the can is usually found in the plumbing section of the hardware store, Home Depot, etc. A small screwdriver is used to put a small amount of flux in the joint.



Next, the joint is heated with the soldering iron --- photo below. Note the smoke rising from the joint (that sounds like something from the 60s).



Once the joint is hot, the solder is touched to the joint and held till a small amount flows into the crack between the two metals, see next photo.

If too much solder is added, the joint is heated with the iron till the solder flows and then the socket is rapped against he workbench to shake off the excess. The solder must be hot enough so that it is all melted and free to flow into the joint. If the solder is only partially melted, a cold solder joint results that will make no better electrical connection than the unsoldered joint.

The photo on right shows a good solder joint with a minimum amount of solder.

When the soldering is finished, the bronze strip and lamp are cleaned with steel wool and the metal prongs by a wire wheel as shown on the right. The socket is then tested. I usually take a couple clip leads and test it directly on the battery or the battery charger. (One clip lead is connected from the flat copper terminal to one battery/charger terminal and the other clip lead is connected from the steel prongs to the other batter/charger terminal.) The bulb should light. I then wiggle and flex everything to make sure the connection is sound. If the connection is intermittent, there is either a poor connection between the socket and the lamp or the solder joint didn't make a good connection to the bronze strip or steel ring. I try cleaning the lamp and contact first. If that doesn't fix it, I reheat the joint, shake out the solder, clean again and solder again.

Once you get one socket finished and you're happy with the results, I suggest you solder the other five so that you won't have to mess with them again.