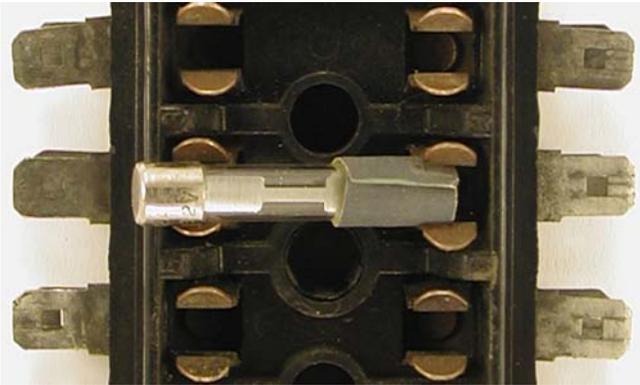


The Ignoble Fuse Holder

by Rick Astley

I have recently seen a rash of failures concerning the fuse holders on MGBs, but the problem could potentially occur on any MG. It exhibits itself as being the symptom of a blown fuse, but when the driver checks the suspect fuse, it turns out to be intact, yet current is not getting from one side to the other.



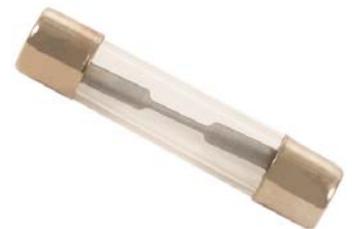
The solution is usually (but see below) to take some fine sandpaper, grit side out, wrap it around the end cap of a fuse, insert the wrapped end of the fuse into each of the fuse clips one by one and move it around to clean the inside surface of the clip. The effect is to remove a very thin layer of electrically insulating oxide from the inside of the clip that prevents current flowing to and from the clip and the fuse cap. But why is the problem occurring?

The reason the inside of the clip is building up a thin oxide layer is all to do with nobility. Yes, class comes into everything and metals certainly have class, or as it's called in the world of metallurgy: nobility. As you may guess, the noblest are the

precious metals platinum, gold and silver, in that order of nobility. The least noble, are magnesium, zinc and aluminum.

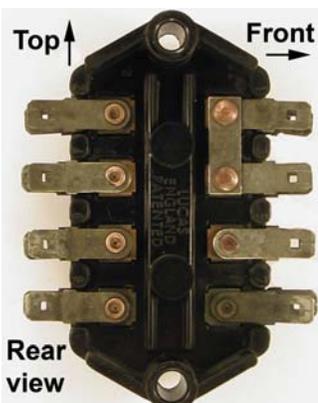
When two metals are put together in the presence of an electrolyte, corrosion can occur. An electrolyte is a solution of water (which when pure does not conduct electricity) and elements that cause it to conduct. Under the hood of a car, and particular an older car, there are fairly aggressive acidic elements that are the product of combustion, which can result in some rapid corrosion. Note that I stated that "corrosion *can* occur", whether it does, or not, depends on how dissimilar in nobility the metals are. The corrosion will occur to the least noble of the two – again, as in life, the poorest get the roughest deal. This type of corrosion is known as galvanic and there are galvanic tables that chart metals to show if two are sufficiently different in nobility for the risk of corrosion to occur.

The clips that retain the fuses in a Lucas fuse holder are made of a copper alloy, probably beryllium copper, copper being highly electrically conductive and beryllium imparting some springiness. Both copper and beryllium are relatively ignoble. The original glass fuses used in MGs, which I believe may still be available, had copper end caps. As the copper fuse end caps and their retaining clips were not made of dissimilar metals, corrosion was negligible to nil. However, look at the glass fuses in your MG and you'll likely find that unlike the original fuses, they have bright and shiny nickel plated end caps. Nickel is relatively noble and corrosion will occur when they are in contact with the inside surface of the copper alloy fuse clip, and because the clip material is the less noble, it oxidizes (a fancy word for corrodes) in the area in contact with the fuse cap, while the cap itself remains nice and shiny. Copper oxide (verdigris), while it does prevent electrical conduction is obviously a lot less destructive than iron oxide (rust).



The long-term solutions are probably:

- Acquire and install original style copper ended fuses
- Use sandpaper to clean the inside of the clips at the beginning of each driving season.
- Install a modern fuse block, itself with nickel clips. However, finding one of suitable size with double contacts at each end may be a challenge.



There is another less common failure of the fuse holder and that is loosening of the rivets that hold the terminals, the plastic body and the clip together. If it is easy to 'wiggle' the terminal relative to the fuse block plastic housing, then it may be necessary to tighten the rivet. Care must be taken in doing this as the plastic used is not as resilient as that found today and it will have become even more brittle over time. Using a rod, such as a nail-set punch, working from the underside, support the top side of the rivet, which can be seen at the bottom of the fuse clip, and gently tap the bottom side, again using a suitable punch. Note the bar joining the left and right side-lamp fuses. Make sure that the block is reinstalled correctly with the bar toward the front and top of the car.