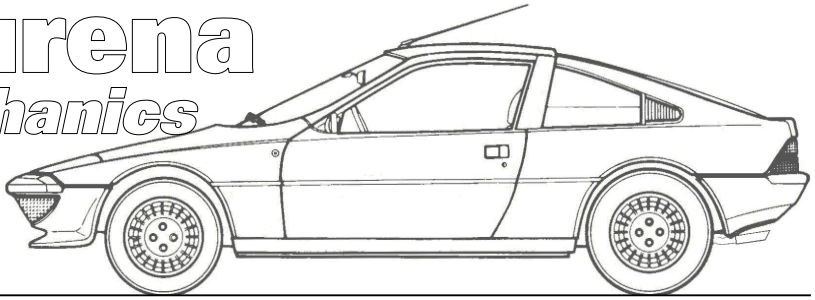
Murena mechanics



Roy Gillard

General lighting

The lighting on a Murena (or Bagheera) is relatively conventional, except for the pop-up head lamps. If the car was imported privately you would have had to add a rear fog lamp on the right hand side as they only included one on the left on the continent. The batch of 250 Bagheera imported in 1977 would have already had this modification done before sale.

Since the right hand rear lamps already had a space for the rear fog lamp and the wiring for them was already in the loom, this is a fairly easy Murena modification, the trickiest part being to add the bulb earth contact. You would also have to change the right dip head lamps for left dip versions, but otherwise everything was fine.

There is one thing that you may not realise though, owing to the pop-up head lamps, the head lamp circuits are not quite straight forward. If you think about it, the reason becomes obvious. When you switch on the dipped beam head lights the pods have to come up. However, if you switch to main beam, then the pods have to stay up. Now you can't simply have a common feed to the solenoid and valve that activates the duel-direction servo to bring the pods up, otherwise you are joining the two circuits together, and that will mean both dip and main beam will be on at the same time!

Circuit separation

In the Bagheera design there was no circuit board so the circuit separation was created by a special relay with changeover contacts, but like any set of points these can get surface corrosion or burning that eventually degrades the contact; and special relays are also relatively expensive.

In the later Murena design this separation is provided by diodes incorporated on the circuit board, yet being small these often go unnoticed until one or more fails. They don't fail very often fortunately, in fact it is quite rare, and often happens only because of outside influence. I have seen a few cars where they have failed an M.o.T. because both beams are on together and the owner has not noticed. And the owner can't understand what is causing it.

Some years ago when I worked at a TVR dealer we had a car in with the same problem. The diodes had failed and been replaced incorrectly with fuses but these didn't separate the circuits, so both beams were on together! Instead of simply fitting two new diodes (similar to a normal blade fuse on that model) someone had cut and joined various circuits, fitted new switches, etc. until they got the lights working good enough to pass an M.o.T. but the driving lamps didn't work which meant the head lamp flash function couldn't work!

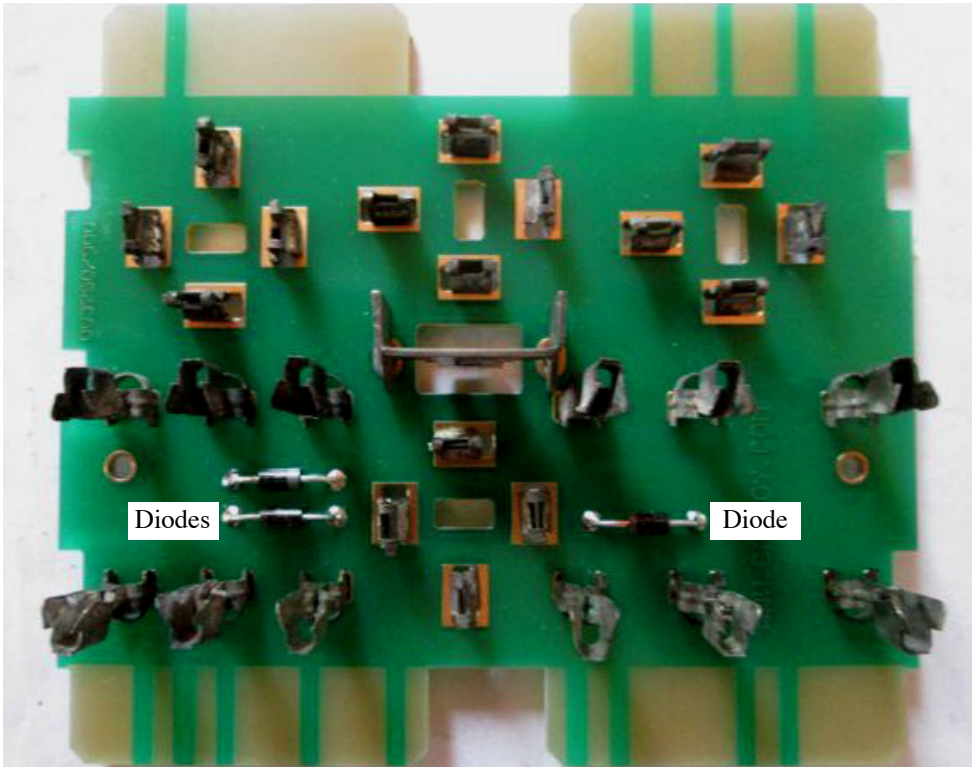
So if you have a Murena and both head lamp beams are on at the same time, no matter which switch position you select, then it is most likely a diode has failed. Since these are soldered to the circuit board, and were never available as a spare part, you would have to obtain one, diode number 1N4004, from an electrical store (Maplins would have been ideal but now they have gone, you will have to find them elsewhere) and then remove the failed one and solder the new one in. The only other alternatives are to modify the system or buy a new circuit board but the latter seems somewhat extreme for just a failed diode. However, if your board has other faults such as damaged tracks, burnt out contact pads etc. it might be worth it.

Here is a photo of a new circuit board showing the diodes.

The single one on the right is the diode through which the solenoid is activated when the main beam is switched on. The lower one on the left is the one through which the solenoid is activated with dipped beam switched on. The upper one on the left is connected to earth and performs the same safety function as diodes fitted in better quality relays - relay coils cannot change their currents instantly so the diode is to protect the circuits from spikes as the current is switched off.

Correct polarity

If you are fitting new diodes please note their polarity and the fact that the two diodes close together on the left are connected the opposite way around. The upper 'earth' diode flow is left to right,



Fuses and relays

Whilst looking at that circuit board I should point out that the fuses from left to right are: a 16 amp ignition circuit fuse, then two 16 amp electrical window switch circuit fuses, followed by two 16 amp live fuses, and finally on the right hand edge the 8 amp side lamp circuit fuse.

Please note that when the board is in the car, the left hand edge is by the left hand side of the car, and the right hand edge is nearest the centre of the car. I mention this because if you have an original hand book (Book 1) the board in the photo on page 53 is the wrong way around!!

The single relay location at the bottom of the photo (or the rear when in the car) is for the dipped beam relay. The top left relay is the ignition activated window relay, the centre relay is the driving lamps relay and the top right one is the main beam relay location. Knowing these positions makes it very easy to check things if necessary on the road side, assuming you know your electrics and relay pin connections.

A normal standard relay has two parallel pins on opposite sides that are the relay activation terminals. The two terminals that are on the other opposite sides you will note are not parallel but at right angles to one another. These are the input and output connections when the relay is activated. Either can be the input or output.

So if we wanted to check the dipped beam relay for instance, maybe because your head lamps have not come on, the live power in is at the top (in the picture) and should have 12v there. The terminal at the bottom should have the output to the lamps when the switch and relay is switched on.

If the lamps are not on, a quick check could be to by-pass the relay by touching a jump wire briefly across those two terminals. If the lamps now flick on, then either the relay has not activated or it is faulty. To check if it is being activated from the switch you would check the left and right connections. One comes from the switch and the other goes to earth.

Let's assume you don't know which is which. Using your meter you put its earth lead to the chassis or battery earth and check with the meter positive lead which has some voltage. If neither have any voltage then you are not getting a feed from the switch. If one of them does have 12v, then the other should be earthed. Now you can check with an ohmmeter, if that earth is making a connection to the chassis or battery earth. If you have a 12v supply one side and an earth on the other then the relay should have operated so if you have no connection across the main power in and out connections the relay is probably faulty.

Note, you can do all this without stripping anything, just by removing the fuse box cover! So having the relays underneath with their connections at the top is actually a big advantage. You would only have to take the circuit board out if you had to change a relay, check the circuit board tracks or check the edge plug terminals.

If all the relay terminals seem to be correct but you are not getting the lamps on, it may be that an edge plug terminal has broken which may be the next thing to check. Or it may be another connection has failed somewhere, but you should see from this little example how easily you can check the circuit board relays as well as the fuses.

cont. over

If you have to remove the circuit board for any reason, please check carefully for any burnt out sections of the track. You might be able to repair minor breaks but if it is bad you will probably need a new board.

The stock of new boards have all been used up including the replacement copies made for Simon Auto and Carjoy, so currently (October 2019) they are unavailable. However, Carjoy are having some new boards made, and this time they will have the modern blade fuses fitted. This involves altering the circuit board so it is taking a little longer to have made.

Fuses

The fuses used on these boards are known as the continental type, and are generally a piece of plastic with the fuse wire wrapped over each end (as below) where it is held in the clips. They are not as good as the English glass fuses or the later and now common type blade fuses. N.B. the photo below is in the correct orientation with the left edge towards the front and the bottom edge nearest the outside of the car. Also 8A fuses should be white and 16A fuses should be red. (but some don't conform!)

One important point is that if you are checking the fuses you **must** remove them and not just look at the link across between the ends. The first thing to note is how tight they are held between the two ends. Often they will be quite loose which means there is no positive contact at the ends. This can lead to the end of the fuse link burning away and you might have a fuse which looks fine across between the ends but is actually barely making any contact at the ends which is just as bad as a blown link.

Glass fuses were good because they made much better contact in the clips and you could see the blown wire inside the glass. (and if you had a piece of fuse wire and some solder, you could actually repair the fuse!) Modern blade fuses are fine and you can usually see when they are blown, or you can test them if they have an opening above each end terminal, but you cannot repair them, so unless you carry some spares the only other option is to decide which item you can do without, and borrow the fuse from that circuit temporarily.

How many fuses does a Murena have? Well that depends on whether it is a standard French build (6) or a German spec. model (8)! The reason is due to a particular German lighting law, and German wired cars have a fuse behind each rear lamp. On a 1983 model it should have an inline blade fuse holder and blade fuse, but previous years it will have the earlier inline 'torpedo' holder with an old style continental fuse.

Edge Terminals

The final thing to warn you about with regard to these circuit boards are the edge connector terminals (as *below*) in the four plugs. These have almost 180 degree bends at the ends and the curved 'tails' are designed to grip the board with the 'tails' on the bottom having positive contact with the circuit board contact patches. The problem is they crack across those end bends and lose firm grip on the board. They might look OK in the plug housing at first glance, but check them with a small screwdriver.

If you don't spot this straight away, by poor performance on that particular circuit, then they will probably arc and cause burning of the contact patch on the circuit board, further degrading the circuit and eventually leading to the board needing to be replaced.

These terminals are getting harder and harder to obtain. They were used on various other cars from the same era and we are all having the same problem. I have a few left at present and I think I've found some Renault terminals that can be used in place of the originals but even those will probably become impossible before long.

So what do we do then? I have been considering this for some time and I think I have an alternative that will be better in the long run but it does involve carefully drilling the board through the contact patches and soldering terminal strips along the board edges. Then fitting all the wires into some mating plugs that fit these strips.

I don't consider soldering all the wires directly to the board as a good idea although that could be another option, but it then makes fitting and removing the board for any work, very tedious and difficult. My solution allows you to unplug the board similarly to the original. I have modified some boards like this and two Murena owners have fitted them, so I know it is possible and they work.

It also means the car will look perfectly standard, can use the same circuit, fuse and relay board, and the fuse box lid can still be fitted. All important if you wish to keep the car looking original.

Roy Gillard