From Little Things—Big Things Grow

Otherwise konw as "Upgrading to LED globes in my 1982 4/4"

Geoff Hollings

I read the article by Ian Merker about upgrading an older Morgan to LEDs and thought it was a good idea that I would do some time.

So, when a few months ago one of my neighbours told me that my brake light was not working on the driver's side, I thought I might as well upgrade to LEDs instead of replacing the broken incandescent globe.

I re-read the article and removed the old globes to check what was installed….. I could not obtain the eXelite bayonet globes in the article, so looked around and found that the company from whom Ian had obtained his new headlight globes, LED Autolamps, also supplied LEDs for the brake/tail, and indicators.

As the local car spare parts shops did not keep them in stock, I ordered brake/tail, indicator, reverse and headlight globes from them directly. The globes duly arrived by post. [photo 3]

The task involved removing the lenses, globes, one brake light assembly, the dash, all the instruments, THEN the seats, drive shaft tunnel, gearbox tunnel, heater fan and indicator switch. [photo 1]

WHY is this so you might ask? Well, here is the story . . . .

First task was the brake lights.

When looking at one of the brake lenses, I found that one of the screws had fallen out. Not that simple though – the old screw had broken in the rear capture nut and could not be removed even after taking the light fitting off the wing and removing the capture nut.

Fortunately, one of our members had a spare capture nut and screw, so was able to help out. Thanks Andrew.

I did notice that the starlock washer which secured the capture nut was heavily corroded and loose, with the result that it was difficult to get the screw into the fitting. A quick search on eBay located some starlocks which arrived a few days later and duly fitted. The new red LED globes are about double the brightness of the old filament globes, so it is a job worthwhile. [photo 2] Second task was the reverse globes. An easy job this time. I did notice one of the old globes was only 5w instead of the normal 21w, so the lights are much better now. [photo 4]

All going well at this time.

The third task on the list were the indicators. I quickly fitted the new orange led globes, only to find that the flasher unit would not work. I then thought, of course, the current had reduced from 1.8A to 0.4A for each globe, so there was not enough current to make the old-style thermal flasher work.

Easy, just get an electronic one. I came back from the local Repco with a Tridon

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What started out as a job to replace the incandescent globes with LED globes led to the removal of the dashboard and instruments, seats, transmission tunnel, indicator switch and heater fan

Worth the effort; the LED globes are about twice as bright as the old incandescent globes

Replacement LED globes for brake/tail, indicator and reversing lights

As with the brake/tail lights the reversing lights are about twice as bright as the original

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The dashboard out to provide access to remove the indicator, and hazard plugs, change the polarity and relocate them

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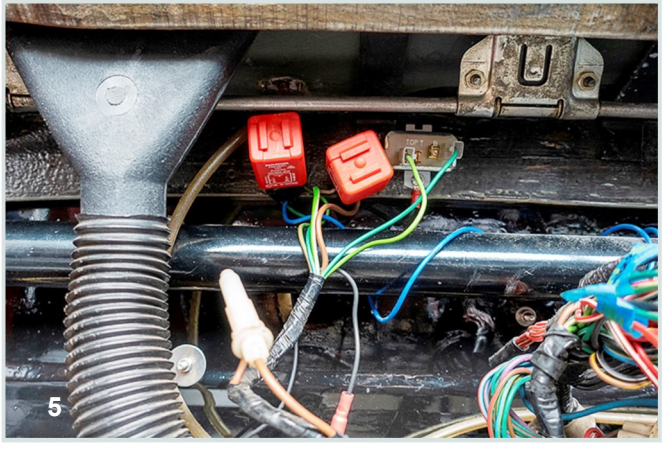
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The handy brake line bending tool

7

The LED headlight globes

The screws that secure the headlight are also the beam adjusters


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two-pin electronic flasher unit. I plugged it in and checked it out, and found that, like the old thermal flasher, it just stays on and does not flash. Puzzled, I ring up and speak with the technical support at Tridon. They advise: “Yes, our electronic flasher units don’t work with LEDs”. They suggested that I add an extra load resistor to each side, but my preference was to find a compatible flasher unit.

So, after a search on the web, I found that even though most flasher units are electronic, many do not work with LED globes.

After calls to a number of suppliers, I identified the correct Narva unit and ordered it at our friendly Repco.

Back home, I plugged in the new unit only to find that does not work. Puzzled, I looked at the wiring diagram on the flasher and then check out the wiring on the Mog and discover that the Mog is wired up with the opposite polarity. It seems that the old thermal flasher units work either way but the new electronic unit needs the correct polarity.

To change the polarity, I need to remove the plug which is screwed into the frame under the top of the dash.

It is at this point that I realise that I will have to replace the old thermal flasher unit on the hazards as well; this unit sits alongside the indicator flasher unit.

I also noticed that the new flasher units are twice the width of the old ones, so one plug will need to be relocated while I am changing the polarity. As getting under the dash to do this without messing up the wiring will be difficult, I decide my best course of action is to remove the dash.

I also decided to use the two-pin flasher for the hazards and to upgrade to the three pin for the indicators where I could use the third pin for a buzzer to reduce the likelihood of winning our prestigious “flasher” award. So again, after discussions with Narva, I went back to Repco to get the correct unit.

I removed the dash, removed the indicator, and hazard plugs, changed the polarity as needed and relocated them. [photo 5] The indicators and hazards now work fine, and like the other lights are about double the brightness. The $5 mini buzzer from Jaycar was so loud and piercing that I had to install it in a small box to reduce the sound level.

Well……, if the dash is out, I might as well have the instruments overhauled because the glass on one is scratched, the speedo was hunting and there was corrosion appearing on the front surround of a number of the instruments.

Paul, the instrument repairer says he can do the work and advised that I should bring the speedo cable at the same time to check, as it often is a problem. OK, I thought. In the process, I found the speedo cable jammed in the gearbox.

There was also a bracket on the gearbox cover to hold the cable, which I could not get to in my garage. So o o o ... next step was to remove the seats, rear tunnel, and gearbox tunnel to get at it.

In hindsight, it was a good thing that I had the instruments checked because the bearing in the speedo was pretty dry and would have failed in the near future and the

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speedo cable was worn out. So, he made me a new cable which was longer and more suited for the five-speed box.

While waiting for the instruments to be overhauled and while the dash is out, I could investigate why the heater fan always operated at full speed, even on the low-speed setting.

I recalled that there was a problem with the switch some time ago, and the local auto electrician said that, as he could not source a new switch, he had fixed it so the fan operated at full speed all the time.

I had recently bought a new switch from the UK and fitted it, but to my surprise the fan continued to run at full speed on both setting one and setting two.

I removed the fan and set it up on the workbench. I expected to find that the half speed resistor had failed, and that was the cause. But . . ., the fan worked fine at both half speed and full speed on the bench. What is going on?

After putting the fan back in the car, I tested it and found it only operated at high speed again. Another puzzle! I decided to trace out the wiring.

I had a wiring diagram for a mid-70s 4/4. To my surprise, I found that the wiring colours on the heater fan connections were opposite to the diagram.

More investigation showed that the auto electrician had also reversed the wiring at the switch. So, after much effort trying to reverse the wires at the switch, I cut the wires and connected them to the original position, victory at last.

Further, now that the dash was out, I could investigate why the indicator switch was not cancelling when turning right. I could now see that the indicator switch return arm was

Output comparison

Fitting	*Size*	*Old globes*			*LEDs*		
		type	*watts*	*lumens*	*watts*	*lumens*	*increase*
Brake	BA15S	incandescent	21	315	6	380	21%
Tail			5	75	2	125	67%
Indicator	BA15S	incandescent	21	315	6	380	21%
Reverse	BA15S	incandescent	21	315	6	380	21%
Sidelights	BA9	incandescent	5	75		240	220%
Number plate	BA9	incandescent	5	75		75	0%
Instrument	E10	incandescent	2.2	33		50	50%
Headlights high	H4	halogen	60	1200	20	2500	108%
Headlights low			55	1100	22	2300	108%

broken on one side and this explained it. So, I ordered a replacement switch from the UK.

The arm on the old unit had been bent to come out in front of the dash when it was installed in the factory, but the replacement arm was straight and would not clear the dash when installed.

I contacted the supplier who advised me to put it in a vice and bend it. It was difficult to hold firmly without putting pressure on the switch end which could damage the switch mechanism.

I spoke with a couple of club members and one offered to help using brake line bending tools. After doing a test bend on the old arm, we were able to bend it using a special pair of pliers designed for bending brake lines. Thanks to Geoff Williams for his help. I'll buy a pair when I need to replace it in another 30 years. [photo 6]

Neither LED Autolights or Repco had LEDs for the sidelights and rear number plate lights, so I purchased brighter sidelight globes from Jaycar and standard number plate globes from eBay.

The Mog was fitted with halogen H4 headlight globes. Removing the headlight surround revealed that the screws to remove the lens to get access to the globe were the same screws used for the beam adjustments. After carefully noting the position of the beams on the back of the garage, I proceeded to remove the lens and replace the globes. [photo 7 & 8]

The instrument back lights were 3/8" Edison screw 2.2w, and were 22mm long. I could not get the globes locally, so purchased some on eBay from autoxenonled. I initially used 20 lumen globes which have now been replaced by 50 lumen which I am testing to see if they are bright enough.

I noticed that the LED globes I purchased for the brake/tail, indicators and side lights had higher lumen output that previous incandescent globes and that is main reason they are brighter. There were also reports indicating that some cheaper LEDs have a lesser light output than reputable brand LEDs. So, it is important to read the details when deciding.

So, now LEDs are fitted throughout. I had also fixed all the things that had been on the list for some time.