

Fitting flashers along with LED bulbs.

...or the philosophy of modification.

My specific focus here is on work I carried out to fit both flashers and LED bulbs to an MG YB but much of this comes out of my previous work to do the same on a TC and a J2 and will be no doubt applicable to many other, if not all, old cars.

Before getting into the details of fitting LED bulbs and indicators to old cars let me outline a few pertinent general considerations which may complicate what at first sight may appear to be a fairly simple process. My intention is not to put people off from treading down this path as I believe that with a little application and a modicum of confidence electricians can be seen to be not the black art that some believe. In order to try to demystify things as much as possible I will try to break things down into what I believe are the issues to be considered to allow individuals to plan their own way through the maze. I also have to point out that what follows contains my considered opinions, though they are backed up by my technical training and a life spent installing, commissioning and repairing systems much more complicated than our cars.

1. Why fit flashers? The standard answer is to bring our cars up to date. The problem is that it is an old car and we like it precisely because it is not up to date. This is not such a strange assertion as it may seem at first sight as some people coming into the old car movement seem unwilling to accept the true nature of the vehicle they are buying. This question is generally, and more relevantly, followed by the assertion that the original setup is "dangerous" as drivers nowadays don't see the semaphores and are thus unaware of our intentions. This is arguably true, as being positioned on the side of the car they are not only out of the sightline of the following driver but do not flash to catch their attention. The flashing problem can be easily overcome by fitting flashing LED festoon bulbs but this would not really address the problem. Inevitably, however, as we tread warily down this path we come to realise that this throws up other considerations and it is those which I will try to address here. For instance, it is the ideal time to consider whether to use LEDs and to ponder the issue of whether to change polarity of the car from positive to negative - but more of these thorny questions later. Whatever route we take it inevitably requires extra wiring to be run and this immediately throws up the tricky problem of originality, but, again, more of this later. If we are fitting a new wiring loom, and considering the age of the car this may be the first and most important decision we make, we will be getting the extra wires we need but we need to be sure that the loom supplier knows our requirements with regard to which wires we need to run, and to where, in order to avoid the suppliers idea of how to implement the modifications being different from our needs. Just accepting the manufacturers "flasher kit add-on" without understanding exactly what we are buying can be problematic. For instance the manufacturer of the particular loom I used had no provision for a "tell tale" light for the indicators which was incorporated in the particular dash switch I used. Thus we need to be sure from the beginning where we are going with this as changes later can be tricky.

2. Why fit LED bulbs? Here I will use the word "bulb" to refer to a device designed to fit a standard (for our cars) BA15 or BA9 socket and consisting of a number of individual LEDs arranged in an array. Of course we could fit flashers without going down the LED route and this

would avoid completely the question of polarity but inevitably there are other things to be taken into account. Firstly let me get out of the way some muddled thinking about LEDs. Ask the average old car owner about LED fitment and the old chestnut about them using less current and thus putting less strain on the generator is bound to be the first thing that comes up. Of course both of these things are true but, as in our cars the generator is perfectly capable of providing the power needed in the first place, are totally irrelevant. Even adding an auxiliary socket for a phone charger or a Satnav, or even a heater blower, is not going to strain the original system beyond its capabilities. Some 1930s MGs did have a problem in this area with generators unable to provide the power necessary even for running with all lights on which is why headlamp bulbs in those days were so low rated (and dim!) but by the time our cars came around after the war technology was much better and, besides, how much night driving do we do anyway? Thus as long as you are not going to fit an outrageous sound or light show system we can't use this as an excuse to go down the LED route. So put away all ideas of fitting an alternator, even if disguised as a generator/dynamo - there's no point apart from bragging rights!

So why do we fit LED lights? Quite simply because they are brighter. They also have the great advantage of being smaller, or at least can be made smaller. This is an important consideration if we are to modify the existing lamp bodies to incorporate extra bulbs to avoid the need to fit ugly or non-original additions but some care is required in choosing which bulbs to use from an ever expanding selection. Here it is pertinent to point out that the individual LEDs in such bulbs can be arranged by the manufacturer to cast their light in various directions so we must take that into account when choosing which one to use and how to orient them in the light units. Of course there are firms who will sell you a ready-made solution to these problems in the form of an insert which they claim is simply fit and forget. My experience is that such claims are never born out in practice. A couple of examples may illustrate this point. Leaving aside the cost, a consideration which I find is less and less relevant to the people who are now coming into the old car movement, we are tying ourselves into a product which has no standard covering it. Thus when it goes wrong we will probably be unable to buy an equivalent unit from another supplier or even from the same supplier, assuming they still exist, as they will probably by then be offering a different, no doubt improved, product. Everything fails eventually and the higher the tech the quicker this is liable to happen. Another problem I have found is that some of these units, due to their integrated nature, can feed stray voltage out into the vehicle wiring sometimes causing unwanted bulbs elsewhere on the vehicle to light. Thus your sidelights may come on with your brake lights, albeit at a lower brightness. At the back this may arguably be an advantage but at the front this may not. It can hardly be argued to be dangerous though. This "feature" is due to the nature of such units which rather than having separate "bulbs", say for brake and sidelights, simply bring on the sidelights at one brightness and increase this for the brakes. This may or may not be a problem, depending on the voltage itself and how other bulbs respond but the problem is easily fixed by the addition of extra diodes. I feel this is just too much to ask of a user though, especially when they have paid as much as they have for a unit full of diodes anyway. I therefore find it easier to stick to individual bulbs, albeit in LED form though the need to use these hybrid bulbs at the rear was forced on me by space considerations inside the ST51 bodies.

3. LEDs are polarity sensitive so whether we should we change the car's whole polarity from

positive to negative is a pertinent question. Here the motives and attitudes of the people who are now coming into the old car movement often come into play. If the intention is to fit high tech modern systems on the grounds that someday you may need them I refer you to my previous comments about why you bought an old car in the first place. Speaking to people who espouse this course of action I find more muddled thinking which can be summarised as: "negative earth is better". This is offered without any real evidence, which is not surprising because there is none. What there is is some sort of claim about galvanic corrosion which, while it may be a theoretical possibility it is at best marginal and anyway hardly a credible consideration in cars which are so little used, probably never intentionally go out in the rain and are often undersealed up to their windcreens anyway. The choice of negative or positive earth matters nothing to an electron which only responds to a relative polarity difference regardless of which pole is connected to the metalwork of the vehicle. Even the ubiquitous use of negative earth nowadays is little more than a convention which acts as a standard avoiding the necessity to manufacture two different flavours of equipment. Even the problem of fitting modern negative earth parts to a positive earth car is often fairly easily overcome just by supplying it with the polarity it expects. Or to put it another way: just make sure it is insulated from the car metalwork. A wooden dash makes a perfectly satisfactory insulator or you can just mount the addition to a plastic bracket. This is how I have gone about things with my LED light conversions and guess what - they work.

4. How should we approach the question of originality? Ah yes originality! This question has as many answers as people who have an opinion on it. Inevitably the following will have to reflect my opinion though I will attempt to take as objective a view as possible - a vague hope perhaps. For our immediate purposes this will concentrate on where to site additional indicators at the front and back but also consider whether we should do it at all. I fall into the school which is of the opinion that we should make as few changes to the original system as possible in the knowledge that there may have to be a tradeoff between aesthetics and perceived safety. Of course it goes without saying, I hope, that any changes made should be reversible but I also only really consider them if the law requires it and if they can be concealed as much as possible. The reversibility mantra is commonly heard but I do wonder if it is simply trotted out to justify the owners' intentions, or deflect criticism of their actions. T Type steering boxes and gearboxes fall into this category and don't let's talk about seat belts. Whatever the reason it does make reference to what I consider an important point. Many people in our movement refer to this point by considering themselves to be merely the custodians, rather than owners, of the vehicle. The older something becomes the more this matters. Archaeologists and historians will understand this point best. Even the market recognises this with original vehicles, whether in the form of them being largely untouched or sympathetically restored to original configuration, fetching premium prices. Thus when we and our vehicles are younger we may modify them to suit ourselves with the cry "it's mine and I'll do with it what I want" being often heard. As they, and we, age I feel more respect is called for and originality thus becomes more important. Would you put a brake servo on a veteran car? Issues of safety, especially on modern day roads cannot be totally ignored though.

5. Questions of reliability. This may seem a strange one but any changes we make must consider whether we are actually making the car electric, or indeed other systems, less reliable. This alone is a good reason for avoiding the use of high tech wizardry as the higher the tech the more chance of

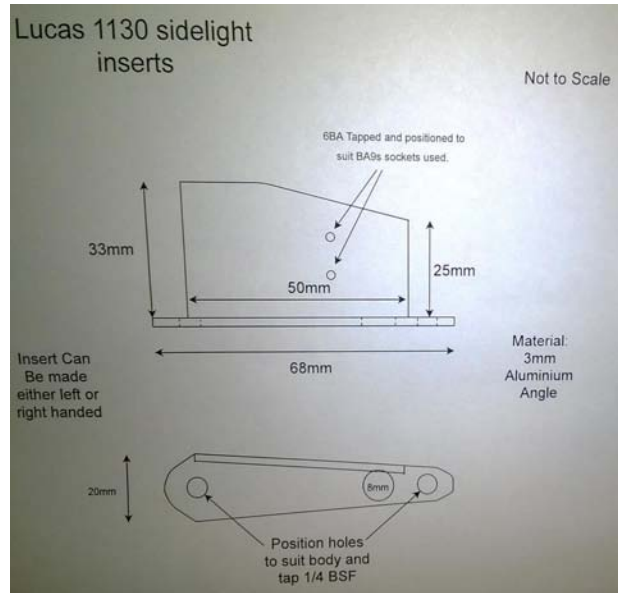
it failing. This is really stating the obvious as if something is not fitted it cannot fail though this point may not occur to those who fit modern electronics in place of earlier electro-mechanical technology. Some take hi-tech to extremes, however, and I have even heard of an LED unit which has its own software based controller though I am unsure if this is commercially available. This may be an interesting intellectual exercise but I feel it is seriously disrespectful to ageing machinery. Nevertheless there is a belief that by fitting, say, an electronic ignition system, we are improving reliability. This is only true if our view of reliability is reduced to extending the time between failures. There is an alternative way of looking at things, however, which acknowledges that the original system may be more likely to fail earlier than the high tech one but this is only because it contains more user serviceable parts. There are people who when asked on a bulletin board for how to approach the repair of a generator control box will helpfully recommend fitting a solid state insert which, while it may be capable of giving improved regulation - if setup and specified correctly - in reality it replaces a little understood item with one which only the designer really understands. It also ignores the inherent reliability and effectiveness of the original unit thousands of which are still working satisfactorily after all these years. Will the solid state insert last as long? Remember it contains a lot more parts to fail and do you really understand how it works? And, besides, aren't we trying to avoid turning our pride and joy into a commodity?

In an old car movement which is moving from being populated by people who have dirt under their fingernails to those who have large wallets the understanding of routine service has moved from being something we do to something we pay for. The loss of technical knowledge that accompanies this means that we are prone to believe hi tech is always better. It may last longer but when it fails it is more likely to do so suddenly leaving us stranded and unable to fix something we don't actually understand, whereas the original system would often allow us to limp home rather than have to call the breakdown service. A little knowledge, and routine servicing, is our saviour at times like this.

Having said all this it has to be said that some aspects of old cars reliability can gain by some degree of modification. Here we have to acknowledge that the Y Type has a particular Achilles heel in the self-cancelling mechanism and the slip ring arrangement to enable the horn and indicator wiring to operate as the steering column turns. Such a mechanism can usefully be bypassed by an auxiliary horn and indicator switch mounted on a separate, relatively low tech, panel as I have done which avoids the mechanical problems of the original. More compromise with originality! Please don't call me a hypocrite.



6. Practical considerations. Firstly I am assuming a willingness to use a hacksaw, file and drill. If you are happy with these tools you should have no problem. At the front of the car not too much compromise has to be made in order to avoid fitting supplementary indicator units which are arguably fairly ugly by design. In addition the original enclosures are at a better height than the rear to stand a chance of being seen by other drivers. I have used here the smaller sized modern LED bulbs now becoming available to fit both indicators and sidelights in the front Lucas 1130 "torpedo" lights though I have had to use the smaller BA 9s fittings to squeeze them in while adding shrink insulation on my later units to avoid them shorting.



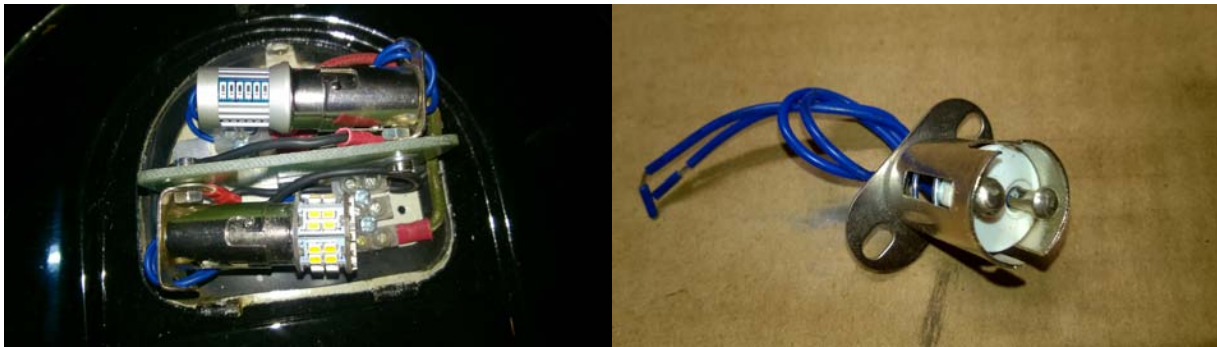
Specialists will sell you 1130 inserts with the larger BA15d fittings intended for a single twin filament bulb. These work satisfactorily when used with filament bulbs but have the disadvantage that both clear and amber colours cannot be got within a single bulb without going to LEDs. Although here in the UK clear indicators at the front are, I believe, legal, as are red at the rear, I feel

that amber indicators may avoid too much scrutiny by the uninitiated and at least give a nod to the expectations of other road users. My original solution to this on my TC when still using filament bulbs was to use two with BA9s fitments. Using two separate bulbs also avoids the "stray voltage" problem which I came across on my J2 when I fitted LEDs. The use of two bulbs allowed an easy conversion to LEDs as smaller BA9s units became available along with a variety of colours. In my case, having retained positive earth I had to use an insulator between the metal of the mounting with nylon fixing bolts as well as reverse the bulb connections in order to use easily, and cheaply, available negative earth bulbs.



Perhaps somebody will start producing these inserts by 3-D printing. Isn't technology wonderful – sometimes!

At the rear our ST51, or "D" lamps, require a little more ingenuity. When I rebuilt my TC in the early 1990s, before small, coloured and really bright LED bulbs became available, two bulbs per unit, for brake and sidelights, sufficed as I built a relay unit to emulate the later TD and TF system in which the same filament was used for both brakes and indicators. This was achieved by flashing (or occulting) the brake lights when both were in use. In the YB I have used an arguably better (some would say "safer") system by separating the two out. This simplifies things by doing away with the need for the relay unit but does call for yet another bulb to be shoehorned into an enclosure originally designed for only one. In fact I ended up squeezing two twin filament Led units in either side consisting of indicator, brake, side and reversing lights. This has provided two brake lights and two reversing lights unlike the singles of the original cars. With two bulbs in one I have unfortunately had to use positive earth bulbs, although for convenience I have also used an insulating partition similar to the metal original found in some ST51 enclosures, while using the necessary BA15d bulb holders. The "s" & "d" suffixes indicate single or double contacts. This is probably the place to point out that BA15d holders and bulbs come in two types with either equal or offset locating pins. I have used offset pin bulbs which ensure that bulbs are always inserted the same way round. This matches the commonly available bulbs but I could only find equal pin holders requiring a few minutes work with a rat tail file sort out.



This could also be done on T Type with proper indicators working on both sides of the car rather than relying on little understood hand signals or an expensive relay unit. The single, puny lamp of the original has probably, in most if not all cases, also been long replaced by two, though in the case of T Types reversing lamps would not normally be used.

The insert sellers will tell you that red LEDs work better than white behind the red lenses of the original units. I have found that this is true as a white LEDs output is in a different part of the light frequency spectrum from an incandescent bulb and so they may not look quite as red. Indeed I have found some original lenses where both warm and cool white LED bulbs show a slightly more amber colour. This may arguably be a useful effect if used for emulating the modern amber indicators but how well this works is still to be fully evaluated. I therefore decided to use red LEDs for the brake lights and reversing lights in the outer halves of the ST51 units and white LEDs in the inner halves for the Indicators and Sidelights.



By this means I was also able to use white light through a clear side lens for the number plate illumination. This involved some compromise with the reversing lamps as it would undoubtedly be better if they were white but I feel red would work well enough especially as there are now two rather than the single of the original car. To use white reversing lights would require a white lens which would not work for the indicators. I decided to use the brighter half of the two bulbs for the brake lights and indicators for safety reasons relegating the reversing lamps and side lights to the less bright half. This is normal practice for the original filament bulbs where side lights are 5w and brake lights and indicators are 21w. The slight difference in colour between the white and red bulbs of the brake and indicators may be an advantage when both are on together but I am making no real claims for this. I could have used the same bulb, in the outer section, for side and brake

lights respectively and gained a certain amount of white light for the reversing light in the inner partition from the number plate window but I feel this would be marginal and besides it would require some sort of interconnection between the red sidelight in the outer partition and the white bulb in the inner partition to provide number plate illumination. A couple of diodes would, I am sure, have sufficed for this but I rejected it as just that bit too complex.

The keen eyed among you will notice that I have not addressed the question of using LED bulbs in the headlights. I feel that this is a separate subject which would throw up regulatory questions which I would like to avoid and besides I have no experience of them. Finally may I please put in a plea for the original semaphores? It would be sad to see their idiosyncrasy lost in the name of progress, reliability or safety so I have managed to retain them in working condition even if their need has been bypassed. The smiles on the onlookers' faces make their refurbishment well worthwhile.

Ian Thomson. January 2022

