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**Regulatory Position on the Use of LED Light Sources in Historic Vehicles**

**Background**

The use of LED light sources has been of interest to the historic vehicle community for as long as LEDs have been readily available and not surprisingly many articles have been written on the subject in both club magazines and in the specialist press. Unfortunately, not all of the information provided has been accurate and FBHVC felt it should research the subject to enable the provision of definitive guidance to its members.

In addition to research by the FBHVC Legislation Committee an opinion was also sought from Department for Transport and the Committee were gratified to find their conclusions confirmed. However, we should repeat a warning from the DfT reply – “The guidance provided is based on the requirements of The Road Vehicle Lighting Regulations and all vehicles must comply when used on the road, ultimately interpretation of law is the sole prerogative of the courts.” As the title implies this article relates solely to the regulations surrounding the use of LEDs but nevertheless a brief explanation of what we mean by LED and the reason why their use can be beneficial might not come amiss. LED is an abbreviation of light emitting diode and their advantage stems from the fact that they do not generate as much heat as a conventional incandescent bulb. Thus, for a given electrical power the light output is much higher, or conversely a given light output can be achieved from a lower electrical power. This latter characteristic is of great value in early vehicles with marginal generator output. Unfortunately, the relevant regulations are quite complex and there is no simple overall yes or no answer to the question “is it legal to use LEDs in the existing lamps on my historic vehicle?” The situation is different for different lamps and also for different dates of first registration of the vehicle in question. This article will explain the background before summarising the conclusions at the end.

There is no regulation that specifically prohibits the use of LEDs in lamps first used prior to the e/E marking requirements, although there is a requirement for e/E marked lamps fitted to a vehicle first used on or after 1st April 1986 to be fitted with e/E marked bulbs. (see above) The applicable date varies for different lamps but it should be noted that these dates are such that vehicles from the end of our period will be affected.

The regulations also include a requirement applicable to all lamps that they shall not cause undue dazzle or discomfort to other persons using the road. This should be borne in mind whenever a lamp is made to be brighter than it was originally designed to be. With particular reference to headlamps, a light source of a different type and in consequence of different physical size and shape is very unlikely to work correctly with the optical design of the lamp and the risk of causing undue dazzle or discomfort becomes a very real one.

Another complicating factor is that the regulations quote minimum wattages for certain lamps. For dip-beam headlamps these range from 10W for small motorcycles to 30W for four or more wheeled vehicles and similarly 15W to 30W for main beam headlamps. Stop lamps on vehicles first used after 1st January 1971 and all direction indicators require a minimum of 15W. These minimum wattage limits were undoubtedly included originally to ensure adequate brightness of the lamps in question but now they provide a barrier to the use of LEDs. This arises because of the greater efficiency of LEDs, i.e. more light from fewer watts, the result being that the LEDs are of too low a wattage to comply with the regulations even though the actual light output may be entirely adequate.

**Conclusions**

**Lamps where the use of LEDs is legal** subject to the conditions noted earlier:

* **Front Position Lamps.** (Side lamps). Vehicles first registered before 1st January 1972 LED light sources in the original lamps are compliant.
* **Rear Position Lamps.** (Tail lamps). Vehicles first registered before 1st January 1974 LED light sources in the original lamps are compliant.
* **Rear Registration Plate Lamps.** Vehicles first registered before 1st April 1986 LED light sources in the original lamps are compliant.
* **Stop lamps.** Vehicles first registered before 1st January 1971 LED light sources in the original lamps are compliant.

**Lamps where the use of LEDs is not legal:**

* **Stop lamps**. Vehicles first registered after 1st January 1971 LED light sources in the original lamps are non-compliant. This is because LEDs will not meet the minimum wattages specified in the regulations.
* **Direction Indicators. (flashing type).** LED light sources in the original lamps are non-compliant. This is because LEDs will not meet the minimum wattages specified in the regulations.
* **Headlamps**. LED light sources in the original lamps are generally non-compliant. This is because LEDs will not meet the minimum wattages specified in the regulations. However, in some particular cases it may be possible to locate LED light sources of compliant wattage.

The 1970s saw the immergence of lamps approved to European standards. There were two parallel sets of standards, normally technically identical but emanating from different organisations. These were ECE Regulations and EEC Directives, lamps approved to the former were identified by an approval number preceded by a capital ‘E’ whilst those approved to the latter bore a similar mark preceded by a lower case ‘e’. These are commonly referred to as ‘e/E marks’. The testing required to gain such an approval for a lamp was far more scientific than anything that had gone before and included measuring actual light output across a standard grid. Repetition of this performance can only be guaranteed by use of bulbs meeting precise standards and for this reason a similar approval regime exists for bulbs and e/E marked lamps on vehicles first used after 1st January 1986 are only permitted to be fitted with approved, and e/E marked, bulbs. Whilst today LEDs are tested and approved for use in specified lamp assemblies none bear the approval permitting them to be used in e/E marked lamps intended to employ incandescent bulbs. Lamps where the use of LEDs is not legal: l Stop lamps. Vehicles first registered after 1st January 1971 LED light sources in the original lamps are non-compliant. This is because LEDs will not meet the minimum wattages specified in the regulations. l Direction Indicators. (flashing type). LED light sources in the original lamps are non-compliant. This is because LEDs will not meet the minimum wattages specified in the regulations. l Headlamps. LED light sources in the original lamps are generally non-compliant. This is because LEDs will not meet the minimum wattages specified in the regulations. However, in some particular cases it may be possible to locate LED light sources of compliant wattage.

The Road Vehicle Lighting Regulations, in addition to specifying which lamps are obligatory and the provisions they are required to meet, also permit the use of additional lamps, which are referred to as optional. These lamps are required to meet some but not all of the provisions specified for obligatory lamps with the result that there are no wattage requirements for optional headlamps, either dip or main beam.