

Technical tips 1 Fuses.

A couple of questions that pop up a lot is what rate of fuse is correct and how do I work it out? And “why does my headlight fuse blow when I start the car with the lights on?”

Ohms law is the answer. Nearly all cars are 12 volt (v) nominal (actual maximum working voltage should be 14.5v when charging at 1,500+ rpm) but accessories are usually rated at 13.5volts, it's not too difficult to do as volts, amps and watts are all related.

Standard blade fuses are rated as; 1.0, 1.5, 3, 5, 7.5, 10, 15, 20, 30 & 40 amps. Colors are always the same for each value.

Ceramic,” bullets” are slightly different having 16 & 18 amp for instance but nearly the same range.

Add up the wattage of all the components on a single fused circuit, for wiper & light lifter, window, door locking motors, etc, you need to read the specification panel on the motor or in a manual but would read something like 13.5v 20amps, xxxx rpm.

Bulbs are easy, 5 watt (w) side and tail are standard, so one side of the car, (each side should be independently fused) would be front and rear side $5w + 5w = 10$ + number plate $3w =$ total $13w$ divide by $12v = 1.08$ amps. = (go up to next standard size fuse) 1.5amp fuse.

Indicators = $21w + 21w + 5w$ (side repeater) + $1.5w$ (dash warning light) = $48.5watts / 12 = 4$ amps = 5 amp fuse but as the hazards are usually fused on the same circuit this is normally doubled to 10a.

Right main = $60w (+ 1.5w$ warning lamp = $61.5w)$ divided by $12v = 5.125$ amps = 7.5 amp fuse.

These are O.K. because as I said the normal working voltage of a car when running is 14.5 volts which decreases the amps, ($60w / 14.5v = 4.14A$) and therefore allows a margin for resistance in the cables, switches and connectors.

You may deduct from this that there is a greater danger of fuses failing when standing without the engine running, hence a lot of cars "go wrong" after being stood and are then started up as the nominal voltage can drop as much as 3 volts when cranking but of course the wattage remains the same thereby boosting the amperage by up to 50%! In the case of our head light this would shot up to over 6.6 amps, still within our safety range of 7.5 amps though.

Never replace a fuse with one of a higher rate, this could cause overheating and a fire, always find the cause of a blown fuse and never, never short out the fuse with a solid bar or silver paper to “get you home”, it could be the last thing you car does. Literally!