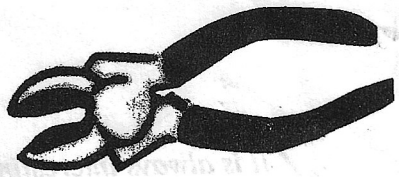
ELECTRICS MADE SIMPLER.



Extract from a series of articles by Blair Percival.

The Lucas colour code is used by many British made cars (foreign vehicles use different colours) and whilst there are detail differences between makes, in general, single colour wires tend to come from the power source and wires with a thin second colour stripe, or trace, go to the accessory concerned. Wires with trace colours often start from a fuse. Each circuit has the same primary colour, headlamps for example being blue. Different trace colours will be used for different wires, and only the primary colour is referred to below for simplicity.

Lucas Colour Code Primary Colours:-

Brown	battery	Red	side lights
White	ignition	Green	auxiliary
Blue	headlamp	Black	earth.
Yellow	generator (up to 1960)		

Brown wires take power directly from the battery and white wires take power from the ignition switch (sourced from a brown wire). Brown wires give their power to blue (headlamp) wires and, fuse protected, red wires (side, rear and panel lights etc.), via the relevant switches, All these components, because they are powered by brown wires, direct from the battery, will operate independent of the ignition switch. White wires go to fuses, then via different coloured wires to switches and then to auxiliary components. Since power is from the white wires, these are controlled by the ignition switch and invariably protected by fuses.

A word of warning. Some cars will have been restored and/or modified from original specification.

Most cars (except with glass fibre bodies) have their earth return via the chassis, but most light fittings have an extra earth wire. The relevant light will at best be dim, unless this wire makes a good connection. Bad earth connections are a very common source of lighting problems.

Shorts can lead to fires. The fuse should blow if the component has one (with the correct fuse fitted!). Turning off the ignition cuts power to "white wire" components. "Brown wire" shorts can only be stopped by disconnecting the battery (or cutting the wire!), so a battery cut out switch is a good idea.

Foreign alternatives to the code are:-

France: (coloured dot on connector no trace.)		
	Red	ignition & sidelight
	Black	generator
	Grey	indicator & headlamp.
Italy:	Brown	switches
	Blue	ignition & indicator
	Green	headlamp
	Yellow	sidelight.

Germany:	Red	charging
	Black	ignition & indicator
	White	headlamp
	Grey	sidelight

Fords built before 1960, and those built in Germany, such as the Capri, do not use the Lucas code.

Most ordinary circuits use 14/0.25 specification wire, head lamps, spot lamps and rear screen heaters 28/0.3, charging systems 44/0.3 (dynamo), or 65/0.3 (alternator). The figures represent the number of strands in the wire and the thickness of each wire in millimetres. Equivalent Imperial measurements, used on older British cars, are 14/0.010. 28/0.012 and 44/0.012 for dynamos. The second figure refers to a measurement in inches.

As a general guide alternators require cable capable of taking some 40 amps, dynamos 25 amps, head lamps 17 amps and general wiring 6 amps, but it is very important to make absolutely sure before fitting or replacing wiring and you should consult the relevant authority for your particular vehicle. Some vehicles have different requirements. When replacing wires if you cannot get the exact primary and trace colour combination, at least try to use the same primary colour, or mark the wire using the correct colour PVC tape. Too thin a wire and it will overheat and that can be dangerous.

To find the required amperage divide the wattage by the voltage. For example a headlamp bulb of 70 watts in a 12 volt system, requires 5.8 amps and so 6 amp rated wiring needs to be used or 12 amp wiring where two 70 watt bulbs are fed.

ELECTRICAL WIRE CAPACITY & SIZES

Different measurements are used to show the specification of wiring in different countries and over different periods and there has also been a change to metric in Britain. Most motor factors will have wire shown in the UK Size, metric or in amps.

14 strands of 0.30 mm equates to the old imperial size of 14/0.012 inches and is equivalent to 1.0 sq. mm. cross section. The American Wire Gauge has inverse numbering as the wire gets thicker.

RATING	UK SIZE	IMPERIAL	METRIC	U.S.
6 amps	14/0.25	14/0.010	0.7	18-19
8 amps	14/0.30	14/0.012	1.0	18
13 amps	21/0.30	21/0.012	1.5	15-16
17 amps	28/0.30	28/0.012	2.0	14
21 amps	35/0.30	35/0.012	2.5	13
27 amps	44/0.30	44/0,012	3.0	12-13
35 amps	65/0.30	65/0.012	4.5	10-11
42 amps	84/0.30	84/0.012	6.0	9-10