



Cable talk

Mains hook-up cable periodically needs replacing

Electrical systems in caravans and motor caravans need to be correctly specified and checked periodically. **John Wickersham** explains

NEW CARAVANNERS are often surprised to learn that there are two completely different electrical systems in touring and motor caravans. On the one hand there's a 12V supply which draws power from a leisure battery. Then there's a 230V mains system which connects into site hook-ups.

Apart from the fact that a caravan's 230V inboard charger keeps its leisure battery topped-up, the 12V DC and 230V AC systems are otherwise completely separate installations.

In recognition of this, the Club publishes two free leaflets which explain these different supply systems – *Mains Electrical Installations in Trailer Caravans and Motor*

Some owners want their lighting provision improved



Caravans and Additional 12V Wiring in Trailer Caravans. (Note: neither of these publications focuses specifically on towbar wiring issues; these are covered in a specific leaflet.) They are available to download from the Club website.

Owner issues

Some caravanners have little interest in electrical circuits or wiring specifications, whereas others like to know what ensures that their appliances work correctly. A few owners also add further components such as extra reading lights or items such as more powerful water pumps.

Normally the Club doesn't encourage DIY installation work, although some members have sufficient knowledge and experience to perform tasks such as replacing faulty micro-switches on taps or enhancing the 12V lighting.

Regardless of personal involvement, all caravanners are advised to get their mains system periodically submitted for inspection and to keep the official certificate which verifies its integrity.

Mains 230V components

On a safety note, recent information has revealed that some members are using mains hook-up cables whose replacement is long overdue. In fact, after five years of reasonably heavy use, my own cable started losing some of its flexibility – so it was duly replaced with a new one. There is no specific age at which cables should be replaced, but any sign of damage or deterioration should be treated as a warning. The cable should also be tested as part of any periodic electrical inspection.

Inside a hook-up cable's outer orange insulation sleeve, the cross-sectional area of each core in the three separate cables should be 2.5mm². This complies with BS EN 60309 – 2. Not long ago it was thought that 'rogue' orange sheathed cable was being sold at heavily discounted prices. When the copper cores in its three cables were checked, it was found they were 2mm² which doesn't meet BS EN standards.

As regards the 230V system inspection, the Club advises owners to get their mains systems checked "not less than once in every three years" or even more frequently in the case of heavy use (p631, *Sites Directory & Handbook 2009/10*). Equally, if you buy a pre-owned model that wasn't sold with a recently signed and dated report confirming



Snap lock connectors are sometimes used in 12V systems

A soldered joint was used on this loudspeaker



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the integrity of its 230V system, you are strongly advised to get the installation checked by a qualified specialist before putting the caravan into commission.

Many caravan workshops can carry out this kind of inspection for you, but this in-depth check is far more searching than the functionality test conducted during a standard habitation service. Alternatively, a suitably-qualified electrician can do it.

Older touring and motor caravans

Many older models were not built with a 230V system and their owners often want a 'mains facility' installed retrospectively.

That's usually possible, although a caravan system is different from the 230V wiring circuits installed in our homes. For instance, the 'flat twin and earth' semi-rigid cable used in domestic buildings should not be employed in touring caravans. Flexible cable whose core comprises numerous copper strands is used instead; when coupled to screwed connections, this type of cable is far less likely to shake loose when a caravan is on the move.

Habitation 12V wiring

Whereas a faulty 230V 'mains' system can cause electrocution, a caravan's 12V set-up is much safer. However, a 12V short circuit can start a fire. That's why DIY projects should only be undertaken by those with electrical knowledge, suitable tools and approved components – especially cable of the appropriate rating.

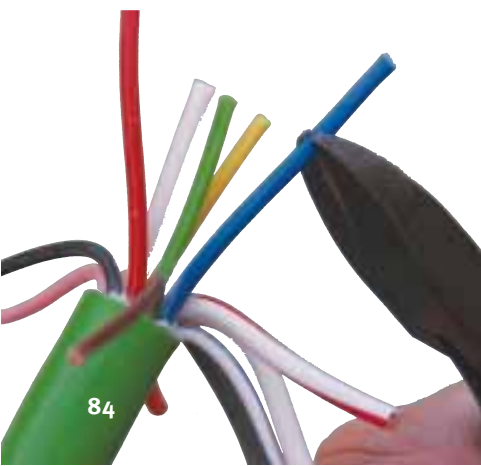
Tools

For simple checks, a 12V test light indicates when a cable or component is 'live'.

However, greater accuracy is achievable using a multi-meter, and a reasonable 'budget' version can be purchased for less than £20. Inexpensive wire cutters, insulation strippers and crimping tools are also readily available.

Connectors

All connectors have to be suitable for the rigours of the road and various products are used. Particularly useful are 'crimp connectors' which are often used by auto electricians. Snap-lock couplings may be used for 12V systems, too, but crimp



Cables in a Powerpart consumer unit are pre-connected



Some digital multi-meters are sold for under £20



This DIY tool does a fair job securing crimp fittings

fittings perform many more functions. Incidentally, installers still use soldered connections for certain jobs.

Cable type and specification

It is important that a 12V cable achieves the specification appropriate for its intended tasks.

For instance, a diaphragm water pump requires a substantially thicker gauge cable than the type used to run a light unit. That's because this type of pump consumes more current (measured in Amps) than a typical interior lamp. Using a cable that's too thin can lead to overheating – if its plastic insulation were to melt, all sorts of problems might occur.

The gauge of cable is usually marked on its supply drum. Alternatively, and with the help of good eyesight and patience, the rating can usually be confirmed by counting a cable's strands.

Below left: sharp cutters give a tidy finish on 12V flexible cable



Cheap 12V testers have a translucent handle that contains the test lamp



An 'Auto' cable stripper removes insulation easily



Counting copper strands can reveal cable rating

FURTHER INFORMATION

- **Caravan Club technical information leaflets** – call 01342 336611 or see caravanclub.co.uk
- **The Caravan Manual** – see haynes.co.uk
- **Pennine Leisure Supplies** – call 01422 313455 or see plsgroup.co.uk
- **W4 Accessories** – call 01243 553355 or see w4limited.co.uk

The table below, which draws on information given in *The Caravan Manual* (published by Haynes), interprets this information.

This is, of course, only a condensed overview and cable length is a further issue to consider. Couplings like snap locks and crimp fittings also come in different colours to depict their suitability for cables of different ratings.

Finally, if you buy a pre-owned caravan, it's always wise to get its 12V system checked at an Approved Workshop. ■

No. of strands	Cross sectional area in mm ²	Current rating in Amps (max)	Typical application
14	1.00	8.75	Interior lights
21	1.50	12.75	Extractor fan
28	2.00	17.50	Fridge feed but 2.5mm better
36	2.50	21.75	Diaphragm water pump