

How to...

One day

...FIT A BATTERY-TO-BATTERY CHARGING SYSTEM

Most motorhomes have a built-in charging system to recharge your leisure batteries via the mains hook-up cable and the alternator, when on the road. Some also have an additional input for a solar panel.

While leisure batteries are easily recharged on hook-up – usually around 10 to 20A – they are not always that quick to recharge via the alternator. The older split-charge systems can be quite slow and for a campervan that uses sites without mains hook-ups, clearly you need something that can put out some serious current to recharge faster.

On my own 2016 Renault Trafic, I had already planned to use two 100Ah Banner leisure batteries, with a Solar Technology 120W solar panel. So, I needed a system beefy enough to rapidly recharge 200Ah.

I had planned to use a Ctek battery-to-battery charging system and mains charger, but this would have meant fitting two boxes and cost more than the solution I chose: an NDS Power Service Gold 40. This cost £399 and had the advantage of being an all-in-one unit with a 40A battery-to-battery charger, a 20A mains charger and a built-in MPPT

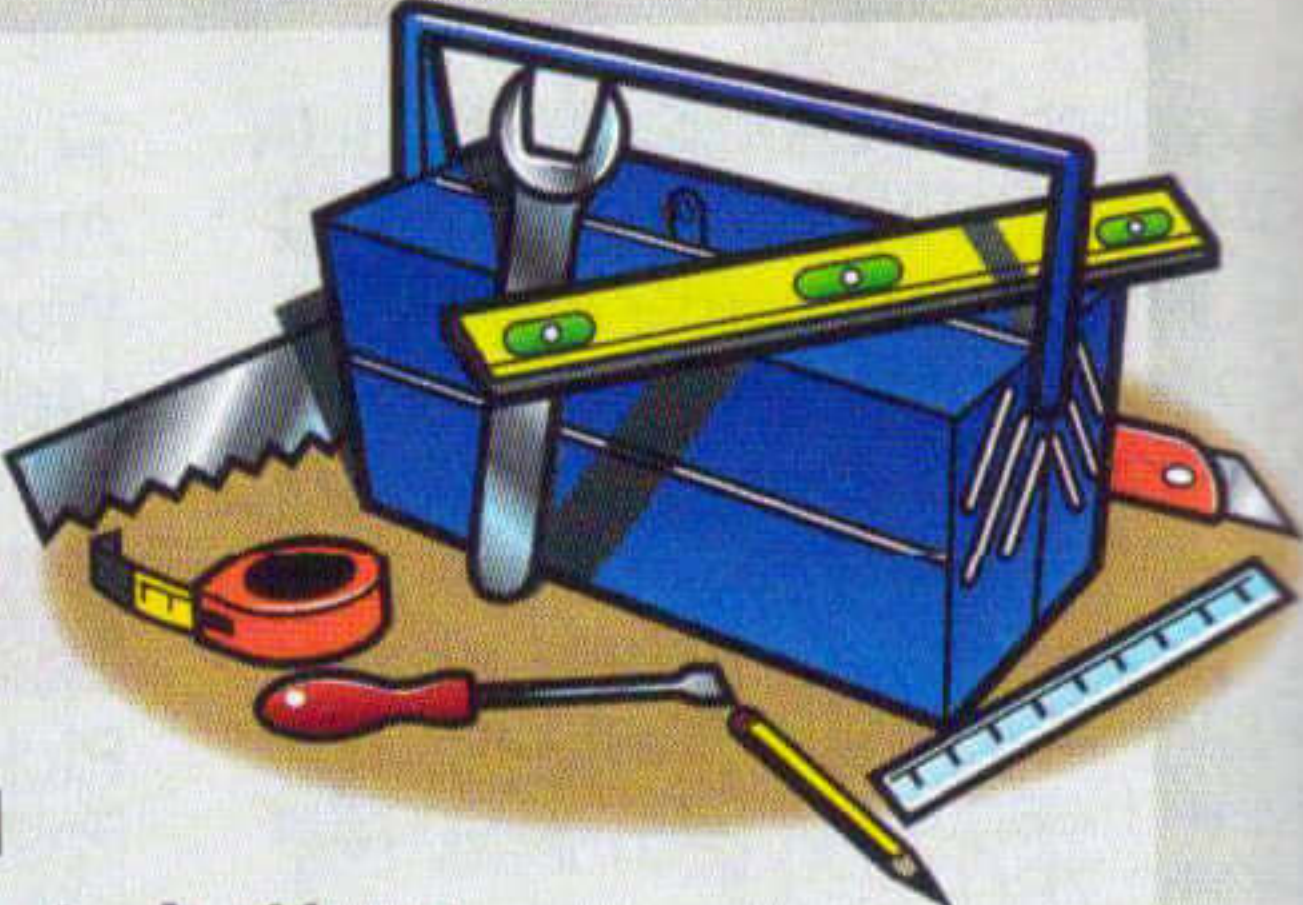
solar panel regulator accepting an input of up to 20A (good for solar panels up to 240W). Best of all, it has a built-in fuse box and is really compact – roughly the size of a bottle of port – making it ideal for a campervan.

Fitting is relatively easy, the only tricky part is running the heavy-duty battery cabling to the van's battery (it must be fused at the van battery end) and finding the D+ output from the alternator. This depends on the vehicle you have (the newer your 'van, the harder it will be due to the higher amount of gubbins in the engine bay!).

In the Trafic, there were plenty of spare terminals to attach the 240A cabling to and a bolt-on bracket was made to hold a Megafuse holder. The 240A cable was then fed under the vehicle (avoiding any moving parts) and into the rear of the vehicle. No holes were drilled in the metal – there are a series of grommets in the sill.

I had to contact RoadPro to check the wiring, but it was very helpful (and can fit it for you, it's worth noting).

Either use this device as an all-in-one charging system, or use it as a supplementary battery-to-battery charger to an existing charging system. Since fitting, the leisure

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- ✓ Multimeter
 - ✓ Selection of screwdrivers
 - ✓ Automatic wire cutters
 - ✓ NDS Power Service Gold 40-M battery-to-battery charger (from RoadPro)
 - ✓ Wire terminals
 - ✓ Fuse holders
 - ✓ Mega fuse holder for main battery wiring (used with 50A fuse)
 - ✓ Scrap of aluminium for underbonnet bracket
 - ✓ 27A cable for smaller wiring (Halfords)
 - ✓ 240A cable pre-terminated and ordered to length (via eBay seller, willinton)
 - ✓ Screws in various sizes
 - ✓ Cable conduit
 - ✓ Cable ties
 - ✓ Durite self-adhesive aluminium heat shield tape

batteries have always been charged and, while wild camping at Silverstone Classic, it powered a 1,500W inverter, all the lighting (mains and 12V) for my friend's tents and awning for three days. As well as charging five phones a night. So, it certainly works!

PETER ROSENTHAL



1 The first step is to mount the NDS Power Service Gold 40-M control box; this will determine the length of all the wiring. The steel case has four feet that simply need to be screwed onto a panel (a custom-made one, here)

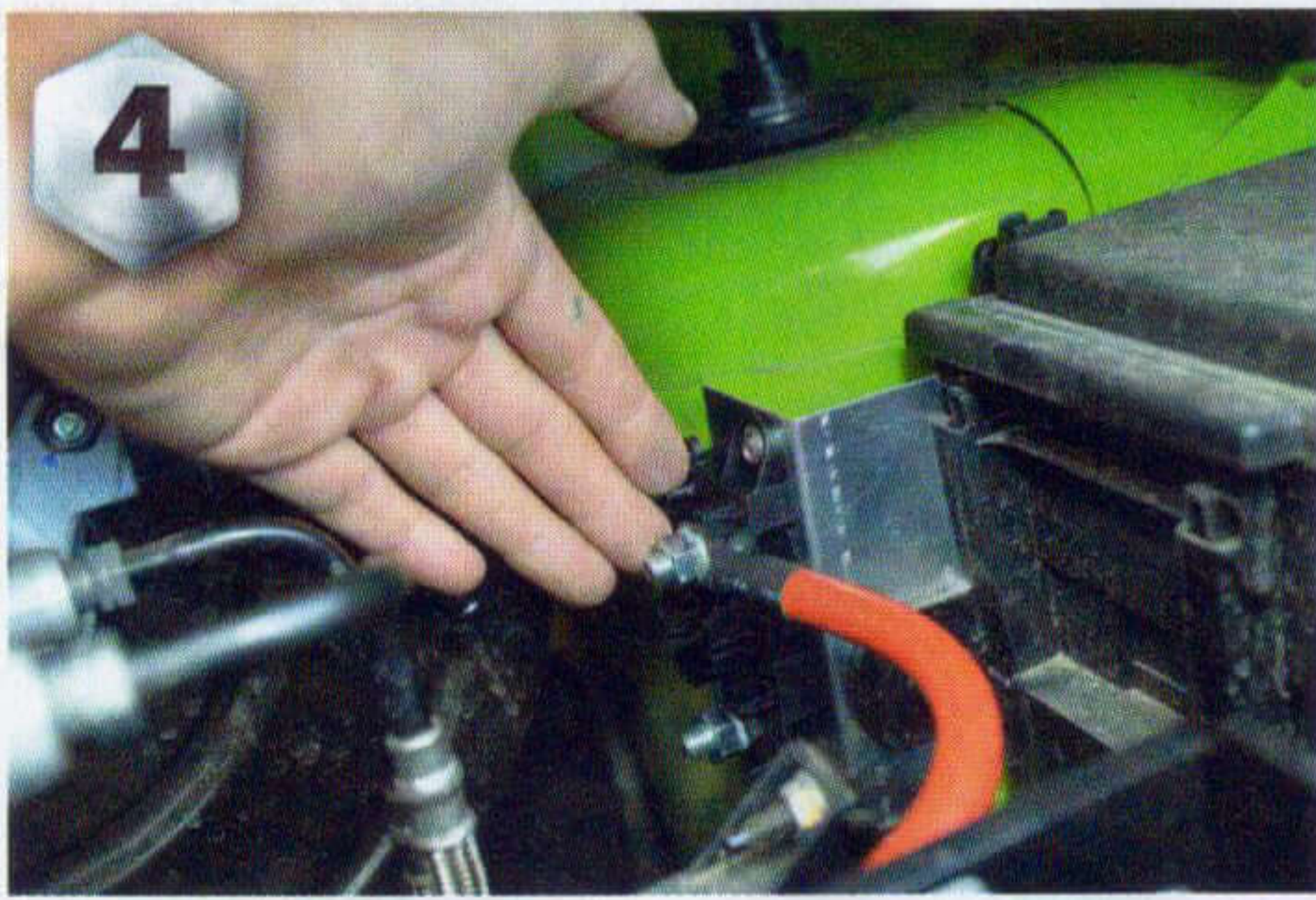
2 The supplied mains lead connects directly to the vehicle's consumer unit, while the position of all the 12V wiring is clearly marked on the casing. The two earth leads were bolted to the vehicle chassis using rivnuts and screwed to terminals 1 and 2 on the NDS unit



3 All the outputs from the NDS charger were fed to the leisure batteries and then a separate feed was run from the leisure battery to this bank of fuses. This marine fuse box then divides all 12V power to lighting, fridge and water pump

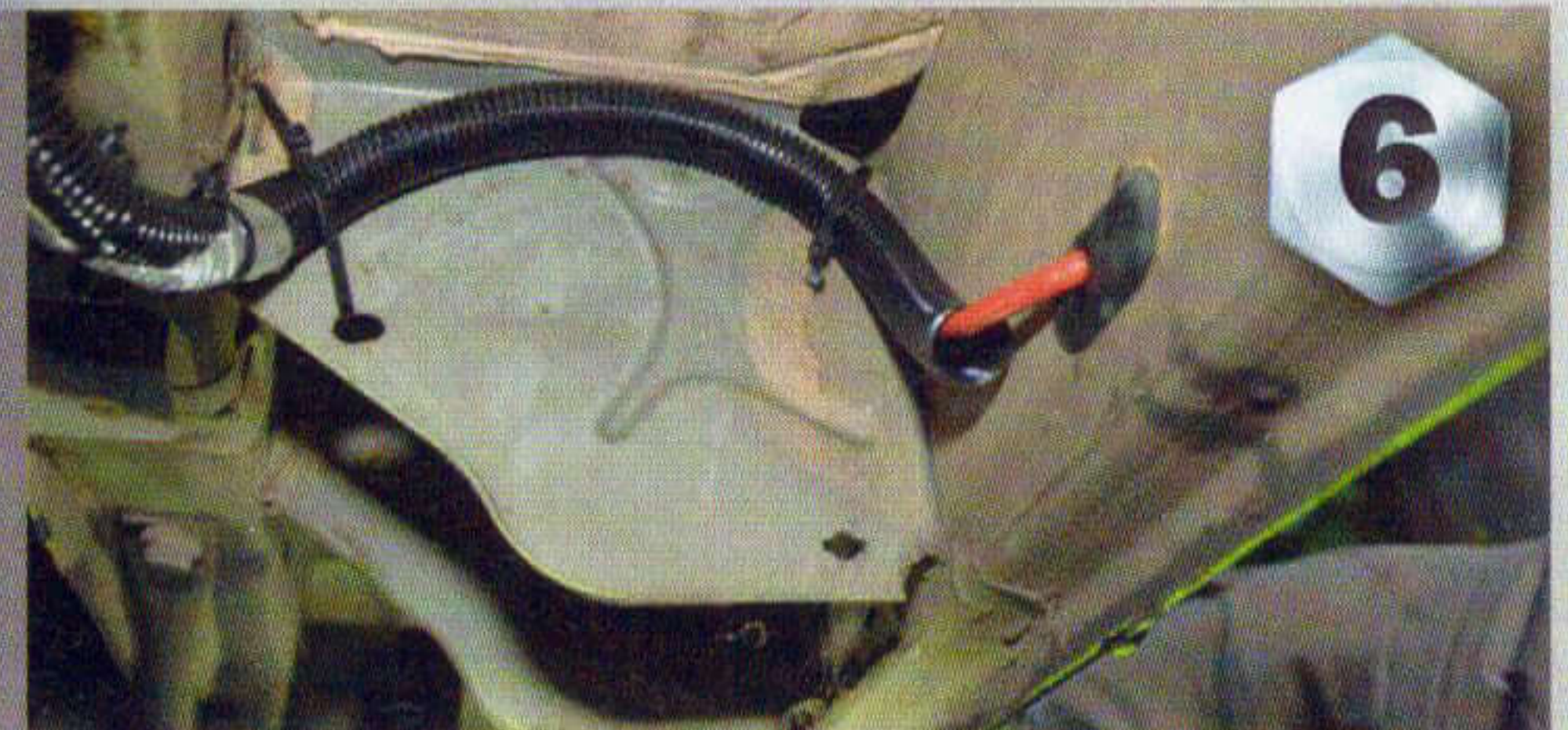


4 For the 40A battery charger to work, a short 240A cable was bolted to the battery terminals and run directly to a Mega fusebox. This was mounted on an L-shaped aluminium bracket bolted to an existing fixing screw

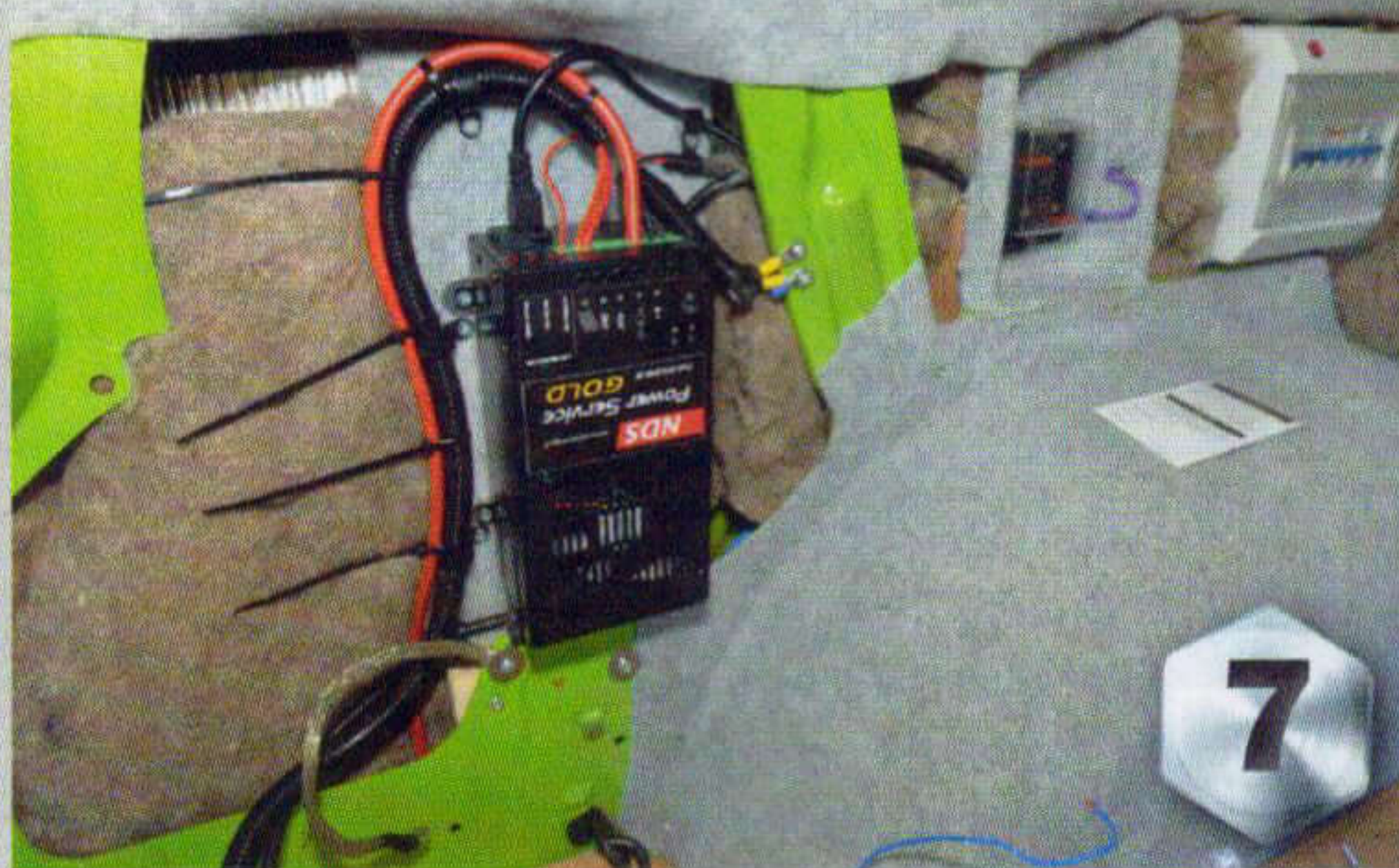


5 The 240A cable was cable-tied to the nearside brake pipes and fed on and over the exhaust system via conduit and lots of cable-ties. To protect the cabling from heat, fibreglass strand aluminium tape was wrapped around the section above the exhaust

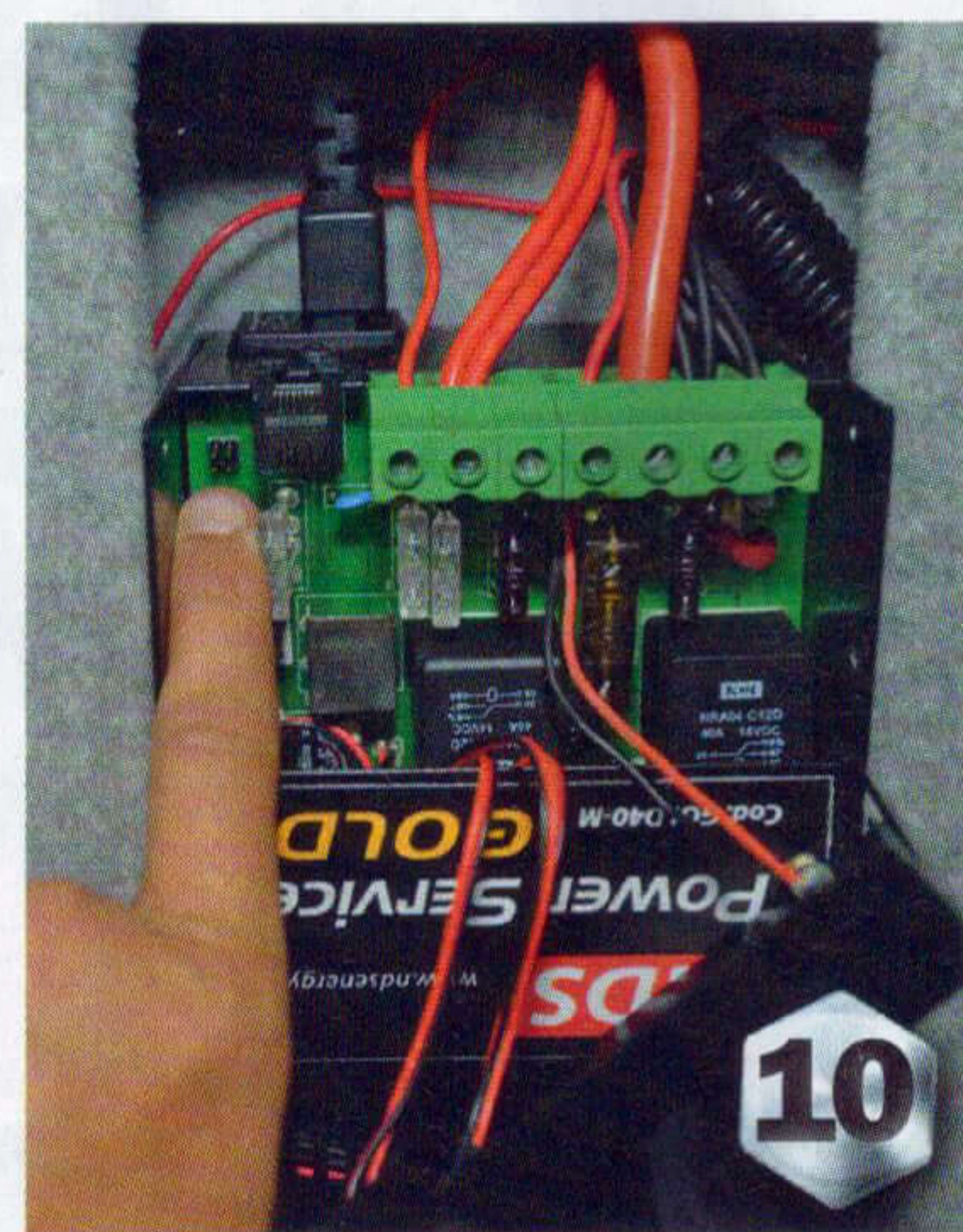
6 On the offside, a hole was drilled in this rubber grommet and the 240A cable fed into the inner sill. Cable-ties secure it and extra conduit was used in the inner sill to prevent damage to the cable from movement



7 The 240A cable was fed up from the inner sill, the end bared and screwed into terminal 3 on the NDS unit (which has an internal 40A fuse). A 50A Mega fuse was then fitted to the vehicle battery end of the wire



8 The wire to terminal 4 on the NDS unit must be connected to the D+ output of the alternator on a modern vehicle with a smart alternator (any vehicle with a stop-start system). Using a multimeter, I identified the correct pink-coloured wire in the underbonnet fusebox and teed into this. Other vehicles may use different wire colours, so check first. This wire was then fed – via a 10A inline fuse – to the NDS unit following the same path as the 240A battery cable (which it was cable-tied to)

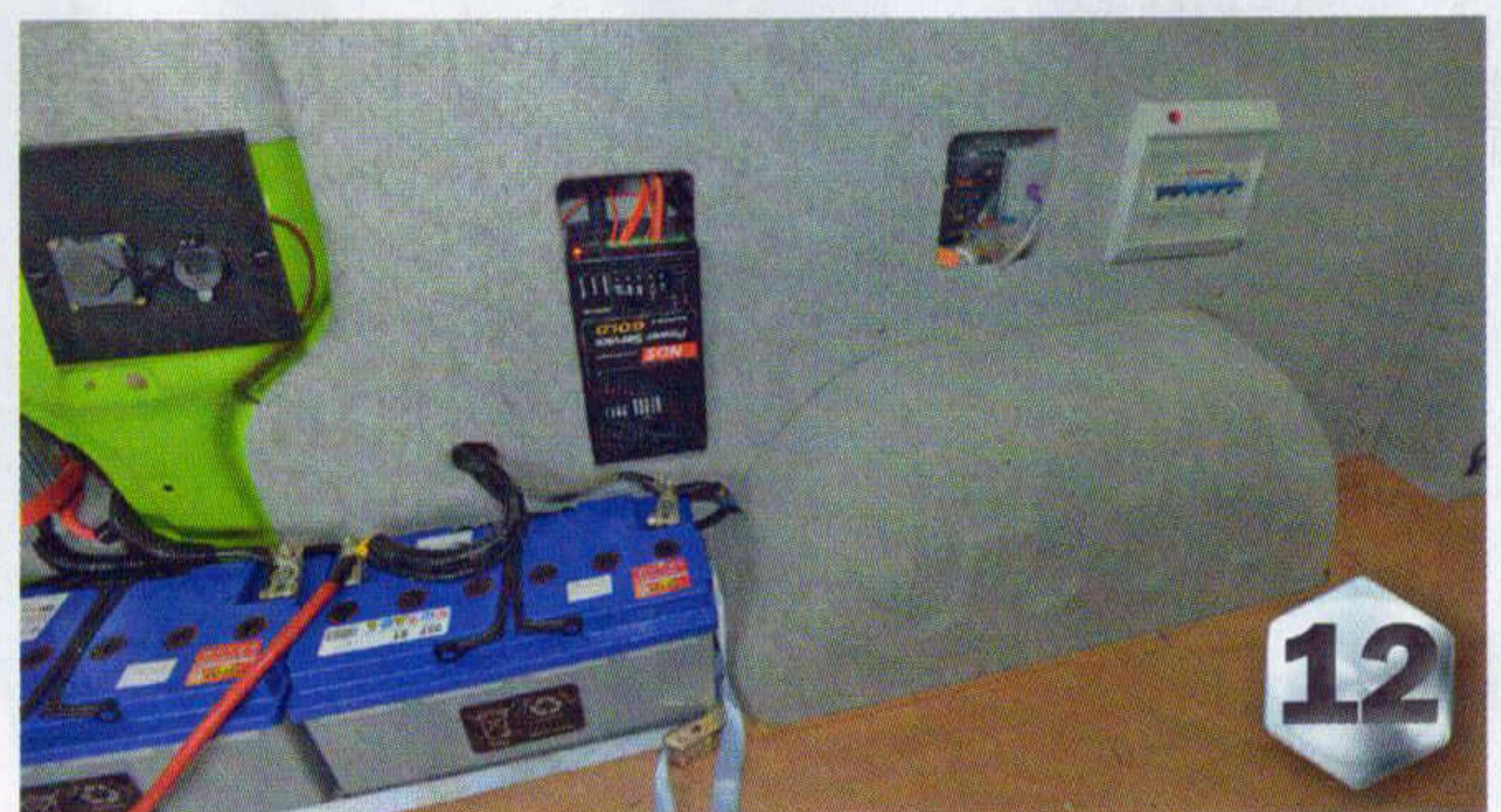


10 These two terminals are jumper posts and there is a small bridging device that is used to connect them in different ways depending on the application (this is all in the instruction manual). In this case, as we were using a smart alternator, the jumper was removed entirely

11 With the fuse cover reattached, the wiring was checked and all the fuses attached under the bonnet. The LED flashes to indicate the source of power (the solar panel in this case) and the number of flashes indicates the charge programme it is in. Again, this is all explained in the manual



9 With both underbonnet fuses removed, these four screws were removed to gain access to the NDS's fusebox. Make sure you allow room to get a screwdriver onto the ends of these screws when you fit the unit



12 A thin sheet of plywood was cut around the charging system and trimmed with Veltrim to finish off. This will all be hidden inside cabinets in time. The vehicle was then started up and all the headlights switched on (to trigger the alternator to start charging). The LED switched from 'solar' to 'alternator' to indicate the power source had changed. Finally, the system was plugged into the mains and the 240V AC LED illuminated. Success!