



Guide to... CARAVAN DIY

Minimise your maintenance bills with these simple DIY projects!

68

Install a roof-mounted Truma solar panel

Boost your battery with some free sunshine!

70

How to fit a Vision Plus TV antenna

Upgrade your aerial for improved onsite viewing

72

Repairing Birkholz window frames

Prolong the life of these veteran caravan windows

74

Change and clean Al-Ko stabiliser pads

Regular maintenance will keep your pads operating smoothly

76

How to care for your van's leisure battery

High-quality charging is the key to peak performance

78

Fit a photocell-operated LED awning light unit

Head for the bright lights!

81

How to boost your car's rear suspension

Improve your car's suspension and your towing experience



CUT OUT
AND KEEP
GUIDE!



Also available as a FREE ebook – see
www.practicalcaravan.com/know-how/ to download yours!



CUT OUT
AND KEEP
GUIDE!



HOW TO FIT A... TRUMA SOLAR PANEL

A solar panel helps boost your power and is an easy DIY project, says Nigel Hutson

SOLAR PANELS ARE being fitted to more and more new caravans as standard kit, and they're certainly useful, especially if you store your van or go off-grid – even on the dullest days, it will help to keep your battery topped up.

Fitting one might sound a bit daunting, but it's actually pretty straightforward, as we discovered when we installed a Truma 65 Wp SolarSet kit (three other sizes are also available from Truma).

You will need to do a bit of planning, and decide where you're going to mount the panel, bearing in mind that you have to drill a hole in the roof to pass a fairly thick cable. That cable then needs to end up being connected to the battery via the control unit. Once decided, it's time to get started.

Preparing the roof

The first thing to do is thoroughly clean the roof where the solar panel is going to sit. We washed and dried the area, before cleaning it with white spirit and then the supplied cleaning spray.

Next, from within an overhead locker inside the caravan, a 2mm pilot hole was drilled through the roof, followed by a 12mm hole. Truma suggests using a 35mm hole-cutter for this, but because the cable was quite flexible and didn't lift the roof leadthrough housing, the 12mm hole was sufficient in our case. Any burr around the hole was removed.

Rather than having cables trailed across the roof, we decided to fit the panel over the housing – there was lots of clearance.

Take the cable (with the Y-connector and waterproof connections) and pass it through the roof leadthrough housing, ensuring that the Y-connector is on the outside. You'll need to leave about 50cm (20") to the outside.

Tighten the screw connections around the cable where it passes into the housing, using the 24mm and 27mm spanners to



Tools required for the job

- Truma 65 Wp SolarSet kit
- Basic cleaning equipment (bucket, sponge and so on)
- Cloths • White spirit
- Cleaning spray (included in the kit)
- Drill with 2mm to 12mm bits
- T25 Torx bit
- 24mm and 27mm open-ended spanners
- Electrical crimps (ideal but optional)
- Various screwdrivers
- Wire cutters/trimmers
- Stanley-type knife

ensure a watertight fit. Once that's done, pass the other end of the cable through the hole in the roof, leaving just enough for you to turn the housing over.

Now comes the messy bit! You need to put a bead of the supplied adhesive around the base of the roof leadthrough housing. That sounds simple enough,

but one of our tubes split and we ended up with adhesive all over the place.

Once you have the bead of adhesive around the housing, feed the remaining cable through the roof until the housing sits over the hole, and gently press the housing into place, ensuring there are no gaps in the adhesive (as this also keeps any water out of the caravan), which needs to be 1-2mm thick.

Installing the panel

The feet then have to be attached to the solar panel. As a precaution, you could tape some of the cardboard packaging to the panel to protect it from damage. The feet are attached flush to the frame, using the Torx-headed drilling-screws.

We marked the location of where the holes needed to be and carefully drilled 2mm pilot holes in the frame, before attaching the feet with the Torx-headed drilling-screws, which was easier than letting the screws cut their own holes.

Working back on the roof of the van, connect the waterproof connections



Future Publishing Limited, the publisher of *Practical Caravan*, provides the information in this article in good faith and makes no representation as to its completeness or accuracy. Individuals carrying out the instructions do so at their own risk and must exercise their independent judgement in determining the appropriateness of the advice to their circumstances. Individuals should take appropriate safety precautions and be aware of the risk of electrocution when dealing with electrical products. To the fullest extent permitted by law, neither Future nor its employees or agents shall have any liability in connection with the use of this information. You should check that any van warranty will not be affected before proceeding with DIY projects.



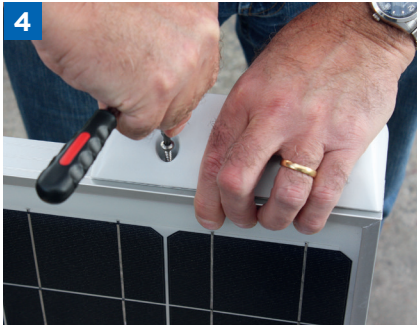
1 Drill the hole for the cable



2 Feed cable via roof leadthrough housing



3 Apply bead of adhesive to housing



4 Attach feet to the solar panel



5 Secure cables with clips/ties supplied



6 Clean off any excess adhesive



7 Mounting the control/charger unit



8 Connections to the battery



9 Unit operating with battery connected

on the cables on the solar panel with those on the cable leading into the van, then secure any loose cable under the panel with the clips/ties provided.

To ensure the panel is fitted squarely, mark the roof with non-permanent pen or masking tape. Using the supplied adhesive, run three parallel lines on each of the undersides of the feet (there are markings on the feet to guide), then turn the unit over and put it into position.

Press the unit down to form a secure bond, again leaving a thickness of 1-2mm of the adhesive. If the adhesive has been applied correctly, it shouldn't ooze out, but if it does, it can be wiped away using a cloth and the supplied spray cleaner.

Ideally, the unit should then be left for the adhesive to harden (24 hours) before the spoiler is attached. This simply slots into place on the front edge.

Now, working inside the van, you need to decide where to fit the control/charger unit. We chose to mount ours inside the

overhead locker where the cable from the solar panel was fed in. The cable was cut to the required length, then hidden inside self-adhesive trunking (from a DIY store) to keep things tidy. The ends of the wires were fitted with electrical crimps.

After drilling a 12mm hole through the bottom of the locker, the rest of the cable was fed through and into the bed base below. Self-adhesive trunking was used to hide the cable. The wires in the end of the cable inside the locker were trimmed and fitted with electrical crimps.

Next, the control/charger unit was secured to the caravan wall using short screws, before connections from the panel and the cable from the battery were made in the appropriate places (pictures on the unit show where these need to be).

The cable leading to the battery was cable-tied to others on the floor of the bed base before being passed through into the battery locker (with the battery removed). This required another 12mm

hole to be drilled and the cable fed through, and any gaps sealed.

Working outside the van, cut the cable to the same length as the van's battery connections. With ours, we were able to attach the cables to the control/charger unit to them (as well as the van's leads). As is usual, the red wire attaches to the positive connection, and the black to the negative. Once again, cable-ties were used to keep things tidy.

Truma recommends fitting the supplied temperature sensor, especially for AGM batteries. Lack of space in our battery locker prevented us from doing so, but if fitted, it attaches to the side of the battery as near the positive terminal as possible, then the wires are fed back to the control/charger and attached to the appropriate connections. This cuts charging from the panel if the battery gets too hot.

With the battery connected, the system should be operating, and the green LED illuminated. Select your type of battery, the charging current distribution and the pulse width modulation charging frequency. The default setting for this is 25Hz. **PC**

Thanks to Truma for the SolarSet, and to my son James for his invaluable help

'A solar panel is useful, especially if you go off-grid – even on the duller days, it will help keep your battery topped up'

CUT OUT
AND KEEP
GUIDE!



HOW TO FIT A... VISION PLUS TV ANTENNA

Nigel Hutson shows you how to upgrade your TV aerial for top-quality viewing

AFTER I REWIRED the connectors and put them into the correct places when our caravan was new, we never really had any issues with the performance of the Status omnidirectional TV antenna. That was more than 20 years ago.

My parents owned that van for many years, and it became clear that the original antenna didn't perform as well as the latest directional ones. So when Vision Plus offered me one of their Status 570s to fit, it was an opportunity too good to be missed.

Check the roof profile

The caravan was a 1999 Abbey GTS 215, so I had concerns that I would be unable to fit the antenna vertically – the van has a curved roof profile. “Not a problem,” I was told by Vision Plus, and an angle-adjustable roof mount was produced to replace the standard one. This caters for angles up to 15 degrees. I was also given a special blanking plate, which fits directly over where the old omnidirectional antenna would be removed.

In fitting the new antenna, I went against the best advice given by Vision Plus. They advise, where possible, to fit the antenna on the offside of the van to avoid possible damage when travelling.

However, that would involve major rewiring of the caravan, so it was almost a direct replacement for the original,

Tools required for the job

- Vision Plus Status 570 aerial
- Cross-head screwdriver
- 2.5mm hexagonal allen key
- Sealant
- Electric drill and small drill
- 50mm hole-cutter
- Spirit level • Washing-up liquid

which had in fact done many thousands of touring miles without incident.

Before fitting, the first thing to do is to ensure the caravan is as level as possible. It's hard to gauge vertical otherwise!

Next, remove the old TV antenna. The coaxial cable needs to be undone from the old amplifier and any cable fasteners removed. Two 2.5mm grub screws, which secure the antenna to its base, need to be released using an

allen key. Once they're released, the whole antenna should lift out of its base, together with the coaxial cable.

The next job – removing the original mount – was probably the most difficult part of the whole operation. After prising out ancient sealant from the screw holes, remove the four cross-head screws that hold the mount to the roof.

Our mount had been really well sealed to the roof, but with some careful use of scrapers, it did eventually come off.

Clean and prepare

The next step is to clean away all of the old sealant. When the roof is clean, after putting ribbon-type sealant around the new blanking plate, it is screwed to the roof in the same holes that secured the old antenna. Trim off excess sealant.

The old amplifier was then removed from within the overhead locker, but

IMPORTANT!

The antenna's amplifier has a 12V supply that needs to be fitted, so ensure the 230V mains and 12V battery are safely disconnected



Lift out the old antenna



Secure new mount to roof using old holes



Carefully cut the 50mm hole



Place mounting plate over the hole



Future Publishing Limited, the publisher of *Practical Caravan*, provides the information in this article in good faith and makes no representation as to its completeness or accuracy. Individuals carrying out the instructions do so at their own risk and must exercise their independent judgement in determining the appropriateness of the advice to their circumstances. Individuals should take appropriate safety precautions and be aware of the risk of electrocution when dealing with electrical products. To the fullest extent permitted by law, neither Future nor its employees or agents shall have any liability in connection with the use of this information. You should check that any van warranty will not be affected before proceeding with DIY projects.



'The first thing to do is ensure the caravan is as level as possible. It's hard to gauge vertical otherwise!'

the 12V supply (exactly the same as the new one) and TV/radio connections were kept because they would be reused.

There was more good news when it came to locating the new antenna. The overhead locker in front of where the original wiring was located turned out to be perfect, as it was deep enough for the mast (intrusion of 280-305mm).

The centre of the hole for the mast must be at least 50mm from any wall. A template is provided. If you are fitting an angle-adjustable mount, when siting the mast, ensure the tapered washer doesn't foul on the wall. With a suitable position for the hole selected, carefully

drill a pilot hole through the ceiling and roof. This must be vertical! Then, using the 50mm hole-cutter, I cut up through the ceiling board, but worked down from the roof to cut out the rest of the hole. This left smooth edges inside and out.

The mounting plate and foam seal are then screwed to the roof (16mm screws), surrounding the hole.

Taking the mounting foot, twist the central sleeve around inside the rubber gaiter until the tilt lines up with the angle of the roof and the screw holes in the mounting plate. Guide the mounting foot through the hole and secure to the foot using 32mm screws.

Working inside the caravan, place the tapered washer and locking plate on the bottom of the central sleeve, which will be protruding, and tighten, ensuring the assembly is vertical. Then secure the locking plate with 16mm screws.

Assemble the antenna

The antenna is then assembled. Insert the driveshaft into the 'gearbox' of the antenna and turn anticlockwise until the 'gearbox' has rotated through 90 degrees and is vertical.

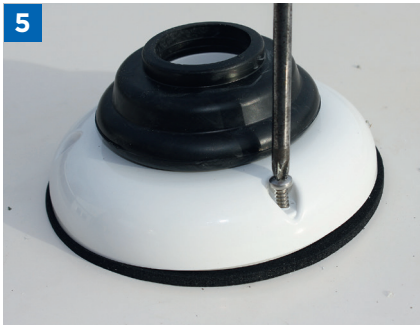
Pass the coaxial cable through the metal mast, then push the mast over the three O-rings (smear them with washing-up liquid to help). Secure the mast with one of the supplied M5 bolts.

Ensure the H/V indicator is threaded fully down on the winder mechanism, then slide the whole assembly into the mast, ensuring the driveshaft locates in the 'gearbox' and the H/V indicator is centred in the window. Secure with the other M5 bolt, making sure both bolts are flush with the mast.

Feed cable and mast through the mount from the top, then attach and secure the locking collar.

Locate the amplifier near the mast, and in an accessible spot. Ensure there is enough coaxial cable between mast and amplifier for when the mast is raised. Do not allow kinks in the coaxial cable, or for it to be pulled tight in any position.

Connect the 12V battery, tidy up any loose cabling, then try out the antenna with a TV (and radio). Ours worked brilliantly, right from the word go. **PC**



Attach mounting foot to mounting plate



Secure tapered washer and locking plate



Wind the 'gearbox' to 90 degrees



Assemble and secure winder mechanism



Attach and secure the locking collar



Mount amplifier in an accessible place



HOW TO REPAIR A... CARAVAN WINDOW

Windows in some older caravans can be difficult to repair or replace, says Sam Coles, but this simple DIY project should extend their life

OWING TO THEIR similarities in build and design, most caravans share the same manufacturers when it comes to windows.

Some of the most well-known brands are Dometic-Seitz, Heki and Fiamma.

However, certain older units (including mine) were fitted with windows made by a firm called Birkholz, which has long since ceased manufacturing them.

A quick glance through online forums highlights the problems this can cause when you try to source replacement windows (basically, size incompatibility with current ranges) and spare parts for any repair work.

Catch operation

In the main, Birkholz windows are quite robust and give long service, but those fitted to my van are of the three-point catch variety, using one central lever to operate all three catches simultaneously.

To do this, the lever drives a PVC strip in a channel which, in turn, activates the left and right catches.

As mentioned, the activation strip is made from PVC, and those of you who have an understanding of plastics will know that this material has an Achilles heel – it can become brittle over time.

Added to that, when PVC is cold, its malleability decreases, making it even more likely to fracture.

This article outlines the process of replacing the PVC with nylon, which has better thermal/ageing characteristics, coupled with excellent self-lubricating properties that enable it to slide more smoothly in the guide channel.

The material I've used here is Nylon 6, which was procured from a wholesaler (Amari Plastics, although others are also available). I decided to buy a complete minimum-order sheet (1m x 2m, 1.6mm thick) because trying to buy strip with

the dimensions required is non-viable. Although buying the whole sheet cost £42 at the time (check the website for the latest price), it enabled me to repair the five windows in my caravan at an average cost of £8 per window (with a bit left over).

You'll also need an aerosol can of PTFE.

Procedural tips

The old PVC is likely to be brittle and might break even more when removed. This is undesirable if it can be avoided, because the PVC has to be used as the pattern for cutting the new strip. Try warming it with a heat gun or hairdryer.

When cutting the new strip of nylon, it is essential not to go oversize – it is very difficult to remove any excess once cut.

Be sure to check that the new strip will run smoothly in the channel before you move on to cutting the apertures. **PL**

**'I repaired the
five windows in my
van at an average
cost of just £8
per window'**



A split in this PVC strip rendered the left-hand window catch inoperative



Remove the end-stop screw from the left-hand side of the window frame

Tools required for the job

- Marking gauge
- Craft knife
- Shears/scissors
- Torx screwdriver
- Various items from any conventional toolbox



Future Publishing Limited, the publisher of *Practical Caravan*, provides the information in this article in good faith and makes no representation as to its completeness or accuracy. Individuals carrying out the instructions do so at their own risk and must exercise their independent judgement in determining the appropriateness of the advice to their circumstances. Individuals should take appropriate safety precautions and be aware of the risk of electrocution when dealing with electrical products. To the fullest extent permitted by law, neither Future nor its employees or agents shall have any liability in connection with the use of this information. You should check that any van warranty will not be affected before proceeding with DIY projects.



Next, remove the window stay-bracket from the right-hand side of the frame



The central sliding block is now ready to be removed from the window frame



Using two screwdrivers, push to release lugs, then pivot block out from runner



Block removed, showing four recesses driving strip when catch is operated



To remove side catches, push inwards with screwdriver then pivot from runner



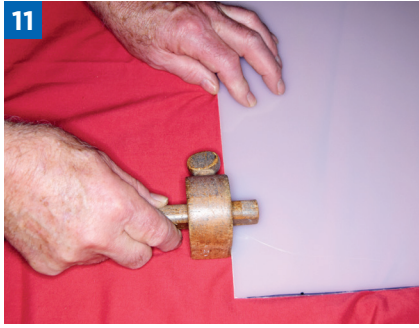
Widened section of track on left-hand side to facilitate withdrawal of strip



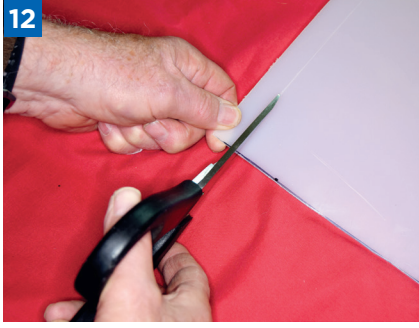
Damaged PVC strip is then removed via the widened section of the track



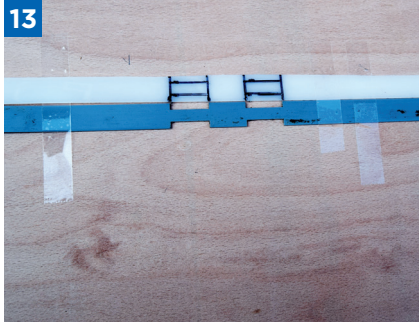
Set marking gauge to the required width (17mm in this example)



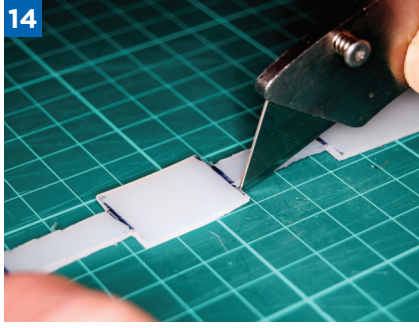
Next, carefully mark up the edge of the nylon sheet before cutting



Using sharp scissors or shears, cut along the marked line



Reassemble PVC strip next to nylon strip, then mark the aperture cutting points



Using a craft knife, carefully cut out the apertures as marked



Using white spirit and a small brush, clean the inside of the guide channel



Next, apply PTFE spray to the inside of the track and allow it to dry



Insert nylon strip into channel, then clip in drive block and side catches. Finally, replace stay-bracket and end-stop screw



HOW TO...

CHANGE & CLEAN AL-KO STABILISER PADS

Simple maintenance will keep these small essentials functioning, says Nigel Hutson

I SUSPECT MANY of you, like me, have completed a journey towing the caravan that was accompanied by groaning sounds emanating from the rear of the car every time you turned a corner, especially when travelling at slow speed.

No, I'm not talking about the "Are we there yet?" from the children! In the vast majority of cases, the unwelcome noise will be coming from the stabiliser, and is generally a result of contamination of the friction pads by dirt, which causes them to glaze over.

There are four friction pads; one on either side, which grip the towball when the handle is pressed down, and one up front and another to the rear, neither of which is designed to move.

Rectification of the problem is very simple. A temporary fix is to give the pads a quick clean in-situ with a piece of fine emery paper/cloth. However, we'll also have a look at how to check the wear of the pads, then remove them for cleaning or replacement, using just a few tools.

Examine the pads

It doesn't matter whether your stabiliser has the red handle or is the later black style, the procedure will be the same.

First of all, couple the caravan to the car, but don't engage the stabiliser.

You will see on either side of the red rubber soft dock at the front of the hitch unit there are recessed areas, and on each side of the silver handle, adjacent to the hitch, an arrow.

Press the handle down and at the point where you feel some resistance, check where the arrows are. If they're either below the recessed area, or within it, the side pads are fine. If they're the top side, then they are worn and need replacing.

Moving to the hitch handle, looking at the front of it, if you can see the green plastic segment below the red one (not



Tools required for the job

- Small flat-head screwdriver
- Small punch
- Small hammer
- 14mm open-ended spanner
- T30 Torx key
- Fine emery cloth
- Brake cleaner
- Clean cloth

the button on the front of the hitch showing correct engagement!), the front and rear pads are fine, but if you can only see the red segment, they are worn and will need replacing.

Now, detach the caravan from the car. Starting with the side pads, first remove the small red caps (unless they've already

fallen out) on either side of the hitch, and then, using a small punch in the hole, tap out the friction pads. They'll drop out from within the hitch itself.

Occasionally, a washer/shim or two might come out with the pads. These are necessary for correct adjustment within the hitch, so make a note of which (if any) side they come from, and put them back in the same place during reassembly.

Examine the pads, and if they have a shiny, glazed appearance, rub with fine emery paper/cloth until the glaze has gone and they're smooth. Then give them a final clean with brake cleaner.

Once you're happy that the pads are in good condition, or you've decided to put in new ones, replacement is the reverse of removal. Put the stem on the pads into

'A temporary fix is to give the stabiliser pads a quick clean in-situ with a piece of fine emery paper/cloth'



Future Publishing Limited, the publisher of *Practical Caravan*, provides the information in this article in good faith and makes no representation as to its completeness or accuracy. Individuals carrying out the instructions do so at their own risk and must exercise their independent judgement in determining the appropriateness of the advice to their circumstances. Individuals should take appropriate safety precautions and be aware of the risk of electrocution when dealing with electrical products. To the fullest extent permitted by law, neither Future nor its employees or agents shall have any liability in connection with the use of this information. You should check that any van warranty will not be affected before proceeding with DIY projects.



1 If indicator is above the recessed area, the pads are badly worn and need replacing



2 The first step is to raise the stabiliser handle and the hitch handle



3 Prise out the red plastic cap on either side (unless they have already fallen out)



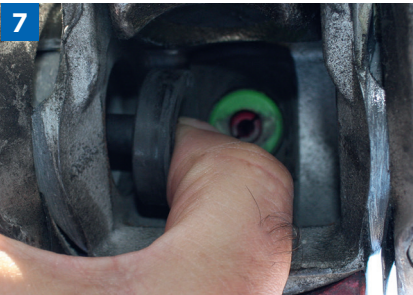
4 Tap out the side friction pads using a small hammer and punch (one either side)



5 Examine the pad. The one on the right is new, the old one on the left looks glazed



6 Clean off the glazing using fine emery paper/cloth, then apply brake cleaner



7 Insert the pads and click back into place



8 Replace the red plastic caps



9 To remove the front pad, first you'll need to take away the red rubber soft dock



10 Lock the button in position with a 14mm open-ended spanner



11 Remove the Torx-headed screw and the front friction pad. Clean and reattach



12 Remove the Torx-headed screw from the rear pad. Clean/renew, then reattach

the holes from within the hitch, and then press firmly (making sure that your hands aren't contaminated with any grease/oil), and they should click back into place.

It will possibly take firm pressure from both thumbs to do this. Finally, replace the small red caps.

To remove the front pad, first remove the red rubber soft dock on the front of the hitch. It simply pulls off. Then pushing up from the inside of the hitch, lift the button on the front, which shows correct engagement when attached to the tow car, and place a 14mm open-ended spanner around it to stop it retracting.

Looking at the front of the hitch, underneath where the red rubber soft

dock was, you'll see a Torx-headed screw. Remove this with the T30 Torx key.

The front friction pad will come out easily with this removed. As with the side pads, clean or renew as required, then replace, which is the reverse of removal.

The Torx-headed screw only needs to be nipped up (Al-Ko recommends a 5nm torque setting). Remove the spanner.

Check engagement

The rear pad, which is at the back of the hitch area, is similarly held in place by a Torx-headed screw. Remove the screw and then the rear pad (which might need gentle assistance with a small flat-head screwdriver). As with the other pads,

clean/renew and replace, which once again is the reverse of removal.

Attach the caravan to the car and check the hitch engages correctly. In addition, recheck the wear indicators, just in case something has not gone back as it should. It's better to find problems now, rather than when you hitch up for a tour!

If you're happy, detach from the car and replace the red rubber soft dock. You could find this is the hardest part of the job, as you'll get it attached on one side, and then it will pull off from the other.

If you are in any doubt as to the wear, or there are signs of contamination of the pads by oil or grease, replacement is going to be the most sensible option. **PC**



HOW TO... CARE FOR YOUR LEISURE BATTERY

A steady supply of electricity is vital on tour, and being let down by a failing leisure battery could easily ruin your trip, says Nigel Donnelly

What is a battery?

In the simplest terms, a battery is just a plastic box full of electricity. All caravans will have at least one battery, but some have two or more.

When you are using your van, the main way your leisure battery will be charged is if you are on site and plugged into a hook-up, when it will be topped up by the mains charger fitted as standard in all modern tourers. But to keep your batteries in optimal condition, you really need high-quality charging.

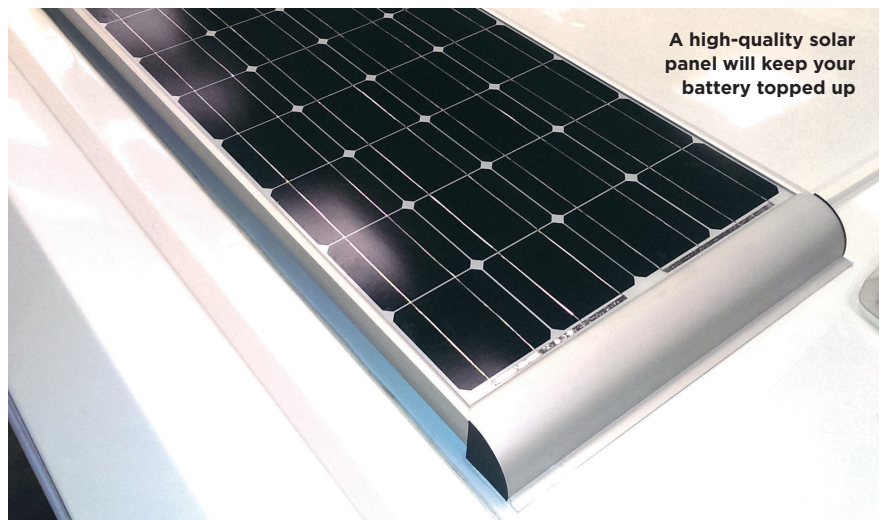
Install a solar panel

Adding a solar panel (p68) is a no-brainer if your caravan is stored outside. A quality solar panel will keep your battery topped up. They are not cheap, but when the sun is out, your battery will get the benefit.

This doesn't need to be hot summer sunshine, either. A bright winter day can provide enough power to keep your battery healthy and stop it discharging and deteriorating.

Secure the battery

Batteries are held in place by straps or clamps. Take some time to ensure the battery is securely fastened in its locker.



A high-quality solar panel will keep your battery topped up

If it can move excessively, the connections can be loosened, and internal damage to the battery can occur as a result of excess vibration when you are travelling.

Charge your battery better

There are various things that will quickly kill a battery and top of the list is being left in a discharged state.

If you expect your leisure battery will be left unused for a while, at least ensure

it is fully charged before it is laid up. Batteries naturally discharge when they are not in use, so if you charge the battery fully beforehand, it will be longer before it discharges again. Leave your battery discharged for any length of time and its life expectancy will be shortened and performance will degrade.

Different types of battery will need different charging approaches to get the most out of them. Standard battery



Leisure batteries need to be stored safely and fastened securely...



... to ensure that they do not move around excessively in transit



'To keep your batteries in optimal condition, you really need high-quality charging'

chargers just throw power at the battery and will charge it to around 80% of its capacity. To get more than that, you need to charge your battery better.

If you aren't a battery expert, buying a 'smart' or 'intelligent' battery charger takes the guesswork out of high-quality charging. Simply tell the charger what type of battery you are charging and it will sense the state of the battery and work out the best way to charge it.

Intelligent chargers provide staged charging, rather than a constant charge at one voltage. Varying the voltage is better for the health of the battery, so these chargers sense the state of the battery and charge at the optimum level.

Once the battery reaches 100%, the charger switches to offering a 'float' charge, to maintain the battery without overcharging.



Corroded terminals can cause problems

Standalone smart chargers are available for prices starting at around the £100 mark. Hooking up your leisure battery to a smart charger from time to time will prolong its life and effectiveness, and mean that it's less likely to let you down when you really need it.

Clean the battery

Even if your battery is in good shape, a little care goes a long way. Corroded battery terminals can occur as a chemical reaction between posts and clamps.

This corrosion can cause problems in charging and using your battery. Check the tightness of the cable connections, clean the terminals and protect them with a smear of petroleum jelly or lithium grease. Look for signs of damage to the battery casing. This takes minutes, costs virtually nothing and will help to ensure you get the most out of your battery.

Low electrolyte levels

For lead-acid batteries, low electrolyte levels cause the lead plates that comprise the battery to deteriorate. Ensure that the battery is flooded with distilled water, especially when it is being charged. **PC**



Future Publishing Limited, the publisher of *Practical Caravan*, provides the information in this article in good faith and makes no representation as to its completeness or accuracy. Individuals carrying out the instructions do so at their own risk and must exercise their independent judgement in determining the appropriateness of the advice to their circumstances. Individuals should take appropriate safety precautions and be aware of the risk of electrocution when dealing with electrical products. To the fullest extent permitted by law, neither Future nor its employees or agents shall have any liability in connection with the use of this information. You should check that any van warranty will not be affected before proceeding with DIY projects.

CUT OUT
AND KEEP
GUIDE!



KNOW-HOW //
CARAVAN DIY



HOW TO FIT A... PHOTOCELL AWNING LIGHT

Follow Nigel Hutson's step-by-step guide to upgrading your awning light

THE AWNING LIGHT on my parents' ageing Abbey still worked, even though it was all of 17 years old, but it was now shining a rather dull yellow, rather than its original bright white.

We had cleaned its cover several times, but the plastic had discoloured with age. Not only that, it still had the original type of bulbs, rather than energy-saving LEDs. So it was time for a change.

We could have replaced like for like, but we thought it might be handy to have a unit with a photocell, to switch the light on when it was dark outside.

If you use well-lit full-facility sites, an awning light isn't a necessity, but on CLs/CSs, it can be invaluable. What better way to help you find your keys (and see the door lock) when it's pitch black outside, than a light that switches itself on?

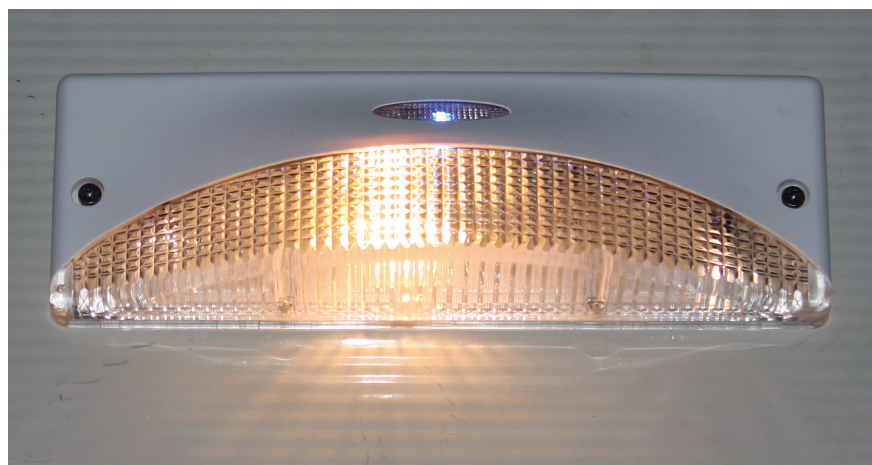
Lights and switches

We bought a new light unit incorporating a photocell, which switched on a couple of LEDs. We then realised that the lights operated independently – the photocell LEDs were wired separately to the main light, a power-hungry halogen bulb.

So a new light switch was required, together with some rewiring, and at the same time, the halogen bulb would be changed for an LED unit.

We would be working with the 12V system, so first, both the mains power and the 12V battery were safely disconnected.

Next, we ensured the new unit was slightly larger than the original, because the screw holes securing each to the side of the van would inevitably be in different positions – as were the power cables.



Tools required for the job

- Cross-head screwdriver
- Small flat-head screwdriver
- Electric drill with 2mm and 8mm bits; 22mm wood bit
- Stanley knife
- Mastix gun and cartridge of sealant
- Wire strippers and crimps
- Insulating tape

Knowing what we were faced with, the old cover was unclipped from the light unit, and the screws securing the unit to the caravan were removed.

It was amazing the light had worked so well, because when we started to remove the electrical connections, most of them disintegrated. It might have been possible to reuse the power cables on a new unit if it only required a switched single live feed and single earth, but ours required two of

each, so rewiring would be needed. The original wiring ran inside the van's wall and roof, so we had to make the job as neat as possible using trunking.

With the unit removed, the old power cables were trimmed and the ends insulated with tape (the other end of the power supply would be disconnected from the switch, so would no longer be live), before being tucked inside the van wall. All of the old holes were then well filled with sealant (Carafax IDL 110).

Disconnecting the cables

Working inside the van, the wall switch that operated both an internal light and the awning light was removed, and the cables disconnected (noting which wire was where for the internal light).

The cables ran in trunking inside the dresser, which gave us easy access when the cover was removed. We'd bought a new triple light switch that matched the original, but the hole where the switch had been mounted needed enlarging. Using a 22mm wood bit and a Stanley knife, the hole was opened out.

Carefully measuring where the new light unit would fit, an 8mm hole was >>

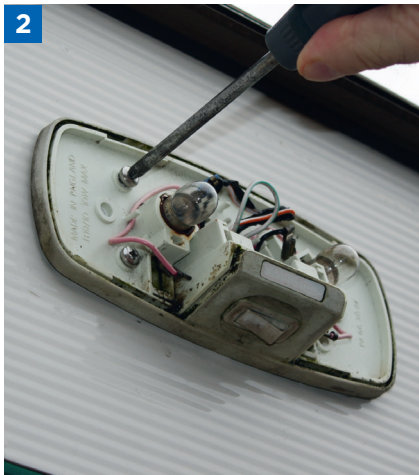
'What better way to help you find your keys when it's pitch black outside than a light that switches itself on?'



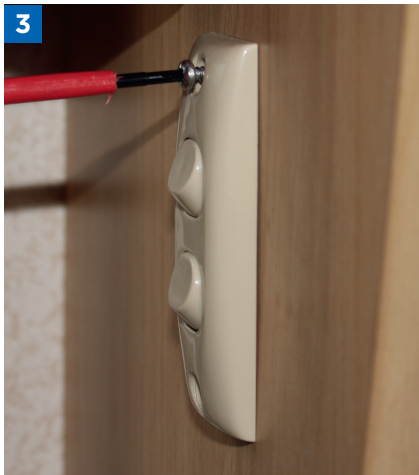
Future Publishing Limited, the publisher of *Practical Caravan*, provides the information in this article in good faith and makes no representation as to its completeness or accuracy. Individuals carrying out the instructions do so at their own risk and must exercise their independent judgement in determining the appropriateness of the advice to their circumstances. Individuals should take appropriate safety precautions and be aware of the risk of electrocution when dealing with electrical products. To the fullest extent permitted by law, neither Future nor its employees or agents shall have any liability in connection with the use of this information. You should check that any van warranty will not be affected before proceeding with DIY projects.



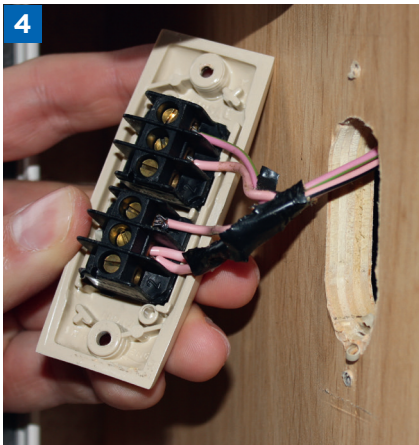
The old unit worked, but was discoloured



Taking out the screws securing the old unit



Removing the old light switch



Wiring and hole for the old switch



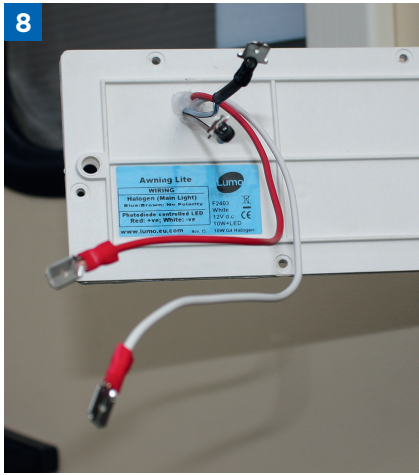
Cutting and insulating the old wires



The new switch and the old hole



Using a 22mm wood bit to open up hole



The cables on the new light unit



Drilling the 8mm hole from outside



Sealing the holes from the old light unit



Halogen bulb in the new light unit...



... replaced with energy-saving LED



drilled through the wall (after drilling a much smaller pilot hole) where the wires would pass through to the inside.

Then, self-adhesive trunking was fitted (we decided that this would look better if it covered the whole gap between the washroom wall and the dresser, rather than being cut off halfway along).

With that in place, working from the outside and using the 8mm hole, the same hole was drilled through the back of the trunking, and then another hole was drilled into the dresser cabinet to where the original wires were.

Before fitting the unit to the caravan, we changed the halogen bulb for an LED.

Attaching the new unit

The new light unit was supplied with self-tapping screws, which were used to loosely attach it to the wall, feeding the wires through the hole in the wall first.

Crimped bullet connectors were attached to the ends of the wires feeding the photocell LEDs, and crimped spade connectors for the awning light.

With the original power feed from the battery connected to the new switch unit, power to the other two switches was 'piggybacked' from this (as the originals had been). Then, two lengths of red cable (live) were run from the switches to the cables from the light unit (with their respective crimped connectors).

Next, an earth cable was rerouted, which was connected using a terminal block to two lengths of earth cable (black). The loose ends of these were again connected to the 'spare' cables from the wires attached to the light.


Testing the lights

With the switches in the 'off' position, the 12V battery was reconnected to test the various lights. The great news was that everything worked first time.

Not only was the awning light much brighter than the old unit, but the small LEDs, working in conjunction with the photocell, switched on just as they should. As well as a pair of white LEDs shining down, there's a snazzy blue one where the photocell is housed.

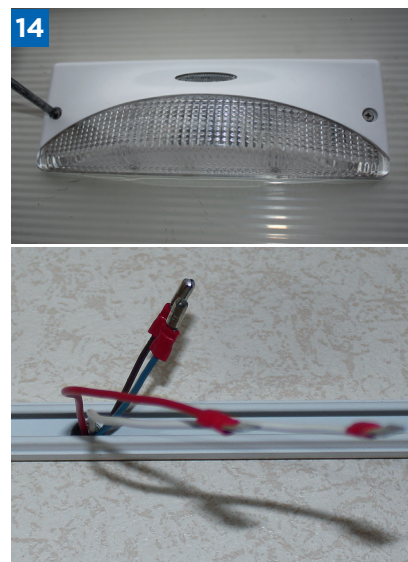
Then, with the battery disconnected, the light unit was removed and sealant applied to the back and around the hole where the cables enter the caravan, and around the screws and screw holes.

The new unit was then secured to the caravan wall. Internally, the cables were tidied inside the trunking, and finally, the switch unit was secured before reattaching the 12V battery.

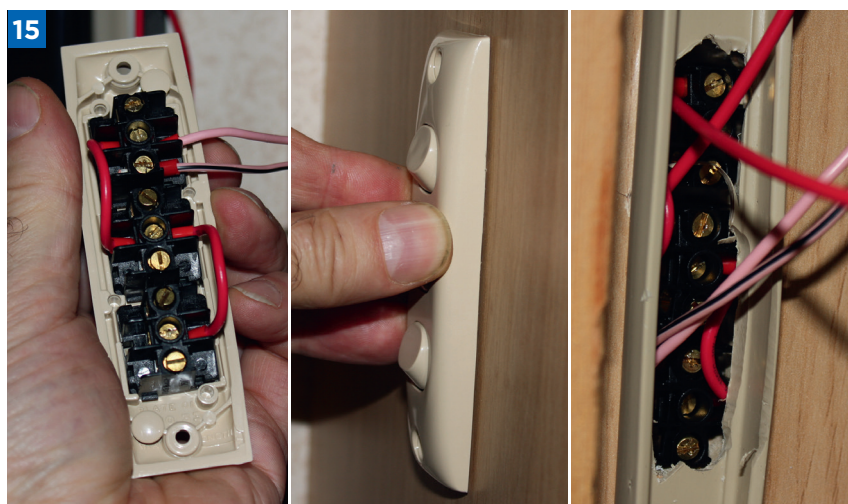
Job done! The result is a neat and practical upgrade from the original awning light, and one which also offers the added security and convenience of having photocell-activated LEDs. 



13 New trunking inside the caravan behind the light unit; 8mm hole in the trunking



14 Loosely attaching the new light unit, with wiring fed inside



15 LEFT TO RIGHT Original wires and 'piggybacks' on the light switch; positioning and fitting the new switch; view from inside trunking in the dresser cupboard



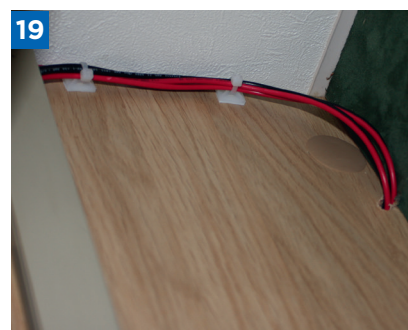
16 Sealant on back of the replacement unit



17 New awning light shines bright and clear



18 New switches for the new light unit rewired and neatly fitted in position



19 Cabling for the new light tidied away and secured inside dresser cupboard



HOW TO... BOOST YOUR CAR'S REAR SUSPENSION

Upgrade your tow car's suspension and you'll feel the difference, says Nigel Hutson

OVER THE YEARS, I've upgraded many suspension systems on cars, from simple rubber inserts that sit between coils, to changing springs and shock absorbers, to fitting self-levelling units. The latter were by far the most successful, but of course they came at a significant cost.

In everyday motoring, soft suspension might give a comfortable ride, but plonk a caravan on the back and fill the boot with clobber (making sure the rear axle load isn't exceeded, of course), and there can be all kinds of problems.

Starting with aesthetics, a car that's dragging its backside and a caravan hitch almost on the ground simply doesn't look right. Taking that a stage further, the jockey wheel grounds at every little bump, and the car's suspension bottoms constantly. In the worst case, the car's steering can be so light, it struggles for grip and gets 'floaty', and the ride feels like you're on a cross-Channel ferry in a Force 10 storm, with the outfit all over the place – potentially dangerous.

Beefing up suspension

My son James recently acquired a 2016 Ford Mondeo estate with standard suspension. He knew he would be towing a caravan so decided to have a towbar fitted to the car, and while the rear suspension wasn't bad, he fancied beefing it up a little.

After doing a bit of research, we decided that MAD Auxiliary Springs were the way to go (these didn't alter the original suspension, so are a good choice if any warranty is likely to be affected).

The MAD kit consisted of a pair of bright blue auxiliary springs, upper and lower spring seats and comprehensive instructions for our particular vehicle.

The fitting looked a doddle. A lift was used for the car in the instructions, but we would be doing the job at ground level, (safely) using a jack and axle stands.

Before any dismantling, we began by taking some important measurements.

Tools required for the job

- Wheel chocks
- Trolley jack
- Axle stands
- Torque wrench
- 18mm and 19mm sockets with extension bar
- Thread lock

With the car parked on a level workshop floor, the distance from the ground to the top of the rear wheel arch was:

Empty boot 71.0cm

Full boot (tools and so on) 70.0cm

Full boot plus 100kg ballast 67.5cm

These would be rechecked after we installed the auxiliary springs.

While each vehicle is likely to have variations in how the auxiliary springs are fitted, the kits are supplied with instructions pertinent to each car.

The front wheels were safely chocked and the park brake applied. As James's car has automatic transmission, the gear selector was in Park.

Loosen the wheel nuts/bolts on both of the rear wheels – but do not remove them at this stage.

Jack up the rear

Then, using the appropriate jacking point, raise the rear of the vehicle on one side, enough to get an axle stand under a designated place on the car.

With that in place, do the same on the other side and ensure the car is firm and steady, and not likely to topple.

Now, with the rear of the car raised, we started work on the rear nearside and removed that wheel, leaving the offside one in position for the time being (belt and braces!).

The jack was placed under the rear suspension to take its weight, but not lift. The first task was to remove the >>



1 Before starting the upgrade, three key measurements are required



2 The rear of the vehicle supported on axle stands for the procedure



3 Removing the upper shock absorber mounting bolts



4 Checking that the cables and hoses aren't under tension



Feeding auxiliary spring into main spring



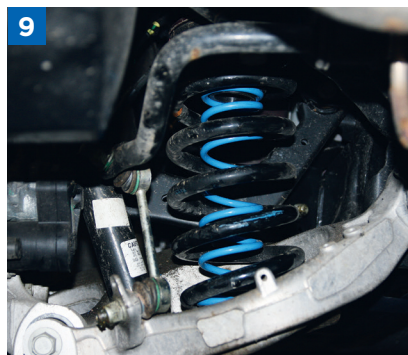
Auxiliary spring inserted into main spring



Upper and lower auxiliary spring seats



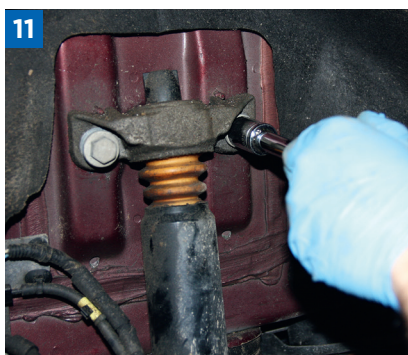
The upper spring seat in position



Auxiliary spring correctly rotated



Applying thread lock



Replacing shock absorber upper mounting



Replacement upper mounting in place



New measurements showing increase

top shock absorber mounting bolts. These had thread lock applied during their initial installation, so were quite stiff to remove as they unthreaded.

The upper mount hung on a pair of small locating pins, so had to be pulled forwards off of these.

The jack was slowly lowered to allow the suspension to extend to its maximum. With that released, it's important to make sure that any brake hoses and cables are not under tension.

Feeding in auxiliary springs

The bottom auxiliary spring seat was then inserted into the hole in the lower suspension arm, where it 'clicked' into place (inside the main spring).

Next, the auxiliary spring was fed into the main spring from the bottom and by rotating it, was wound up inside the main spring. With the auxiliary spring inside the main spring, the upper spring seat was placed on the top and the unit

centred in the upper main spring plate. The bottom end of the auxiliary spring was slotted onto the lower spring seat.

The instructions are specific about placing the winding ends of the auxiliary springs. The nearside one has to have the top winding end pointing rearwards (with the offside one pointing forwards).

With the jack under the suspension, it was raised so the top shock absorber mount slotted over its locating pins. The bolts were then refitted after


some thread lock had been applied, and were torqued to the appropriate setting. The road wheel was then refitted, before we repeated the work on the offside.

With both sides completed and the car lowered to the ground, the wheel nuts/bolts were tightened to their correct torque settings. Following a road test, we took the measurements again:

Empty boot 71.5cm

Full boot (tools and so on) 70.5cm

Full boot plus 100kg ballast 69.0cm

The instructions suggest the headlight beams may require adjusting, so it's something that we'll monitor. Although he hasn't towed the caravan yet, James says the solo ride is much improved. 

Many thanks to Ivan Fomin, MD of MSE Hiller, Chesterfield, for the use of his workshop for the project



Future Publishing Limited, the publisher of *Practical Caravan*, provides the information in this article in good faith and makes no representation as to its completeness or accuracy. Individuals carrying out the instructions do so at their own risk and must exercise their independent judgement in determining the appropriateness of the advice to their circumstances. Individuals should take appropriate safety precautions and be aware of the risk of electrocution when dealing with electrical products. To the fullest extent permitted by law, neither Future nor its employees or agents shall have any liability in connection with the use of this information. You should check that any van warranty will not be affected before proceeding with DIY projects.