

KEEP YOUR COOL!

Pia, our new resident Techspert from Southern Spirit Campervans shares tips and invites your questions...

The fridge is your RV's most important appliance. It's also your biggest 12 V consumer and often you'll use it without wondering if it's running under ideal conditions. I could write pages about how important ventilation – and for absorber fridges, insulation – is. It's likely your fridge would benefit from another external vent and also a 12 V fan. It's also likely the 12 V wiring to your fridge is under-dimensioned and doesn't have 6 mm wire, but to make changes there we would require more serious modifications.

old & mouldy fridge sealing

Fridge 101

Compressor fridges like Waeco, Engel, Vitrifigo, etc, draw heavily from your 12 V system when under load. In normal operation the fridge compressor will 'cycle' by kicking in and out, which is how it maintains a set temperature. You will hear when your fridge compressor is running as there is a little humming noise.

Absorber (LPG) fridges like Dometic or Thetford, by comparison, work on a design that essentially exchanges heat for cold: to make a fridge cold it produces heat. Under normal conditions they operate around 40°-70°C, measured on the fridge back, and you can feel this on the outside of the cupboard around the fridge or the external vents.

Usually your fridge runs 24 hours a day and that's why you need to ensure it uses as little power as possible. A fridge, depending on size, draws between two and eight amps per hour, under load. Tip: You can find specific information on the inside label of your fridge or in your user manual. Once known you can roughly calculate how much power your fridge will use in a 24 hour period. For example, if

under full load the fridge is using 4 amps (48 Watts) and your battery is rated at 100 amp hours (AH), after 24 hours the fridge would have used 96 AH and your battery would be almost dead empty. Bear in mind a deep-cycle battery should not be run down to less than 70 per cent capacity before recharging, to ensure optimal life. In our 100 AH battery example this means you only have 30 AH of usable power, which equates to 7.5 hours fridge time. And that's not taking into account lights, the water pump or any other 12 V systems!

These figures assume the fridge engine compressor/absorber unit runs all the time. Let's see what can be easily achieved to improve fridge performance. Remember: Fridge performance impacts directly on how long you can stop without mains power when you go camping.

Fridge Seals

The seal of your fridge is very important because it makes sure the cold cannot escape, therefore requiring less power to maintain a set temperature. You can check the fridge rubber when the door is attached, but it's best done if you take the door off. Usually,



The back of a fridge can be a complex place, especially in a three-way unit like this. Clean carefully to maximise airflow and inspect wiring and any gas fittings to ensure all are in good condition.

the door is attached on a hinge that can be unscrewed, although sometimes the screw is hidden under a cover. It's important to check the rubber all around, especially along the bottom.

Your fridge seal should be soft and when pressed it must compress. Likewise, when released it should become 'thicker' again. Also, the fridge seal should be nice and clean, so check for mould, mildew, cracks and splits, and for food remains or rust particles (often found on the bottom part of the seal). If the seal still looks and feels reasonable give the rubber a good clean. Best results will be achieved if you carefully pull the rubber seal out – most are only pressed into the fridge door, not screwed in. You can clean it with a soft sponge using specific cleaner or just a white distilled vinegar diluted in warm water. You can also place the dismantled seal in a bucket with vinegar/warm water solution for 30 minutes to make the job easier.

When fitting the seal back to the fridge door make sure you're not using sharp tools that might cause damage. For long life and to keep the seal soft you can treat the rubber with

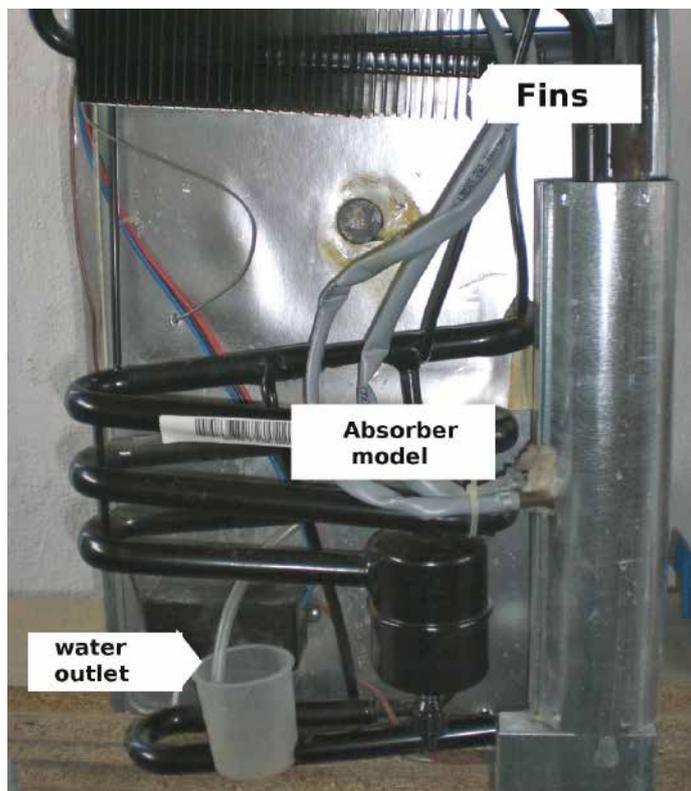
some glycerine or talcum powder, which you can apply simply by wiping on. Check and maintain your seal once or twice a year. Keep it clean on a regular base just with some soapy water and a soft sponge, but don't forget the bottom even if it's harder to reach.

If the seal is damaged you should change it right away or as soon as possible. Either contact the manufacture to buy a new one or for some models you can buy the seal after-market for a much better price. One online supplier of after-market fridge seals in Australia is fridge-seal.com.au. Choose your brand from a drop-down menu and enter the model for a price check. They deliver Australia-wide and as an example a seal for a Dometic RM 2553 is \$60.00.

Clean Your Behind!

This is one for the slightly more advanced or adventurous fridge owner. Making sure the area behind your fridge is free of built-up dust, dirt, insect nests or whatever ensures maximum airflow and cooling. This in turn reduces battery load and preserves precious amp hours.

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For a compressor fridge you'll need to do this from inside the vehicle. These fridges are usually set in a cupboard and in some cases have a frame that's screwed on. Alternatively, inside you'll find four to six plugs on the left and right sides, located on the internal fridge body towards the door, which covers the screws. Remove them and carefully pull the fridge out, making sure you disconnect the 12 and/or 240 V as you do so.

For absorber fridges you'll need to work from the outside and take the ventilation covers/



frames off to reach the area behind. Do not forget to seal the vent frames when putting them back on.

Once you've reached the back you'll be surprised what you find! The idea again is simply to clean, which can significantly improve the performance of your fridge. Only use a vacuum cleaner, tooth brush and a damp microfibre cloth for best results. Most important here is to clean the upper fins (silver or black) as dust and dirt can sit perfectly in between them and stop the fridge from working properly.

While cleaning you should also check the fridge's overall condition for things like rust or poor condition gas pipe fittings. Also check how thick the 12 V wiring is and if the crimps and connections are neat and tight. If everything is okay reinstall the fridge into its cupboard or replace the external covers, deepening on fridge type, and if any screws are involved I suggest replacing them with new stainless steel ones.

This check and clean-up should be done once a year, but if you've discovered something suspicious, like large rust spots or loose wiring I suggest taking some pictures and contacting your trusted RV repairer.

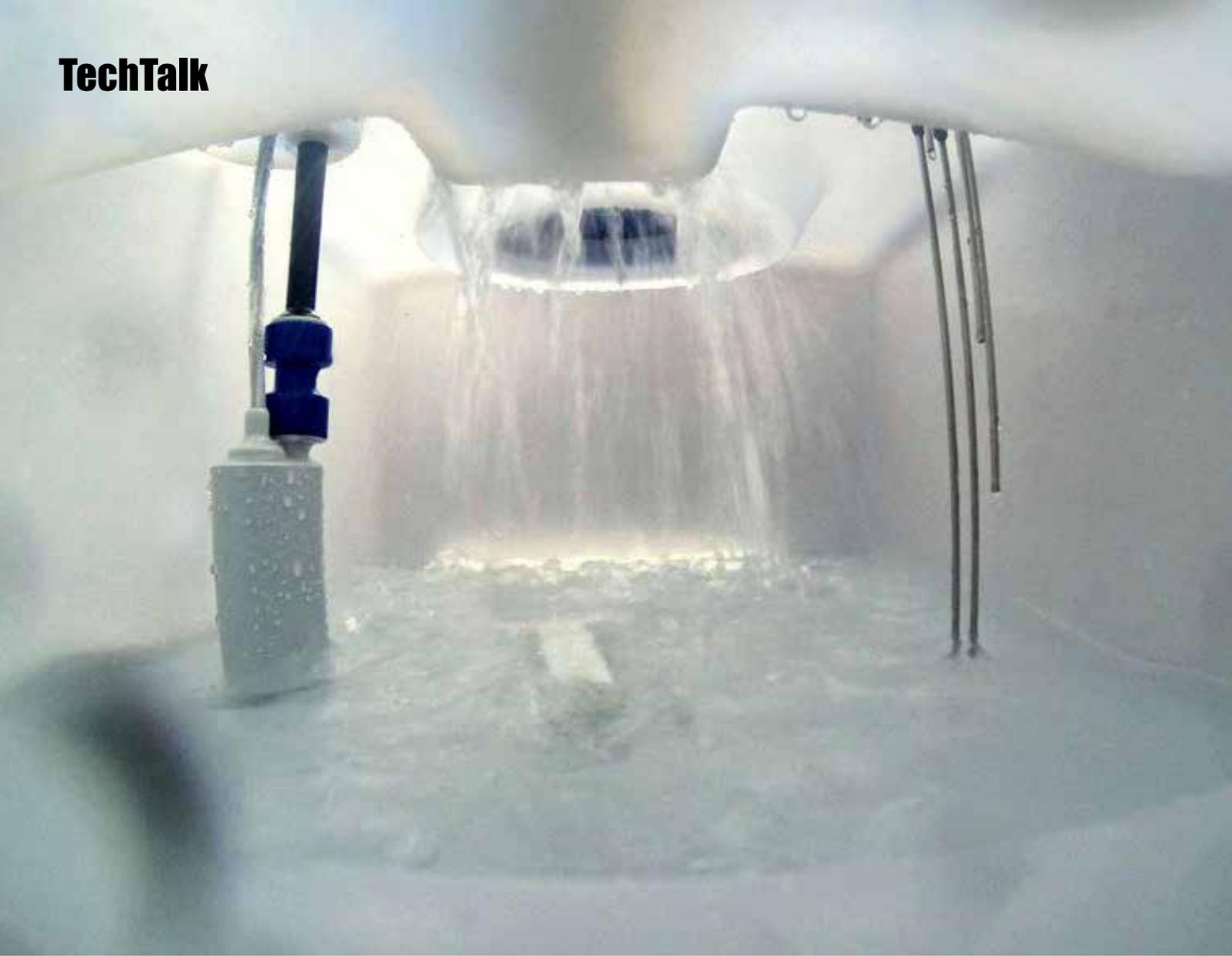
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Tanks A Lot!

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This issue we take a look at your vehicle's fresh water system and how to get the most from it. Regular maintenance is – or should be – part and parcel of the RV ownership experience. A recent survey of motorhome owners by a German magazine found 58% perform an annual system clean-out and 16% clean more than once a year, but 26% have never cleaned their systems. It's likely statistics in Australia would be the same or worse!

All except the oldest or most basic campervans and motorhomes have a fresh water tank and at least one filter fitted. Basically there are two types of filters: Those for the water pump and those to improve the quality of your fresh water.

Pump Filters

Every water pump has a filter to protect it from damage. The filter is installed between the tank and 12 V (or 24 V) pump, which you'll often find under the body of your vehicle. One reason such a filter is important is that without it most pump manufacturers will void the warranty.

These little filters often have a cap that can be unscrewed without uninstalling the whole filter. Inside the cap is usually a small fine filter that can be taken out and cleaned, which you do simply by rinsing and cleaning away any muck with clean water. As the filter's job is to protect the water pump from sand, sediment and small particles it's essential to check and clean this filter on a regular base. I would suggest



every couple of months as the job should take less than five minutes. If you find a lot of residue in the filter in a short period of time the chances are you have a lot of ‘rubbish’ in your tank. What you definitely don’t want is a broken water pump while on a trip, so check and clean the filter regularly and you’ll likely get a longer life span out of your pump too.

Other Filters

Another filter type is one that attaches to your filler hose, filtering the water before it enters the tank. One such popular product is the **inline filter** from BEST, which can also be used when connected to mains water. This way you not only prevent sediment and other solids entering, you also prevent the formation of biofilm – a slimy film of microorganisms – in your water system.

Often you’ll find drinking water filters as permanent fittings in your vehicle’s plumbing system and chances are you’ll find them somewhere underneath the sink. With these,



make sure you follow the instructions of the filter manufacture and change the filters or cartridges as required (some have reminder/information stickers). In case you’ve bought a used RV or are just unsure, change them



anyway. Such filter systems can also be fitted aftermarket and are a worthwhile inclusion in any recreational vehicle.

The life cycle of most filters is one year. However, if your system is infected with biofilm they might only last a couple of months. Such water filters not only make your water taste better, they also make it healthier and safer.

Cleaning Up

Finally, how often do you clean your RV's water system? Have you ever cleaned it? Well, there's no time like the present! It's recommended at least once a year.

If your tank has a large inspection cap – like **Fiamma tanks** – you can do a visual check and manual clean. If not, give the tank a flush by filling it while leaving the pump filter cap off to let the water run out, as a first step. Then use a tank sanitiser like **Waterpure** or **Tank Clean** to improve the quality in your fresh water tank as well as the whole system. We

recommend using proven products and not DIY recipes with baking soda, chlorine or vinegar, especially as some actually encourage biofilm development.



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Safety First!



OH&S are more than just capital letters, says our resident Techspert from [Southern Spirit Campervans...](#)



gauge must be in green area

OH&S are more than just capital letters, says our resident Techspert from Southern Spirit Campervans...

In our work shop we have noticed over the years that a lot of RV owners forget about 'health & safety' in their vehicles, especially once 'occupation' is removed from their daily routine.

Very recently a customer's pop-top awning caught fire and he only noticed when the canvas skirt was flaming away! Unfortunate there was no working smoke alarm and therefore the damage was much more extensive and expensive to repair than it would have been with early intervention.

When an vehicle is first registered or modified to become a campervan/motorhome the following is on the MUST HAVE list to get on the road:

- Fire extinguisher
- Smoke alarm

In states like Queensland, where vehicles don't have to undergo annual road worthy inspections as long as they are owned by the same person, there is no one 'official' to oversee any safety checks. For your own protection – and that of fellow travellers – you shouldn't miss the following basic checks on a very regular basis:



gas detector

Fire Extinguisher:

- Check the overall condition and especially check if the handle/release is loose or wobbly
- Check the nozzle isn't cracked or blocked, otherwise replace
- Check the pressure gauge: If needle not in the green zone replace the whole unit immediately
- Check the manufacture date of your fire extinguisher. Most often you'll find this as a stamped number on the bottom (see picture).

While manufacturers say a fire extinguisher works for around 5-15 years we recommend changing it ever 3 years. Once you've used the extinguisher – even if just a little – replace the whole unit. Last but not least, spend a second thinking about the actual location of your fire extinguisher. Is it easy to reach? Is it in the right place? For example, if you're in bed

and need to pass through the kitchen area to evacuate? Make sure its not hidden and buried behind or underneath luggage or fixtures. And while one extinguisher is the minimum legal requirement there's no law against having two, three or more!

Smoke Alarm:

- Test it on a monthly base
- Use top quality batteries and change them once a year.

Tip: Most smoke alarms have a test button on the outside that you press to hear the alarm beep (so you don't have to hold a frying pan with burning food underneath to test it!).

Changing the batteries: Most smoke alarms have a twist opening mechanism, so turn until the clip releases the unit from the wall/ceiling base plate. Turn the unit over and you will see the batteries. Make sure after changing batteries to test the alarm immediately.



manufacturer date is May 2012

Gas Detectors – LPG & CO

While a gas detector is not on the must-have list for manufacturers I believe one is a good investment if any gas appliances are fitted. For example, an LPG fridge, stove or water heater. There are different set-ups available; some are wired into the 12 V system while others are battery powered.

LPG gas detectors range in price from \$40 to \$120 and are really worth considering. For installation make sure it's less than 30 cm above the floor as LPG, like natural gas, is heavier than air. Also, make sure it's not too far from your gas appliances and/or gas sources.

The other type of gas worth detecting is carbon monoxide (CO), an odourless and colourless gas that's the byproduct of combustion. In high concentrations it causes drowsiness, unconsciousness and leads to death.

In an RV your gas appliances give off carbon monoxide, but especially the cooker as it's

unflued and inside your living area. CO is slightly lighter than air so position a detector around head height. Detectors range from less than \$10 to more than \$100, but skip the cheap imports and go with a name brand around mid price. Unlike an LPG alarm a CO detector should have a digital readout of parts per hundred million. Anything over 35 is – literally – cause for alarm! 🚨

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Flush With Success?

**RV toilets can be Heaven or Hell
according to our resident Techspert
from [Southern Spirit Campervans...](#)**



Previous page: This is what a toilet cassette looks like inside after years of use without cleaning. Enough said!

Above: Toilet cassettes require basic but regular maintenance, with the lip seal (66188) the most common wear item.

The primary thing that separates a motorhome from a campervan is a bathroom, usually complete with shower and loo. A bathroom makes your travels more independent and is certainly a must have during the night, but it's likely the loo is also the feature you dislike most in your vehicle.

Incidentally, I've seen a lot of motorhomes where owners did tell me they've stopped using the toilet and now just use the bathroom as a large storage cupboard. Sad. Most often they said the smell and hassle of waste disposal, plus leaks and discomfort were the factors that ultimately put them off. Disposing of toilet waste in most non-American vehicles is done by means of an externally accessed cassette, and that's what we're focusing on in this issue.

So, how do you get the best from your motorhome's toilet? One big thing is to use the toilet and any additives exactly the way recommend by the manufacturer. Also remember a cassette toilet needs a bit more

attention than your toilet at home. The distance from the toilet seat to the waste cassette is short and direct, so there are some rules you need to abide by to get the best from your system:

- Always make sure you open the cassette **BEFORE** using the toilet
- After use flush, then immediately close the cassette again
- Only remove the cassette when lid is closed!
- After emptying give the cassette a flush of fresh water and swirl it around to make sure **EVERYTHING** has left the tank
- Make sure when you push the cassette back into the holding compartment that it 'clicks' firmly into position (the yellow or green plastic lever clips behind the white holding brackets on the bottom). If the tank is not in the right position it might not align with the upper part of your toilet and that's when leaks happen, or the tank lid can become jammed



An old lip seal in need of replacement.

- If you have a toilet cassette compartment with small storage compartments beneath the cassette that are covered by white lids, ensure the lids (particularly the rear one) are in place. Without the covers the cassette doesn't sit properly into position and leaking can occur. Check such under-cassette areas and be sure to clean them on a regular basis.

Proper Tank Cleaning

One product that's great to clean your tank from the inside is Thetford's **Cassette Tank Cleaner**. It's the ultimate cleaning agent for regular use. Cassette Tank Cleaner is used to quickly remove the build up of stubborn calcium deposits and severe scaling found inside your waste tank – no scrubbing required! Thetford advises to use it after every major camping trip and a bottle costs around \$11.50. Click

[HERE](#) to watch a short video of it in action. Alternatively, a oxygen cleaner can be used. Either way it should become routine to clean your tank from inside.

Maintenance, repairs or refurbishment

The part that needs to be replaced most frequently is the cassette lip seal. It seals the cassette to the toilet and if broken or full of scale and grime it's most likely you'll have odours and even leaks into the bathroom. Leaks can also cause waste to run down the outside of your cassette that can pool in the area below. Quite often you'll see leaks making their way into the shower tray by running from the cassette compartment into the shower area – or even worse – under the shower tray where you have no access!

Replacing a lip seal is fairly easy and if you click [HERE](#) you can watch a video that shows how to refurbish a Thetford cassette, including replacing the lip seal. The seals themselves can be purchased very reasonably through RV online shops or even on eBay. Just be sure you check exactly which toilet you have before ordering any parts. In Europe Thetford and Dometic offer an overhaul kit for their toilets, but as yet these kits aren't available in Australia, although you can search for them online.

I suggest you use very thin toilet paper and stay away from 3-layer deluxe super soft products – they just won't dissolve! Look after your cassette toilet and it should provide years of relatively trouble free service. But neglect it at your peril! Mr & Mrs iMotorhome suggest trying to use your motorhome toilet for liquid waste only, except in emergencies. This reduces odours and makes the job of emptying and cleaning that much nicer. Happy flushing!

Suggested Products

Here are some everyday products that will help keep your cassette clean, reduce or eliminate odours and breakdown waste.

Product	Description	Amount	Cost	Cost per usage	Buy
Odour B Gone	Australian made product with multipurpose usage options that can also be used in smaller half portions	<ul style="list-style-type: none"> • 20 disks per bag • Eco-friendly and easy to use • Non-perfumed. 	\$25.00	\$1.25	http://www.odour-b-gone.com.au/Odour-B-Gone.htm
Thetford – • Aqua Kem • Aqua Rinse	<ul style="list-style-type: none"> • A Thetford product in liquid form for use in cassettes and the flush water tank. • The rinse product also protects flush water systems from developing biofilm 	<ul style="list-style-type: none"> • 75 to 100 ml per 10 L tank • Non-perfumed 	From \$18.50 for 2 L	<ul style="list-style-type: none"> • \$1.70 (Kem) • \$1.00 (Rinse) 	http://www.portapotti.com.au/
Bio Pak & Porta Pak	Easy to use satchels to drop into the cassette. Some are septic friendly.	<ul style="list-style-type: none"> • Comes in packs of 15 or 30 satchels • Deodorised 	From \$17.50	From \$1.20	Buy on eBay or online RV shops
Flush-It Traveller	100% biodegradable utilising natural bacteria to eat away smells and digests waste.	<ul style="list-style-type: none"> • 4 sachets per pack • Very easy to use • No artificial deodoriser 	\$19.00	\$4.75	http://www.biomaster.com.au/collections/traveller/products/flush-it-traveller
SOG – A chemical-free, no-smell toilet solution	A system where odours are filtered externally through a carbon filter combined with a 12 V fan	<ul style="list-style-type: none"> • One-off investment • Chemical free 	\$180-\$300 plus installation	Change filters every 6 months for less than \$30	http://www.aussietraveller.com.au/pages/products

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A Word of Awning!

**Get you awning ready for summer with
the help of our resident Techspert
from **Southern Spirit Campervans...****



A properly installed and working awning is a boon to summertime travel. However most units, especially smaller/lighter weight ones, aren't up to strong winds or heavy rain, so take care where and when you use them.

Summer is coming and it's good to find a shady spot under your awning to help make the most of outdoor living. The majority of campervans and motorhomes in Australia have what's known as a box awning and the most popular brands are **Thule Omnistor**, **Dometic** and **Fiamma**. Box awnings are designed to protect the awning tarp when not in use. You can find models with manual pull-out or wind-out mechanisms and even a 12 V motor to extend and rewind the awning. Also, with some models you can retro fit a 12 V motor if desired. Usually they set up with their legs on the ground or in brackets on the side of your vehicle.

One of the most popular box awnings is the Fiamma F45 and we'll use it as the example in this article. As much as owners love the benefits of awnings – especially in summer – it's rare they take a close look or take care of them until the day the awning is not working properly. Follow these tips to help avoid that day!

Wind carefully

When the awning has been wound in check the front and rear. You may discover that while the front end (lead bar) is sitting flush in the closed position the other end is still sticking out (see photo). This means the awning is winding-in unequally. It is important for the awning to close properly to ensure it's secure while driving and also to protect the tarp and mechanism. If that's the case try this:

TIP 1: Extend the awning around 0.5 m and check that the legs are properly clipped into the storage position and lying flat in the inside of the lead bar.

TIP 2: [Click Here](#) for a video guide from Fiamma about fixing closing issues.

Keep it Clean

Another problem is that over time the awning tarp might get smelly and you'll find mildew in several areas.



Tear-Aid is an excellent product that can greatly extend a damaged awning's life.

TIP 1: If you have to rewind the awning while wet make sure that as soon as possible you wind it out again in good weather and let it dry. Another option is to wipe it dry shortly after being closed wet, then let it dry thoroughly at the first opportunity.

TIP 2: Give your awning an occasional wash. Don't use a high pressure cleaner; instead, give it a hand wash on both side with some mild soapy water and include some drops of tea tree oil, which is anti-fungal. To reach the upper side more easily set the awning up on a steep angle. Just don't forget to let the tarp dry thoroughly after the wash. Additional you can spray and wipe the awning with some vinyl tarp rejuvenating spray for future protection.

Lubricate!

If the legs won't clip easy into the storage position or their operation is getting a bit stiff this might be due to a lack of lubrication or the wrong type of lubricant being previously used (grease can trap dirt particles in the mechanisms). In the worst cases the legs/mechanism have been forced in the wrong directions and are slightly bent, either by strong winds or human handling.

TIP: Where you see dirt and old sticky grease, remove it completely. Use a non-grease-based lubricant and operate the awning a few times to ensure the lubrication penetrates all the way into the mechanisms. Then have another close look and carefully operate: You might see a slightly bent or damaged part is causing the issues. We have had good experience with a can of Lanolin spray in these situations.

Holes?

Check the tarp for small rips and holes. Once the tarp has been damaged, wind and further use will make these small little rips larger over time and a complete tarp replacement can be expensive.

TIP: If you spot damage fix it straight away. We have used in the last years for urgent repair purposes **Tear Aid Type B**. The repair kit can be purchased for under \$15 and has the benefit of not only being clear, it doesn't become gummy. And when applied from both sides the awning often lasts a long time.

Box Damage

The outside of the box awning – especially the front and rear caps – often suffer after a while from slide impacts and scratches (like when you 'touch' a tree branch when parking). Also, UV light can make the plastics brittle.

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TIP: For small scratches use a plastic polisher after cleaning the caps. A spray-and-wipe UV protector is a good way keep the plastic parts of your awning in a good shape, too. There are several suitable products like **303 Aerospace** and others on the market that can be used

Clips

The wall mounting clips for the legs on the side of the vehicle can often be hard to open and close.

TIP 1: Check they sit on a flat surface. On some vehicles the brackets are positioned where the body panel is slight curved and this can cause difficulties fitting the legs in. If that's the case talk to a trusted RV repairer to see if the problem can be fixed.

TIP 2: Clean and lubricate the holding clips.

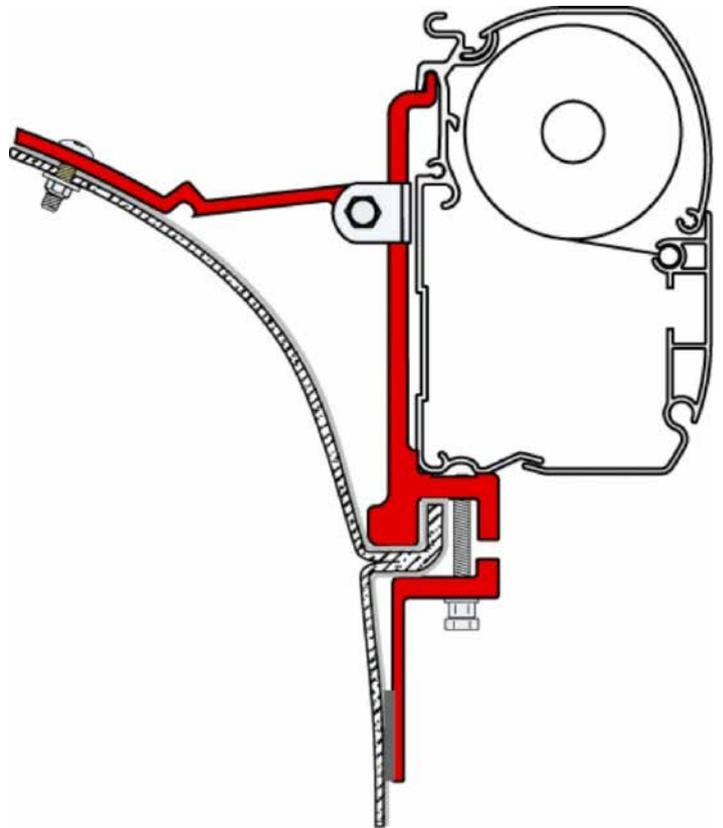
TIP 3: Change the plastic clips to the more sturdy solid aluminium ones that you can buy from your Fiamma Dealer.

Things To Watch Out For!

For the longevity of any awning:

- Don't use your awning in storms and strong winds and rain. It's best to enjoy it in calm weather and/or very light rain
- Don't leave your awning set up and go away for a long time. The weather might change, which can harm it
- Use an awning rafter (tensioning rod) to reduce flapping in the wind, especially on larger awnings

- Make sure you awning legs are pegged down to the ground
- Don't manoeuvre your vehicle while the awning is out or even partly extended!



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A Last Word of Awning!

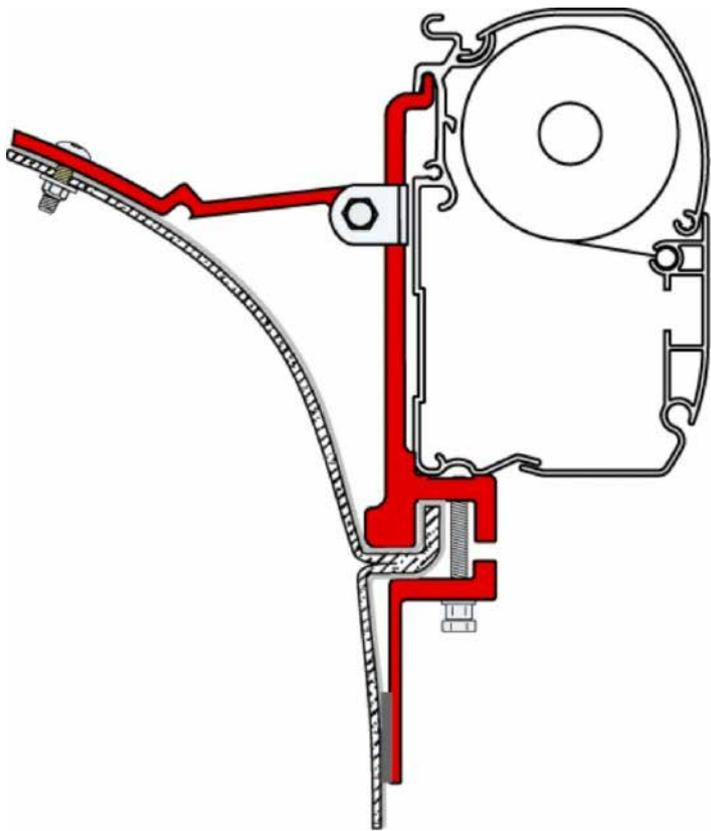
DIY awning installers beware, says our resident Techspert from Southern Spirit Campervans...

To van owners considering a DIY fitting of a wall mounted awning like Fiamma's F45 series, please pay attention to the following important advice to make sure you have fun with your awning!

Box awnings usually only come with standard wall brackets that have been designed for flat walls like you find on big coachbuilt

motorhomes. So if you own a HiAce, Transporter, Ducato, Transit, etc, you will discover there are no flat side walls at all! Also, smaller awnings need two brackets and larger ones usually need three, and manufacturers mark specific places where the brackets must be fitted to the rear of the awning. However, this is not where the brackets would fit most easily, so pay special attention. If the brackets

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DIYers take note: Make sure the awning box is vertically mounted or you'll create problems for the future.

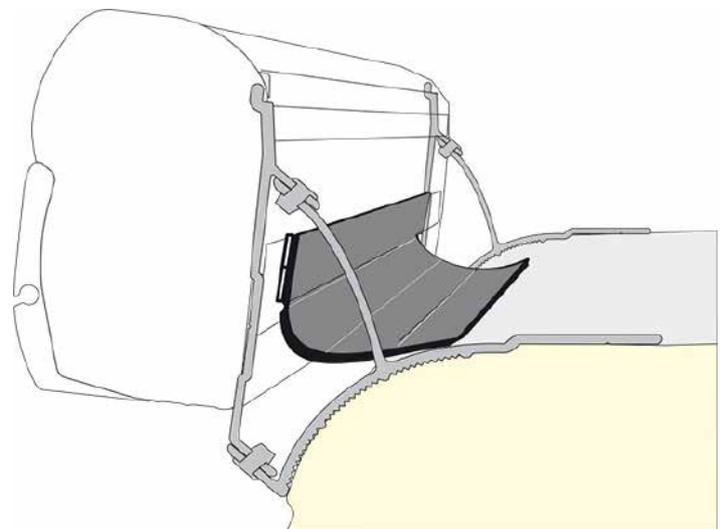
are not in the correct position along the rear it can cause huge problems for the big awning arms that support your awning when extended. Brackets in the wrong positions can, for example, cause the awning box to bow and bend. Also, they can cause fixtures like bolts to shear off after a while due to force and movement, with the awning falling off the vehicle as you travel!

Unfortunately I have seen many awnings fitted to vans – both DIY jobs and professional installations – where this vital step has been ignored. The result is the awning box doesn't sit vertically; instead usually leaning inwards towards the vehicle. This issue will harm your awning and the mechanism as you wind it in and out against gravity. Not only will it wear the mechanism much more quickly, it might result in damage to the whole awning.

The easiest solution is a bracket kit for your van, like Fiamma's Van Bracket Kit specifically for

T4 and T5 Volkswagen Transporters. Of course they also make kits for the other popular van models too. Alternatively, if you are a handy person you might be able to fabricate your own bracket adapters by using the original brackets and designing an adapter/spacer bracket.

If going to a 'professional' installer ensure the awning box is fitted vertically and is neither leaning towards or away from the side of the vehicle. Remember, in the long run getting a perfect fit at this stage is the foundation of many happy years of awning use! 🚐



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RV First Aid!

Getting a first aid kit together for your RV is vital, says our resident Techspert from [Southern Spirit Campervans...](#)

I regularly have people calling me and reporting a problem when they are on the road. Often they are in trouble in a remote location where there are no repairers, or where a repairer doesn't have the time and/or parts to solve their problems. In some cases I've been able to help customers over the phone by troubleshooting the problem, but a lack of basic tools on board becomes a real roadblock in helping them get going again.

It's common sense to carry a first aid kit when travelling, but how many of you have an RV first aid kit to basically patch up your vehicle at least enough to get it somewhere for proper repairs? Even if you're not a very handy person you should carry one, as chances are you can find a helpful soul out on the road to assist. Here's a list of things I recommend you pack away "just in case" when next you hit the road...

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Fuses

I can not say it often enough: Check where the fuses are in your RV and which ones are used, then always carry some spares. Fuses have been designed to protect appliances and 12-volt circuits, however no fuse is built to last forever. They can blow due to an electrical overload (their job), but occasionally just fail due to age, vibration or whatever.

Fuses are the first things to check if any of your 12 V appliances aren't working. Take the fuse out and check if the 'wire' is broken, which means it has blown. Often you will find several items are protected by one fuse. For example you have a fuse for the 12 V lights but there is only one fuse for several lights. So if one unit has a problem you loose use of them all. Having a spare fuse, plus maybe using some insulation tape after disconnecting the faulty light from the circuit, will fix the problem temporarily and let you use the remaining lights.

The average RV has either automotive style blade fuses (the ones with coloured plastic bodies for different amp ratings) or glass fuses. Some of them are easy to find as there is an obvious fusebox; some – like Project Polly's – are hidden behind a little panel by the switch, while others are fitted to a inline fuse holder. Also, you might find some 12 V circuit breakers

– grey little blocks that are wired inline with the cables. The little 12 V circuit breakers often have a auto reset, which means they do trip and cut of the power, but after a moment they come back on again.

Have a look inside you RV. Often you'll find fuses close to the area where your house battery is located or as mentioned above, in the switch panel. Where ever they are you must become familiar with their location and how to change them.

The colour coding of blade fuses makes it easy to see how strong (in amps) the fuse is and makes the changing with the correct replacement even easier. Colour codes for blade fuses are:

- Brown: 7.5 amp
- Red: 10 amp
- Blue: 15 amp
- Yellow: 20 amp
- Clear: 25 amp
- Green: 30 amp

Just be sure to replace like-for-like!





Tools & Other Essentials

You need a basic tool kit and the following tools will come in handy in a lot of day today scenarios:

- Shifting/adjustable spanner
- Hammer
- Small screwdriver
- Medium screwdriver
- Pliers

Check what sorts of wood and metal screws are used in your RV and buy a packet or two. They will come in very handy to replace the ones that invariably fall out as you travel!

Cable ties are another essential. Buy a selection of different sizes as they come in very handy to temporarily secure loose items or even replace a missing bolt. At a pinch you can even join them together daisy-chain style to make them longer if required! Some examples of use include securing wires, cables or plumbing hanging beneath your vehicle or for keeping a broken

awning in its box until you can get it repaired. Of course, the heavier the job the larger/thicker cable tie you'll need to use.

Velcro one-wrap straps are also good things as they are reusable. They're ideal to neatly store away a 240 V extension cord, ropes, use as curtain ties, hold in place small items, or used on an awning rafter to hang small things up, etc.

SOS Emergency/rescue silicon tape is absolutely essential! It's available from different manufacturers under various brand names and can be used to fix:

- Holes/splits in pipes/hoses in the plumbing system (hot and cold)
- Damaged 240 V extension leads
- Holes/splits in fresh or grey water connection hoses
- Broken shower hoses or failing washers from shower head to hose
- Insulate exposed 12 V wiring ends or damaged cable skins

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You can even completely wrap a house water pump if it's leaking badly, which should help enough until you can get a proper repair. It also can fix radiator hose leaks and much more. Make sure you read how to use it for best results. However, the main secret is to apply and wrap around very tightly. You can find some videos about the use of them for example by clicking [HERE](#).

Lanolin spray can be used for protection, lubrication purposes and maintenance. It's ideal for use on:

- Roof scissors that are stiff and hard to operate
- Metal drawer slides
- Hard to operate wind-out awning mechanisms
- Sliding door tracks and mechanisms on vans so they close easier

An alternative to lanolin spray is WD40, which will also do the same jobs.

Tear Aid – type A (fabric) and B (vinyl) – is great to add to your first aid kit if you have an awning and/or a pop top campervan. It's ideal to use on rips and holes in roof canvas skirts, awnings, tents and annexes. Tear aid works very well and will last for a while, and because it's clear is a nice way to repair rips and tears. For a basic instruction video click [HERE](#).



As a quick and cheap alternative you could use duct tape, but keep in mind it might leave adhesive residue on the material when taken off and should only be used for a very temporary repair as it's not UV stabilised.

How much will a first RV aid kit cost you?

This will vary and depend on the quality of tools you buy. You also might or might not have a plastic box such as a old tackle box you can re-use to hold everything. In any case an outlay of \$100 to \$250 should see you well set up, depending on just what you decide to include. However, compared to the hassle and inconvenience a minor breakdown or problem can cause when you're travelling and a long way from help, whatever you spend will be a good investment. Safe travels! 



Ask The Techspert!

If you have any maintenance questions or problems email us at techtalk@imotorhome.com.au and we'll see what we can sort out. Please include photos as well as a description of any problems and we'll share them and the answers with all our readers.



12 Volt Tips!

Tips on preserving your house battery, from our resident Techspert at Southern Spirit Campervans...

Here are some simple but effective ways to preserve your house battery's power. All you need to do is change your power consumption habits and you'll soon be able to stay longer in your favourite camping spots!

12 Volt Lights

Take a close look at the bulbs in your lights. Halogen, fluoro and LEDs are the most common. I still see a lot of

motorhomes with halogen and fluoro lights, especially outside (think awning). There is usually a way to change the whole fitting to a modern and less power consuming LED, but if not possible consider replacing the bulb with an LED. You'll save big on power with LEDs, especially if you have four or more lights on at once.

To check your bulbs take the covers off and write down the wattage of the bulb. Some lights

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have a sticker on the back but you'll need to remove the fitting to see it. Write down the wattage for each light and when finished add up all the figures to get the consumption in watts.

Say you have 4 lights and added together they consume 40 watts. Now convert this to amps as follows: Watts ÷ volts = amps. So $40\text{ W} \div 12\text{ V} = 3.33\text{ amps}$, per hour. Click [HERE](#) for an online calculator.

Your house battery is rated in amp hours (AH); for example 100 AH. This means that if all 4 lights are on for 10 hours you will have drained 33.3 amps. Swap to LED lights and you could easily reduce consumption by 50 to 60%.

TIP: If you are considering changing the light fitting check out the option of multi-voltage lights. They usually have an operating range of 9 to 33 volts instead of just 12 volts. Multi-voltage lights can therefore deal with current fluctuations and as a result will last longer. They also eliminate the flickering sometimes seen with LEDs. Replacement bulbs and new lights can be easily found in RV accessory shops, on Ebay or other online stores, or at RV shows.

Turn Things Off!

This is a simple rule but one often ignored or forgotten. It means make sure things you don't need are turned off and applies to all things such as water pumps, lights, hot

water systems, etc, but especially important is the TV (I'm referring to LCD models here). Often I see people turn off the TV with the remote but it's still in stand-by mode, meaning it's still using power. You can see this by the little red light on the front when the TV is off. An average TV in standby mode consumes 1.5 to 3.5 amps per 24 hours in your motorhome!

The same caution can apply to some antenna and antenna boosters: Make sure they are really turned off when not in use. It's also a very good idea to get into the habit of always switching off everything not in use – particularly when leaving your vehicle for a while.

Your Hungry Fridge

Make sure your fridge is used the smart way, so don't overload it and don't place warm food inside (don't under load either, a near-empty fridge takes a lot of cooling down). Also, don't open the door every 10 minutes. Get your head around what you want to take out and/or put in before opening the door, to avoid having it open too long. Try to park in the shade or at least avoid full sun on the side where the fridge is. These little hints can save you a couple of amps every day – and every little bit counts!





In iMotorhome Issue 81 I wrote a long article about your fridge and related consumption improvements. You might like to download the back issue [HERE](#) or the article as a PDF from our website [HERE](#) .

Charge and Go!

A lot of us carrying gadgets like phones, tablets, netbooks, laptops, battery chargers for cameras. etc, and for most of these you can buy 12 V adapters/chargers that fit into a 12 V socket. A good way to preserve house battery power is to charge as many devices as possible while driving, via your vehicle's 12 volt outlet/s.

Another great idea is a portable 12 V battery bank (or two) you can charge-up at home before departure, through a 12 V socket while

driving or when plugged into mains power. Some of the large battery banks are even suitable to jump start your RV in case you accidentally flatten the starter battery. Compact in size and weight and attractive in price (around \$100) they are very useful.

Ed's note: I carry a small Kogan Universal Power Bank with 11,000 mAh capacity that has 2 USB outlets (1 A and 2.1 A). It's sufficient to fully charge an iPhone 6 twice and even has a digital readout of its reserve power level. Cost was \$59 inc shipping.

Also, be sure to top up any portable devices when plugged into mains power – before departure from home or in a caravan park – or if your house batteries fully charged via solar during the day.



Inverters and 240 V Appliances

Have a good think about if you really need a 240 V inverter, especially for electronics that can run on battery power and/or be charged via 12 V sockets or USB outlets. If you have 240 V appliances to run and no access to mains power be sensitive with the size of the inverter, the wattage of the appliance and the intended length of use.

For example an 800 W microwave will use around 6 amps in only 6 minutes, while an induction cooktop on medium heat will use around 20 amps in just 15 minutes of cooking!

Also, make sure that straight after using the appliance you turn the inverter off. Most inverters suck power from your battery when switched on even if no appliances are plugged in or running.

Inverters should be used keeping in mind how easily they can drain your house batteries and how the batteries will suffer after being drained – especially repeatedly – to a low level. I highly recommend fitting a Low Voltage Disconnect device (LVD) when using an inverter as it can prevent deep draining and battery damage.



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Gas Stoves

Tips on keeping your gas cooker, well, cooking. From our resident Techspert at [Southern Spirit Campervans...](#)



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The majority of RVs have LPG cookers. Over the years, or if you have bought a used vehicle, there might be some little 'road blocks' here and there that stop it running at peak efficiency. Gas is a great and convenient way of cooking but sometimes it pays to take a closer look.

General:

- Always make sure that when your RV is in motion the LPG is turned off. You can do that on the gas bottle itself and also shut off the (yellow) valve in the gas compartment or close to the cooker. Think of it as extra insurance.

Safety:

- Check that your LPG appliances are up to date and legal. Some older vehicles from a different state or DIY builds might not have been registered as a camper/motorhome and might not be compliant



Top: Combined cooker and sink units are common but incorrect installation can cause gas supply issues.
Above: Ensure your LPG locker has a red warning sticker.

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This Dometic GasChecker makes checking LPG cylinder levels easy. Worn gas burners should be replaced and newer ones regularly cleaned to ensure efficiency and safety.

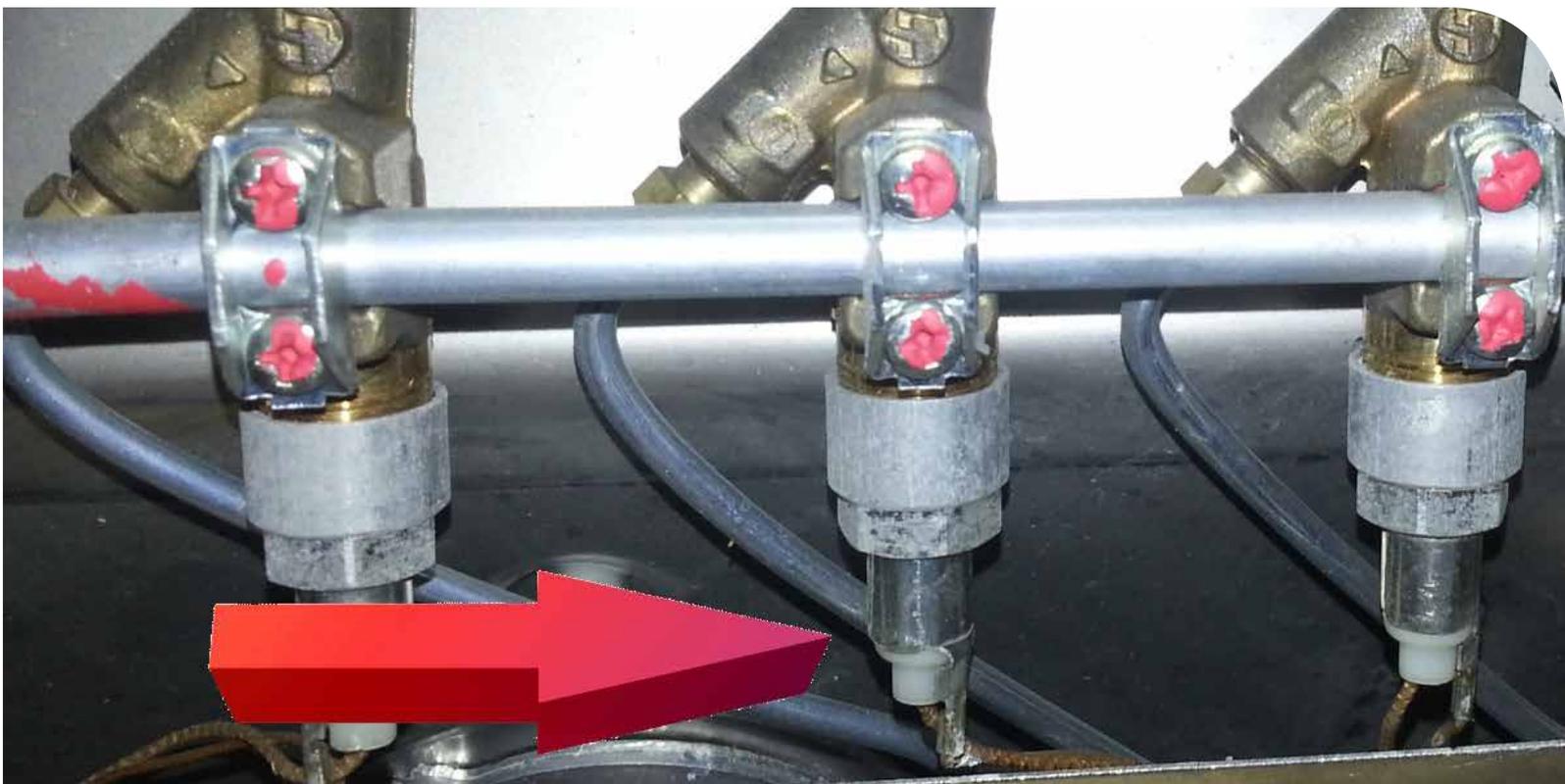
- Consider installing a gas alarm inside
- Make sure when operating gas appliances that you have sufficient ventilation
- Make sure there is a red LPG sticker on the door of your gas locker, so in case of an incident other people or emergency responders know that you have LPG on board and where the gas locker is
- Cooking with gas means a open flame, so check that you know where your fire extinguisher is and check that it's still up to date and unused ([see Issue 83](#)). Also make sure you have read the gas appliance instructions that are most often located on the door of the gas cylinder locker or on a sticker in the kitchen.
- Make sure any shut-off valves in the gas lines are open
- Make sure the 12 V power switch for the igniter is on. Sometimes you'll find a switch on the panel for both the rangehood and cooker ignition. As a standby keep some long matches onboard in case of an ignition power problem.
- If your cooker has a glass lid make sure it's open vertically (90 degrees). There is a stop on the lid hinges that blocks gas getting to the burners.
- If you are a handy person try to have a look on the bottom of the stove. Maybe the 12 V igniter cable is loose and needs to be reconnected. If the connection is dirty be sure to clean it before reconnecting.

Issues and troubleshooting

The starter button won't ignite the stove:

- It sound obvious, but make sure the gas cylinder is connected, turned on and has still gas inside

NOTE: Make sure you never bend or pull on copper gas pipes as they can crack or break. Always see an expert for gas plumbing work.



Gas supply lines under a three-burner cooktop. Any problems with gas supply should be left to a qualified expert.

One or more burners has a tiny flame, or no flame at all:

- This can often be seen on burners which are fitted in stove/sink units and on the burner closest to the water tap
- Make sure the burner/s and lid are not damaged, misshapen or squashed. Give the burner a couple of light taps with a little hammer (no heavy hammering!). Any little builds-ups that can block the jets and/or gas outlets will hopefully loosen and the flame will come back up or get larger again
- Alternatively, try to clean the jets with some compressed air and blow them clean
- Keep your stove and burners clean and dry at all time
- The flame shuts down or dies shortly after igniting the stove

Refer to the picture with the red arrow. This connection could be loose and need careful tightening. The picture is taken from the bottom of a three burner stove.

Handy tip:

In case you are wondering how much gas you have still in the cylinder:

- Boil some water and pour it slowly over the cylinder. You'll see a small white ring where the gas level is!
- There are now some very handy gas level indicators, such as the Gas Pen from Dometic

Please keep in mind that when you work on your stove you do so at your own risk and you are liable for any damage that might occur. If you are unsure about the problem with your stove please see a licensed LPG plumber who is authorised to work on RV systems, or your trusted local RV repair business.