

# The MURVI Club Newsletter

Autumn 2023



Happy Campers at Malvern

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## Editorial

Due to a number of factors including a late trip into France then the expiry of my computer this Edition is yet again published later than I would have liked. However, the Meteorological Office say winter doesn't start this year until 22<sup>nd</sup> December so I guess it isn't too late to publish the Autumn edition of the Murvi club Newsletter.

Thanks to the excellent response from Members it is a full edition with rallies, trips and technical matters covered. As always, I take full blame for all errors and spelling mistakes!

## Inverter

### David White

In a previous e-mail to the group, I asked some questions before I embarked on installing an inverter in my 2018 Morocco. I have now installed it and as requested by a couple of people, here is how I got on. There are some very knowledgeable people on here so If I have done anything amiss, please let me know.

To think about first:

- The main thing here is the amount of power you need and what is feasible from the battery. My requirement was for a hair dryer and possibly a Kettle to limit the use of LPG which is becoming harder to get.
- Be realistic. My early thoughts were ridiculously high as to the the ability to draw large amounts of power.

I will let you know at the end as to what I was able to achieve. Rex gives excellent advice if in doubt.

Take aways:

- The key is to work out how much power you need. I wanted an 800W hair dryer and a 1Kw kettle. You should then double it for the size of inverter to avoid strain. Hence, I went for a 2 KW inverter, but will only use half its power.
- Inverters are very cheap now and mine cost £254, though I could have bought cheaper.
- Locate the inverter next to the battery due to voltage drop over long cables.
- Get good leads from the battery to the inverter. I used 25mm<sup>2</sup> cable as you get a large power drop with thin cables.
- Insert a circuit breaker between the battery and inverter, for protection and also isolation
- Get an inverter with a remote on/off switch
- Do you need pure sine wave? I went for it as less likelihood of damage to items connected to the inverter. If you are going to charge electronic stuff then pure sine wave is essential.
- Make sure you connect the cables to alternate batteries, if both leads are connected to one battery, even though the other battery is connected to it, the first battery will take the majority of the load.

The detail.

I wanted to power a hair dryer and a kettle. Maximum power draw is 1000 watts though realistically it's 800. I double this and bought 2kw inverter, a Novopal 2000W Pure Sine Wave Inverter 12V to 230V 240V Car Converter Power Inverter with LCD Display, 2 AC Outlets and USB Port-Remote Control for Motorhomes, from amazon.



Reason I choose this model is that there were lots of good reviews. On amazon there are loads of inverters, from £45. I don't want to be the first one to use something, so good reviews were key.

Price, I could have spent a thousand pounds or more on more established names such as Victron, but my usage is light and infrequent, so I felt it was not worth the expense. It's a pure sine wave, just as the mains power is a sine wave. There are cheaper inverters that produce power with a jagged sine wave (known as "modified sine wave"). This can be harmful to delicate electronics and some electrical motors. For the small cost saving I went pure sine wave, for peace of mind and ability to connect anything to the inverter.

Remote switch. There are two reasons for this. The first, is power drain when not in use. There are several stories going round on the use of battery power when the Inverter is switched off, and a remote switch ensures that when it is off then no power is taken by the inverter.

The second is convenience. The inverter ideally needs to be near the battery which means it is in an out of the way place so is not easy to switch on and off. It also gives peace of mind in that you can see the state of the battery easily and also you can be sure the unit is off if you have and self-doubt issues, as to whether you turned it off or not.

Lastly, I chose this unit for its size. The Morocco batteries are behind the bed. There are 2 X 100 AH batteries behind a wooden panel that is held in place by two screws. On either side of this panel there are two stage areas that I use for infrequently used items. The one on the right was a perfect size to take the inverter and is right next to the batteries and fits perfectly in this space.



After screwing the inverter to the back wall, I then installed a circuit breaker. I used RED WOLF 150A Circuit Breaker Waterproof Car Audio Inline Circuit Breaker w/Manual Reset Fuse Holder Inverter, for Car Motor Marine Boat, for Car Audio Solar Inverter, from Amazon at £14.99. This is connected between the battery and the inverter for Over voltage protection but also for long periods when not in use I can isolate power to the inverter.



This circuit breaker can be used as a kill switch. When you push the reset button, the circuit will be cut off automatically. To make the circuit on, you need to push the reset arm back

Once these are in place you can then measure how long you need for each cable to connect the battery to the inverter. I used sunshinesolar.co.uk. They were a good price at £24, and came fitted with terminations and shipped the next day. These were the 25mm<sup>2</sup> cables which are needed as the voltage loss on thin cables is huge. The inverter did come with 2 cables but these were too short and too thin.

Make sure you have the cables connected to different batteries so they share the load rather than connected to one battery even if it gives you shorter cables. I used black cable direct from the battery to the inverter and two red cables, one from the battery to the circuit breaker and another from the circuit breaker to the inverter. The cables are very flexible so easy to install.

Once this was done, I did a test to make sure it is working before moving onto the wiring on the 240v side.

I used 2.5mm<sup>2</sup> cable from the inverter as I installed 2 sockets over 5m of cable. The cabling went from the inverter to the back of the wardrobe and I installed one socket in the wardrobe at the top



The cable for the remote on/off switch followed this cable and mounted below this socket but facing the outside of the wardrobe. I then fed the cable from the socket through the ceiling void (I removed the Fan that gave me access to this area to the rear of the van where I installed the second socket in the kitchen next to the bathroom door. Very fiddly to get the cable through but worth it as this cable is completely hidden.



The end result of this work is I am very pleased with the inverter, and the installation looks neat.

In terms of operation, yes the hair dryer on a low setting (800 watts) works fine and my wife is very happy with it. You cannot use it at a full setting which is 1500 watts as this takes way too much power from the battery and will just almost instantly drain it.

Also, at 800 watts it is not used for long and with it being switched on and off when being used means the battery has a little recovery. I have a 2 panel solar system so charging of the batteries is very good.

As regards the kettle at 1000 watts. This is a no go. It will run it but a huge drain and would kill the battery if left on to boil a kettle, let alone doing this several times a day (we drink a lot of tea). I tried also with a 600 watt kettle. This starts ok but as it takes a fair amount of time, the battery was being taxed and was starting to get near battery damage level, so I stopped this before it boiled. So not a success. More battery power is needed if I want to use them for serious kettle boiling, so will stay with gas in the meantime.

It should be noted that my batteries are 5 years old so not perfect for delivering optimum power.

# Malvern Rally Photographs

**Graham Collins**

[Captions by the Editor]

Say Cheese!



And again, Cheese!



One last time – say Cheese. What do you mean “No”?



## Tour de France

**Penny McCallig**

We always watch the Tour highlights and decided to see it live this year. Made a very rough plan and set off near the end of June. First stop at Pont de L’Arche, parking outside the campsite accompanied by birdsong from nesting martins. It’s a thriving village with tempting boulangeries and cafes.

Panic the next day as I’d left the Camping Car Park card at home, but soon sorted over the phone and a new card issued. We meandered south, loving the fields of sunflowers and wildflower meadows where Andrew was able to fly his planes.

Our first view of the cycling was at Irun, just over the border in Spain, where half the town gathered at bars in the main square so they could dash over to see the spectacle along the road and then return to socializing, drinking and tapas.

We made time to visit our favourite places: San Sebastian, and Hendaye for swimming – there’s a new cycle track from Irun now, around the marina to the beach.

People may say you see more of the Tour on TV, but there's nothing to beat the atmosphere and excitement as everyone waits for the Caravan of advertising vehicles that precede the main event. Towns and villages where the race is passing through set up big screens and the bars show TV coverage. Families and friends all join in the festivities.

Over the next couple of weeks, we drove north and west, staying sometimes at Camping de mon Village – former municipal sites now run by the Camping-Car Park organisation. Basic but clean facilities, and very good value.

Revolution laiveries (washing machines) are very useful, often in supermarket car parks, you can leave the washing while you shop. Ideal if you're staying on aires rather than campsites.

A nice stop off near Bergerac is the Ferme d'Eydi at St Germain et Mons. No services but a farm shop where we bought delicious homemade ice cream, local walnuts and honey. Also, a lovely greenway to cycle along the Dordogne.



Saint Hilaire les Places has an ACSI campsite, a Camping-Car Park next to a swimming lake, and a village bakery, so ideal for watching the Tour pass a few Km away. We settled down to wait at the roadside, opposite a large family of all ages from small children to an old lady in a wheelchair. The kids sprayed her with water to combat the heat and kindly asked us if we wanted the same treatment. As the caravan came through, they all shouted for 'cadeau' and sure enough collected lots of booty. That was



the day Mark Cavendish had to abandon the race so we were sad he wouldn't win another stage this year.

Several days later we reached Chatel in the French Alps, where the telecabine took us up above the town and after a short walk we were in Switzerland. The mountain stages of the Tour are the most exciting, but also the most crowded and not easily accessible as the roads are closed to make way for the race.

We enjoyed it so much we set off to see the Vuelta in Spain, at the end of August, but sadly had to return after one night when our Webasto developed a leak and flooded the floor - but that's another story.



## Mirror, Mirror

### Lindsay Paterson

I have always had issues with the driver's door mirror. The field of view was always along the side of the van so I bit the bullet and bought a new mirror.

The replacement of the mirror is covered in many YouTube videos. I replaced the driver's mirror with the new one and the field of view was enhanced.

I measured the angles, comparing old and new. The new mirror (shown on the left next page) was not at such an acute angle. The pictures show the relative differences. I believe the wrong mirror can be fitted, from a LHD van, and this is what I had originally.

[Editor's Note: Mirror glass is available in flat and convex. The latter gives a wider angle of view. As Lindsay discovered ones for LHD vehicles are built with different angles to RHD ones. The view from the passenger's seat in the image on the right below would probably be perfect.]





## Gas Free Murvi

### Mervyn De'ath

Your first question is probably why? Probably the main reason is the engineering challenge, 'is it really possible?'. In addition, I was spurred on by the difficulty of finding LPG gas refill stations in the wilds of Scotland and the surrounding islands. Also, if you get rid of the gas you get rid of the risk of fire, explosion and carbon monoxide poisoning, so worth considering.

I did some YouTube research on van electrical systems and found lots of channels detailing serious 3KW+ 240V electric systems with some van convertors now only providing gas free vans (see Victron Van Land). So definitely possible but probably difficult to shoehorn into the Murvi.

I initially considered getting Rex to build a new van with an all electric specification but decided that the extended timescale for new builds, plus the added cost of perhaps £40K over the likely sale price of our 2014 Morocco XL ruled that out, so I decided to re-engineer our existing van.

We already had a 1KW inverter which was fine for powering a small electric kettle (800W) or a toaster (600W) or a milk frother (600W) but only one at a time. If we were to also run an induction hob (typically 1KW per ring) and or an electric oven we were going to need at least a 3KW inverter. Now

to run 3KW from a 12 volt battery will require about 250 Amps (A) continuous from the batteries. This fact directly led to the choice of batteries.

Lithium batteries need the protection of a battery management system (BMS) to prevent overheating when charging and damage when cold. They also need protection from over discharge, too much current or too low voltage. Many Lithium batteries come with a built in BMS but these have a lower limit on their maximum current draw, typically 100A. Since I only had room for two batteries, 2x100A was not going to meet the need. I settled on the very expensive Victron 200Ah batteries which could each supply 200A giving me a maximum of 400A. These batteries needed an external BMS.

I planned on using the Victron MultiPlus 3KVA inverter because the Victron units have a very important feature called power assist. When on a campsite with electric hook-up, the 16A supply can provide about 3.5KW, but an all-electric van will have a load greater than that, particularly in the winter when you might be using electric heating. The Victron inverter can top up the incoming supply, so in theory you could have 3.5KW shore power plus 3KW inverter giving 6.5KW. So, when plugged in you can run pretty much everything at the same time without tripping the site breaker. When the cooking stops the spare shore power automatically starts re-charging the batteries.

The next issue is how do you charge the batteries. Ideally you would cover the roof with solar panels and only camp somewhere sunny, e.g. California. That does not work here and we only managed to get a single 200W solar panel on the roof of the van. Our batteries store nearly 5KWh of electricity, that is 1KW for 5 hours, so to fully charge them from the solar panel at maximum output would take 25 very sunny hours. In practice you do well to average half the rated output over the daylight hours so about 1Kwh per day. Charging from the engine alternator is of course also available as is fitting a second alternator. The Victron Orion charge controller we used provides 360W of charging when the engine is running so about 14 hours driving to fully charge the batteries. In practice the batteries are rarely, if ever, fully discharged and a mixture of driving and solar will just about keep up with your daily use.

We only occasionally wild camp and the aim is to be able to survive on the batteries for a maximum of 2 nights. If we are careful, we can cook, make drinks, run the fridge and wash etc for a day on 2-3KWh. Provided it does not rain all day we will get some top-up from solar, plus we also have a folding solar panel which provides a further 200W. Ideally together they will provide over 2KWh a day.

We typically stay on CLs which increasingly provide electric hook-up so when we plug in the batteries will charge at over 1KW and can therefore charge to full in under 5 hours.

The conversion was done in phases because we did not want to take out the gas cooker until we were confident that all electrics were reliable and solar was possible in our climate. The first step was to install all the electrical equipment.

200W solar panel with Victron 15A solar charge controller

Additional Solar charge controller for the portable solar panel

Victron Orion 30A DC-DC charge controller energy from the alternator

2x Victron 200Ah Lithium batteries

Victron MultiPlus 3KVA inverter

Victron Lynx BMS battery management system

Victron Lynx Busbar and fuses

Victron 65A electronic switch to switch off the 12v supply to the Murvi fuse box.

The first picture shows the equipment mounted on the panel at the back of the wardrobe and the



second one (next page) the view into the wardrobe showing the inverter mounted in the top half.



The next job was to replace the 3-way fridge with a 12V compressor version. Compressor fridges are about 3 times as efficient as the 3-way absorption types and will use around 250-300Wh per day.

We have found the change of fridge to be a transformation. We switch it on a few hours before we set off and just let it run. The freezer section remains cool enough to keep frozen food OK for a few days without worrying that we forgot to switch over to gas when we parked for a few hours.

Having installed the electric system and the new fridge we went on a short shake down trip, the first of the year, before we embarked on our 6-8 week tour to Scotland and Orkney. It was after we had descended a steep hill that we noticed water running across the floor from the bottom of the wardrobe. First trip of the year, after a winter with some cold periods, a leak in the Webasto dual-top heater was the prime suspect. Inspection of the heater in the base of the wardrobe confirmed that there had been water accumulating there over some time. We discovered through extensive internet

searches that 1: the Dual top was obsolete 2: there were no replacement boilers available anywhere 3: eBay had a complete unit for sale in America for \$9000 4: the nearest service agent could not even look at it for 3 months.

A trip to Orkney without a working heater was not on. I decided that since we now had 3KW of power available I would fit an electric water heater and continue to use the Dual Top as an air heater only. I found a 6 litre heater with 850W element which claimed to heat the water from 10-60°C in 20 minutes. The heater would fit in the bottom of the wardrobe and the plumbing from the dual-top could be re-routed fairly easily. Two weeks later we were ready to go.



The Orkney trip was a great success, after a couple of early issues which were easily resolved the hot water and electrics worked really well. Getting hot water for a morning shower was transformed. Previously we used to program the Webasto to come on a 6 a.m. with a heating temperature of 10°C so that we could run it for a couple of hours heating the water, then at 8 a.m. the program would raise the set point to 20°C to heat the cabin. This worked OK when on diesel but when on electric even at 2KW it was hit and miss as to what temperature the shower would be. With the electric heater we switch it on when we make the first cup of tea of the day and 15 mins later we have a tank of water at 60°C. Since this needs to be mixed with some cold for the shower you are guaranteed to get a good hot shower. The second person can take a shower pretty much straight away because although the tank temperature is now reduced it is not much below 40°C otherwise the earlier shower would have

run cold so it only takes 5 mins or so to get the tank back to 60C. So much better, the early morning angst at shower time is completely removed. After we returned from Orkney it was time to finally remove the gas cooker. We had taken a portable induction hob with us on the trip and had convinced ourselves that all electric cooking was going to be OK. The gas stove was removed and a stainless steel



worktop cover used to fill the gap. This had a cutout for a two ring induction hob. Below this with a bit of carpentry I fitted a small electric oven.

We have taken two short trips since going all electric and are very happy with the transformation, the only issue left is we have a LPG tank under the van half full of gas which we need to empty and remove. I did try emptying it by running the gas cooker for a few hours prior to removing it but had to stop because of the build up of heat on the headlining. This was with all the doors open.

We still have the external gas point connected so we could get a gas BBQ to use up the gas over the next few years.

# A Mystery Damp Carpet

John Laidler

A week into our autumn holiday in France this year we spotted a damp patch in the middle of the carpet. It was exactly where the dog sleeps so he was our first suspect but a tentative “sniff test” did not detect any doggy smells. More investigation revealed it was fresh water but we had no idea where it was coming from. There are no pipes under the floor at this point and the pump was not cutting in and out which is the usual sign of a leak in the water system.

A few days later, after much head scratching, I opened the rear door behind the kitchen to see if I could find a leak here – and was successful. Designs may differ but our Murvi water tank has a large red access cap halfway up it and a trickle of water was coming from the cap. I managed to reduce but not stop the leak by tightening the cap a fraction of a turn. I also pushed a microfibre cloth under the strap below the cap to catch what water was still leaking. The combination of these measures brought the leak under control to the extent I decided not to try anything further while we were away and wait until we were home and I could take time over doing a repair.

After draining the tank the cap was easily removed although a zip tie securing a water pipe, visible in one of the images below, had to be cut in order to get the cap off completely.

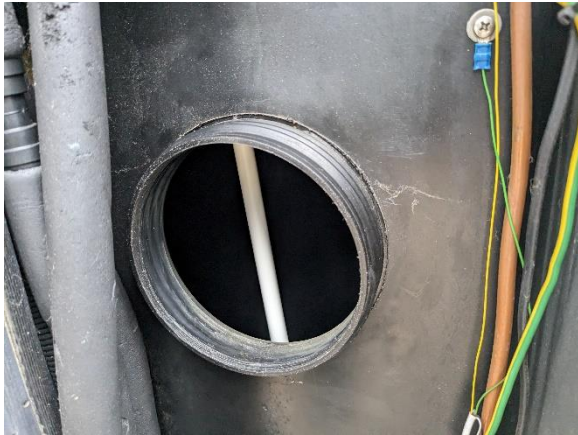
Once the cap was removed, I found the old sealant under it, which was not difficult to remove. The cap also has a soft foam washer but as the label on the cap says, sealer must be used when refitting it. I bought a tube of Dow 781 sealant which says it is safe to be used with drinking water. A bead of this was applied to the cap which was then carefully screwed back into place. I left it for 72 hours with both the drain and filling points open so a bit of air could circulate through the inside of the tank. With fingers crossed I then refilled the cap and so far the leak has not returned.

The real problem with dealing with the leak was drying out the vehicle afterwards. The water had dripped onto the plywood floor and gone under it as well. I can only assume the damp patch we discovered is at the lowest point of the floor. We have been running a dehumidifier in the vehicle continually at time of writing for three weeks and I think it is almost dry now. I bought a £10 damp meter which has two spikes you can press into wood or walls to measure the moisture content. It works well on carpets too and with it I have observed the patch of carpet it considers damp growing smaller. The amount of water we are emptying out of the dehumidifier each day is also reducing significantly. The good news is so far, we can find no long-term damage. The floor remains flat and although I will continue to monitor the carpet for damp, we seem to have got away with it.

The tightened cap and microfibre cloth to catch the drips can be seen on the right.



Cap removed (left). The water is drawn from the top of the tank through the white pipe which reaches down to the bottom of the tank. Old sealant on the underside of the cap (right).



New sealant applied (left). Cap replaced and new zip-tie added to secure the water pipes (right).



## Next Edition

The next edition will be published at the end of January 2024 and a request for contributions will be posted in December – but you don't have to wait! Just email anything you have to the following address at any time. [newsletter@hub.murviclub.org.uk](mailto:newsletter@hub.murviclub.org.uk)