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WATER SYSTEM & OPERATING INSTRUCTIONS

WATER SYSTEM

General

The motorhome is fitted with a fresh water supply system and a waste water system. All water hose used in the system is flexible non-toxic food quality hose and all plastic parts in the system conform to Directive 90/128/EEC.

Fresh water tanks are located under the vehicle floor.

Water level indicator display is on the digital electrical control panel located adjacent to the habitation door. The fresh water is moved through the system by a pressure switch.

Waste Tank

The waste water tank is fitted underneath the vehicle, just behind the rear wheels and incorporates a drain tap and inspection cap.

Water Level Indicator

The water level indicator digital display is mounted on the panel above the sliding door on the Pace and Tempo, for the Rhythm on the wardrobe side.

Filling the Fresh Water Tank

Fill the tank through the exterior filler cap identified with the FRESH WATER transfer. Water flowing from the overflow pipe indicates a full tank.

Fresh water system

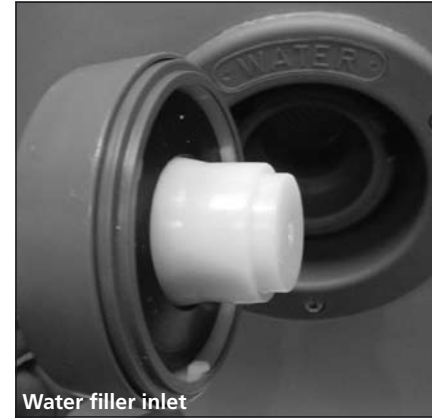
- (i) All fittings, including the holding tank, water pipes, taps and connections are of food quality material (to BS6920) and therefore, should not affect the quality of the water used. It is recommended however, that the system is flushed through twice before it is used for the first time, and always cleaned/flushed after it has stood unused for a period of time (eg over the winter period). Care has been taken (using smooth bore pipes etc) to eliminate as many water traps as possible.

- (ii) When filling the fresh water system remember to check that the water source is suitable for use as drinking water and, if you are using a hose pipe or water carrier, that it is also made from nontoxic materials (preferably food quality material).
- (iii) The fresh water tank may be drained either via a plug in the base of the tank accessible via the cleaning hatch or by the drain tap situated below the skirt panel (model specific).



- (iv) The fresh water system is pressurised by a pump which will continue to operate until it senses a pre-set pressure in the system.

WARNING: If the fresh water tank is completely empty the pump will be unable to pressurise the system and will operate continuously. In this situation it is essential that, in order to avoid damage to the pump, it is switched off using the pump isolator switch on the distribution panel until such time as the water tank has been filled.



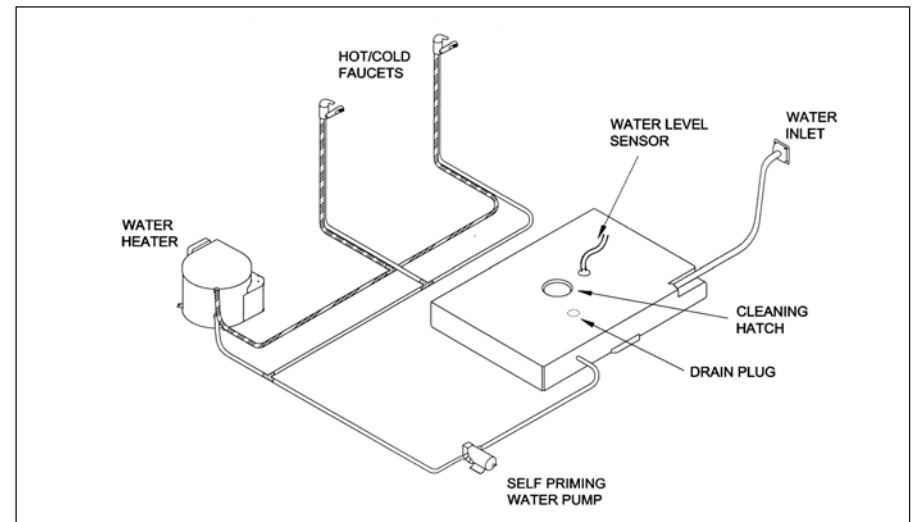
Waste water system

- (i) The waste water holding tank is secured underneath the chassis of your motorhome and is gravity fed.
- (ii) In order to eliminate unpleasant odours as much as possible, only smooth bore pipes are used. These are fitted with waste traps under the floor which should be cleaned periodically by unscrewing the lid and flushing with clean water.

However, should the waste water tank be overfilled, then the waste water will backfill the drain pipes until it eventually appears in the shower base. In order to prevent this, please take note of part (iii).

- (iii) The waste water gauge shows the level of the tank, it is therefore, recommended that the waste water tank is checked on a daily basis, emptying when required. This is done by opening the valve located just beneath the side skirt on the exterior of the Motorhome.

It should be emptied either directly, or via a waste water container (not supplied) into a designated waste water area.



Fresh Water Tank

Your motorhome is fitted with a water tank filled from the outside via a lockable water filler cap. When filling, use a hose manufactured from non toxic material, to prevent tainting of the water. Remember, if the water heater has been drained it will require 2.2 gal/ 10 litre or 2.6 gal/ 12 litre (dependant upon model) of water to fill it.

To do this open all hot water taps (except shower) and run pump until water comes from the taps.

Top up fresh water tank after priming the water system. As with the waste tank, a valve is fitted in the skirt area allowing drainage of the fresh water tank.

Please ensure all taps are fully turned off when not in use.

We recommend the use of Milton 2 sterilising fluid for cleaning and sterilising the water tank and system.

An explanatory leaflet is available from: The Milton Food Hygiene Advisory Service, Whitehall Lane, Egham, Surrey, TW20 9NW

Guidance on cleaning portable water tanks and the water system in motor caravans

The water systems, and in particular storage tanks, in Caravans or Motorhomes are susceptible to contamination by bacteria if care is not taken with their use and cleaning.

The symptoms caused by bacterial contamination are not purely limited to gastrointestinal diseases, but may also manifest themselves as ear, nose, throat, eye or skin infections. It is therefore important that you carry out the following procedure prior to using the Caravan or Motorhome each time, even if you boil or filter all water you use for drinking.

Separate Water Containers

1. All water remaining in the container should be disposed of so that the container is empty.
2. The outside of the container should be thoroughly cleansed and washed down to remove any dirt, dust or other contaminant. Water at a suitably hot temperature containing an appropriate detergent is recommended for this purpose.
3. Water should be put in the container, swirled around, then emptied out.
4. The container should then be totally filled with water containing an appropriate sterilant solution and allowed to stand for the recommended contact time (e.g. Milton for 15 minutes).
5. The solution should be emptied from the container.
6. The opening of the container should be cleaned thoroughly with an appropriate prepared wipe impregnated with a sterilant.
7. The container should be inverted whilst stored overnight (if possible).
8. The container must be filled with mains water only and mains water only should be used for the above cleaning procedure.
9. On no account should garden hoses be used to fill water tanks.

For Systems:

1. Drain down the system (open all taps to allow air in, enabling the system to drain quickly).
2. Remove any water filters fitted, and replace with a short length of hose or empty filter cartridge (this will ensure the filter is not affected by the disinfectant/sterilant solution).
3. Fill the system by using the pump with a disinfectant/sterilant solution (check that the solution at full strength appears at all taps/showers). Allow to stand for the recommended period of time.

4. Drain the system completely.
5. Thoroughly clean the outside of all taps/ connectors with a cloth soaked in the disinfectant/sterilant.
6. Flush the system through with clean drinking water until no traces of disinfectant/sterilant can be detected at any tap.
7. Replace the filter. Suitable sterilising chemicals are available from your Caravan or Motorhome dealer, accessory shop, chemist or home-brew shops. It is not, however, recommended to use bleach or sodium metabisulphite.

This guidance has been prepared with the kind co-operation and assistance of The Environmental Health Department of The Borough Council of King's Lynn and West Norfolk.

Warranty

Products are guaranteed from the date of purchase against defects in materials and workmanship. If the unit proves faulty, return it to your supplier with proof of purchase and purchase date. Please note that frost damage is not a valid warranty claim. The manufacturer retains the right to repair or replace the unit. The manufacturer cannot be held responsible for claims arising from incorrect installation, unauthorised modification or misuse of the product. The above does not affect your statutory rights.

Draining the Fresh Water Tank

Drain tap located on the right-hand side of the vehicle below floor. The tank should be drained prior to a period of not being used or during winter months.

Draining the Waste Water Tank

Open the exterior drain tap at the rear, right-hand side of the motorhome. It is recommended that the waste tank is drained at frequent intervals (e.g. daily) when on site.

Water system winterisation

Motorhomes may be in use during the winter but when not in use, even for short periods, the water system must be completely drained.

One night of freezing temperatures is all that is required to cause expensive permanent damage to water system components. Frost damage may not be claimed under the motorhome warranty.

To drain the system, proceed as follows:

1. Park the motorhome on level ground.
2. Ensure that the gas and electric supplies are turned off.
3. Open all hot and cold taps.
4. Drain fresh water tank as described.
5. Drain the waste water tank as described.

Water system will now drain - allow approximately 5 minutes.

6. Leave all taps open, see Water Heater instructions for winterisation of the heater.

Setting up the Water System

1. Replace/close all drain valves and plugs.
2. Close all taps.
 - (a) Check all plumbing connections.
 - (b) It is recommended at this point to sterilise your water tank and flush the system through with a proprietary sterilising fluid obtainable from chemists.

Do not use domestic bleach, camden tablets or sodium metasilphide.

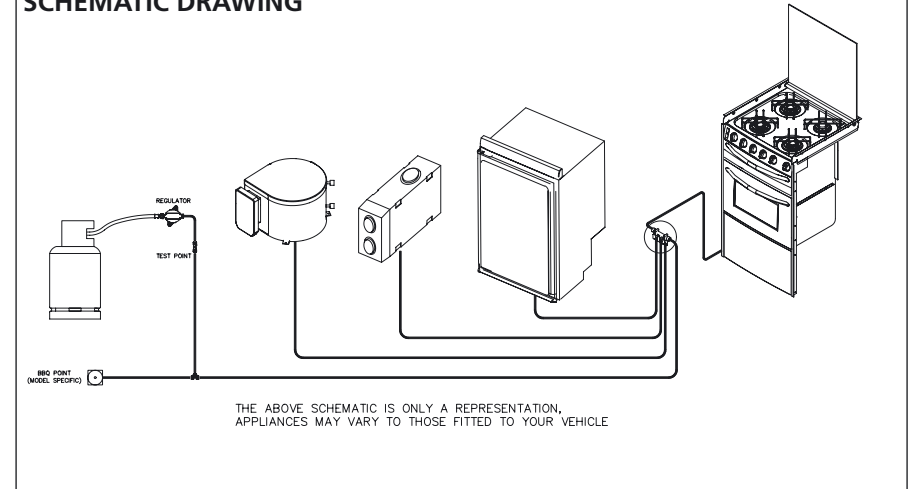
Pressure sensitive water pump**Setting up the Water System****Check out Procedure**

Examine the installation. Ensure all pipes and connections are fitted and tight, there are no kinks in the hoses and the battery is fully charged (or a 12V DC converter of at least 10 amp capacity if used).

Initial Operation

1. Fill the tank with water.
2. Open all taps - hot and cold.
3. Switch pump to 'ON' position. Allow time for the hot water tank to fill. Shut off each tap as flow becomes steady and free of air. Shutting off the last tap should cause the pump to shut off.

To check for leaks a positive pressure check with a pressure gauge is recommended. A drop in pressure with all taps off will indicate a leak in the system. Correct all leaks, no matter how small.

TYPICAL GAS SCHEMATIC DRAWING**Gas****GENERAL INFORMATION****Gas Bottles**

Bottled Liquefied Petroleum Gas (LPG) is the most convenient portable source of fuel for your vehicle.

Unless en-route heating has been installed, make sure that heating and cooking appliances and the gas cylinders are switched off before you move the vehicle.

Regularly check flexible gas hose, joints and connections for tightness. Finally make sure that each gas appliance is working efficiently to the recommendations of the appliance manufacturers.

Only use gas bottle cylinders that are located within their dedicated position within the gas bottle housing, never extend hose - hose lengths must not exceed 400mm.

Regulator

Your vehicle is supplied with a wall mounted gas regulator plumbed inside the gas bottle compartment. The regulator and all appliances work at a harmonised 30mb pressure, which work with Butane and Propane gas.

Pressure regulation system in this vehicle has a fixed working pressure of 30 mbar with a flow rate of either 1.2 kg/H or 1.5kg/H and complies with the requirements of EN 12864 annex D.

We do not recommend the use of an inline LPG BBQ with the 1.2kg/H regulator when other LPG appliances are in use.

Note: Unless en-route heating has been installed the regulator valves should always be in the 'OFF' position when driving.

**Standard regulator****Gas Hoses**

High-pressure hoses or pigtails as they are called must be used with the new style regulator.

LPG bottle i.e. Propane, Butane, BP and

Camping Gaz cylinders all have unique bottle adaptor connections. It is important to check you have the correct hose and adaptor to suit your gas bottles.

Push on hoses are no longer permitted under the latest regulations.

The new high-pressure hoses have threaded connections and must be securely attached to the regulator and to the gas bottle.

Ensure that there is a constant rise in the flexible gas hose between the gas bottle outlet and the regulator elbow.

WARNING: Inspect flexible gas hose(s) regularly for deterioration and renew as necessary with the approved type, in any case no later than 5 years after the date of manufacture marked on the hose.

WARNING: Ensure hoses do not become entangled in door mechanism.

TYPES OF GAS

Butane

Butane is supplied in the UK in green, blue or aluminium bottles.

All these have a male left hand thread EXCEPT for Camping Gaz which has a special female right hand thread and Calor 7kg and 15kg and aluminium bottles which have a special clip-on connection. Continental bottles usually have a male left hand thread similar to but not identical with UK butane.

Butane is suitable for use at temperatures down to 2°C but will not work below that.

Propane

Propane is supplied in red, or partly red bottles which have a female left hand threaded connector. Scandinavian countries use the same connector. Germany and Austria supply propane with a male connection.

Propane will work at temperatures as low as -40°C and is therefore suitable for all winter caravanning.

GAS SAFETY ADVICE

WARNING: If you smell gas or suspect a leak and if it is safe to do so, isolate the gas appliances and turn off the gas bottles at the regulator. Evacuate the vehicle and ventilate. Seek professional advice as to the cause of the leak.

WARNING: Inside outlet sockets shall only be used with dedicated appliances i.e. equipment supplied with the Motorhome. No gas appliance shall be used outside when connected to an inside socket.

Facts about LPG

LPG is not poisonous.

Bi-products are harmless.

There is danger if all air and oxygen were excluded. (Ventilation holes must be kept clear at all times).

LPG has been given a smell by the manufacturers in order to identify leaks.

Awning Spaces LPG Appliance Exhaust

There is no danger of pollution of an enclosed awning space by the LPG exhaust from a refrigerator venting into it, as awning spaces are generally well ventilated.

Space heaters may produce sufficient exhaust to pollute the awning space, if it is totally enclosed, from a general comfort, smell and hygiene point of view. In the extreme case there could be a build up of carbon dioxide to a dangerous level.

Owners are advised to allow some fresh air circulation in the awning space when such appliances are in use.

PRECAUTIONS

- Never look for a leak with a match. Always use a soap solution or its equivalent when testing connections. Do not operate any electrical apparatus whatsoever, especially light switches. If the leak is not obvious, the vehicle should be evacuated and qualified personnel consulted.

- Always turn off the gas cylinder valve or inlet to the vehicle when the appliances are not in use.
- Never use gas appliances without adequate ventilation.
- Avoid naked lights when connecting or changing a cylinder.
- Check the flexible hose frequently.
- The gas is heavier than air and therefore sinks to the lowest point.
- Keep bottle gas containers outside (and protected against frost). If they must be kept inside make sure they are well away from heat.
- Always seek advice when in doubt.

WARNING: Do not use appliances with a different working pressure to 30mbar.

WARNING: Maintain adequate spacing of combustible materials from sources of heat.

WARNING: Do not use independent portable gas appliances inside the vehicle.

WARNING: Always read individual appliance instructions.

Ventilation

WARNING: Safety ventilation shall in no circumstances be obstructed even partially, screens and grills must be kept clean and free from dust

All ventilation complies with BSEN 721 and vents should not be obstructed in any manner as this could lead to insufficient fresh air. In this case the confined atmosphere becomes depleted of oxygen which leads to the formation of the highly poisonous gas 'carbon monoxide'. Carbon monoxide is odourless, colourless and tasteless and will rapidly cause unconsciousness and death with little or no warning prior to collapse. THERE IS NO DANGER WHEN ADEQUATE VENTILATION IS PROVIDED.

Changing gas cylinders

The following procedure should be adopted:

- Extinguish any fire, flame or source of ignition (including cigarettes, pipes and pilot lights) before changing gas cylinders.
- Wherever possible change gas cylinders in the open air.
- Ensure that the gas cylinder valve(s) is/are closed before disconnecting any empty cylinder or before removing the plastic cap or plug on the outlet connection of the replacement cylinder. (Note. left hand thread.)
- Make firm gas-tight joints. Any leaking vapour will smell. If a leak is suspected after changing gas cylinders and opening valve, test by brushing with soapy water around the joints. Bubbles will form if vapour is leaking. Never use a naked flame.
- Ensure that the replacement gas cylinder is the correct one for the installation.
- Gas cylinder valves are of various designs depending on the type of cylinder and the use for which it is intended and it is essential that the correct pressure regulator with the correct pressure setting and capacity for the installation is used in accordance with manufacturer's instructions.

- g) In the case of a connection on the pressure regulator which relies upon a sealing washer(s) to maintain a gas-tight joint, it is essential to check that the washer is present, is sound and is correctly positioned prior to making the connection. Where the connection relies on a metal to metal seating or bull nose connection to obtain a gas-tight joint it is essential that the mating surfaces are clean and undamaged. In no case should a damaged valve or connection be used.
- h) Where connections are designed to be tightened with a spanner, it is essential that a spanner of the correct size is used and that the union is firmly tightened, hand tightness is not sufficient. When self-sealing valves are incorporated in a gas cylinder, connections should be made in accordance with the manufacturer's instructions and tools should not be used.
- b) The initial use of dry powder extinguishers is recommended only if it is likely that the leakage can be stopped by closing the cylinder valve or that the cylinder can be speedily removed.
- c) Cool with water all gas cylinders that cannot be removed.
- d) As soon as possible remove cylinders adjacent to the fire to a safe place in order to gain access to the seat of the fire.

Connection

Ensure that the gas regulator hose is correctly connected to the gas cylinder in the gas bottle compartment and that the hose connection is tight.

Gas bottles must be fully located, seated at the base of the bottles and restrained by the strap provided in the dedicated compartment position. Straps are positioned to suit 6kg, 7 kg and 13kg bottles.

WARNING: If using cylinders other than those recommended, the user must ensure these are adequately supported, ventilation openings must not be obstructed and the cylinders must not cause damage to other fixtures and fittings located in the compartment.

Open ended gas hoses must always be protected from dirt and insects.

Before turning on the gas supply at the regulator, ensure that all gas operated equipment in the vehicle is turned off.

All gas equipment is supplied through a central Gas Manifold System which has individual isolation taps for each appliance (Fig. A).

Leaks

Action to be taken in the event of a suspected leak:

- If a gas leak is suspected, close the gas cylinder valve or other valve at the inlet to the vehicle. Do not operate electrical switches. Open all doors and windows to disperse any gas escape.
- The strong unpleasant smell of LPG will enable the general area of the leak to be detected. Check that gas is not escaping from an unlit appliance. In the case of a leak, close cylinder valve(s) and call a competent installer to rectify the fault.
- If a leaking gas cylinder cannot be stopped, remove the cylinder to a safe place in the open air in an upright position away from drains and any source of ignition.

Fire

Precautions and actions to be taken:

- A fire extinguisher of adequate size and preferably of the dry powder type should be available.

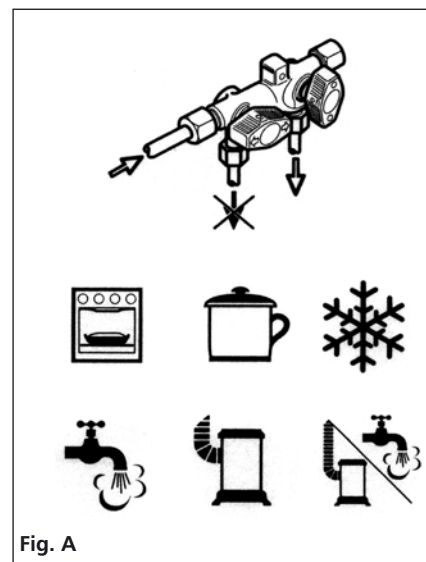


Fig. A

THERMAL INSULATION AND HEATING

Your vehicle has been designed to achieve a thermal insulation and heating level for specific climatic conditions when tested according to the procedure in EN1646-1. The classifications are as follows:

GRADE 1

A vehicle with an average thermal transmittance (u) that does not exceed $1.7w/(m^2k)$.

GRADE 2

A vehicle with an average thermal transmittance (u) that does not exceed $1.7w/(m^2k)$ and which can achieve an average temperature difference of at least $20k$ between inside and outside temperatures when the outside temperature is $0^\circ C$.

GRADE 3

A vehicle with an average thermal transmittance (u) that does not exceed $1.2w/(m^2k)$ and which can achieve an average temperature difference of at least $35k$ between inside and outside temperatures when the outside temperature is $-15^\circ C$.

ELECTRICITY

As with electricity in the home, care must be exercised when handling mains electricity.

Your attention is drawn to the following notice as laid down by the Institute of Electrical Engineers.

INSTRUCTIONS FOR ELECTRICITY SUPPLY

On arrival at site

- Before connecting the motorhome installation to the mains supply, check that:
 - the mains supply is suitable for your installation and appliances, i.e. whether it is AC or DC and whether it is at the correct voltage and frequency, and
 - your installation will be properly earthed. Never accept a supply from a socket outlet or plug having only two pins, or from a lighting outlet.
 - any residual current device (earth leakage circuit breaker) in the mains supply to the vehicle has been tested within the last month.

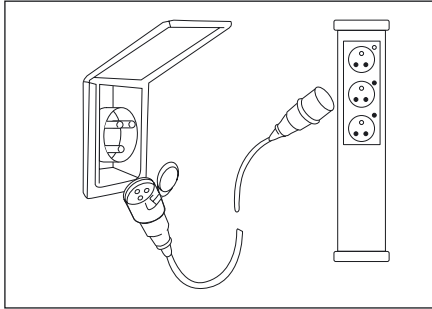
In case of doubt, consult the site owner or his agent.

- Make sure that the switch at the site supply point is off.**
- Lift the cover of the electricity inlet provided on the vehicle, and insert the connector of the supply flexible cable.
- Remove any cover from the socket outlet provided at the site supply point, and connect the plug at the other end of the supply flexible cable to this. Switch on the main switch at the site supply point.

On leaving site

- Switch off the main switch at the site supply point and remove the flexible cable connector replacing any cover fitted.
- Disconnect the flexible cable from the vehicle.

It is important that the main switch at the site supply point should be switched off, the supply flexible cable disconnected, and any cover replaced on the socket outlet at the site supply point before disconnecting the flexible cable from the vehicle. It is dangerous to leave the supply socket or supply flexible cable live.



For vehicles that are generally left unused for long periods in the open it is strongly advised that the mains installation is inspected periodically to ensure that it is safe to use.

The IEE Wiring Regulations recommend that mains installations in motorhomes are re-inspected every year. An annual inspection by a qualified person is recommended (see list below) who should sign and issue a periodic inspection report.

Suitably qualified persons acceptable to the SMMT/NCC to sign and issue Inspection and Completion Certificates should be one of the following:

- An approved contractor of the National Inspection Council for Electrical Installation Contracting* or
- A member of the Electrical Contractors' Association of Scotland
- A qualified person acting on behalf of the above (in which event it should be stated for whom he is acting).
- The names and addresses of Approved Contractors in any locality (there are over 10,500 in the UK) can be obtained from Electricity Shops, or direct from:

NICEIC

Vintage House, 37 Albert Embankment
London SE1 7UJ
Telephone: 0207 564 2323

The names and addresses of members of the Electrical Contractors' Associations can be obtained direct from:

ECA

Esca House, Palace Court
London W2 4HY
Telephone: 0207 313 4800

ECA of Scotland

23 Heriot Row, Edinburgh EH3 6EW
Telephone: 0131 225 7221

In case of difficulty consult an approved electrical installation contractor (who may be the local electricity company). It is dangerous to attempt modifications and additions yourself. Lampholder-plugs (bayonet cap adaptors) should not be used in any circumstances.

GENERATOR GUIDELINES

Your motorhome can be used with a generator provided these guidelines are met:

- Lack of regular servicing can be the cause of most generator problems, gensets under 2kW are mainly dependent on engine speed for output frequency and voltage. Poor or no servicing may cause the engine speed governor to run the genset to fast. Therefore, frequency and output voltage can rise above the specification of the machine data plate i.e. 230V at 50Hz. This may cause damage to electrical/electronic equipment (such as battery chargers).
- A generator should always run for a few minutes prior to connection with the motorhome electrics, to allow it to warm up and the output to settle to a steady level.

- The AC output of generators is often derived from an AC alternator, rectified to DC then inverted back to AC. In essence this means the output sinewave may not run sophisticated electronics efficiently. Some of the new wave of gensets are more sophisticated in their production of a sinewave output and are more suited to run electronic equipment.
- If in doubt consult your genset dealer or manufacturer for advice.

POWER CONSUMPTION

OVERSEAS CONNECTION

Note: Connection to a mains voltage supply OVERSEAS requires particular attention.

Care must be taken when connecting supplies abroad since the supplies can be of REVERSE POLARITY. The significance of REVERSE POLARITY is that when equipment is switched off it may not be electrically isolated.

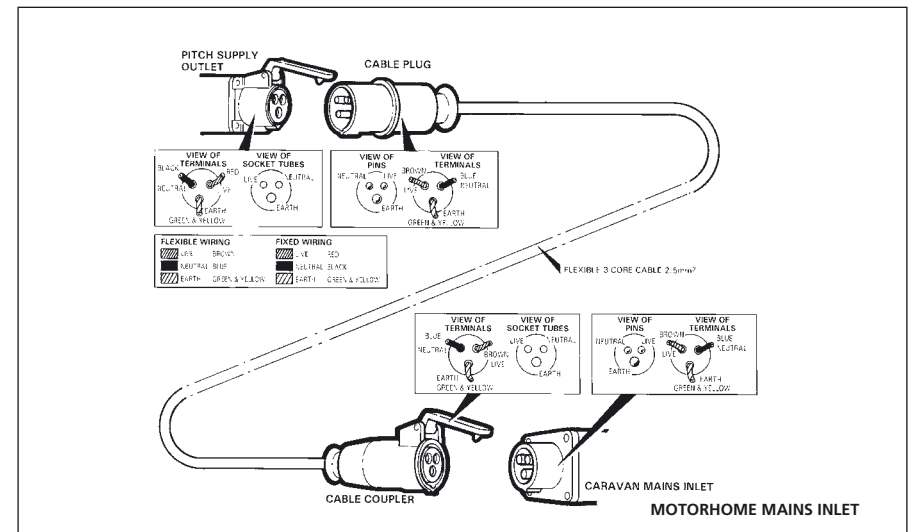
The only certain way of making equipment safe is to unplug it.

If electrical polarity indication is not included in your vehicle electrical equipment, it is useful to have a means of checking polarity of the mains supply, especially when touring overseas.

There are several proprietary makes of equipment available for the purpose.

If it can be achieved, it is preferable to connect live to live, and neutral to neutral to maintain full electrical protection.

CHECK all vehicle equipment is set-up to accept the site supply before actually switching on.



230V MAINS ELECTRICAL EQUIPMENT POWER CONSUMPTION

Please note:

It is possible that the 230V mains electrical equipment may not all operate simultaneously. A typical UK motorhome site mains hook up point provides a maximum output of 10 amps and on some continental sites the available output may be as low as 5 amps.

If your loading exceeds the site supply it may trip the site circuit breaker. Please check the available mains output with your site operator.

Similarly loadings on each circuit breaker within the vehicle should be observed

A label positioned close to the MCB's will identify which appliances within the vehicle are fed from which MCB. Consulting the table (Typical Appliance Consumption Figures) in conjunction with this label, will give an indication of which appliances can, and cannot, (site supply allowing), be operated simultaneously.

WARNING: Never allow modifications of electrical or LPG systems and appliances except by qualified persons.

TYPICAL APPLIANCE CONSUMPTION FIGURES

Appliances	230V		12V		LP GAS Grams/hour
	Watts	Amperes	Watts	Amperes	
Thetford N80	140 / 200W	0.6Amp / 0.9Amp	Only when driving		14 / 21 g/h
Dometic RM7271 fridge	135w	0.6a	Only when driving		11g/h
Waeco CR80 fridge	25w	0.108a	24w	2a	Not applicable
Truma Ultrastore water heater	850w	3.7a	Not applicable		120g/h
Truma Combi 4 heater/boiler	2000w	8.5a	67w	Max 5.6a	160 - 320g/h
Truma E2400 heater	Not applicable	Not applicable	7 - 13w	0.6 - 1.1a	100 - 200g/h
Spinflo Triplex	Not applicable	Not applicable	Not applicable	Not applicable	112g/h
Hotplate 2	Not applicable	Not applicable	Not applicable	Not applicable	112g/h
Hotplate 3	Not applicable	Not applicable	Not applicable	Not applicable	180g/h
Grill	Not applicable	Not applicable	Not applicable	Not applicable	115g/h
Oven	Not applicable	Not applicable	Not applicable	Not applicable	112g/h
SMEV hotplate	Not applicable	Not applicable	Not applicable	Not applicable	196 - 320g/h
SMEV oven/ grill	Not applicable	Not applicable	Not applicable	Not applicable	95g/h
Battery charger 25a	500w	Max 3.6a	Not applicable	Not applicable	Not applicable
Water pump	Not applicable	Not applicable	48w	4a	Not applicable

Note: These are approximate figures for guidance only.

CONNECTING SERVICES