

## SERVICES

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# Services

## WATER

Connection of services is dealt with under the separate headings.

In all cases users should become familiar with the equipment manufacturers' instructions.

Advice and leaflets, if not supplied with the caravan, can be obtained from the suppliers of the equipment.

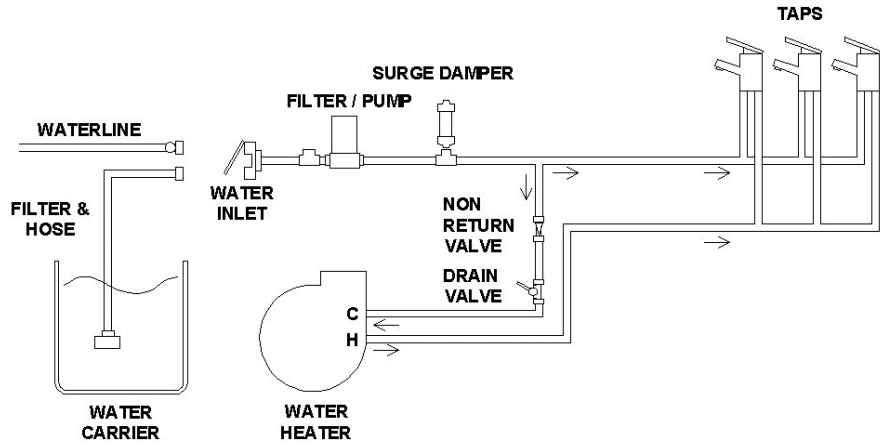
Before making connections of any description to the caravan or its equipment, ensure that ALL equipment is turned off.

## WATER SYSTEMS – TANK OPERATION

One of three systems will be installed depending upon the specification of the caravan:

- Without an internal water tank
- With internal water tank (manual changeover valves)
- With an internal tank (automatic tankfill)

## Caravans without a water tank



The inboard pump draws water into the caravan, via the inlet on the offside of the caravan. This is directed to the water heater, taps and shower. An umbilical hose, with baffle, is supplied with the caravan to connect between the inlet and an aquaroll or similar external container.

### To prime the system:

Ensure that the external water container is full.

Close all of the taps except one, which should be open in the hot position.

Check that the water heater dump valve is in the closed position (Yellow handle on floor near water heater vertical).

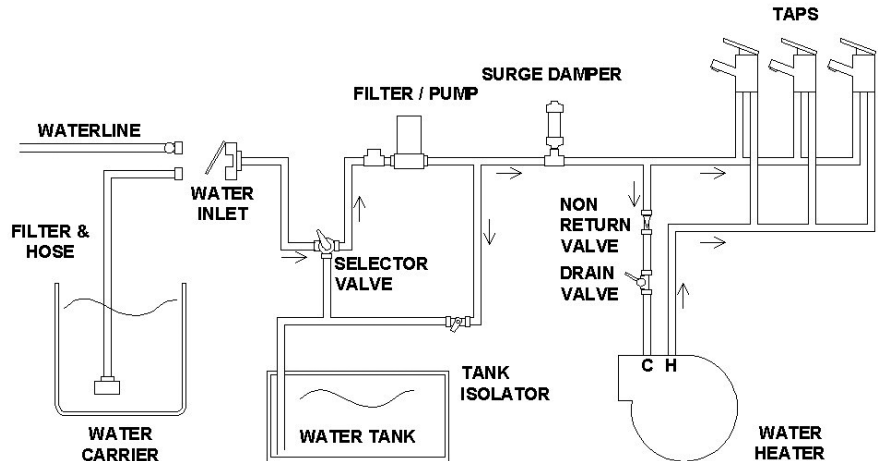
Switch the pump on using the button on the control panel. The system will first fill the water heater, and then water will flow through the open tap. This tap can then be moved to the cold position until water is again flowing.

Repeat the procedure at each tap.

To drain / winterise the system please see separate details later in this handbook.

If a mains water connection is used, please ensure this is a Truma Waterline connection, which has a built in pressure reducing valve. When using this type of connection the water is still routed through the pump, and therefore the pump will need to be switched on to supply water to the water heater, taps and shower.

## Caravans with internal water tank and manual changeover valves



The inboard pump can draw water from the internal water tank or via the inlet (external source) on the offside of the caravan to be directed to the water heater, taps and shower.

Within the same area, a Silver inline valve is located. When the White selector valve is set to draw water from the external source, opening this Silver valve will fill the internal tank.

A White selector valve located on the floor (behind the front centre drop down flap), is used to decide whether water is drawn from the external source or the internal tank.

If this Silver valve is closed then water from the external source will be directed to the water heater, taps and shower.

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When the internal tank contains water, the internal water tank can be selected as the source via the White selector valve. Please ensure the Silver valve is in the closed position, so water will then be drawn from the tank and be directed to the water heater, taps and shower.

A label positioned on the drop down flap, close to the valves, shows the correct position each valve should be in for each type of operation.

When priming the system it is not important whether the tank is filled first, or the water heater and pipework are primed first. To prime the water heater and pipework:

Ensure a supply (internal or external) is present and that the White selector valve is in the correct position to use that source.

Close all of the taps except one, which should be open in the hot position.

Check that the water heater dump valve is in the closed position (Yellow handle on floor near water heater vertical).

Switch the pump on using the button on the control panel. The system will first fill the water heater, and then water will flow through the open tap. This tap can then be moved to the cold position until water is again flowing.

Repeat the procedure at each tap.

To drain / winterise the system please see separate details later in this handbook.

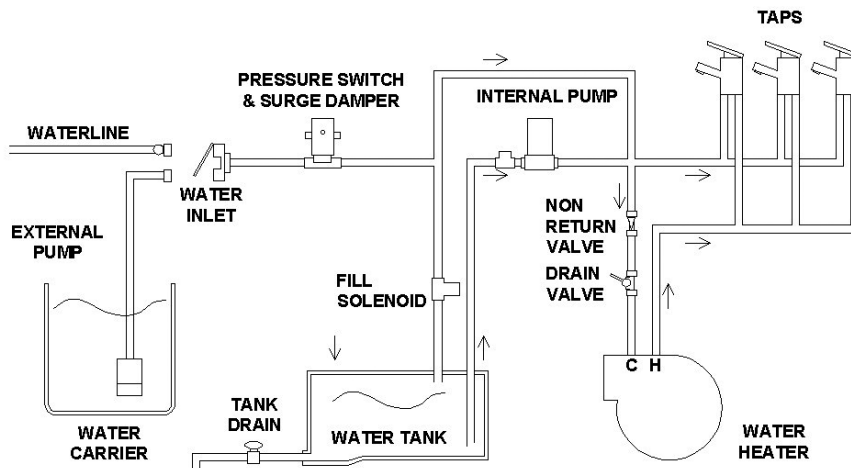
If using a Truma Waterline connection, the method of operation is unchanged.

### Caravans with automatic tankfill

The system can operate in two ways:

#### Tank fill OFF

In this mode the system will use the external pump to draw water from an external container (i.e. Aquaroll), to supply the water heater and taps.



#### Tank fill ON

In this mode the system will use the internal pump to draw water from the internal tank, to supply the water heater and taps. In the

background the external pump will run, when required, to draw water from the external container to maintain the level of the internal tank. The system works in the following ways:

When the system is first primed, the level in the internal tank will initially be zero / empty – The tank fill system will attempt to use the external supply to fill the tank.

Once the system is primed, if the level in the internal tank is above ½ (50%) then the internal pump will supply the taps on demand, and the external pump will not be used.

If as water is used, the level of the internal tank falls below ½ (50%), then the external pump will run to attempt to fill the internal tank back to full (100%).

To use the external container to supply the water heater and taps, and not use the internal water tank:

Ensure that the external water container is full, the external pump is submerged in that container, and that the external pump is correctly connected to the inlet socket in the side of the caravan.

Close all of the taps except one, which should be open in the hot position.

Check that the water heater dump valve is in the closed position (Yellow handle on floor near water heater vertical).

Select 'tank fill OFF' on the caravans control system (See separate instructions on how to do this), and press the pump button on the control panel to switch the pump on.

There will be a short delay while water is first transferred from the external source into the water heater, and once this is full, water will flow through the open tap. This tap can then be moved to the cold position until water flows again.

Open the other taps/mixers in the caravan at both the hot and cold positions, until water flows from each tap.

To use the internal pump and fitted water tank, with automatic tank fill:

Ensure that the external water container is full, the external pump is submerged in that container, and that the external pump is correctly connected to the inlet socket in the side of the caravan.

Close all of the taps except one, which should be open in the hot position.

Check that the water heater dump valve is in the closed position (Yellow handle on floor near water heater vertical).

Check that the skirt mounted fresh water tank drain valve is closed, and/or the drain bung in the bottom of the internal fresh water tank is in place.

Select 'tank fill ON' on the caravans control system (See separate instructions on how to do this), and press the pump button on the control panel to switch the pump on.

There will be a short delay while water is first transferred from the external source into the internal tank, and then on to the water heater and taps. Once water is flowing from the tap, the tap can then be moved to the cold position until water flows again.

Open the other taps/mixers in the caravan at both the hot and cold positions, until water flows from each tap.

When initially priming the water system, tank fill will continue to operate until the internal water tank is full. To fill the internal water tank, water heater and all pipework to each tap and shower may take in excess of 50 litres of water, which is more water than is contained in a typical external container.

The tank fill system cannot monitor the level of water in the external container. As a result, there is a time limit to how long the external pump will run for each fill cycle. If this time limit is exceeded the external pump will cease operating - To re-start the tank filling procedure (i.e. after the external container has been replenished), turn the pump off at the control panel, and then back on again. As re-filling the external container may take some time, it is recommended that the pump system be turned



## Services

off at the control panel while no external supply is available.

If using a mains water connection, it is recommended that the pump button on the control panel is left 'off'. In this way the internal tank remains isolated, and the internal pump is not used: The pressurised water supply from the mains water connection is delivered directly to the water heater and taps.

To drain / winterise the system please see separate details later in this handbook.

## ULTRAFLOW WATER (INTAKE HOUSING)

### Introduction

The Ultraflow Water Intake Housing (1) is part of an unique, high quality product range designed to bring together with an on-board pump (not in scope of delivery) water to your caravan in a convenient and efficient manner.

Truma Ultraflow operates in the caravan water supply as a pressurised system and requires an on-board pressure pump with pressure switch.

The non-return valve (5) must be fitted between the drain valve and the first "T" connection. This also prevents the back flow of hot water to the cold water taps.

Please note the correct flow direction of the valve. No further non-return valves or other parts that can reduce the water flow may be used. Additional Truma drain valves do not reduce the water flow.

The Intake Assembly (7) is detachable from the Water Intake Housing for security and while touring.

To connect the assembly, simply align the plug with the socket and push into position.

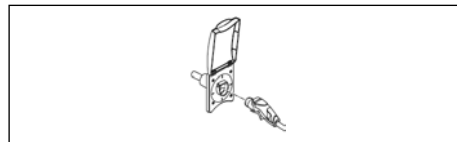
To remove, pull the lower trigger and pull the plug from the socket.

### Operating instructions

#### Ultraflow Water Intake Housing

Raise the lid, clean both the water socket and the plug of the Intake Assembly.

Plug the intake connector into the socket.



Place the assembly into the water container, ensuring that it is fully submerged before operating the system. The Dust cover (8) is to stop contaminants falling into the water container.

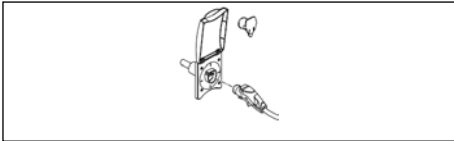


To remove the Intake Assembly from the Water Intake Housing, To remove, pull the lower trigger and pull the lower trigger and pull out the hose plug.

**WARNING: DO NOT REMOVE BY PULLING THE HOSE. PLEASE ENSURE THAT THE LID IS PROPERLY CLOSED BEFORE DRIVING!**

## ULTRAFLOW FILTER HOUSING (TANK FILL CARAVANS ONLY)

Raise the lid, clean both the water socket and the plug of the pump assembly. Plug the pump assembly into the socket.



Plug the pump connector into the socket. Place the pump into the water container, ensuring that it is fully submerged before operating the system. Dust cover (8) is to stop contaminants falling into the water container. To remove the pump assembly from the Ultraflow Compact Housing, pull the lower trigger and pull out the hose plug



**WARNING: DO NOT REMOVE BY PULLING THE HOSE OR ELECTRIC CABLE.**

### Routine maintenance

Ensure that the O-ring seal on the hose plug

and the socket are free from dirt. To aid fitting of the plug assembly smear the O-ring with vegetable oil.

### Notes

Before winter storage the water system must be completely drained and the filter cartridge (only with the Ultraflow Filter Housing) removed. The filter hole may be sealed with the filter cap.

Clean the water system at the start and end of the season with sterilising fluid (see notes under sterilising).

If the pump fails to deliver water the most likely cause will be air in the system. Switch off the pump and shake the pump assembly in the water. Then switch on again.

### Sterilising

When cleaning the water system at the start or the end of the season it is advisable to use a sterilising fluid e.g. Chempro SDP or similar.

Flush the system thoroughly to remove the effective fluid traces.

After sterilising the system at the start of the season it is recommended that in the Ultraflow Filter Housing a new filter cartridge should be fitted.

### Accessories

Ultraflow Water Pump Assembly

The Water Pump Assembly comes complete

with the water pump, container cover and storage clip. The submersible pump needs no priming and is extremely quiet in operation. This pump can be used with both the Ultraflow Filter Housing and the Ultraflow Compact Housing.

Standard pump assembly (hose length 800 mm) part no. 46040-01

Special version for motor caravans (hose length 1000 mm) part no. 46040-10



### Ultraflow Waterline

The Ultraflow Waterline is a 15 metre “food quality” hose pipe. It comes complete with fittings and a special pressure reducing adaptor which allows caravanners to connect their Ultraflow caravan water system direct to a mains water supply without modification. part no. 46090-01



# Services

## AUTOMATIC WATER SYSTEM PUMP

### FEATURES

Self-Priming  
Dry Running  
Soft Noise Absorbing Mounts  
Snap-in Port Fittings  
Built-in Bypass Less Pulsation  
Corrosion Resistant Materials  
Meets ISO 8846

### SPECIFICATIONS

Motor: Permanent Magnet, Ball Bearing Totally Enclosed. CE Models are fully suppressed.

Pump: Three chamber diaphragm design Self-priming up to 9 feet suction lift; Pump able to run dry without damage

### OPERATION

With pump switch off and battery fully charged, fill water tank, open all faucets, then turn pump switch on. Water will begin to flow. When the water is free of air, turn faucets off. Remember, you are filling the water heater and pipes. When all valves are shut-off, pump will stop. Should pump fail to stop, turn switch off and see the trouble shooting.

When water is first introduced, or the water supply in the internal tank, or aquaroll, runs out, air will be present in the pipework. It is important that every tap is run to remove any air in the system before, for instance, the

shower is used. Air left in pipework local to a tap can act as an accumulator and affect the ratio of hot and cold water flowing from other taps or shower mixers in the system.

## TROUBLESHOOTING

**Warning: before servicing pump, turn off pump and drain water from system!**

### Failure to prime

#### Motor operates, but no pump discharge

Restricted intake or discharge line

Air leak in intake line

Debris in pump

Punctured pump diaphragm (pump leaks)

Crack in pump housing

Dump valve left open

#### Motor fails to turn on

Loose wiring connection

Pump circuit has no power

Blown fuse

Pressure switch failure

Defective motor

#### Pulsating flow

Restricted pump delivery.

Check discharge lines, fittings and valves for clogging or undersizing

#### Pump fails to turn off after all fixtures are closed

Empty water tank

Insufficient voltage to pump (low battery)

Punctured pump diaphragm (pump leak)  
Defective pressure switch

#### Low flow and pressure

Air leak at pump intake

Accumulation of debris inside pump and plumbing

Worn pump bearing (excessive noise)

Punctured pump diaphragm (pump leaks)

Defective motor

#### System care and maintenance

##### Winterising

Allowing water to freeze in the system may result in damage to the pump and plumbing system.

Non-Toxic antifreeze for potable water may be used with Truma pumps. Follow manufacturers recommendations.

**Do not use automotive antifreeze to winterize potable water systems. These solutions are highly toxic and may cause serious injury or death if ingested.**

1. Drain the water tank (if fitted). Open tank drain valve. You may use the pump to drain the tank by opening all the faucets in the system. Allow the pump to operate until the tank is empty. Do not operate the pump more than 15 minutes continuously

2. Open all faucets and purge the water from the plumbing system. Turn power to the pump off. Be sure that all the water from the tank and drain lines are drained

Remove quick connect inlet and outlet fittings from the pump and turn the pump on to pump out remaining water from the pump head. Be sure to have a catch pan or a rag under the pump to prevent water from spilling. Turn the pump off once the plumbing is empty. Leave the fittings disconnected from the pump until the system is ready to be used again.

Place reminder in a prominent position saying that plumbing is not connected.

Be sure that all faucets are left open to protect against damage to the plumbing.

## Sanitising

### Guidance on cleaning portable water tanks and the water system in touring caravans

The water systems, and in particular storage tanks, in caravans 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 gastro-intestinal 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 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 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



## Services

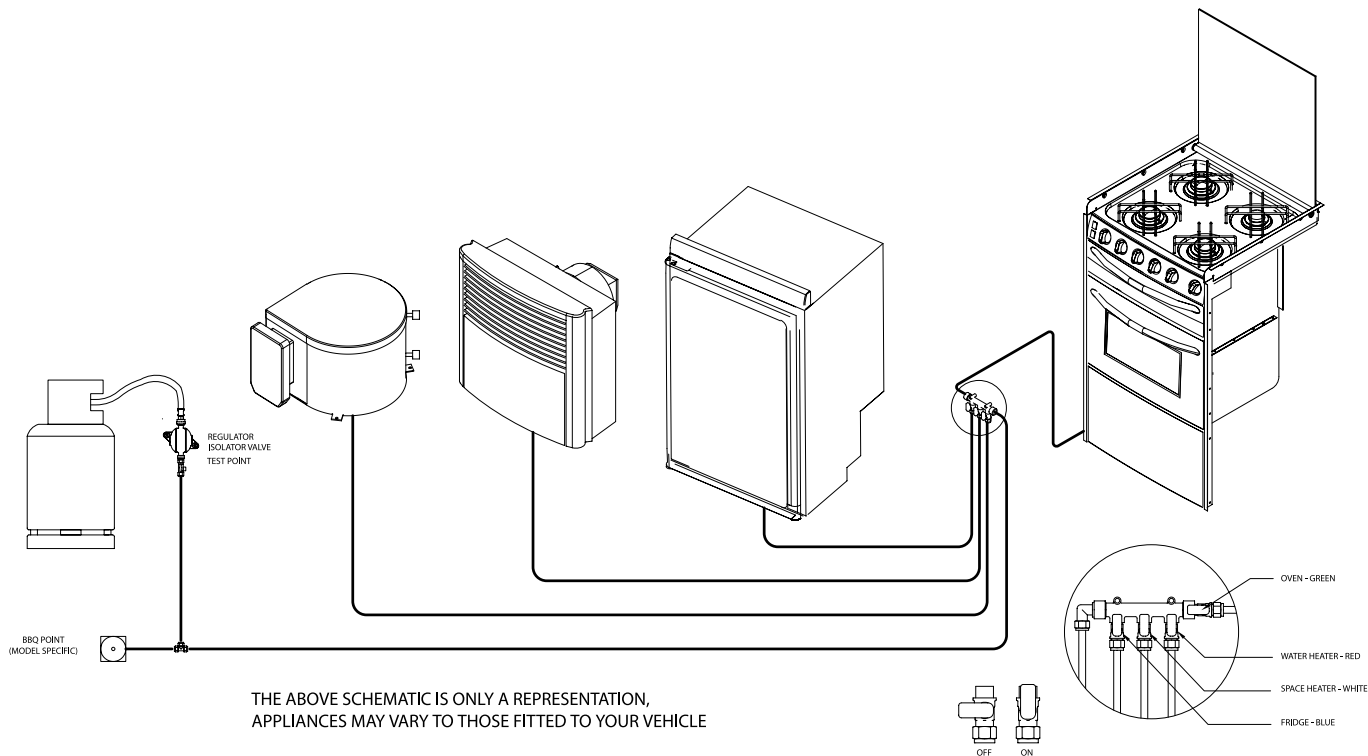
The Borough Council of King's Lynn and West Norfolk.

### **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.

## Typical gas schematic drawing



THE ABOVE SCHEMATIC IS ONLY A REPRESENTATION,  
APPLIANCES MAY VARY TO THOSE FITTED TO YOUR VEHICLE

# Services

## GAS

### GENERAL INFORMATION

#### Gas Bottles

Bottled Liquefied Petroleum Gas (LPG) is the most convenient portable source of fuel for your caravan. Make sure that heating and cooking appliances and the gas cylinders are switched off before you move the caravan.

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 front gas bottle housing, never extend hose - hose lengths must not exceed 400mm.

#### Regulator

Your caravan 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 1.5 kg/h and complies with the requirements of EN 12864 annex D.

Note: Regulator valves should always be in the 'OFF' position when towing.

#### DuoControl (Model Specific)



The DuoControl combines the gas pressure regulator and the changeover valve in one unit for operation as a two-cylinder system. When the operating cylinder is empty, DuoControl automatically changes over to the reserve cylinder.

- Combines a gas pressure regulator and a changeover valve in one unit
- Automatically switches over to the reserve cylinder
- Complies with EN 13786

#### Gas Hoses

A high pressure hose, or pigtails as they are being called must be used with the new style regulator (Fig B).



Fig B Gas regulator

LPG bottles i.e. Propane, Butane and Camping Gaz cylinders all have varying 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 new 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.**

## Cylinder compartment

All cylinder compartments have two universal plastic mouldings fitted to the floor of the compartment that are designed to fit both steel and BP Gas Light cylinders and two universal support cradles with straps for retaining the bodies of the cylinders at mid to high level and two universal support cradles with straps for retaining the bodies of the cylinders at mid to high level.

## TYPES OF GAS

### Butane

Butane is supplied in the U.K. in green or blue 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.

### A 7kg bottle is recommended for butane gas use.

Continental bottles usually have a male left hand thread similar to but not identical with U.K. 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.

### A 6kg bottle is recommended for propane gas use.

## GAS SAFETY ADVICE

**WARNING: If you smell gas or suspect a leak or in the event of a fire and if it is safe to do so, isolate the gas appliances and turn off the gas bottles at the regulator. Evacuate the caravan 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 Touring Caravan. 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.

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



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## 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 caravan should be evacuated and qualified personnel consulted.
- 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.

**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. Cookers shall not be used as heaters**

**WARNING: A BBQ point inlet valve, if fitted, must only be used for the connection of portable LPG appliances.**

**Always read individual appliance instructions**

## Ventilation

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. KEEP SCREENS OR GRILLS CLEAN AND FREE FROM DUST

## Roof-mounted Flue installations

All flue installations should be inspected once a year throughout their length for corrosion. Flues should be replaced if any sign of perforation is found. Ensure that the replacement is of an approved type.

## Connection

Ensure that the gas regulator hose is correctly connected to the gas cylinder in 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 and 7kg 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 caravan is turned off.

All gas equipment (except barbecue) is supplied through a central Gas Manifold System which has individual isolation taps for each appliance (Fig A), as follows:

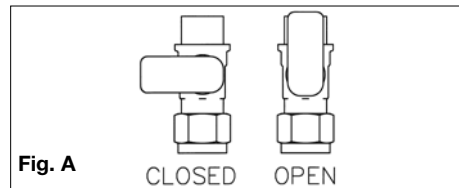


Fig. A

RED	-	Water Heater
WHITE	-	Space Heater
BLUE	-	Fridge
GREEN	-	Oven

Note: the external barbecue point is fed from the main feed through a built in integrated isolation valve. See schematic layout for details.

### Thermal insulation heating

Your caravan has been designed to achieve a thermal insulation and heating level for specific climatic conditions when tested according to the procedure in EN1645-1.

The classifications are as follows:

#### Grade 1

A caravan with an average thermal transmittance (u) that does not exceed 1.7w/(m2k).

#### GRADE 2

A caravan with an average thermal transmittance (u) that does not exceed 1.7w/(m2k) and which can achieve an average temperature difference of at least 20k between inside and outside temperatures when the outside temperature is 0°C.

#### GRADE 3

A caravan with an average thermal transmittance (u) that does not exceed 1.2w/(m2k) and which can achieve an average temperature difference of at least 35k between inside and outside temperatures when the outside temperature is -15°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 caravan site

1. a. Before connecting the caravan installation to the mains supply, check that 13 pin plug and hitch have been disconnected from the towing vehicle, once disconnected the 13 pin plug should be placed in the holder provided to ensure protection against mechanical damage and the elements,



13 pin plug example

(b) 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,

(c) 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, and

(d) any residual current device (earth leakage circuit breaker) in the mains supply to the caravan has been tested within the last month.

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

2. **Make sure that the switch at the site supply point is off.**
3. Lift the cover of the electricity inlet provided on the caravan, and insert the connector of the supply flexible cable.
4. 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.

Note: Use mains cable fully uncoiled and protect from traffic.

**It is important that the main switch at the site supply point should be switched off, the supply flexible cable disconnected, and**



## Services

**any cover replaced on the socket outlet at the site supply point before disconnecting the flexible cable from the caravan. It is dangerous to leave the supply socket or supply flexible cable live.**

Because touring caravans 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 touring caravans are re-inspected every 3 years by a qualified person who should sign and issue a periodic inspection report.

NOTE: The manufacturer recommends annual inspections.

Suitably qualified persons acceptable to the NCC to sign and issue inspection and completion certificates are:

- an approved contractor of the National Inspection Council for Electrical Installation Contracting\* or
- a member of the Electrical Contractors' Association
- 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: 0171 582 7746

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: 0171 229 1266

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

**WARNING: current consumption in the caravan must not exceed 16 amps or the pitch permitted maximum if this is less than 16 amps.**

**It is dangerous to attempt modifications and additions yourself. Lampholder - plugs (bayonet-cap adaptors) should not in any circumstances be used.**

## 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.

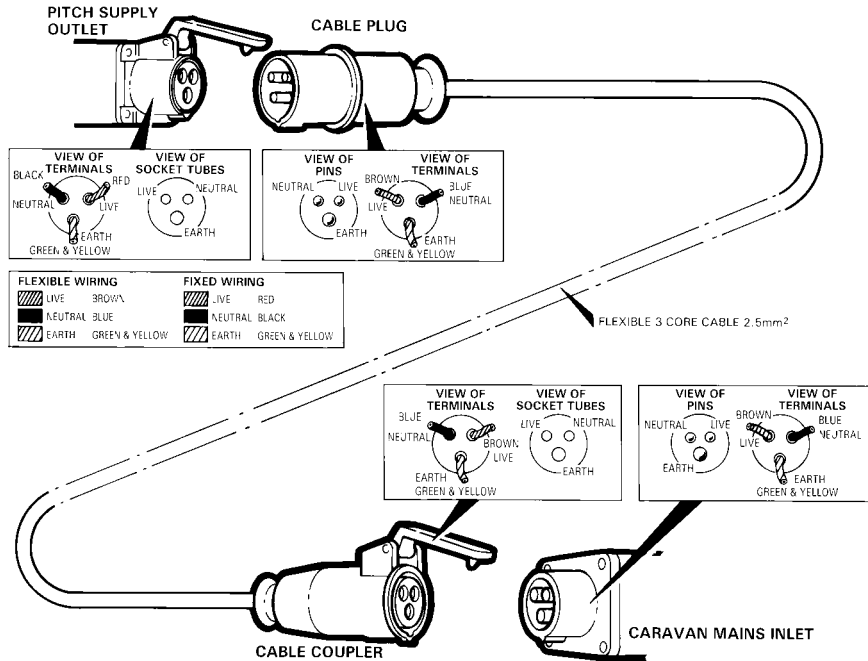
The only certain way of making equipment safe is to unplug it.

It is useful to have a means of checking polarity of the mains supply, especially when touring overseas. There are available several proprietary makes of equipment for testing polarity.

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

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

### WIRING OF CONNECTING CABLE AND CARAVAN MAINS INLET



Warning: it is essential that connections are made exactly as shown. If terminal markings are not in accordance with the diagram they must be ignored. If in doubt consult a qualified electrician.

The legal length of the mains inlet cable is 25 ± 2 metres. When in use it must be fully uncoiled and protected from traffic.



### **230V MAINS ELECTRICAL EQUIPMENT POWER CONSUMPTION**

Note: It is possible that the 230v mains electrical equipment may not all operate simultaneously. A typical UK 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 supply with your site operator.

Similarly loadings on each circuit breaker within the caravan should be observed. A label positioned close to the MCB's will identify which appliances within the caravan are fed from which MCB. Consulting the table on page 52 in conjunction with this label, will give an indication of which appliances can, and cannot, (site supply allowing), be operated simultaneously.

**TYPICAL APPLIANCE CONSUMPTION FIGURES**

Appliance/ Item	230 Volt		12 Volt		LP Gas
	Watts	Amperes	Watts	Amperes	grams/hour
Refrigerator	115 W	0.5 amp	Only when towing		12 - 17.5 g/h
Ultraheat Space Heater	500 W	2.2 amp	12 W	1.0 amp	30 to 280 g/h
	1000 W	4.5 amp	12 W		
	2000 W	8.5 amp	12 W		
Ultrastore Water heater	850 W	3.7 amp	Not applicable		120 g/h
Cooker	Hotplate 1	Not applicable		Not applicable	161 g/h
	Hotplate 2	Not applicable		Not applicable	110 g/h
	Hotplate 3	Not applicable		Not applicable	73 g/h
	Hotplate 4	800 W	3.5 amp	Not applicable	Not applicable
	Grill	Not applicable		Not applicable	117 g/h
	Oven	Not applicable		Not applicable	125 g/h
Battery Charger	430 W	1.9 amp	Not applicable		Not applicable
Lighting 230V (based on 2x 40 W bulbs)	80 W	0.3 amp	Not applicable		Not applicable
Lighting 12V (based on 10 W bulb)	Not applicable		10 W	0.8 amp	Not applicable
Pressure switched pump	Not applicable		48 W	4.0 amp	Not applicable
Radio/ CD player	Not applicable		12 W	1.0 amp	Not applicable
Microwave (factory fit)	1000 W	4.0 amp	Not applicable		Not applicable

Note: These are approximate figures for guidance only.



