



	Section
Introduction / Warranty / Body Construction	1
Motorhome Code	2
Preparing for the Road	3
On the Road	4
Arrival on Site	5
Safety & Security	6
Connection of Services	7
Technical Specification	8
Fitted Equipment	9
Care of your Motorhome	10
Useful Information	11
Service Section	12
Index	13



Welcome.

Congratulations on your purchase of an Auto-Sleeper motorhome. We are confident it will give you many years of pleasure.

This handbook has been compiled to enable you to obtain the maximum pleasure from your vehicle. It contains the appliance instructions along with advice on safety matters.

Please read this Handbook thoroughly so that you are conversant with all the motorhome systems, operating instructions and precautions.

Failure to observe these recommendations or precautions may result in incorrect operation of equipment and subsequent risk to occupants.

Information leaflets and literature on safe operation of appliances and equipment fitted to your motorhome are included in the Auto-Sleeper Customer Pack. Please read these carefully prior to use.

Should you experience any difficulties contact your dealer who will be pleased to offer advice.

It is the policy of Mercedes and Auto-Sleeper to continually improve their vehicles, so whilst the details contained in this Handbook are correct at the time of going to press, they reserve the right to alter the specifications at any time without notice.

Auto-Sleeper motorhomes offer a variety of customer uses and whilst each vehicle features the optimum storage, fluid, seating and sleeping capabilities, it is the customer's responsibility to select the proper combinations of loads without exceeding weight capacities.

Your Auto-Sleeper motorhome conforms to the European standard of EN 1646.

Model

This Handbook covers the Mercedes Surrey and Northants, both of which are based on the Mercedes Sprinter 313 CDi medium wheelbase chassis cab.

The Surrey is designed to carry four persons in forward facing seats with lap and diagonal seatbelts, whereas the Northants is designed for two persons.

Gas System

This handbook is for use on vehicles with a 30mbar gas system. The gas system pressure is noted on a label in the gas locker.

Conversion Type

Coach-built conversion, two or four berths. Laminated panel and glass-fibre combination. Insulated panels have GRP outer skin.

Climatic Conditions

The motorhome is designed for use in temperate climates, and is certified Grade 1 in accordance with EN 1646-1: 2004., indicating an effective heating system is fitted but has not been tested for thermal performance.

Handbook

Any queries should be addressed to your Auto-Sleeper dealer.

Appliance Instructions

The appliance instructions included have been extracted from those supplied from the appliance manufacturers.

Automotive - Mercedes

For all automotive matters you should refer to the Mercedes vehicle instructions manual. This includes tyre pressures, referring to the type of tyres fitted.

The Auto-Sleeper conversion does not affect the tyre pressures in any way as it is built within the design envelope of the base vehicle.

IMPORTANT:

In the interests of safety, replacements parts for appliances must conform to the



manufacturer's specification and should be fitted by them or an authorised agent.

Your Auto-Sleeper conforms to the CEN Standard EN1646-1/2004 for habitation requirements relating to Health and Safety.

To deal with your queries efficiently, always quote your vehicle's production number which can be found in the glove compartment.

Please read and complete the warranty registration card supplied with your vehicle; and return to the address below, without delay.

Auto-Sleepers Limited,
Orchard Works,
Willersey,
Nr Broadway,
Worcestershire
WR12 7QF

Tele: 01386 853338

Fax: 01386 858343

E-mail: aftersales@auto-sleepers.co.uk



Statement

Auto-Sleepers Limited (hereinafter called "the Company") hereby guarantees the body conversion of the motorhome against failure arising through defects in workmanship or material under normal use and service for a period of two years from the date of purchase or registration whichever is the earliest. Subject to the limitations and conditions specified the Company will, during the warranty period, repair free of charge any defects which arise in the conversion part of the motorhome and which are found on inspection to result from faulty workmanship or materials.

Condition

The benefit of this warranty shall apply only to the Purchaser, including those subject to hire purchase or credit sale agreements, and can be transferred at a cost of £50 plus VAT to subsequent owners until it expires. Note that this is not the case with the optional third year warranty package taken out at the time of purchase the transfer of which is subject to a charge.

It is a condition of this Warranty that the motorhome is delivered to an authorised dealer or distributor of the Company (or the Company's factory at the Company's discretion) for inspection and afterwards collected from there at the expense of the Purchaser.

This warranty does not extend to faults attributable to wear and tear or to defects repaired by or on the instructions of the Purchaser without first obtaining the Company's written authorisation. Faults attributable to wilful damage, negligence, abnormal conditions and failure to follow the Company's instructions (whether oral or in writing), misuse or alteration are excluded. Ancillary equipment i.e. awnings, bicycle racks, aerials etc are not covered by this warranty.

This warranty does not apply to a motorhome that has been subject to overloading or otherwise misused or has not been maintained in accordance with the Company's recommendations contained in the handbook.

This warranty applies only to the body conversion and does not cover any failure or defect in the chassis or engine.

Where, under the terms of this warranty a replacement item is supplied the conditions of the warranty shall apply to that item for the remaining period of the original warranty term covering the defective part.

It is a condition of this warranty that the Purchaser shall notify an authorised dealer or distributor of the Company of the model, type, and job number of the vehicle and provide details of the alleged defect within 14 days of its discovery.

It is a condition of this warranty that the conversion warranty is subject to an annual Habitation Check, carried out by an authorised dealer.

Any disagreement between the Company and the Purchaser as to the interpretation of this warranty shall be referred for determination to an independent arbitrator to be appointed by mutual agreement or in the event of no agreement by the Society of Motor Manufacturers and Traders.

This warranty is valid only in the European Union and the Company's distributors, dealers or agents have no authority to vary its terms. **The card must be received within 14 days of registration for the warranty to be active.**

This warranty becomes valid only when the Company has received the completed registration card.

The Purchaser's attention is drawn to the Motor Manufacturers Warranty that covers the chassis, body and engine of the motorhome.

The Purchaser's attention is also drawn to the fact that these terms and conditions do not affect the Purchaser's statutory rights.

**BODY CONSTRUCTION:**

Side Walls: GRP - Mercedes White.

Floor Vinyl: Dark Wood Block CL0209.

Furniture: Jakarta Teak.

Curtains: To match upholstery colour.

Carpet: Oasis Madrid.

Cushions/Upholstery: Leya.

Exterior Graphics: Surrey - BS1736.
Northants - BS1749.



THE COUNTRY & COASTAL CODES

Upon arrival at your destination you should be aware of the Country Code relating to motorhome owners. This is entitled the *Motor Caravanners' Code*.

Code of Conduct - Camp Sites

Arrivals

- Report to reception immediately on arrival.

Vehicle Movement

- Keep to roadways unless otherwise directed.
- Adhere to speed limits. Note that these are generally 10 mph. (Remember that the stopping distance on grass is considerably greater than on tarmac).
- Only a person in possession of a current driving licence may drive on the site.
- Park correctly as advised on your pitch. Where possible leave 20ft of free space around your vehicle.

Use of Site

- Use the electrical mains hook-up in the correct manner and with caution.
- Ensure that all fresh water taps/connections are turned off after use.
- Have care and consideration when using all facilities (toilets and showers etc.) and leave them clean and tidy. Young children should be escorted.

To avoid possible damage to sewage purification works, only approved chemical fluids must be used. Under no circumstances may coal tar, phenol or caustic-based fluids be used. Disposable napkins and similar bulky items must not be put into chemical closet emptying points but should be wrapped in a polythene bag and placed in the container provided. (Put all litter in containers marked for the purpose).

Noise

- Do not make excessive noise.
- Children should be restrained from making excessive noise.

- Flying kites and model aircraft and the use of items like catapults or air-guns as well as ball games should not be permitted among, or close to, motorhomes.
- Musical instruments, record players, radios and televisions should not be used to the inconvenience of other people on site.
- Open and close doors quietly.
- Power generators must be adequately silenced and used with consideration and according to restricted site times.

Dogs and Pets

- All dogs and other pets should be kept under control.
- Unless permission has been granted, no animal should be allowed loose on the site and leads must not exceed 10ft.
- No animal should be allowed in the shower/toilet blocks.
- Do not let dogs foul the site.

Fire Precautions

Adhere to and make note of all fire precautions concerning the whereabouts of the fire points.

Although not compulsory, it is recommended that a 1 kg (2lb) dry powder fire extinguisher is carried. It should comply with BS 5423 and be marked BSI or FOC approved. It is important to check at regular intervals that the extinguisher is working as is required by types meeting BS 5423.

Careful thought is necessary for the positioning of the extinguisher, which should be near the door but not too close to the cooking equipment where sudden flames could make it unreachable. In the kitchen area, a fire blanket is a worthwhile precaution.

Unless permission has been granted, barbecues should not be used. When permission has been given, consideration should be given to the annoyance that can be caused to other users of the site. Open fires are not allowed.



Awnings and Tents

Awnings and tents should only be used when permission has been obtained.

When on grass and staying for more than a few days, the ground sheet and/or side flaps of awnings should be periodically raised in order to avoid damage to the ground.

Departure

- Leave the pitch clean and tidy.
- On leaving, check out with the reception paying the required dues.

Wild camping

Camping away from licensed sites, without the permission of the landowner or his agent, is not allowed in the United Kingdom. When permission has been granted, all aspects of this Code should be adhered to.

On no accounts should:

- Litter be disposed of other than in receptacles provided.
- Water be allowed to escape from the vehicle.
- Chemical toilets be emptied except into the disposal places agreed with the landowner.
- Washing or similar be hung outside the vehicle.

Parking

Motorhomes should only be parked in approved places.

When using the facilities of a motorhome at such times, care and consideration should be given to those around them.

Driving

When using a motorhome on either the public highway or private road, the Highway Code should be complied with and full consideration given to other road users.

In the event of a motorhome travelling slowly and there being a queue of traffic behind, the driver of the motorhome should, where possible, pull over in order to let the other traffic pass.

When the vehicle is in motion it is compulsory

that all passengers are seated and seat restraint straps worn.

Before moving off, elevating roofs **MUST** be lowered and correctly secured, and top hinged windows closed. Likewise all doors and access lockers for gas containers and chemical toilets must be properly closed.

Exterior steps should be properly retracted and secured.

When the vehicle is being refuelled, or on a ferry, all gas systems must be turned off.

Gas appliances should only be used when the vehicle is in motion when the manufacturer of the appliance permits such use.

Handbook

Before using a motorhome all aspects of the handbooks produced by the chassis manufacturer and the converter must be read and adhered to.

Environment

Care and consideration should be taken to protect the environment.

Observe the Country and Coastal Codes shown below:

The Country Code

Enjoy the countryside but respect its life and work.

More people than ever before are exploring the countryside, interested in farming, plant life, bird watching or just observing the general wildlife. Whatever your interest, there is a lot to learn, but please observe the following code.

Guard against all risk of fires. Hay and heath land catch alight easily and once ablaze are very hard to put out. *Remember: Fire Spreads Quickly.*

- Keep to public paths across farmland.
- Use gates and stiles to cross fences, hedges and walls.
- Leave livestock, crops and machinery alone. View from a distance.
- Take your litter home - it is unsightly and harmful to wildlife.



- Help to keep all water clean.
- Take special care of country roads.
- Make no unnecessary noise. Most animals are very timid, noises can disturb them unnecessarily. If you want to get the best out of the country, go quietly.

The Coastal Code

As our coastlines are increasingly used for recreation and education, the following suggestions are made to enable us to enjoy our inheritance and preserve it for posterity.

- Do not trample about, or move rocks unnecessarily.
- Do not frighten seals or seabirds.
- Do not spear fish.
- Do not spill detergents, solvents or fuel from boats as these can kill marine life.
- When sailing, moderate your speed - the wash from a fast boat can destroy banks and nests.
- Live mollusks and crustaceans need not be collected as souvenirs - dead shells can usually be found.
- Shellfish can take years to grow and fines can be imposed for not observing national regulations.
- Do not pull up seaweed unnecessarily.
- Make your visit instructive - not destructive.
- Look at material, don't remove it. Take notes and photographs, not specimens.
- Observe bye-laws and be considerate to others.
- National Trust property or Country Parks have regulations to protect the wildlife. Follow these.

Fire Precautions

You should also make yourself aware of the local fire regulations.



YOUR MOTORHOME (Weights explained)

Mass in Running Order (MRO)

The weight of your motorhome as it leaves the factory, as new with standard fixtures and fittings, plus an allowance for driver and 90% fuel.

Maximum Technically Permissible Laden Mass (MTPLM)

The maximum weight of the vehicle when fully laden for use on the road. See specification section for actual figure.

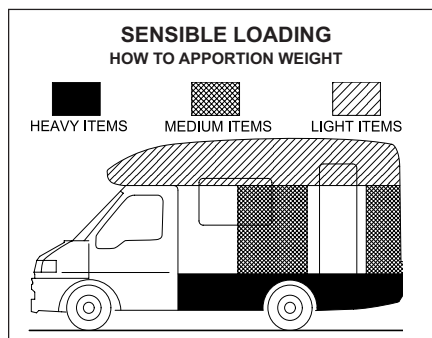
User Payload

The load margin (payload), this represents the difference between the Mass in Running Order (MRO) and the Maximum Technically Permissible Laden Mass (MTPLM). It shows the maximum weight which can be loaded into your motorhome, covering items such as food, crockery, cutlery, clothing, bedding, gas cylinders, etc. See Technical Specification for actual figure.

Please take care to ensure that you have allowed for the masses of all items you intend to carry in the motorhome, e.g.. passengers, optional equipment, essential habitation equipment and personal effects such as clothing, food, pets, bicycles etc.

Although there are additional seat belts within the motorhome, please refer to the stated number of passengers that are allowed due to the MRO and MTPLM.

LOADING AND DISTRIBUTION OF WEIGHT IN THE MOTORHOME



Loading

Correct weight distribution is a major factor in making your motorhome a balanced and pleasant vehicle to drive without compromising road-holding. Care should therefore be taken to ensure that heavy items are well spaced and are in as low a position as possible, for example, low cupboards and bed boxes.

DO NOT EXCEED THE STATED MAXIMUM LOAD. ITEMS FITTED OTHER THAN STANDARD EQUIPMENT WILL DEplete THE PAYLOAD STATED IN THIS HANDBOOK.

WARNING: Under no circumstances should the maximum permissible laden mass of the motorhome be exceeded.

Roof Loading

DO NOT ALLOW CHILDREN TO CLIMB ONTO THE ROOF.

Roof Rack Bars and Ladder (optional)

When using the optional roof rack, care should be taken to see that all the items are securely anchored. Apart from general cleaning and polishing, the roof rack and ladder require no special maintenance.

WARNING: Take special care when on the roof in wet or frosty weather conditions, which cause it to be particularly slippery.

Maximum load within the area encompassed



by the roof rack should not exceed 75 kgs (165 lbs) with a maximum loading of 8 kg (17 lbs) per square foot.

Before Moving Off

Whenever making a journey with your motorhome, either setting off on holiday or returning home, it is good practice to run through this simple checklist.

1. Close and secure all cupboards and drawers and check any loose articles. Do not store tins, bottles, etc. in overhead lockers.
2. Close and secure all windows and roof lights.
3. Leave all curtains and blinds open to aid visibility.
4. Check that gas cylinders are securely fastened and turn off all gas appliances, except those heating appliances designed to function while the vehicle is in motion. Also, ensure that the gas locker door is securely fastened.
5. Ensure that there is sufficient gas to meet your needs.
6. Switch off 230 volt supply at source, disconnect mains cable from vehicle. Beware of potential electric shock from wet cable. Coil cable and store in a safe place.
7. Check your RCD's/MCB's for operation.
8. Check and if necessary, charge the conversion battery.
9. Check battery selection switch is in the OFF position.
10. Check that the battery is secure and that the battery box lid is fastened.
11. Ensure the fridge is on 12V operation and door lock is set. (**Note:** the electrical relays will allow the fridge to be run on the vehicle battery when the engine is running.)
12. Remove any external fresh water connections etc.
13. Make sure any heavy articles are stored in accordance with the loading procedure. Tables should also be made secure.
14. Lock the motorhome exterior door (remember to take out your keys).
15. Check your external rear view mirrors and adjust if necessary.
16. Check that all corner steadies are wound up and that, if a step is used, it is put away before moving off.
17. Check wheel nuts are secure and tyre pressures are correct.
18. Ensure, if required, that your fresh water tank is full and your waste tank is empty.
19. Referring to your base vehicle manual, check all fluid levels including automotive fuel and tyre pressures. Remember to check that your spare tyre is of the recommended pressure.
20. Ensure that, on models fitted with an elevating roof, the roof is securely locked down with the exterior catches applied.
21. The fridge vent covers should be fitted when the vehicle is to be driven in order to comply with European Type Approval regulations for vehicle external projections.
22. Ensure that the toilet flush tank only contains a small amount of water (1-2 litres) in order to minimize the risk of leaks or spillage whilst the vehicle is in motion.
23. Check underneath the vehicle for stray items.
24. Safely store levelling blocks away in an appropriate place.



Pulling Off

Engage the clutch smoothly.

Avoid wear and tear on clutch and transmission by taking extra care.

Change gears smoothly.

Try not to jerk the clutch.

MOTORWAY DRIVING

Speed Limits (UK)

If a speed limit is not in force, your motorhome can be driven up to 70mph on motorways and dual carriageways.

1. Reduce Speed:
 - i) In high or cross winds.
 - ii) Downhill.
 - iii) In poor visibility.
2. High sided vehicles cause air buffeting, so extra care must be taken when passing or being passed. As much space as possible should be given.

Motorway Handling

Do not bump the kerb with the wheels.

When passing other vehicles allow more than the normal clearance.

Allow longer to get up speed to pass.

Do not swing out suddenly.

Carry out all manoeuvres as smoothly as possible.

Use nearside wing mirror to check motorhome has cleared when overtaking.

Spare Wheel

CAUTION: Familiarize yourself with this section prior to driving the vehicle and take careful note of the warnings given.

Your Mercedes vehicle does not have a spare wheel. Instead it is supplied with a tyre sealant system to seal small punctures, particularly those in the tyre tread. The tyre sealant system is located in the stowage compartment in the right hand door sill.

For full instructions on how to use the tyre sealant, refer to the Mercedes handbook supplied with the vehicle. Look in the index at the front of the book for the section entitled

'Tyre sealant' which gives details of the storage location and using the sealant.

After using the sealant, drive to the nearest workshop, at a maximum speed of 50 mph, to have the tyre repaired or replaced.

Rear Step

On moving off the rear step retracts automatically. In the event of the rear step being left extended, a buzzer, positioned behind the dashboard, will sound (when the ignition is switched on) - and will continue to do so until the rear step has been fully retracted.

Marker Lights

Marker lights are fitted to the front, rear and side (if required) of the vehicle. These illuminate when the side and/or headlights are switched on. They use a 12V cap-less push-in type bulb which is accessed by removing the lens which is held in place by two screws.

Cycle Rack

In order that a cycle rack can be fitted, the rear panel coachwork has been strengthened accordingly. Timber is bonded into the bodywork immediately above the rear light units, laterally across the vehicle. This allows the lower mounting brackets for the Fiamma Pro-C cycle rack to be fitted in a suitably reinforced area. In the event of a cycle rack being fitted, the cycle rack when folded will increase the vehicle length by 400mm. Your Auto-Sleeper dealer will give further advice or assistance if required.

Whilst Driving

Whilst the vehicle is being driven ensure that:

- Both the passenger and driver wear seat belts - this is a legal requirement.
- Heavy loads are not stored in top cupboards or in areas from which they may become detached. Please ensure that heavy items are stored low down and take care not to overload individual wheels, the axles or the MTPLM.
- Table(s) are stowed in the correct position and table legs secured in their retaining clips.



- Furniture lids are lowered; cupboards and flaps are closed and secured.
- The refrigerator door is closed and secured by its travelling catch.
- The retractable rear step if fitted, is folded away or, if a separate step is supplied, it is safely stowed in the vehicle.
- Roof ventilators are closed and locked in the down position.
- The bathroom is not used whilst the vehicle is in motion. (Note: Refers only to models fitted with shower or toilet compartment).
- Top hinged windows are closed, and securely fastened.
- Children do not roam around the vehicle; they may fall and injure themselves.

Passenger Seat Swivel

By releasing the locking handle, the passenger seat swivel may be turned to face the rear of the vehicle. It is important that whilst travelling, the passenger seat swivel is locked in the forward facing position.

Map Storage

In the rear of each cab seat there is a map pocket for storage of maps, periodicals and light items.



CHECK SITE REGULATIONS

Siting your Motorhome

When siting your motorhome, keep to the roadways unless otherwise directed. Obey the speed limit which, in general, is 10 mph. Only a person in possession of a current driving licence is permitted to drive on the site. Stopping distances on grass are considerably greater than on tarmac.

Selecting a Pitch

Carefully select where you wish to park your motorhome. The site should be as level as possible, well drained and away from boggy areas and, preferably, not under or near trees. Consider also, how you will move your motorhome when leaving the site. For example, on sloping ground in wet conditions, pitch facing downhill.

Levelling

The optional rear corner steadies, which can be lowered by using the brace supplied, are designed to give greater stability to the vehicle when it is stationary on site. The brace is stored in the wardrobe.

Note: On no account should the rear corner steadies be used to jack up the vehicle when carrying out maintenance or changing a wheel.

It is important to site your motorhome level to ensure correct operation of the refrigeration, cooker, etc., by using purpose made ramps and NOT bricks or such items.

Awning Light

The exterior awning light is controlled by the 'Aux' switch on the electrical control panel.

Fridge vent covers

Remove the fridge ventilation covers from the outside vents, by turning the screws anti-clockwise and pulling the covers gently outwards from the bottom. Store in a safe place and replace in the reverse fashion, prior to driving on public roads as noted in section 3.



SAFETY

Important: Your attention is drawn to the notice affixed in the motorhome advising on fire prevention, ventilation and what to do in case of fire.

Children

Do not leave children alone in the motorhome in any event, keep potentially dangerous items out of reach as at home. e.g. matches, drugs, etc.

WARNING: When upper bunks are used by children especially under six years of age care shall be taken against the risk of them falling out.

Fire Extinguishers

It is recommended that a 1 kg (2lb) minimum capacity dry powder fire extinguisher be located by the main exit door at all times.

A pan fire should not have an extinguisher aimed at it but be smothered with a fire blanket (which should be stored by the cooker).

In case of fire

1. Get everyone out of the motorhome as quickly as possible using whichever exit is the quickest including windows. Do not stop to collect any personal items.
2. Raise the alarm — Call the fire brigade.
3. Turn off gas container valve if safe to do so.

Ventilation and Condensation

The ventilation points on your motorhome are fixed points of ventilation which are stated by the European Standards. Under no circumstances must these vents be blocked or obstructed. It is advised that fixed ventilation points and any protective screens are checked and cleaned (if necessary) on a regular basis.

Fresh air circulation should be allowed below the motorhome when appliances are in use and when flues terminate below the floor to allow free evacuation of the products of combustion. At least three sides of the underfloor space should always be kept open and unobstructed especially by snow. Do not

make any additional openings in the floor.

Under no circumstances must these vents be blocked or obstructed.

Additional night time ventilation is obtained by releasing the window catches and placing them in the second groove on the frame catch.

Awnings

There is no danger of pollution of an enclosed awning space by the LPG exhaust from the refrigerator venting into it.

WARNING: Space heaters may produce sufficient exhaust gases 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.

Note: Motorhome owners are advised to allow some fresh air circulation into the awning space when such appliances are in use.



ELECTRICAL SYSTEMS

Batteries

Battery terminals and connectors should be firmly attached. Battery surfaces should be free of moisture and dirt.

Where removable cell taps are fitted these must be screwed firmly home.

When removing a battery always remove the negative cable first. On re-connection the negative cable should be connected last. Switch off all lamps and appliances before disconnecting the battery. Do not smoke while working on or near to the battery.

Fuses

Always replace blown fuses with one of a correct rating.

Overload

Never overload any electrical circuit, especially the 12-volt socket outlet. The rating of appliances should be checked before connection.

Shower Compartment Light

Ensure that water does not ingress into the light unit.

Charger Unit

Keep the charger unit well ventilated and never allow material or bags to be in contact with the unit casing which gets hot when the unit is operating.

230 Volt Mains Operation

Before connecting to the supply, ensure that the contacts in both the plug and the socket are clean and dry and that the hook-up plug is firmly located and locked into the socket. The RCD must be easily accessible at all times.

GENERAL

Before using your Auto-Sleeper, you should be fully conversant with the following safety precautions; if you are in any doubt as to the meaning of any of them you should contact your supplying Auto-Sleeper dealer. Please read the following carefully.

In the interests of safety, replacement parts

for appliances should conform to the appliance manufacturer's specification and should be fitted by them or their authorised agent.

WARNINGS:

- 1 Never use portable cooking or heating equipment, other than electric heaters that are not of the direct radiant type, as it is a fire and asphyxiation hazard.**
- 2 Do not use cookers as heaters or dry clothes etc on the cooker or space heater.**
- 3 Make sure that combustible materials can not come into contact with hot surfaces or burners.**
- 4 Surfaces of appliances may become hot in use and the guard provided does not give full protection to the young and elderly.**
- 5 Do not use additional independent gas appliances inside the vehicle.**
- 6 Never allow modifications of electrical or LPG systems or appliances except by qualified technicians.**

The water heater fitted to this vehicle is of the "room sealed" type, any replacement should be the same, i.e. "room sealed".

Turn off all gas equipment and cylinders/tanks and any other heating appliances before travelling.

Ventilation openings are located below all the gas appliances, and in the base of the gas locker. In winter conditions make sure the vents are clear of snow and mud. These openings should be regularly checked and any mesh covering them cleaned with a stiff brush to prevent any risk of them becoming blocked. The openings are provided for your safety - please do not obstruct them.

Air Bags

Do not fit rear-facing children's seats to front facing seat protected by air bags. It is recommended that small children do not sit in the front passenger seat whilst the vehicle is in motion. Follow the advice given in your base vehicle instruction book.



Smoke Alarm

Features

- Battery operated.
- Operating light (LED) flashes approximately every 45 seconds confirming unit is powered.
- Low battery warning. Unit “beeps” approximately every 45 seconds for up to 30 days when the battery needs replacing.
- Sensitivity test button. Tests sensitivity, circuitry, battery, horn (and emergency light, model 350 only).
- Loud 85 decibel Piezo electric alarm. Automatically resets when hazardous condition has passed.

WARNING: Test smoke alarm operation after vehicle has been in storage, before each trip and at least once per week during use.

Your alarm requires one 9 volt battery. Under normal use, the battery should last approximately one year.

Simple maintenance

Vacuum every six months to help keep the unit working efficiently. Open cover and gently vacuum interior of detector. Keep vacuum nozzle from touching the unit.

Problems are indicated by two events:

1. The alarm does not sound upon pressing the test button.
2. The operating light remains steadily on or off (i.e. does not flash approximately once every 45 seconds, when the unit it not in alarm).

Try the following:

1. Inspect for obvious damage.
2. Visually check that unit contains recommended battery type.
3. Check that battery is properly connected.
4. Gently vacuum as recommended above.
5. Replace battery.

If these procedures do not correct the problem, do NOT attempt repairs. Contact the manufacturer.

SECURITY

Chassis number

Record the chassis number and the factory job number of your motorhome, and keep them in a safe place at home.

The chassis number is a 17 digit number, beginning with the letters WDB, and is found on a plate located at the base of the driver's seat. (This plate also contains the permissible weight data).

The factory job number is an alphanumeric code consisting of a letter followed by four numbers, and is found on a label inside the glove box.

Motorhome Theft

The theft of a motorhome can occur in the most unlikely circumstances; from a motorway service area, even from an owner's driveway.

Secure all windows and doors when your motorhome is unoccupied even if only for a short length of time.

Additional security

Consider fitting any device which might deter or prevent intrusion by thieves. A wheel lock prevents removal of the wheel.

Window etching of the chassis number is a cost effective deterrent.

Free crime prevention

Advice about securing your motorhome, protecting your valuables, property marking, either at home or whilst on site, can be obtained from the Crime Prevention Officer through your local Police Station.

Central Locking

WARNING: Possibility of lock-out.

Please note that the Mercedes security system has a feature which re-locks all the doors (including the habitation area door) within 40 seconds of them having been unlocked unless one of the cab doors has been opened.

Under a specific circumstance - the owner is inside the vehicle, unlocks it using the remote control and exits via the habitation door without opening a cab door - the security



auto relocking remains active. This results in the central locking system re-locking the habitation door after 40 seconds and can leave an unwary owner locked out of his vehicle.

In order to avoid this possibility, always take the keys when exiting the vehicle. In any event, we would always advise the keys must never be left in an unattended vehicle no matter how close to it the owner intends to remain.

Of course, there is no need to take the keys if someone remains inside the vehicle.



Please read and become familiar with operating instructions for equipment fitted in your motorhome.

Connection of services are dealt with under separate headings, Water, Electricity and Gas.

WATER SYSTEMS

Fresh/Waste Tanks

The fresh and waste water tanks are located under the floor near the middle of the vehicle. The drain taps for both tanks are clipped to the underside of the vehicle on the offside, with the waste drain being nearer to the rear of the vehicle.

For capacities of both see the Technical Specification Section.

The fresh water tank is filled through the lockable cap on the exterior of the vehicle. All pipe work is manufactured to food grade material specification.

Breathers

Both tanks are fitted with breathers, which allow air displacement when filling. When filling the fresh water tank, water may escape through these breathers; this should give no cause for concern.

Frost Precaution

If the vehicle is not being used during freezing conditions the water must be drained. Whilst the vehicle is being used in such conditions, and the water heater is at risk of freezing, it should be drained by opening the drain valve.

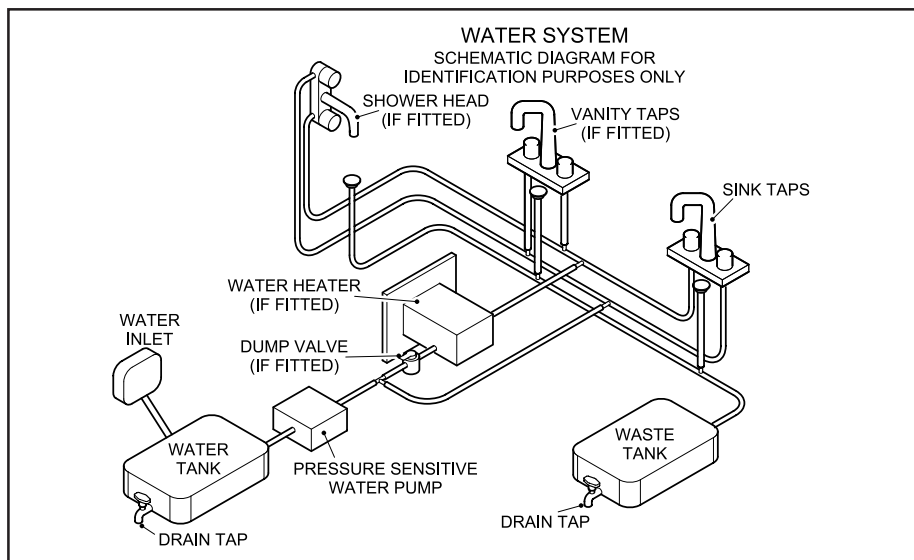
FRESH WATER PUMP

A Flojet R3426-500 Triplex Diaphragm automatic water system pump is fitted beneath the drawer in the base of the wardrobe. This is a self priming pump, mounted on noise absorbing mounts, which has the ability to run dry without damage. It has a flow rate of 5.3 litres (1.4 gallons) per minute.

Operation

With pump switch off and battery fully charged, fill water tank, open all taps, then turn pump switch on. Water will begin to flow. When the water is free of air, turn taps off. Remember, you are filling the water heater and the toilet and shower lines. When all valves are shut-off, pump will stop.

Caution: Should pump fail to stop, turn switch off and see the trouble shooting guide.





Sanitising

Portable water systems require periodic maintenance to deliver a consistent flow of freshwater. Depending on use and the environment the system is subject to, sanitising is recommended prior to storing and before using the water system after a period of storage.

Systems with new components, or ones that have been subjected to contamination, should also be disinfected as follows:

1. Use of the following methods to determine the amount of common household bleach needed to sanitise the tank.
(A) Multiply "gallon of tank capacity" by 0.13; the result is the ounces of bleach needed to sanitise the tank.
(B) Multiply "litres of tank capacity" by 1.0; the result is the milli-litres of bleach needed to sanitise the tank.
2. Mix into solution the proper amount of bleach within a container of water.
3. Pour the solution (water/bleach) into the tank and fill the tank with potable water.
4. Open ALL taps (hot and cold) allowing the water to run until the distinct odour of chlorine is detected.
5. The standard solution must have four (4) hours of contact time to disinfect completely. Doubling the solution concentration allows for contact time of one hour.
6. When the contact time is completed, drain the tank. Refill with potable water and purge the plumbing of all sanitising solution.

Winterising

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

Non-toxic anti-freeze for potable water may be used with Flojet pumps. Follow manufacturers recommendations.

Refer to coach or equipment manufacturers instructions for their specific winterising and drainage procedures.

WARNING: Do not use automotive anti-freeze to winterise potable water systems. These solutions are highly toxic and may cause serious injury or death if ingested.

1. Drain the water tank. Open tank drain valve. You may use the pump to drain the tank by opening all the taps 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 taps and purge the water from the plumbing system. Turn power to the pump off. Be sure that all the water from the drain lines are drained.
3. 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 onto the RV. 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. Make a note on your tank filler that the plumbing is not connected.
4. Be sure that all taps are left open to protect against damage to the plumbing.

Troubleshooting

Vibration induced by road conditions can cause plumbing to loosen. Check for any system components that are loose. Many symptoms can be resolved by simply tightening the hardware.

Pump will not start/blows circuit breaker - check:

- Electrical connections, breaker, main switch, and earth connection.
- Is the motor hot? Thermal breaker may have triggered; it may reset when cool.
- Is voltage present at the switch? Try to bypass the pressure switch. Does the pump operate, if it does, it indicates faulty switch.
- Charging system for correct voltage ($\pm 10\%$) and good earth.
- For an open or grounded circuit, or motor, or improperly sized wire.
- For seized or locked diaphragm assembly (water frozen?).

Will not prime/splutters - (No discharge/motor runs) - check:

- Is the filter clogged with debris?
- Is there water in the tank, or, has air collected in the hot water system?
- Is the inlet pipe work/plumbing sucking in air at plumbing/connections (vacuum leaky?)
- Is inlet/outlet plumbing severely restricted or kinked?
- Proper voltage with the pump operating ($\pm 10\%$).
- For debris in pump inlet/outlet valves or for swollen/dry valves.
- Pump housing for cracks or loose drive assembly screws.

Pump will not shut-off/runs when tap is closed - check:

- Output side (pressure) plumbing for leaks, and inspect the leaky valves or toilet.
- For air trapped in outlet side (water heater) or pump head.
- For correct voltage to pump ($\pm 10\%$).
- For loose drive assembly or pump head screws.
- Are the valves or internal check valve held open by debris or is rubber swollen?
- Pressure switch operation/adjustment incorrect, refer to shut-off adjustment for switch.

Noisy or rough operation - check:

- For plumbing which may have vibrated loose.
- Is the pump plumbed with rigid pipe causing noise to transmit?
- Does the mounting surface multiply noise (flexible)?
- For mounting feet that are loose or are compressed too tight.
- For loose pump head to motor screws (3 long screws).
- With the motor with pump head removed. Is noise from motor or pump head?

Rapid cycling - check:

- Pressure switch shut-off adjustment.
- Water purifier, if fitted, should be on separate feed line.
- For restrictive plumbing, flow restrictors in taps/shower heads.



Troubleshooting (continued)

Leaks from pump head or switch - check:

- For loose screws at switch or pump head.
- Switch diaphragm ruptured or pinched.
- For punctured diaphragm if water is present in the drive assembly.

GAS

GENERAL INFORMATION

Gas Bottles

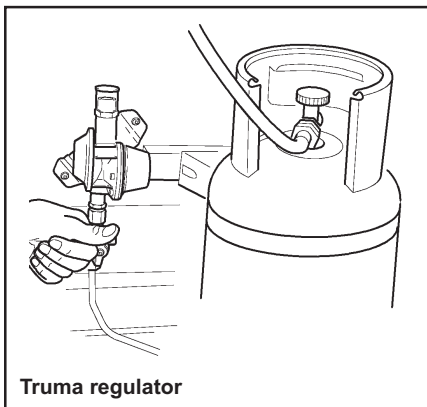
Bottled Liquefied Petroleum Gas (LPG) is the most convenient portable source of fuel for your motorhome. The motorhome includes a gas bottle stowage compartment.

Make sure that heating and cooking appliances and the gas cylinders are switched off before you move the motorhome.

The regulator

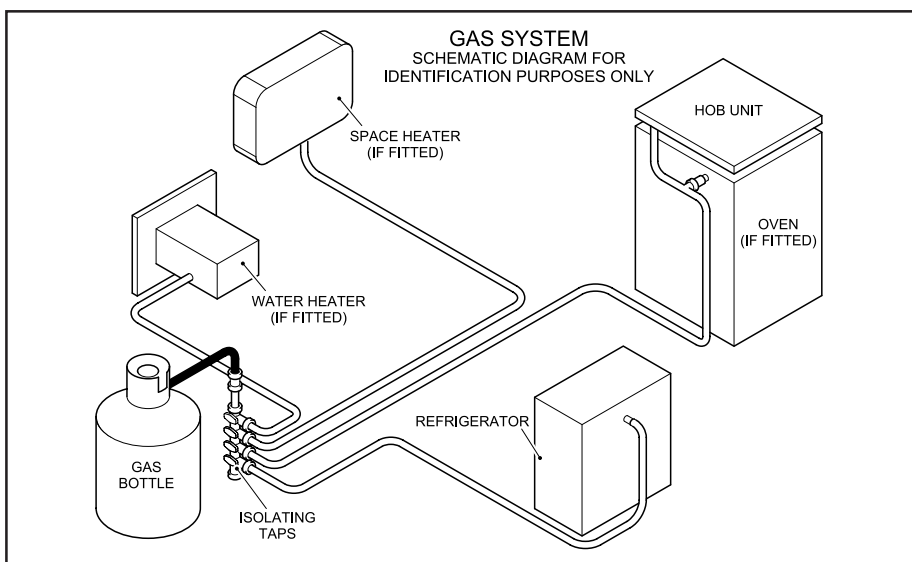
Your motorhome is fitted with a regulator as standard equipment. The gas regulator has a working pressure of 30mbar and is suitable for both propane and butane liquefied petroleum gas. There are dedicated hoses available for different types of gas/bottle. They are also available for camping gas and other mainland Europe LPG suppliers. Please contact your retailer who will have a stock of these hoses.

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



Truma regulator

WARNING: Some industrial LPG appliances operate at high pressure and require a 'high pressure' regulator. This often has an adjusting handle on it. **NEVER** use such a regulator on a motorhome.



TYPES OF GAS

Butane

Butane is supplied in the U.K. 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 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 use.

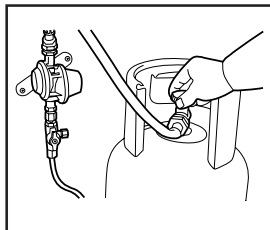
Note: See Technical Specification section for recommended gas bottle sizes.

CHANGING GAS CYLINDERS

Ensure that the cylinder is empty, then:

- i. Turn off the tap located by the gas regulator.
- ii. Turn off cylinder valve and all gas appliances.
- iii. Remove the gas

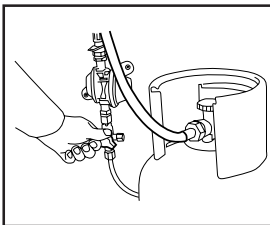
hose from the cylinder. If the gas hose is left disconnected protect the open inlet against the entry of dirt or insects.



- iv. Release retaining strap.
- v. Remove cylinder from gas locker and stand on ground.
- vi. Fit plastic protecting cap to cylinder.

Full cylinder:

- i. Place cylinder in cradle in gas locker.
- ii. Remove plastic protector from cylinder.



- iii. Connect the gas hose.
- iv. Connect retaining strap.
- v. Turn on cylinder valve and then systematically relight appliances as required.

If cylinders other than those recommended are used, then the user must ensure that:

- 1) The cylinders are adequately supported.
- 2) Do not block ventilation openings.
- 3) Cannot cause damage to fixtures and fittings located in the compartment.



GAS SAFETY ADVICE

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.

Only use gas cylinders stored in the dedicated gas locker. Do not attempt to fit extension hoses or use externally located gas bottles.

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.
- Avoid naked lights when connecting or changing a cylinder.
- Inspect flexible gas hoses regularly for deterioration and renew as necessary

with the approved type, in any case not later than the expiration date marked on the hose(s).

- 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.

VENTILATION

General

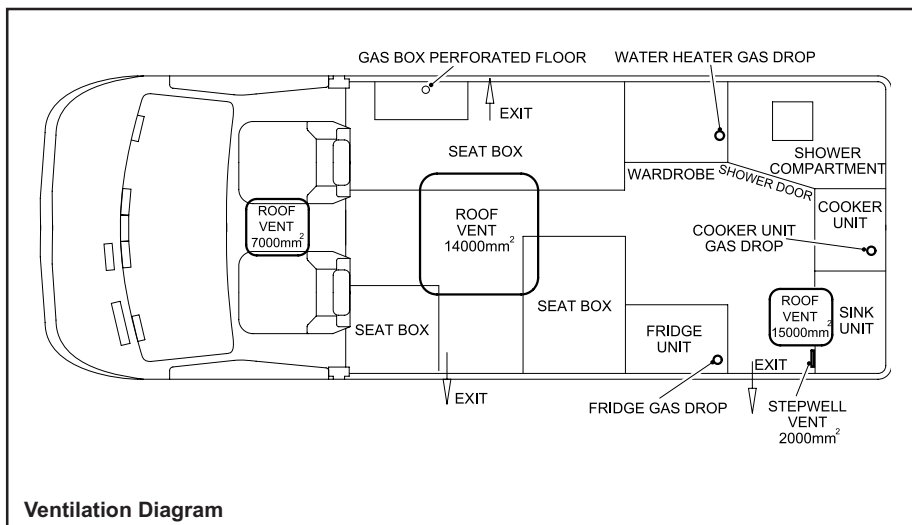
Fixed ventilation is a statutory requirement in all motorhomes. These ventilation apertures are positioned at both high and low level and for your safety should not be obstructed, even partially.

Low Level Ventilation

Under each appliance is a fixed ventilation aperture, of a size commensurate with the rating of the appliance itself. It is either gauze covered or incorporates a fixed plastic vent. This should be checked regularly to see that it has not become blocked.

High Level Ventilation

High level ventilation is provided by the roof vents. The ventilation provided has been carefully calculated and relates to the rating



Ventilation Diagram



of the appliances in the vehicle. Roof vents must not be covered with anything that may limit or affect the ventilation they provide.

Maintenance

Under no circumstances should any fixed ventilation aperture be blocked, covered, either partially or fully, or be modified in any manner whatsoever. They should be checked at least annually for damage or blockage. Screens and/or grilles should be kept clean and free from dust. See diagram of upper/lower ventilation.

All ventilation complies with BS EN 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.**

When you are cooking, it is essential to provide additional ventilation such as opening windows near grill, cooker or oven.

Roof-mounted Flue installations

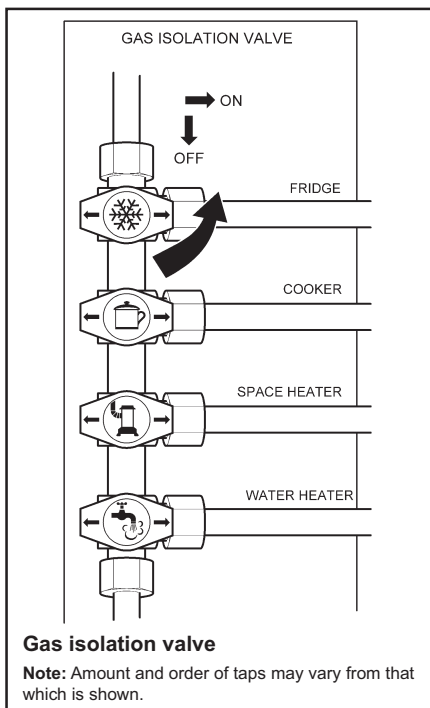
All flue installations should be inspected once a year throughout their length for corrosion. Flues should be replaced if any sign of perforation is found. Ensure that the replacement is of an approved type.

WARNING: Never allow modification of LPG systems and appliances except by qualified persons.

Connection

Ensure that the gas regulator is correctly connected to the gas cylinder in gas bottle compartment and that the hose is tight. Before turning on the gas supply, ensure that all gas operated equipment in the motorhome is turned off.

All gas equipment is supplied through a central Gas Manifold System which has individual isolation taps for each appliance denoted by a symbol (see below).



WARNINGS:

- 1 **Interior outlet sockets must only be used with original appliances supplied by manufacturer.**
- 2 **No appliance must be used outside when connected to an internal socket.**
- 3 **No additional appliance must be used inside the motorhome.**



Never use portable cooking or heating equipment other than electric heaters, that are not of the radiant type as they are a fire and asphyxiation hazard.

Safe Usage

To avoid accidents, the following fundamental advice should be carefully read before using gas appliances or changing gas cylinders.

- Always read and follow the use and maintenance instructions provided by the manufacturers of gas equipment. Should any soot accumulate on pans, fire radiants, etc., or any smell be produced, consult a competent installer on the correct maintenance and adjustment of burners.
- Never check for gas leaks with a naked flame.
- Always turn off the gas cylinder valve(s) or inlet to the motorhome or other dwelling when gas appliances are not in use.
- Never use gas appliances without adequate ventilation. All gas appliances require a plentiful supply of fresh air for correct operation. Fixed ventilators or air inlets should not be stopped up. Where practicable, turn off all appliances before retiring to bed, preferably at the cylinder or inlet to the motorhome or other dwelling.
- Unless the appliance incorporates automatic ignition, when lighting an appliance always make sure you apply a lighted match or taper to the burner before turning on the gas.
- If any appliance is disconnected for repair, maintenance, etc., ensure that the gas line is capped off.
- If taps are stiff to operate or appear to be a source of leakage, call in a competent installer to rectify. LPG taps require a special grease.
- Always seek advice when in doubt.

Input Ratings

Input rating for the gas appliances are as follows:

Refrigerator	0.1kW
Heater	2.4kW
Grill	1.5kW
Water heater	1.5kW
Oven	1.5kW
Hob burners (x3)	1.5kW (each)

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

The motorhome mains inlet flexible supply cable and its limits are shown on page 7-12.

1. Before connecting the motorhome installation to the mains supply, check that:
 - (a) the mains supply is suitable for your installation and appliances, i.e. whether it is a.c. or d.c. and whether it is at the correct voltage and frequency,
 - (b) 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
 - (c) any residual current device (earth leakage circuit breaker) in the mains supply to the motorhome 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 motorhome, 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.

Caution: Be aware that the 12V appliances, except the refrigerator, will not operate whilst the ignition is switched on and the vehicle engine running. The master switch on the electrical control panel controls the 12 volt supply.

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 MOTORHOME. IT IS DANGEROUS TO LEAVE THE SUPPLY SOCKET OR SUPPLY FLEXIBLE CABLE LIVE.

Note: Please check appliance manufacturers handbook to see if suitable for use with generator or charger.

A generator may only be connected via the mains socket. If using a generator you also need to comply with the requirements/ instructions supplied with the generator.

Because motorhomes are sometimes 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 3 years by a qualified person (see list) who should sign and issue a periodic inspection report. (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 motorhome 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. Never allow modification of electrical systems and appliances except by qualified persons. Lampholder-plugs (bayonet-cap adaptors) should not in any circumstances be used.

CAUTION: The Truma Ultraheat has the potential to draw 8 amps at 2kW. It is, therefore, advisable to check the supply rating before switching on two loads (items) greater than the supply as this may cause an overload and the circuit breaker to trip.

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.

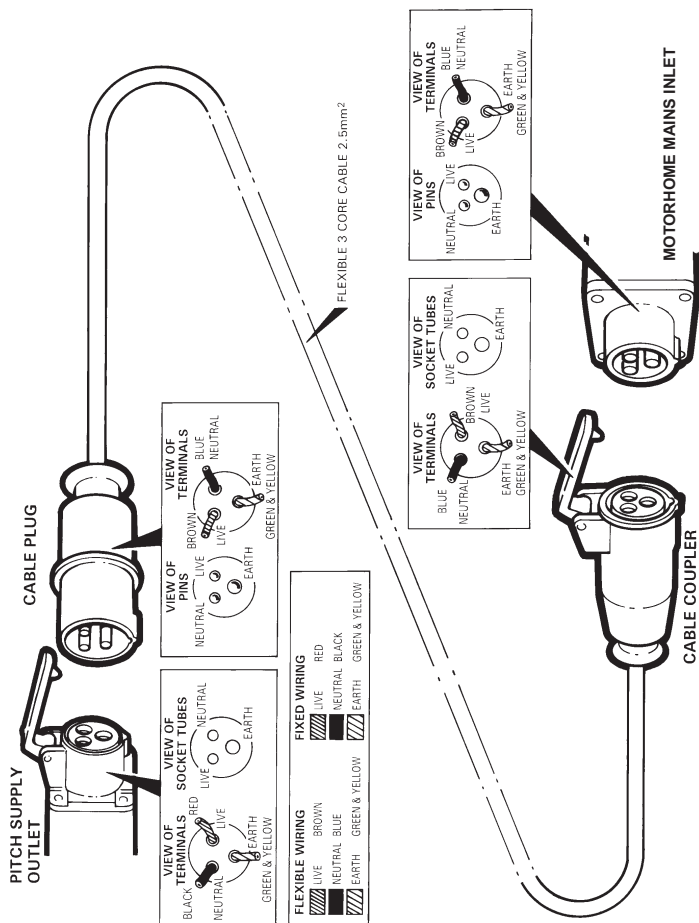
If electrical polarity indication is not included in your motorhome electrical equipment, it is useful to have a means of checking polarity of the mains supply, especially when touring overseas. There are available several proprietary makes of equipment for testing polarity.

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



WARNING: 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.



WIRING OF CONNECTING CABLE AND MOTORHOME MAINS INLET

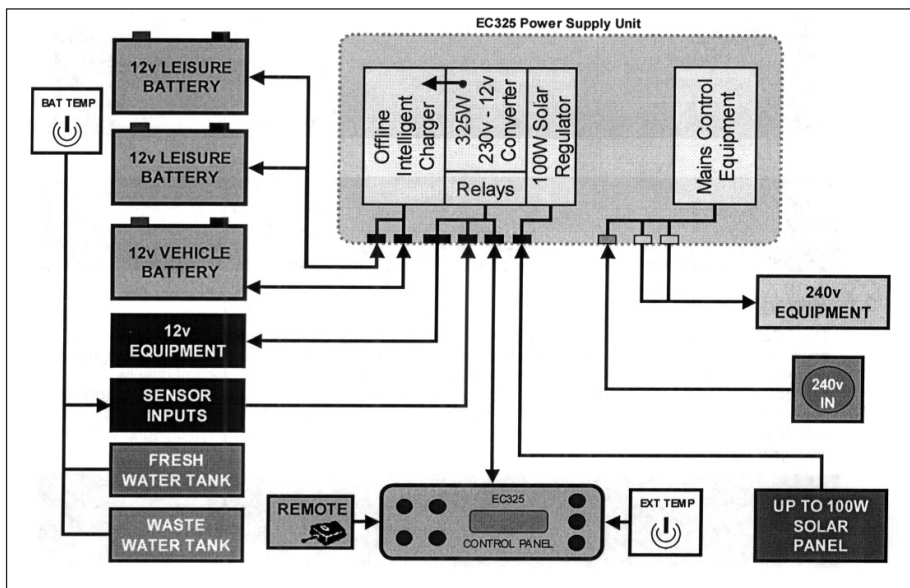
EC325 POWER CONTROL SYSTEM

1 Key Features

- 325W (~25A) Power Converter - Converts the 230V mains supply into 12v DC power to run the leisure equipment and supply the battery charger.
- Intelligent 'offline' Battery Charger - Uses a process of disconnecting the leisure battery from the leisure equipment during the charging process, which allows the battery charger to charge batteries quicker, recover heavily discharged batteries and achieve a higher final charge level than traditional battery chargers.
- Built-in dual Solar Regulator - Allows the direct connection of a 20 to 100W solar panel without the need for additional components. The dual regulator charges both the vehicle and leisure batteries simultaneously.
- System Monitor Circuit - Monitors key components within the power supply to ensure optimum operation. A simple 'traffic light' indicator shows the power supply status.
- Enhanced Digital Control Panel - With scrolling menu system, battery condition (voltage and current), water tank levels, tank and battery level warnings with battery protect circuit, alarm clock and programmable event timer.

2 System Overview

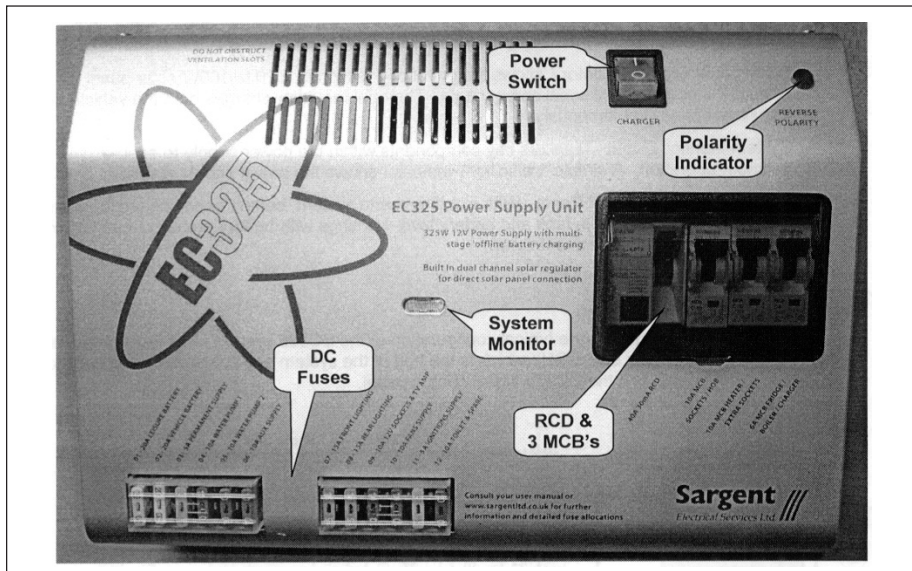
The following diagram shows the typical configuration of the EC325 system. The key component is the EC325 power supply unit (PSU), which is the hub of the system and provides connectivity to the ancillary components and the EC325 digital control panel.



3 Power Supply Details

For the safe operation of all electrical equipment within your Leisure Vehicle it is important that you read and fully understand these instructions. If you are unsure of any point please contact your dealer / distributor for advice before use.

The following diagram shows the EC325PSU layout.



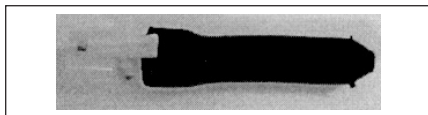
WARNING: Under heavy loads the EC325PSU case may become hot. **ALWAYS** ensure the ventilation slots and the cooling fan have a clear flow of air. Do not place combustible materials against / adjacent to the EC325PSU. The PSU will shutdown if overheated and will restart automatically when cool.

3.1 Battery Charger

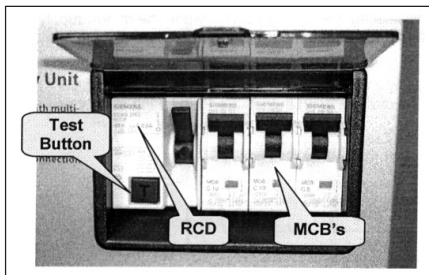
The EC325PSU incorporates an intelligent 'offline' battery charger that disconnects the leisure equipment from the battery while it is being charged. This process allows the charger to use higher charging voltages and to accurately control the charging current. No other equipment may be connected directly to the battery while charging is taking place. This intelligent battery charger draws power from the power converter (see 3.4) when the mains 230v supply is turned on and from the vehicle alternator when the engine is running, therefore the leisure battery is always charged via the intelligent battery charger.

WARNING: Higher voltages maybe present at the battery ($\leq 18v$). Do not connect ANY equipment to the battery while the charger is operating. Failure to comply with this warning may lead to equipment damage and will affect the battery charger performance.

The EC325 system also incorporates a battery compartment temperature sensor (see photograph), which monitors the battery ambient temperature to allow the charger to adjust the charging current if the battery is very cold or hot.



3.2 Residual Current Device & Miniature Circuit Breakers



The Residual Current Device (RCD) is basically provided to protect the user from lethal electric shock. The RCD will turn off (trip) if the current flowing in the live conductor does not fully return down the neutral conductor, i.e. some current is passing through a person down to earth or through a faulty appliance.

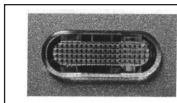
To ensure the RCD is working correctly, the test button should be operated each time the vehicle is connected to the mains supply (see section 5.1)

The Miniature Circuit Breakers (MCB's) operate in a similar way to traditional fuses and are provided to protect the wiring installation from overload or short circuit. If an overload occurs the MCB will switch off the supply. If this occurs you should investigate the cause of the fault before switching the MCB back on.

The following table shows the rating and circuit allocation for the three MCB's

MCB	Rating	Wire Colour	Description
1	10 Amps	White	230v Sockets
2	10 Amps	White (Yellow for heater)	Extra 230v Sockets / Heater
3	6 Amps	Black (Blue for water heater)	Fridge/Water Heater / 12v Charger (internally connected)

3.3 System Monitor



The system monitor circuit checks the power supply key components to ensure optimum operation. The current status is displayed on the front of the PSU by the means of a dear indication that illuminates in different colours depending on the PSU status.

Left	Centre	Right	Status	Indication description
-	-	G	Good	Mains supply on, PSU status good.
-	-	-	Good	Mains supply off, PSU status good.
-	O	G	Warning	Mains supply on, PSU in warning mode. In this mode the PSU will limit the output current to protect the unit from damage. It is still safe to use the unit but the fault should be investigated. Typical causes are battery temperature sensor unplugged, cooling fan not working, internal sensors disconnected or failed.
-	O	-	Warning	Mains supply off, PSU in warning mode.
R	O	G	Failure	Mains supply on, PSU in overheat failure mode. In this mode the PSU will shutdown and all equipment will be switched off. The cooling fan will continue to run until the unit cools down. Typical causes are short-circuited DC output, battery connected in reverse, cooling fan failed, cooling vents blocked / covered, problem caused by prolonged use in warning mode.
R	-	G	Failure	Mains supply on, PSU in overheat failure mode.
R	O	-	Failure	Mains supply off, PSU in overheat failure mode.



3.4 Power Converter

The EC325PSU contains a power converter that powers the leisure equipment when the mains supply is connected. This module supplies 13.5v DC to the leisure equipment up to a maximum of 25 Amps (325 Watts).

The power converter also supplies power to the intelligent battery charger, therefore the available power is distributed between the leisure load and the charger, with the leisure load taking priority as per the following example:

Leisure load	Available power for battery charger
10A	15A
15A	10A
20A	5A
25A	0A

3.5 Solar Panel Converter

The EC325PSU incorporates a built-in dual channel Solar Regulator that allows the direct connection of a 20 to 100W solar panel without the need for additional components. The dual regulator charges both the vehicle and leisure batteries simultaneously and connects to the PSU via a dedicated connector on the base of the unit (see section 5.7 for details).

A connection harness is available from your dealer, the part number is 59065-07.

3. 6 Fuses

WARNING: When replacing fuses always replace a fuse with the correct value. NEVER replace with a higher value / rating as this could damage the wiring harness. If a replacement fuse 'blows' do not keep replacing the fuse as you could damage the wiring harness. Please investigate the fault and contact your dealer.

The following table shows the fuse allocation for the 12 fuses fitted to the EC325PSU.

Fuse	Rating	Fuse Colour	Wire Colour	Description
1	20 Amps	Yellow	Brown / Blue	Leisure Battery
2	20 Amps	Yellow	Brown / Green	Vehicle Battery
3	5 Amps	Tan	Brown / Yellow	Permanent Supply (Radio / Fridge)
4	10 Amps	Red	Green / Blue	Water Pump 1
5	10 Amps	Red	Green / White	Water Pump 2
6	10 Amps	Red	Grey / Red	Auxiliary Supply (Awning / Entry Light)
7	15 Amps	Blue	Grey	Front Lights
8	15 Amps	Blue	Pink	Rear Lights
9	10 Amps	Red	Yellow / White	12v Sockets/TV Amplifier/Entertainment
10	10 Amps	Red	Black / tracer	Fans / Heater Fans
11	5 Amps	Tan	Yellow/ Green	Ignitions Supply (Heaters / Cooker)
12	10 Amps	Red	Purple	Toilet Pump

The following table shows details of the fuse(s) located at the leisure battery.

Battery 1	20 Amps	Yellow	Brown/Blue	Fuse remotely located near battery
Battery 2	20 Amps	Yellow	Brown/Blue	Fuse remotely located near battery 2 (where fitted)



3.7 Battery

A) Type/ Selection

For optimum performance and safety it is essential that only a proprietary brand LEISURE battery is used with a typical capacity of 75 to 120 Ah (Ampere / hours). A normal car battery is NOT suitable. This battery should always be connected when the system is in use. The EC325PSU is configured at the factory for standard lead acid leisure batteries, however your dealer can reconfigure the unit to work with Gel batteries if required. The dealer may make a small charge for undertaking this work. Some vehicle installations can cater for two leisure batteries connected in parallel. In these cases it is recommended that two identical batteries are used. The battery feed is fitted with an inline fuse between the battery and the electrical harness, and is usually located immediately outside the battery compartment or within 500mm of the battery. The maximum rating of this fuse is 20A per battery.

B) Installation & Removal

Always disconnect the 230v mains supply and turn the EC325PSU charger switch to the OFF (0) position before removing or installing the battery. When connecting the battery, ensure that the correct polarity is observed (black is negative [-] and red is positive [+]) and that the terminals are securely fastened. Crocodile clips must not be used.

WARNING: Explosive gases may be present at the battery. Take care to prevent flames and sparks in the vicinity of the battery and do not smoke.

C) Operation / Servicing

Under normal circumstances it should not be necessary to remove the battery other than for routine inspection of the terminals and “topping up” of the battery fluid where applicable. Please see instructions supplied with the battery.

Note: Do not over discharge the battery. One of the most common causes of battery failure is when the battery is discharged below the recommended level of approximately 10v. Discharging a battery below this figure can cause permanent damage to one or more of the cells within the battery.

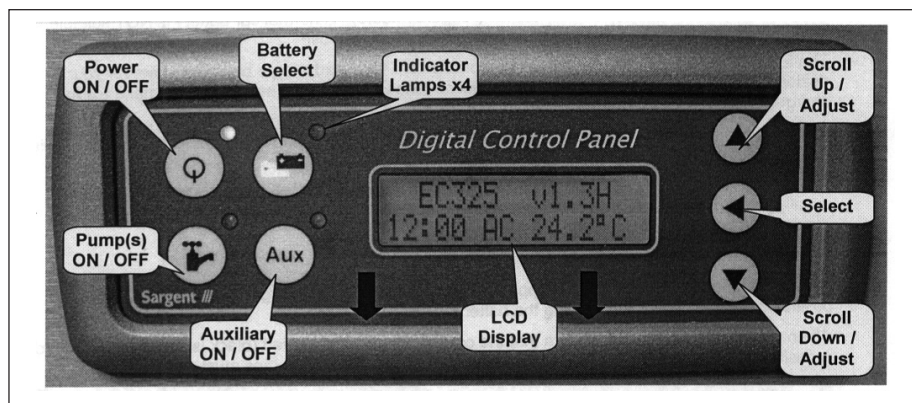
To prevent over discharge, the EC325 system incorporates a battery protect circuit that warns and then disconnects the batteries when they fall below the following conditions:

Battery	Voltage cut off	Action after cut off	Notes
Vehicle	10.9V	Battery selection is changed from Vehicle battery to leisure battery. If the leisure battery is below 6V then a further warning will occur (see below).	This cut off level is designed to protect the vehicle battery from over discharge. The 10.9V level ensures there is sufficient power in the battery to run the vehicle electronics and start the vehicle. This cut off only applies to power drawn from the battery by the leisure equipment; it will not protect the battery if you leave the vehicle lights on.
Leisure	6V	Power is turned off	This is an emergency cut off level to protect the battery from severe damage. You should not rely on this cut off level during normal operation, but manage your power consumption to a discharge level of 10V. This cut off only applies to power drawn from the battery by the leisure equipment that is controlled by the control panel power switch; it will not protect the battery from discharge by the radio or other permanently connected equipment.

4 Control Panel Details

4.1 Layout and Buttons

The following diagram shows the control panel layout and button functions.



Note: to remove the decorative bezel, **pull down** and **lift forward** as indicated by the blue arrows.

Item	Function	Options / Notes
Power ON / OFF	Use to turn the main leisure power on and off.	The adjacent LED is illuminated when the power is ON.
Battery SELECT	Use to select the Leisure or Vehicle battery. Press the button to toggle between the leisure and vehicle batteries. When a battery is selected this battery will be used as the power source and will also be charged by the charger.	The adjacent LED is illuminated when the VEHICLE battery is selected; by default when the power is initially turned on the leisure battery is selected and is indicated by the battery select LED off.
Pump On / OFF	Use to turn the water pump(s) power on and off (see section 4.3).	The adjacent LED is illuminated when the pump power is ON.
Aux On / OFF	Use to turn the Auxiliary power on and off (see manufacturers handbook for details of what items are operated by the auxiliary function).	The adjacent LED is illuminated when the auxiliary power is ON.
Scroll UP ▲	Use to scroll the display up (settings section of the menu) or adjust the selected setting (see section 4.3).	Note: The menu screens operate in a continuous loop, therefore you can use either the UP and DOWN buttons to move to any screen.
Scroll DOWN ▼	Use to scroll the display down (readings section of the menu) or adjust the selected setting (see section 4.2).	
Select ◀	Use to select a men item within the settings section (see section 4.2 & 4.3).	Use to move to the next setting, when entering alarm / event times.

Note: The display backlight operated for approximately 6 seconds after any key press.

4.2 Menu Functions - Readings section

	Display	Description	Options / Notes
	EC325 v1.3H 12:00 23.9°C	Main Control Panel display showing model number (EC325), software version number (v3.1), specification (H), current time (12:00) and internal temperature (23.9°C) in centigrade.	<p>The addition of an asterisk (*) in the top left of the display indicates that the alarm is set.</p> <p>The addition of a hash (#) in the top right of the display indicates that the event timer is set.</p> <p>The addition of the letters 'AC' in the centre of the display indicates that the AC Mains supply is switched on.</p>
▼	Leisure Battery 12.5v (Good)	Voltage reading and battery condition description for the on-board leisure battery See also 3.7C	Less than 10.9 = (Poor) 10.9 to 11.4 = (Fair) 11.9 to 14.4 = (Good)
▼	Vehicle Battery 13.3v (Good)	Voltage reading and battery condition description for the vehicle battery See also 3.7C	Less than 10.9 = (Poor) 10.9 to 11.8 = (Fair) 11.9 to 14.4 = (Good)
▼	Mains Supply ON	Indication of the 230V mains supply	ON = mains supply on OFF = mains supply off
▼	Leisure Battery = Lead Acid	Shows the type of battery configured within the EC325PSU	The leisure battery type can be changed within the EC325PSU to accommodate Gel batteries if required (see section 3.7A for details)
▼	Fresh Water 25% Full	Water level in the fresh water tank (5 measurement levels) If the water pump power switch is turned ON and the later level drops below 25% a warning beep will be heard and the LCD display will flash. To cancel the warning, press the select (◀) button. The warning will not be repeated unless the water pump power switch is turned off and on again. This is to ensure the warning does not become a nuisance.	0% < 1/4 Full (Nearly empty) 25% > = 1/4 Full 50% > = 1/2 Full 75% > = 3/4 Full 100% = Full



	Display	Description	Options / Notes
▼	Waste Water 0% Full	Water level in the waste water tank (2 measurement levels). If the water pump power switch is turned ON and the waste water level rises to 100% a warning beep will be heard and the LCD display will flash. To cancel the warning, press the (◀) button. The warning will not be repeated unless the water pump power switch is turned off and on again. This is to ensure the warning does not become a nuisance.	0% < 1/2 Full 50% > = 1/2 Full (optional level that is not normally fitted by most manufacturers) 100% = Full
▼	External Temp 265°C	External temperature (in degrees centigrade) as measured by the external temperature probe (Only available in H specification systems - see start of section 4.2)	
▼	Battery Current 5.4 Amps	Current (in Amps) being drawn from or charged into the selected battery. If a solar panel is fitted this display will include the current being provided by the solar panel. (Only available in H specification systems - see start of section 4.2)	Negative figure (-) = current being drawn from the selected battery. Positive figure (+) = current being used to charge the selected battery

4.3 Menu Functions - Settings section

	Display	Description	Options / Notes
▼	Pump Select? (Internal)	Shows the currently selected pump that will be operated by pressing the pump on/off switch (TAP symbol). Use the select button (◀) to change. Note: If you water pump stops working, this setting may have been inadvertently changed.	<INTERNAL> = The internal pump will be operated by the pump switch. <EXTERNAL> = The external pump will be operated by the pump switch. <BOTH> = Both the internal and external pumps will be operated simultaneously by the pump switch.
▼	Water Tank Fill? <Start 1 Min>	Allows operation of the external pump for a period of one minute (for filling the internal tank from the external tank). Use the select button (◀) to START (or STOP).	Will have no effect if the external pump is already switched on (see above). Will not operate if the internal (fresh) water tank is showing 100% full.
▼	Clock Set? 12:00	Access to set the internal clock Press the select button (◀) to select HOUR. Use the up/down (▲ ▼) buttons to change. Press the select button (◀) to select MINUTE. Use the (▲ ▼) buttons to change. Press the select button (◀) to exit.	Please note the clock uses a 24 hour cycle.
▼	Alarm Set? 12:00	Access to set the alarm clock Press the select button (◀) to select HOUR. Use the up/down (▲ ▼) buttons to change. Press the select button (◀) to select MINUTE. Use the (▲ ▼) buttons to change. Press the select button (◀) to exit.	Please note the clock uses a 24 hour cycle.
▼	Alarm = Off	Shows the alarm clock status (on/off) Press the select button (◀) to switch between OFF or ON.	The addition of an asterisk (*) in the top left of the main EC325 display indicates that the alarm is set



	Display	Description	Options / Notes
▼	Set Event Timer?	Access to set the event timer Press the select button (◀) to select HOUR ON. Use the up/down (▲▼) buttons to change. Press the select button (◀) to select MINUTE ON. Use the (▲▼) buttons to change. Press the select button (◀) to select HOUR OFF. Use the up/down (▲▼) buttons to change. Press the select button (◀) to select MINUTE OFF. Use the (▲▼) buttons to change. Press the select button (◀) to exit.	Please note the event timer uses a 24 hour cycle. The event timer is used to switch the control panel power on and off in the absence of the user/occupier. See section 4.4 for further details. <i>(Only available in H and M specification systems).</i>
	Event Timer = Off 12:00 till 12:00	Allows the event timer status (OFF/ ON) and the current On and Off times. Press the select button (◀) to switch between OFF or ON. <i>(Only available in H and M specification systems).</i>	

4.4 Event Timer example

The event timer is designed to allow the leisure vehicle user to turn the 12v power on or off (in the same way as using the control panel power button) without being in the vehicle. This allows lights or other equipment to be turned on or off at a predetermined time.

Example - to turn on one interior light at 11.00pm for 1 hour:

Ensure the clock is set to the correct time

Scroll to the 'Set Event Timer?' screen

Following the instruction in section 4.3, set the ON time to 23:00 and the OFF time to 24:00

Scroll to the 'Event Timer=' screen and select ON

Scroll to the main control panel display and ensure a hash (#) is displayed in the right of the display

Turn all lights and 12v equipment off in the vehicle except the light that you want the event timer to automatically switch on

Turn the 12v power off on the control panel

Exit the vehicle

At 11:00pm (23:00) the control panel will switch the 12v power on and therefore any equipment that was left switched on will be turned on. The 12v power will be switched off at Midnight (24:00).

4.5 Warning Messages

Vehicle Battery Dangerously Low	This WARNING display indicates that the vehicle battery voltage is low (10.9 volts or less). The panel will beep for one minutes and then switch over to the leisure battery to prevent draining the vehicle battery.	You can switch over to the leisure battery immediately (and cancel the beep) by using the battery selector switch.
Leisure Battery Dangerously Low	This WARNING display indicates that the leisure battery voltage is low (6 volts or less). The panel will beep for one minute and then switch the power off to prevent damage to the leisure battery.	See section 3.7 for further details.
PSU Over Temp Cooling Down	This WARNING display indicates that the EC325PSU has overheated and is cooling down. The charger and power converter will shutdown to allow the cooling fan to reduce the heat of the PSU.	This warning is unlikely to occur under normal operation. If your PSU does overheat please check the ventilation slots for blockages etc.
System disabled Engine started	This WARNING display indicates that the system has been disabled because the vehicle engine is running.	EMC (Electro Magnetic Compatibility) directive 89/336/EEC requires that electrical accessories within the vehicle are disconnected while the vehicle is in motion.

5 Operational & Safety Information

5.1 Connecting to the Mains supply - Safety checks

For your safety it is **IMPORTANT** that you follow these connections instructions each time your Leisure Vehicle is connected to a mains supply.

- A) **Ensure suitability of the Mains Supply.** Your Leisure Vehicle should only be connected to an approved supply that meets the requirements of BS7671. In most cases the site warden will hold information regarding suitability of supply. If using a generator you also need to comply with the requirements /instructions supplied with the generator. Please note that some electronic generators may not be compatible with your leisure system.
- B) **Switch the EC325PSU internal Power Converter OFF.** Locate the green 'Charger' power switch on the EC325PSU and ensure the switch is in the OFF (0) position before connection to the mains supply.
- C) **Connect the Hook-up Lead.** Firstly connect the supplied hook-up lead (orange cable with blue connectors) to the Leisure Vehicle and then connect to the mains supply.
- D) **Check Residual Current Device operation.** Locate the RCD within the EC325PSU and ensure the RCD is switched on (lever in up position). Press the 'TEST' button and confirm that the RCD turns off (lever in down position). Switch the RCD back to the on position (lever in up position). If the test button failed to operate the RCD see section 5.2.
- E) **Check correct Polarity.** Locate the 'Reverse Polarity' indicator on the EC325PSU and ensure that the indicator is NOT illuminated. If the indicator is illuminated see section 5.2.
- F) **Check Miniature Circuit Breakers.** Locate the MCB's within the EC325PSU (adjacent to the RCD) and ensure they are all in the ON (up) position. If any MCB's fail to latch in the on position see section 5.2.
- G) **Turn the EC325PSU ON.** Locate the green power switch on the EC325PSU and turn to the ON (I) position. The switch will illuminate when turned on.
- H) **Check operation of equipment.** It is now safe to check the operation of the 12v and 230v equipment.

5.2 Common Fault Table

Fault	Possible Cause	Proposed Fix
No 230 volt output from PSU.	Connecting lead between the site and Leisure Vehicle not connected.	Check and connect lead as per 5.1C. Check also input connector at the base of the EC325PSU.
	RCD switched off.	Reset RCD as per 5.1D.
	RCD not operating correctly.	Check supply polarity; if the RCD continues to fail contact your dealer, as there is probably an equipment or wiring fault.
	MCB switched off.	Reset MCB by switching OFF (down position) then back ON (up position), if the MCB continues to fail contact your dealer, as there is probably an equipment or wiring fault.
	No or deficient supply from site.	Contact site warden for assistance.
	Other fault.	Contact your dealer.
Reverse Polarity light is illuminated on PSU	Mains Supply reversed?	The reverse polarity light is designed to illuminate when the Live and Neutral supply has been reversed/crossed over. If the light illuminates there is a problem with the site supply or the cable connecting the supply to your vehicle. The light is designed to work on UK electrical supplies (where the neutral conductor is connected to earth at the sub station). If you are using your vehicle outside the UK this light may illuminate when no fault exists. In these cases consult the site warden for advice.
	Generator being used	The Reverse Polarity warning light is on when using my generator. This is a normal side effect when using some types of generator. Instead of connecting the neutral conductor to earth, some generators centre tap the earth connection making both neutral and live conductors 110V above earth. This 110V difference causes the neon polarity indicator to illuminate. In most cases it is still safe to use the generator, but please consult the generator handbook for further information.
Control Panel Problems	Control Panel has no display	Check batteries, turn EC325PSU charger switch on, and ensure mains supply is connected. Check control panel connecting lead at EC325PSU and behind Control Panel. Contact your Dealer.
	12V Power turns off	Battery save feature has operated to protect the vehicle battery and or the Leisure battery. See 3.7C. Engine has been started, all equipment has been disconnected to meet EMC requirements. See 4.4.
	Control Panel display corrupt/erratic function	Observe control panel handling instructions. Control panel software may have crashed. Reboot control panel by turning off the EC325PSU charger switch and removing fuses 1 & 2 at the EC325PSU (2x20A fuses for leisure and vehicle batteries). Wait 30 seconds then replace the fuses and turn the charger switch on. (Alternatively, remove the bezel at the control panel by pulling down in the centre of the bottom, unplug the control panel multi-way connector, wait 30 seconds, then plug back in and reassemble.
	Control Panel contrast poor	Observe control panel handling instructions. Remove control panel as above but do not unplug. Carefully adjust contrast preset (small adjuster) on back of control panel using jewellers screwdriver.



Fault	Possible Cause	Proposed Fix
Control Panel Problems (continued)	Control Panel current current reading incorrect.	<p>Re-calibrate the current sensor as follows: With the charger switch turned off, and the power turned off at the control panel (no LED's on).</p> <p>Scroll down ▼ the display until battery current is shown.</p> <p>Hold down the select button ◀ (left arrow) until 'calibrating . . . ' appears; keep the button pressed until the battery current reading re-appears. Release the button.</p> <p>Now repeat the process to store the new setting.</p> <p>Hold down the select button ◀ (left arrow) until 'calibrating . . . ' appears; keep the button pressed until the battery current reading re-appears.</p> <p>The current reading should now be correct.</p>
No 12 volt output from PSU	No 230V supply.	Check all above.
	Charger not switched on.	Switch charger switch on (i) position, switch will illuminate.
	Battery not connected and / or charged.	Install charged battery as per 3.7.
	Power switch on control panel not switched to ON.	Turn power on at control panel.
	Battery flat/Battery fuse blown.	Recharge battery, check fuses, check charging voltage is present at battery.
	Fuse blown.	Check all fuses are intact and the correct value fuse is installed as per fuse table.
	Equipment switched off/ unplugged.	Check equipment is switched on and connected to the 12V supply.
	PSU overheated/auto shutdown operated.	Reduce load on system. Allow PSU to cool down. PSU will automatically restart when cool. See 3.2.
Pump not working	Other fault.	Contact your Dealer.
	Fuse blown.	Replace fuse.
	Pump turned off.	Turn pump on by pressing the pump button at the EC325 control panel (tap symbol).
	Setting incorrect.	<p>Both the internal and external pump feeds are controlled from the EC325 control panel. To alter the setting of the pump switch (tap button) see section 4.3.</p> <p>Ensure the setting matches your desired requirement.</p>



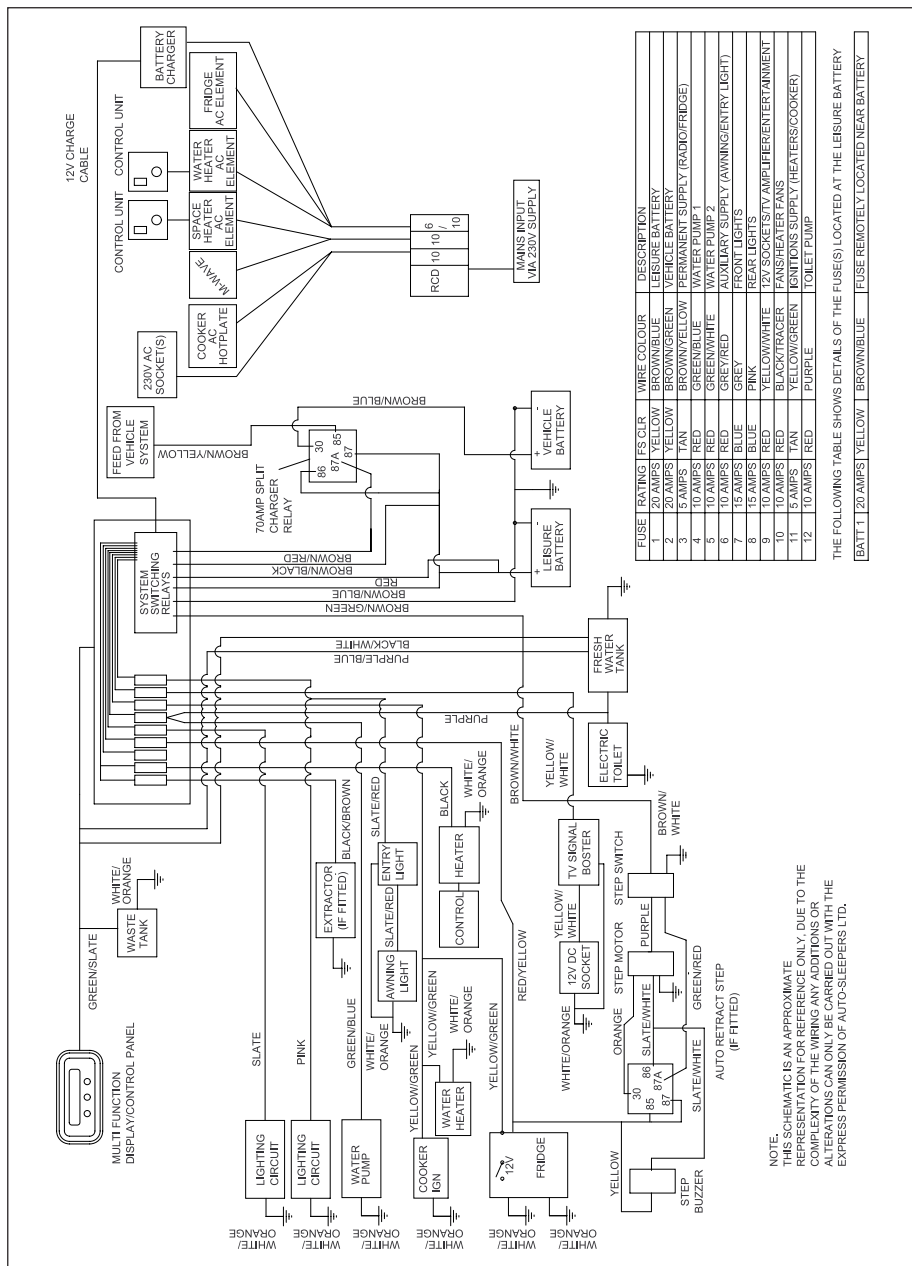
6 Technical Data & Approvals

6.1 Outline Specification

INPUT 230V	230 Volts / 0 to 16 Amps	+/- 10%
OUTPUT 230V	RCD protected, 3 x MCB outputs of 10, 10 and 6A via 2 x 9 way connectors	
INPUT 12V	2 x 20A battery inputs via a single 6 way connector	
SOLAR INPUT	1 x Dedicated solar panel input (20 to 100W panel) via a 4 way connector	
OUTPUT 12V	25A total output via 4 x 16A switched channels protected by 12 fused outputs via a 15 way connector	
Integrated CHARGER	Input 220-240 Volts AC +/- 10%, Frequency 50 Hz +/- 6%, Current 3A max. DC Output 13.5 Volts nominal, Current 25 Amps max (325 Watts).	
Signal INPUT	4 x Fresh water level, 2 x Waste water level, 1 x Engine running, 2 x battery temp sensor via a 10 way connector.	Fresh water negative sensed Waste water negative sensed
Data IN/OUT	Data communication and power to Control Panel via 20 way IDC header connector.	
IP rating	IP31	
Operating temperature	Ambient 0 to 35° Centigrade. PSU case temperature with full load 65°C Max.	Automatic shutdown and restart if overheated/



12V/230V WIRING DIAGRAM





TECHNICAL DATA

Base Vehicle Data

For all matters relating to the base vehicle, and particularly tyre pressures, refer to the base vehicle instruction book or if in doubt consult your local base vehicle commercial dealer.

Weights, Dimensions and Capacities

Before using your Auto-Sleeper you should be fully conversant with all matters relating to weights. The following definitions should be fully understood and then related to the tabulated base vehicle weight data.

Weights

Details of vehicle weights are found below, and are presented in the manner prescribed in the European Standard EN1646-2 for Payloads. All weights are in kilograms (kg).

Take care to ensure that heavy loads are stored low down in bed boxes and low cupboards, and distribute weight evenly side to side as far as possible.

Note 1: Please take care to ensure that you have allowed for the masses of all items you intend to carry in the motor caravan, e.g. passengers, optional equipment, essential habitation equipment and personal effects such as clothing, food, pets, bicycles, sailboards, sports equipment, etc.

Note 2: Warning - Under no circumstances should the maximum technically permissible laden mass of this motor caravan, or its individual axles, be exceeded.

DEFINITIONS

Maximum Technically Permissible Laden Mass (MTPLM)

The Maximum Technically Permissible Laden Mass is a figure given by the manufacturer of the base vehicle. It is the combined maximum permitted weight of the vehicle and all of its contents, both inside and out. The MTPLM is unaffected by the Auto-Sleeper conversion.

Mass in Running Order (MRO)

The Mass in Running Order is defined as the mass of the standard converted vehicle with bodywork including the following:

- Coolants (oil and water)
- 90% of automotive fuel
- Spare wheel
- Crockery
- Washer fluid
- Tools
- Driver (at 75 kg, 11st 12lb)
- Fire extinguisher

All other optional equipment whether on the base vehicle or part of the conversion is excluded from the mass in running order.

Mass of the User Payload

The Mass of the User Payload is the difference between the MPTLM and the MRO. It is the motor caravans carrying capacity for everything placed in or on the vehicle, including the passengers. Please note that a driver (at 75kg, 11st 12lb) is included in the MRO. Everything listed in *italics* below must be subtracted from the payload.

Mass of the Conventional Load

The Conventional Load is the mass of the passengers carried and must be subtracted from the payload. The "EC standard person" weighs 75kg (11st 12lb). The user should adjust the figure according to the mass and number of passengers carried. Motorhome Manufacturers designate passenger seats as being suitable for travelling, and provide seat belts accordingly. Multiplying the weight of the passengers by the number of passengers gives the Conventional Load. Please note that a driver (at 75kg, 11st 12lb) is included in the MRO.



Essential Habitation Equipment

For the purpose of EN1646-2, the mass of the Essential Habitation Equipment includes the mass of the following:

- the LPG cylinders, 90% full.
- the freshwater tank, 90% full.
- the water heater system, full.
- the waste water tank, empty.
- the toilet system flushing tank, full.
- the toilet system holding tank, empty.

All of these must be subtracted from the user payload.

Auto-Sleepers include the low voltage (230V) connection cable and the second battery in the mass in running order.

Options, Personal Effects and Accessories

When options, personal effects and accessories are fitted or carried the mass must be subtracted from the user payload. All optional equipment whether on the base vehicle or part of the conversion is excluded from the mass in running order. Personal effects are any items of any description carried by the vehicle.

To determine accurately if a vehicle is exceeding one of its maximum technically permissible laden masses, the vehicle with all of its load (that is passengers, contents, luggage and external load) should be weighed on a weighbridge.

You may wish to allocate the user payload to suit your own use. For example, to increase the available payload, the water system may be emptied. If the vehicle is not being used for camping the gas bottles can be left at home to increase the mass available for other items.

Gross Train Mass (GTM)

If you are towing a trailer with your Auto-Sleeper, the Gross Train Weight is the maximum allowable weight of the towing vehicle, the trailer and the mass of every item carried. The GTM is given by the base vehicle manufacturer and is unaffected by the Auto-Sleeper conversion. Please check your driving licence to ensure you are allowed to drive a vehicle combination at this weight.

Maximum Braked Trailer Mass (MBTM)

This is the maximum allowable weight of the trailer together with its load, provided the trailer has a braking system, which complies with the local Construction and Use Regulations. The MBTM is given by the base vehicle manufacturer and is unaffected by the Auto-Sleeper conversion.

MTPLM of the Axles

The individual axles also have MTPLM's. The sum of the two axle MTPLM's usually exceeds the overall vehicle MTPLM, but this does not mean you can load each axle to its maximum, because doing so would exceed the overall MTPLM of the whole vehicle.

**WEIGHT AND DIMENSION DATA****WEIGHT DATA TABLE**

SURREY	2.1 TDCi MANUAL	2.1 TDCi AUTOMATIC
Vehicle Designation	313 CDi	313 CDi
MTPLM	3880	3880
Mass in Running Order	3113	3145
Mass of the User Payload	767	735
Conventional Load @ 75kg per person)	225	225
Designated Passenger Seats (excluding driver)	3	3
Essential Habitation Equipment	127	127
Personal Effects (standard minimum figure)	104	104
Remainder for Personal Effects / Options / Accessories	311	279
Optional Roof Rack + Ladder	10	10
Optional Omni Vent	2	2
Optional Corner Steadies	std	std
Gross Train Mass	5880	5880
MBTM	2000	2000
Axle Weights		
Front, in Running Order	1453	1485
Rear, in Running Order	1660	1660
MTPLM Front	1800	1800
MTPLM Rear	2430	2430

**WEIGHT AND DIMENSION DATA (continued)****DIMENSIONAL DATA**

MODEL	SURREY
Base Vehicle Manufacturer	Mercedes
Base Vehicle Model	313 CDi
Wheelbase	3665

METRIC DIMENSIONS (mm)

Overall Length	6445
Overall Width (mirrors extended)	2660
Overall Width (mirrors folded)	2260
Overall Height	3130
Internal Height (maximum)	1960
Internal Height (minimum)	1920
Single Bed (offside)	1920 x 700
Single Bed (nearside)	1850 x 700
Double Bed	2100 x 1920
Overcab Bed	1900 x 1180
Fresh Tank Capacity (litres)	71
Waste Tank Capacity (litres)	53
Gas Butane	3 x 7 kg
Gas Propane	3 x 6 kg

**WEIGHT AND DIMENSION DATA****WEIGHT DATA TABLE****NORTHANTS****2.1 TDCi
MANUAL****2.1 TDCi
AUTOMATIC**

Vehicle Designation	313 CDi	313 CDi
MTPLM	3500	3500
Mass in Running Order	3049	3081
Mass of the User Payload	451	419
Conventional Load @ 75kg per person)	75	75
Designated Passenger Seats (excluding driver)	1	1
Essential Habitation Equipment	127	127
Personal Effects (standard minimum figure)	84	84
Remainder for Personal Effects / Options / Accessories	165	133
Optional Roof Rack + Ladder	10	10
Optional Omni Vent	2	2
Optional Corner Steadies	std	std
Gross Train Mass	5500	5500
MBTM	2000	2000

Axle Weights

Front, in Running Order	1419	1451
Rear, in Running Order	1629	1629
MTPLM Front	1800	1800
MTPLM Rear	2250	2250

**WEIGHT AND DIMENSION DATA (continued)****DIMENSIONAL DATA**

MODEL	NORTHANTS
Base Vehicle Manufacturer	Mercedes
Base Vehicle Model	313 CDi
Wheelbase	3665

METRIC DIMENSIONS (mm)

Overall Length	6445
Overall Width (mirrors extended)	2660
Overall Width (mirrors folded)	2260
Overall Height	3130
Internal Height (maximum)	1960
Internal Height (minimum)	1920
Double Bed	2100 x 1920
Single Bed (nearside)	1920 x 730
Single Bed (offside)	1920 x 730
Overcab Bed (when fitted)	1900 x 1180
Fresh Tank Capacity (litres)	71
Waste Tank Capacity (litres)	53
Gas Butane	3 x 7 kg
Gas Propane	3 x 6 kg

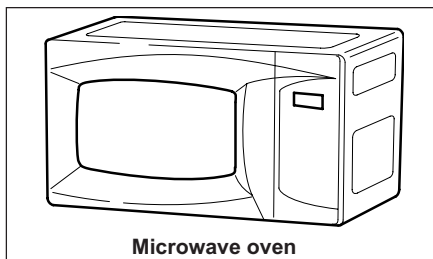
IMPORTANT

To maximise the usage of fitted equipment in your motorhome it is essential that any accompanying manufacturers' literature is read fully. All recommended maintenance and preparation procedures should be followed. The information provided in this manual is only intended as a guide. If in any doubt consult your manufacturer appointed dealer, particularly before attempting to install extra equipment.

In the interests of safety, replacement parts for an appliance shall conform to the appliance manufacturer's specifications and should be fitted by him or his authorised agent.

MICROWAVE OVEN

Model: Daewoo KOR6L1B



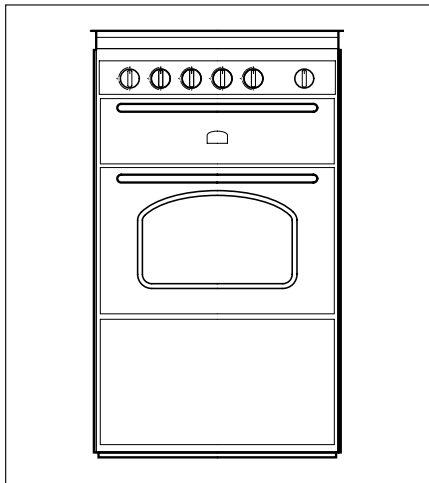
Microwave oven

Features:

- Oven volume in Litres: 20.
- Ten power steps.
- Maximum Wattage: 700.
- Turntable.
- Electronic time control.
- Touch control.

Separate operating instructions are supplied with this equipment.

COUNTRY LEISURE 'CAPRICE' 2040E COOKER



OPERATION

Ensure the gas cylinder is turned on.

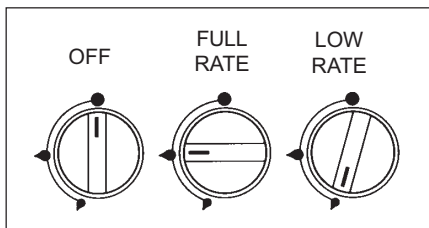
In the event of a gas smell turn off at the cylinder or contact your nearest Auto-Sleeper dealer.

HOTPLATE BURNERS

Caution: Glass lids may shatter when heated. Turn off all burners and grill, and allow to cool, before shutting the lid.

Each burner is controlled individually and is monitored by a flame supervision device. In the event of the burner flames being accidentally extinguished, turn off the burner control and do not attempt to re-ignite the burner for at least one minute. The respective knob positions are shown in below:

To light the burner, press in and turn the knob





anti-clockwise to the full rate position and apply a light to the burner or press the ignition button if fitted. It is necessary to hold the knob depressed during ignition and for approximately fifteen seconds after the burner has lit to allow the flame supervision probe to reach temperature. Should the flame go out when the knob is released, the procedure should be repeated holding the knob depressed for slightly longer.

For simmering, turn the knob further anti-clockwise to the low rate position. To turn the burner off, rotate knob fully clockwise until the line or pointer on the knob lines up with the dot on the control panel. The burners on this appliance have fixed aeration and no adjustment is required. Depending on the gas being used, the burners should flame as follows:

- *Propane* - The flames should burn quietly with a blue/green colour with no sign of yellow tips.
- *Butane* - Normally on initial lighting, a small amount of yellow tipping will occur and then slightly increases as the burner heats up.

Although each burner will support pans from 10 to 22cm, care should be taken not to overload the appliance as reduced performance may result.

When using small pans, the flames should not spread beyond the base of the pan as this will reduce the efficiency of the burner.

GRILL

Caution: Accessible parts may be hot when the grill is used. Young children should be kept away.

1. Ensure gas cylinder/supply is connected and turned on. In the event of a gas smell turn off at gas cylinder/mains and contact supplier.
2. Remove all accessories and packing that may be in the grill including any plastic coating that may be protecting the grill cavity surfaces. Clean the interior before using it for the first time, use soap and water and rinse carefully.
3. To light: Open door, push in the control knob and turn to full rate. Hold a lighted match or taper to the burner and push the control knob in and hold. The burner should ignite and the control knob should be held in for 10-15 seconds before release. If the burner goes out, repeat procedure holding control knob for slightly longer.
4. For models fitted with spark ignition the procedure is similar except that the burner can be ignited by depressing the ignition button which is located on the fascia. Ignition must be carried out with the door open, and if the burner has not lit within 15 seconds the control knob should be released and the grill left for at least one minute before a further attempt to ignite the burner.
5. Please note the grill must only be used with the door open.
6. On first use of the grill, it should be heated for about 20 minutes to eliminate any residual factory lubricants that might impart unpleasant smells to the food being cooked. A non-toxic smoke may occur when using for the first time so open any windows and turn on mechanical ventilators to help remove the smoke.
7. Although the grill does heat up quickly, it is recommended that a few minutes preheat be allowed.
8. Flame Failure Device (FFD): the grill burner is fitted with a flame sensing



probe which will automatically cut off the gas supply in the event of the flame going out. In the event of the burner flames being accidentally extinguished, turn off the burner control and do not attempt to re-ignite the burner for at least one minute.

9. It is normal for the flames on this burner to develop yellow tips as it heats up, particularly on Butane.
10. Variation in cooking can be achieved by using the control knob to regulate the heat setting. In addition, the grill pan trivet can be reversed or removed to give a greater choice of grilling height. Always use the highest trivet position for fast toasting.
11. To turn off: turn the control knob until the line on the control knob is aligned with the dot on the control panel. Always make sure the control knob is in the off position when you have finished grilling.

OVEN

1. Ensure gas cylinders/supply is connected and turned on. In the event of a gas smell turn off at gas cylinder/mains and contact supplier.
2. Remove all accessories and packing that may be in the oven including any plastic coating that may be protecting the oven cavity surfaces. Clean the interior before using it for the first time, use soap and water and rinse carefully.
3. To light: open door, push in the control knob and turn to gas mark 9. Hold a lighted match or taper to the burner and push the control knob in and hold. The burner should ignite and the control knob should be held in for 10-15 seconds before release. If the burner goes out, repeat procedure holding control knob for slightly longer.
4. For models fitted with spark ignition the procedure is similar except that the burner can be ignited by depressing the ignition button which is located on the fascia. Ignition must be carried out with the door open, and if the burner has not lit within 15 seconds the control knob should be released and the oven left for at least one minute before a further attempt to ignite the burner.
5. Place the oven shelf in the required position and close the door. Set control knob to approximately gas mark 5 and heat the oven for about 30 minutes to eliminate any residual factory lubricants that might impart unpleasant smells to the meals being cooked. A non-toxic smoke may occur when using for the first time so open any windows and turn on mechanical ventilators to help remove the smoke.
6. Although the oven does heat up quickly, it is recommended that a 10 minutes preheat be allowed. The oven should be up to full temperature in about 15-20 mins.
7. To turn off: turn the control knob until the line on the control knob is aligned with the dot on the control panel.



8. Flame Failure Device (FFD): the oven burner is fitted with a flame sensing probe which will automatically cut off the gas supply in the event of the flame going out.
9. Shelf: the shelf has been designed to allow good circulation at the rear of the oven and are also fitted with a raised bar to prevent trays or dishes making contact with the back of the oven. To remove a shelf, pull forward until it stops, raise at front and remove.

WARNINGS:

All pans should be mounted centrally over the burners, even when cooling, to protect adjacent walls.

Do not lower hob cover until hobs have cooled.

On no account should these appliances be used as a space heater.

Do's and Don'ts

- Do** read the user instructions carefully before using the appliance for the first time.
- Do** allow the oven to heat before using for the first time, in order to expel any smells before the introduction of food.
- Do** clean the appliance regularly.
- Do** remove spills as soon as they occur.
- Do** always use oven gloves when removing food shelves and trays from the oven.
- Do** check that controls are in the off position when finished.
- Do not** allow children near the cooker when in use. Turn pan handles away from the front so that they cannot be caught accidentally.
- Do not** allow fats or oils to build up in the oven trays or base.
- Do not** use abrasive cleaners or powders that will scratch the surfaces of the hotplate and oven.
- Do not** under any circumstances use the oven as a space heater.

Temperature control

The temperature in the oven is controlled by a thermostatic gas tap and is variable over the range 130 deg C to 240 deg C.

Approximate temperatures for the settings on the control knob are shown in the following table. The temperatures indicated refer to the centre of the oven and at any particular setting the oven will be hotter at the top and cooler towards the base. The variation between the top and centre, and centre to bottom is approximately equivalent to one gas mark. Good use can be made of the temperature variation in that several dishes requiring different temperatures may be cooked at the same time. In this way maximum benefit can be obtained from the gas used to heat the oven. Care should be taken not to overload the oven, adequate spacing being used to allow free circulation for heat.

Cooking guidelines

IMPORTANT - The pan supplied with the oven is multifunctional, for use in grill and oven. The handle design allows for removal or insertion whilst the pan is in use. Always remove the handle when in use.

Larger items may adversely affect the circulation and heat distribution. Best results will be obtained by the shelf positions in this guide. It is not necessary to preheat the oven but advisable for a range of dishes. The oven is capable of full temperature in 15-20 minutes.

Most cookery books give details of the shelf positions and gas mark settings for each recipe. If in doubt about a recipe you intend to use, study the recipe carefully then find a similar dish in our guide and use our shelf position and gas mark setting recommendation. Shelf positions are from the top down. When roasting with aluminium foil care must be taken that the foil does not impair circulation or block the oven flue outlet.



Gas Mark	Temperature			
1/4 - 1/2	265-275°F	130-135°C	Very cool	Meringues
1	285	140	Cool	Stewed fruit
2	300	150	Cool	Rich fruit cake
3	330	165	Warm	Baked custard
4	355	180	Moderate	Victoria sandwich
5	385	195	Fairly hot	Whisked sponges
6	410	210	Hot	Shortcrust pastry
7	430	220	Hot	Bread, scones
8	445	230	Very hot	Puff pastry
9	465	240	Very hot	Quick browning
Dish	Gas Mark	Shelf Position	Cooking Time	
Scones	7	2	8-15 mins	
Small cakes	5	2	15-25 mins	
Victoria sandwich	4	2	20-30 mins	
Very rich fruit cake	2	2	Approx. 60 mins per 500g	
Puff pastry	8	2	15-30 mins	
Flaky pastry	7	2	15-30 mins	
Shortcrust pastry	6	2	15-55 mins	
Shortbread fingers	3	2	25-30 mins	
Ginger nuts	5	2	12-16 mins	
Rice pudding	2	3	100-120 mins	
Baked custard	3	3	50-60 mins	
Fruit crumble	5	3	30-40 mins	
Beef	3	3	25 mins per 500g plus 25 mins	
	7	3	15 mins per 500g plus 20 mins	
Pork	3	3	30 mins per 500g plus 35 mins	
	7	3	25 mins per 500g plus 25 mins	



ELECTRIC HOTPLATE

Ensure the electricity is switched on.

Caution: Glass lids may shatter when heated. Turn off the hotplate and allow it to cool before closing the glass lid.

Caution: Remove all spillage from the surface of the glass lid before opening.

The hotplate control is numbered from 1 to 6. To turn it on, rotate the knob either clockwise or anti-clockwise to the required position. Position 1 is the coolest setting. To turn the hotplate off, rotate the knob until the line or pointer on the knob lines up with the zero on the control panel.

The hotplate is a sealed construction and transfers heat through conduction. For maximum efficiency a correctly sized pan with a flat heavy gauge base should be used. Pan size should be the same or slightly larger (up to 1in/2.5cm oversize).

Before using your hotplate for the first time, we recommend that you prime it and then season it. To prime it, switch on the hotplate for a short period, without a pan, to harden and burn off the coating. Use a medium to high setting for 3-5 minutes. A non toxic smoke may occur during this process. Allow it to cool, then season.

To season, first heat the hotplate for 30 seconds on a medium setting, then switch off. Pour a minimal amount of unsalted vegetable oil onto a clean dry cloth or paper towel, and apply a thin coat of oil to the hotplate surface. Wipe off any excess oil, then heat the hotplate on a medium setting for one minute. Occasional seasoning will help to maintain its appearance.

Leaks

If a smell of gas becomes apparent, the supply should be turned off at the cylinder IMMEDIATELY. Extinguish naked lights including cigarettes and pipes. Do not operate electrical switches. Open all doors and windows to disperse any gas escape. Butane/Propane gas is heavier than air, any escaping gas will therefore collect at low level. The strong unpleasant smell of gas will enable the general area of the leak to be detected. Check that the gas is not escaping from an unlit appliance. Never check for leaks with a naked flame, leak investigation should be carried out using a leak detector spray.

OMNIVENT ELECTRIC EXTRACTOR FAN (optional)

An Omnivent may be fitted as an optional extra in place of the MPK roof vent. It features a hinged roof vent operated by a knob. The vent incorporates a 2-way fan motor; its preferred method of operation may be selected by a rocker switch incorporated into the body of the vent. Switch positions represent the following loading:

Position 1	1.6 amps
Position 2	2.2 amps
Position 3	3.6 amps

Note: Ensure the fan is switched off when the vent is closed.



SEITZ CONCERTINA BLINDS

The windows of the habitation area are fitted with concertina blinds and flyscreens.

The flyscreens pull down from the top, the concertina blinds up from the base and a combination of both may be achieved by clipping both units together in the centre to adopt the required position. It should be remembered that both the flyscreens and concertina blinds are relatively delicate and those in the living area should be treated with care. They should be kept in a dry and dust-free state, it is advised that the mechanisms are only lightly lubricated when they become a little stiff and inoperative - otherwise no maintenance is needed.

The concertina blinds are manufactured from a paper type material and thus cleaning solvents and aerosols should be kept well clear from them.

Unlike Seitz roller blinds, they will not need to be re-tensioned - any problems that should arise should be addressed to your Auto-Sleeper dealer or the Motorhome Service Centre at Willersey.

TRUMA ULTRASTORE WATER HEATER

The Truma Ultrastore is a liquid gas operated storage water heater with an additional 230V electric heating element. It is fitted in the base of the wardrobe and is identified by an external cowl.

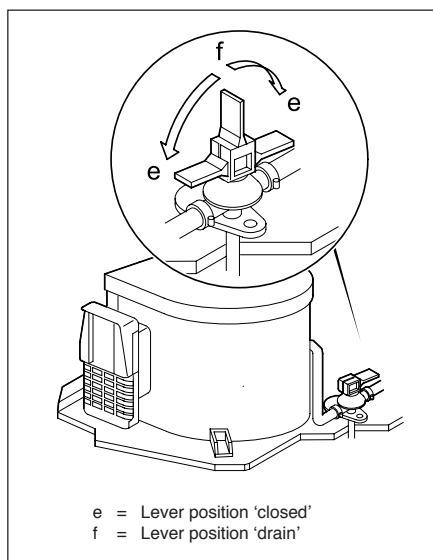
Operating Instructions

Always observe the operating instructions prior to starting. The owner is responsible for the correct operation of the appliance.

A yellow sticker with the warning information is fitted to the wardrobe door. Read this before use.

WARNING: Always mount the cowl cap when the water heater is not being operated and drain the water heater if there is a risk of frost. Claims under guarantee for damage caused by frost, cannot be accepted either by ourselves or Truma.

WARNING: In the event of changing the water pump with one of a different type, ensure that a pressure of 2.8 bar is not exceeded.



Filling the Truma Ultrastore with Water

1. Check that the safety/drain valve in the cold water intake is closed: Lever should be in horizontal position, position (e).
2. Open hot tap in bathroom or kitchen, with pre-selecting mixing taps or single-lever fittings to "hot".
3. Switch on water pump on electrical control panel.
4. Leave the tap open to let air escape while the water heater is filling. The heater is filled when water flows out of the tap.

Residues of frozen water can prevent filling if there is a frost. The water heater can be defrosted by switching on the heater for a short period (max 2 minutes).

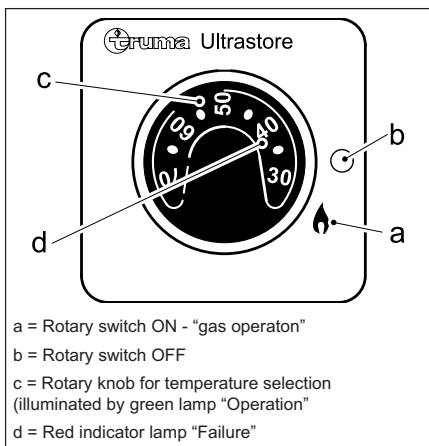
Note: If just the cold water system is being used, without the water heater, the heater tank is also filled up with water. In order to avoid damage through frost, the water contents must be drained by actuating the safety/drain valve and also when the heater has not been used. As an alternative, a shut-off valve can be installed upstream of the cold and hot water connection (your Auto-Sleeper dealer will advise you on this).

Draining the Water Heater

1. Disconnect power for water pump by switching off the water pump switch.
2. Open hot water taps in the kitchen and the bathroom.
3. Open safety/drain valve; with lever in vertical position, (position f).

The water heater can now be drained directly to the outside via the safety/drain valve. Check that the water contents have been completely drained (approximately 10 litres).

Control Panel (gas operation)



GAS OPERATING INSTRUCTIONS

WARNING: Never operate the water heater without water in it.

Remove cowl cover (press upper centre with both thumbs and pull from the top of cover towards you).

Open gas cylinder and open isolation tap in the gas supply line.

Select required water temperature at rotary knob (b), which is infinitely variable from approximately 30 to 70 deg C.

Switch on water heater at the slide switch (a) on the control panel, the green indicator lamp "Operation" then lights up.

If there is air in the gas supply line, it may take up to a minute before the gas is available for combustion. If the appliance switches to "Failure" during this period, switch off the appliance - wait two minutes - and switch on again.

Switching Off (gas operation)

Switch off the water heater at the slide switch (a).

WARNING: Drain the water heater is there is a risk of frost.

If the water heater is not to be used for a long period, fit the cowl cover. Non-observance of this point can lead to the operation of the

appliance being impaired through water, dirt or insects. Close the isolation tap in the gas supply line and turn off the gas cylinder.

No warranty claim will be met if this point is not observed. Always remove the cowl cover prior to operating the water heater.

Red Indicator Lamp "Failure"

The red indicator lamp (d) lights up if there is a failure.

The reason for such an indication is, for example, if no gas is available or if there is air in the gas supply system, triggering the excess temperature monitor. To unlock, switch off the appliance, wait 5 minutes, and switch on again.

In the event of faults, always contact Truma Service (they may be contacted through your local Auto-Sleeper dealer or direct on (01283) 528201).

ELECTRICAL OPERATING INSTRUCTIONS

WARNING: Never operate the water heater without water in it.

To switch on, locate the mains isolator switch in the back of the wardrobe. Push the rocker switch down to turn on the electrical heating. Don't forget to switch off when no longer required.

Note: The water temperature is fixed at approximately 70 deg C. For a faster heating up period the appliance can be simultaneously operated on both gas and electrical power.

Note: The water tank in the Truma Ultrastore is of high quality stainless steel. The plastic elbow water connections and the safety/drain valve fulfil the EC guidelines for food quality in plastic parts (90/128/EEC).

In order to avoid the colonization of micro organisms, Truma recommend heating up the tank to 70 deg C at regular intervals and not using the water as drinking water.



GENERAL SAFETY NOTES

In the event of leaks in the gas system or if there is a smell of gas:

- a) extinguish all naked flames.
- b) do not smoke.
- c) switch off all appliances.
- d) shut off the gas cylinder.
- e) open the windows and doors.
- f) do not actuate any electrical switches.
- g) have the entire system checked by an approved Truma engineer.

WARNING: Repairs may only be carried out by an approved Truma engineer

1. Any alteration to the appliance (including cowl) or the use of spare parts and accessories which are important for the functioning of the heater and which are not original Truma parts, as well as the non-observance of the installation and operating instructions, shall lead to the cancelling of the guarantee and exclusion of liability claims. It also becomes illegal to use the appliance, and in some countries this even makes it illegal to use the vehicle.
2. The operating pressure for the gas supply is 30 mbar (or 28 mbar butane/37 mbar propane) and must correspond to the operating pressure of the appliance (see data plate).
3. Liquid gas systems must accord with the technical and administrative regulations of the particular country in which they are being used (e.g. EN 1949 for vehicles). National regulations must be respected.
Note: The testing of the gas system must be repeated every two years by a qualified specialist and, if appropriate, confirmed on the inspection certificate. The vehicle owner is always responsible for arranging the inspection.
4. Liquid gas equipment must not be used when refuelling, in multi-storey car parks, in garages or on ferries.
5. During the initial operation of a brand new appliance (or after it has not been

used for some time), a slight amount of fumes and a slight smell may be noticed for a short time. Remedial action here is to immediately run the heater and to ensure adequate room ventilation.

6. If the burner makes an unusual noise or if the flame lifts off, it is likely that the gas pressure regulator is faulty and it is essential to have it checked.
7. Items sensitive to heat (e.g. spray cans) must not be stored in the installation area, since excess temperatures may under some circumstances be incurred there.
8. Only pressure control equipment that complies with EN 12864 (in vehicles) with a fixed delivery pressure of 30 mbar must be used for the gas system. The flow rate of the pressure control device must correspond to at least the maximum consumption of all devices installed by the system manufacturer.

For vehicles we recommend the Truma caravan regulator and the Duomatic Plus gas pressure regulator kit for the two-cylinder system. Truma regulators have been specially developed for the harsh stress conditions in caravans and vehicles. As well as a safety valve that provides protection against over-pressure, they also have a pressure gauge that can be used to check the tightness of the gas system. The pressure control equipment should be operated with a de-icing system (Eis-Ex) at temperatures around 0 deg C and below.

Regulator connecting hoses that meet national regulations must always be used in the respective country for which the equipment is destined. These hoses must be checked regularly for brittleness. Winter-proof special hoses must always be used if the equipment is operated during the winter.



TECHNICAL DATA

determined in accordance with EN 624 or Truma test conditions.

Manufacturer:

Truma Geratetechnik GmbH & Co. KG
P.O. Box 12252
85637 Putzbrunn (Munich)
Germany

Water contents: 10 litres or 14 litres.

Water pressure: up to max. 2.8 bar.

Type of gas: Liquid gas (propane/butane).

Operating pressure: 30 mbar.

Rated thermal output: 1500 W.

Gas consumption: 120 g/h.

Heating up time from approx. 15 deg C to approx. 70 deg C (10 litres)

Gas operation approx. 34 mins.

Electrical operation: approx. 45 mins.

Gas and electrical operation: approx. 25 mins.

Heating up time from approx. 15 deg C to approx. 70 deg C (14 litres)

Gas operation approx. 50 mins.

Electrical operation: approx. 72 mins.

Gas and electrical operation: approx. 38 mins.

Power consumption 12V

Ignition: 0.17A.

Heating up: 0.08A.

Standby: 0.04A.

Power consumption 230V

Heating up: (3.7A) 850W

Weight (empty): approx. 6.7 kgs.

Declaration of conformity:

The Truma-Ultrastore model has been tested and approved through the DVGW and fulfils the EC gas appliance guidelines (90/396/EEC) as well as the associated EC guidelines. The CE product number is available for EU countries: **CE-0085AP0038**.

EEC Type Approval:

e1 022604.

Maintenance

Use wine vinegar for de-scaling the water heater; this should be introduced into the appliance via the water supply. Allow the product to react and then thoroughly flush out the appliance with plenty of fresh water. To sterilise the water Truma recommend "Certisil Combina" or "Micropur Forte".

Note: The water tank in the Truma Ultrastore is of high quality stainless steel. The plastic elbow water connections and the safety/drain valve fulfil the EC guidelines for food quality in plastic parts (90/128/EEC).

In order to avoid the colonisation of micro organisms, Truma recommend heating up the tank to 70 deg C at regular intervals and not using the water as drinking water.



FAULT FINDING

GAS OPERATION

Symptom

When switching on, the heater does not operate

Cause

- a) No 12V supply
- b) Window open

Check the power supply (operation voltage min. 10.5V)

Check the water heater fuse (refer to maintenance "Fuses").

Close any windows above the cowl.

When switching on, the heater does not operate and the red lamp lights up

- a) Cowl cover fitted
- b) Air in the gas supply
- c) No gas supply
- d) Incorrect gas pressure

Remove cowl cover and/or clear any obstruction.

Check gas valves and gas bottle.

To unlock (and purge air), switch off the appliance, wait 5 minutes, and switch on again.

Heater operates for a prolonged time and then the red lamp lights up

- a) Over temperature thermostat operated

Check water content, refill if required (close drain valve).

To unlock, switch off the appliance, wait 5 minutes, and switch on again.

ELECTRICAL OPERATION

Symptom

When switching on, the heater does not operate

Cause

- a) No 230V supply voltage
- b) Over temperature thermostat operated

Connect the caravan to the site supply and/or check residual current circuit breaker.

Check water content, refill if required (close drain valve).

The electrical heating element is fitted with an excess temperature cut-out. In event of a fault, switch off at the control panel, wait 5 minutes, then switch on again.

WATER SUPPLY

Symptom

Water drips from the safety/drain valve

Cause

- a) Water pressure too high

Check water pressure (max. 2.8 bar), use a pressure reducer when connected to central water supply.

When opening the cold water tap, hot water comes out.

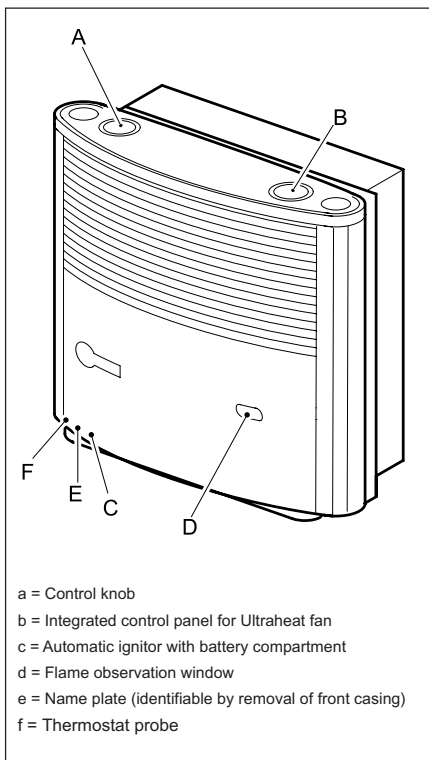
- a) Hot water flows back through the cold water supply

Fit a no-return valve in the cold water supply (refer to installation instructions).

If fault persists contact Truma Service.

TRUMATIC S3002 SPACE HEATER

The Trumatic S3002 is a liquid gas heater with automatic igniter and thermostat. It is fitted beneath the wardrobe. As an option, the Truma Ultraheat may be specified at the time of ordering. This thermostatically controlled mains heating unit is attached to the rear of the S3002, and operating instructions follow this section.



Operating Instructions

Always observe the operating instructions and operating notes prior to starting. As the owner, you are responsible for the correct operation of the appliance.

A yellow sticker with warning information is placed on the inside of the wardrobe door. Please ensure you are conversant with this.

Switching on

Before igniting for the first time, make sure that a battery has been inserted (see notes under "Changing Batteries"). This battery is used for the electrical ignition.

Turn on gas cylinder in gas compartment and open isolation tap for the appliance.

Turn control knob to thermostat setting 1-10 and press it down as far as the stop. Ignition takes place automatically (ignition sparking audible) until the flame ignites.

Keep the control knob pressed down for a further 10 seconds to allow the safety pilot to operate.

Caution: In the event of a fault, always wait two minutes before attempting to re-ignite.

If the flame goes out again, re-ignition is carried out immediately during the closing time of the safety pilot (approx. 30 seconds).

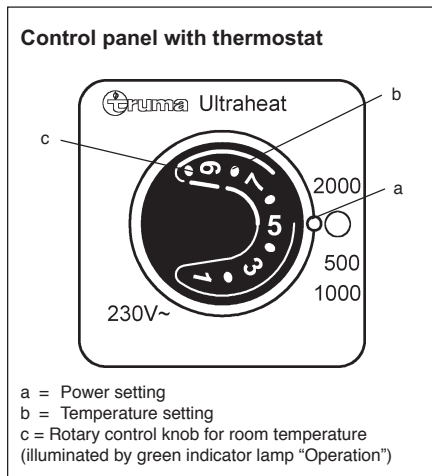
If there is no flame, the automatic igniter continues to operate until the control knob is switched to "0".

To ensure even and rapid warm air distribution as well as lower surface temperatures on the heating unit, we recommend that you operate the heater with an Ultraheat warm air system. (This is fitted as standard on all Monocoque models and the Sherbourne. It is an optional factory fitted extra on the Pollensa and Ravenna).

WARNING: Under no circumstances should this heater be used whilst the vehicle is being driven.

TRUMA ULTRAHEAT

Before operating the heater for the first time it is essential to observe the operating instructions, enclosed with the heater.



Switching on

WARNING: Before switching on, ensure that the fuse protection for the power supply of the camp site is sufficient for the selected power setting (a) (see Technical Data).

Important: The electric feed line for the caravan must be fully unwound from the cable drum.

To switch on:

1. Locate the mains isolator switch in the back of the wardrobe. Push the rocker switch down to turn on the electrical heating. Don't forget to switch off when no longer required.
2. Turn the outer rotary switch (a) to the desired output level.
3. Set the rotary control knob (c) to the desired room temperature.

The thermostat setting on the operating element (1-9) must be determined individually depending on the heating requirement and the type of vehicle. For an average room temperature of about 23 deg C, we recommend a thermostat setting of

about 6-8.

The electric heater can also be operated without the Trumavent fans.

If the heater is operated simultaneously with electricity and gas, the electrical unit will switch itself off before overheating occurs as a result of the stronger gas burner.

Switching off

Switch the heating system off at the rotary switch (a).

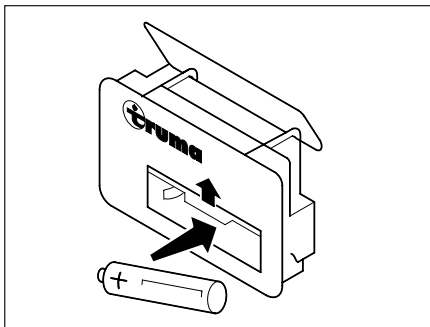
Important operating notes:

1. Repairs may only be carried out by an expert.
2. The heater's hot air outlet should under no circumstances be blocked. Never hang clothes or similar in front of or on top of the heater to dry. This could cause serious damage to the heater as a result of overheating. Do not place inflammable materials near the heater! Please observe these instructions for your own safety.
3. When operating a brand new heater for the first time (or after it has been idle for a lengthy period) you may temporarily notice a slight smoke and smell. We advise running the heater at full power and thoroughly ventilating the room.
4. Any modifications to the appliance or the use of spare parts and accessories important for operation which are not original Truma parts, or non-observance of the instructions for installation and use will result in the guarantee becoming invalid and no liability will be assumed. Furthermore, the approval for operating the appliance will become invalid and in some countries also the approval for operating the vehicle.

Thermostat

Set the required room temperature at the control knob (numbers 1-10).

Changing the batteries on the automatic igniter



If sparking is inaudible, or takes place at intervals of more than a second, the battery needs replacing.

Replace batteries only when the heater is switched off. Insert a new battery before the start of the heating season. (Battery type e.g. Ever Ready Type AA).

Raise the battery compartment cover and replace battery. Pay attention to plus/minus signs. Close compartment cover.

Important Operating Notes

If the gas supply line is full of air, it may take up to a minute before the gas is available for combustion. During this time, hold the control knob in depressed position until the flame ignites.

You will have to find out the exact thermostat setting yourself, depending on how much heat you need and the way your vehicle is designed.

The thermostat probe is underneath the heater.

Note: The thermostat will be adversely affected by cold draughts from refrigerator vents, gaps below doors, etc. Always make sure to avoid problems of this kind, otherwise satisfactory temperature control cannot be guaranteed.

WARNINGS:

1. Under floor combustion, air intakes must be kept clear of dirt and foreign matter and should be regularly checked accordingly.
2. In winter, before switching on the heater, clear all snow from the cowl.
3. Inspect the exhaust duct and all connections at regular intervals, and always whenever there is a blowback.
4. Never allow the warm air outlet on the heater to be obstructed in any way. For instance, never hang washing on or in front of the heater to dry. Misusing your heater in this way could cause serious damage from overheating. Do not place flammable objects near the heater. Please follow these guidelines in the interest of your own safety.

Cleaning (with switched off appliance)

It is recommended that at least once a year, before the season starts, you remove any dust that has collected on the heat exchanger, base plate and fan impeller wheel of the Ultraheat warm air system. The fan impeller must be cleaned carefully using a brush or toothbrush. You will need to remove the heater casing. To do this pull forward at the fold out casing or pull the casing forward at the top, lift it up until it is loose, and then remove it from the installation box.

General Safety Notes

- Repairs must only be carried out by an approved Truma engineer.
- Attention: A new O-ring must always be installed after dismantling the exhaust duct.

Any alteration to the appliance (including exhaust duct and cowl) or the use of spare parts and accessories which are important to the function of the heater and which are not original Truma parts, as well as the non-observance of the installation and operating instructions, will lead to the cancelling of the guarantee and exclusion of liability claims. It also becomes illegal to use the appliance, and in some countries, this even makes it illegal to use the vehicle.



The operating pressure for the gas supply is 30 mbar and must correspond to the operating pressure of the appliance (see name plate).

LPG installations must comply with DVGW for G607. The gas system must be tested every two years by a qualified CORGI engineer.

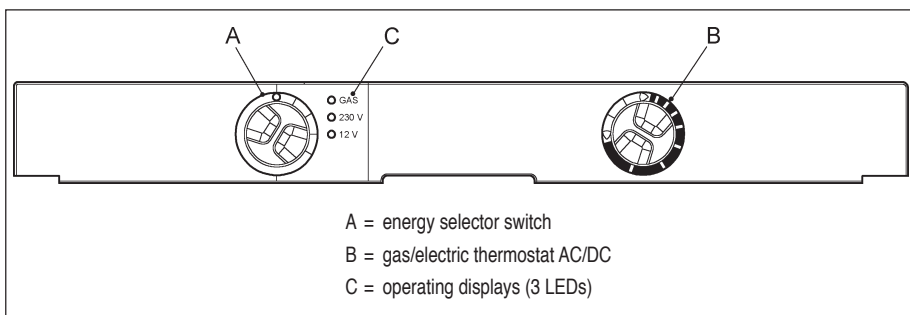
During the initial operation of a brand new appliance (or after it has not been used for some time), a slight amount of fumes and smell may be noticed for a short while. This can be remedied by running the heater immediately at maximum output and ensuring adequate room ventilation.

If the burner makes an unusual noise or if the flame lifts off while burning, it is likely that the regulator is faulty, and it is essential to have it checked.

If the vehicle floor is given a body underseal, all parts of the heater located under the vehicle must be covered up so that the underseal spray does not impede the operation of the heater system. The covers must be removed again when the work is finished.



REFRIGERATOR MODEL RM7291L



Cleaning

Before using the refrigerator, it is advisable to clean the appliance both inside and out.

- Use a soft cloth and lukewarm water with a mild detergent.
- Then rinse the appliance with clean water and dry thoroughly.
- Remove dust from the refrigerator unit at yearly intervals using a brush or soft cloth.

WARNING: To avoid deterioration of materials:

1. Do not use soap or hard, abrasive or soda-based cleaning agents.
2. Do not allow the door seal to come into contact with oil or grease.

Using the refrigerator

- The cooling unit is silent in operation.
- When the appliance is first put into operation, there may be a mild odour which will disappear after a few hours. Ensure the living area is well ventilated.
- The refrigerator will take several hours to reach its operating temperature in the cooling compartment.
- The freezer compartment should be cold about one hour after switching on the refrigerator.

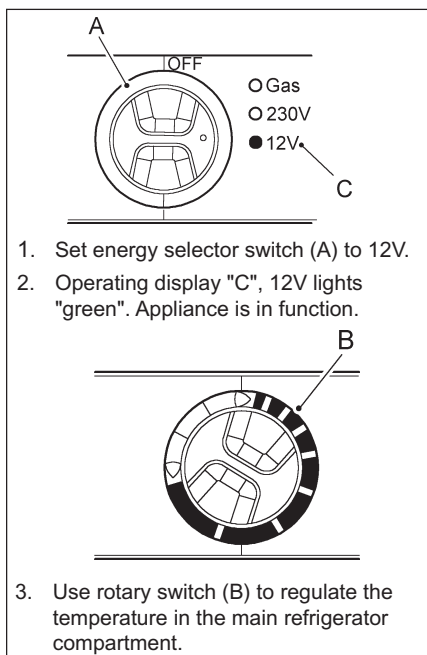
Note: An on-board battery is necessary to run your re-igniter refrigerator on gas.

CONTROLS

Energy Selection

12V Electrical Operation (DC)

- The refrigerator will only operate while the motor is running and the vehicle in motion.



Mains Power

This option should only be selected where the supply voltage of the connection for power supply corresponds to the value specified on the data plate. Any difference in values may result in damage to the appliance.

1. Set energy selector switch (A) to 230V.

2. Operating display "C" , 230V lights "green". Appliance is in function.

3. Use rotary switch (B) to regulate the temperature in the main refrigerator compartment.

Gas Operation

The ignition process is activated automatically, accompanied by a ticking sound approx. 30 sec. Upon successful ignition, the display LED (C) "Gas" lights yellow. The refrigerator is in function. Use rotary switch (B) to regulate the temperature in the main refrigerator compartment.

1. Open the valve of the gas cylinder.
2. Open the shut-off valve to the gas supply.
3. Set energy selector switch (A) to gas.
4. Set rotary switch (B) to "MAX" position.

Gas Faults

In the event of a gas fault (e.g. gas cylinder empty), the operating display (C) flashes yellow.

Remedies:

Set the energy selector switch (A) to position "OFF".

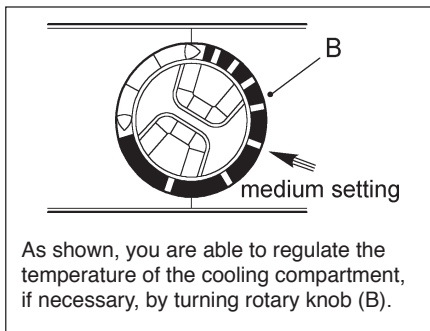
1. Is there any gas in the gas bottle?
2. Is the gas bottle valve open?
3. Is the on-board shut-off valve open?
4. Set the main switch (A) to "on". The reignition starts again.

If after about 30 seconds the operating display (C) starts flashing red again, the gas fault has not been cleared (e.g. air in the gas pipe).

- Briefly switch the refrigerator off and then on again using main switch (A). To remove air from the gas pipes, repeat this procedure 3-4 times.

If these actions do not help, please call an authorised Dometic Service Centre.

Temperature Setting Cooling Compartment



- The cooling unit's performance is influenced by ambient temperatures.
- TIP: Please select the medium setting for ambient temperatures between +15°C and +25°C. The unit operates within its optimum performance range.

Storing food

- Always store food in sealed containers, aluminium foil or similar.
- Never put hot food into the refrigerator, always let it cool down first.
- Products that could emit volatile, flammable gases must not be stored in the refrigerator.
- Store quickly perishable foods directly next to the cooling fins.

The freezer compartment is suitable for making ice cubes and for short-term storage of frozen food. It is not suitable as a means of freezing foods.

Making Ice Cubes

Ice cubes are best frozen overnight. At night, the refrigerator has less work to do and the unit has more reserves.

WARNING: Only use drinking water!

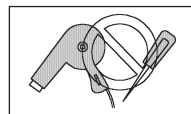
Defrosting

As time goes by, frost builds up on the fins. When the layer of frost is about 3mm thick, the refrigerator should be defrosted.

- Switch off the refrigerator, as described in "Switching Off".
- Remove the ice cube tray and food.
- Leave the refrigerator door open.
- After defrosting (freezer compartment and fins free of frost), wipe the cabinet dry with a cloth.
- Use a cloth to mop up the water from the freezer compartment.
- Switch the refrigerator back on again.

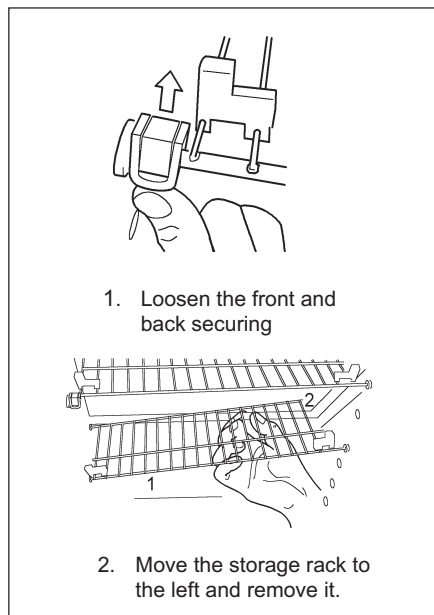
WARNING: The layer of ice must never be removed forcibly, nor may defrosting be accelerated using a heat source.

Note: Water thawing in the main compartment of the refrigerator runs into an appropriate container at the back of the refrigerator. From there, the water evaporates.



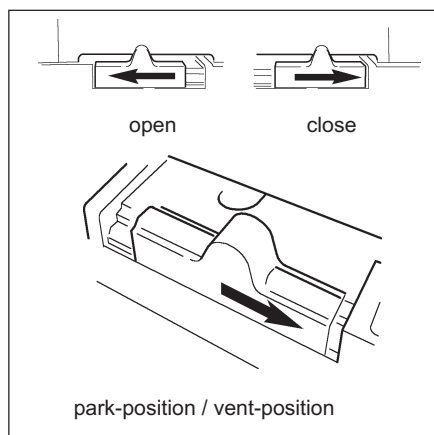
Positioning the storage rack

Dismantling:

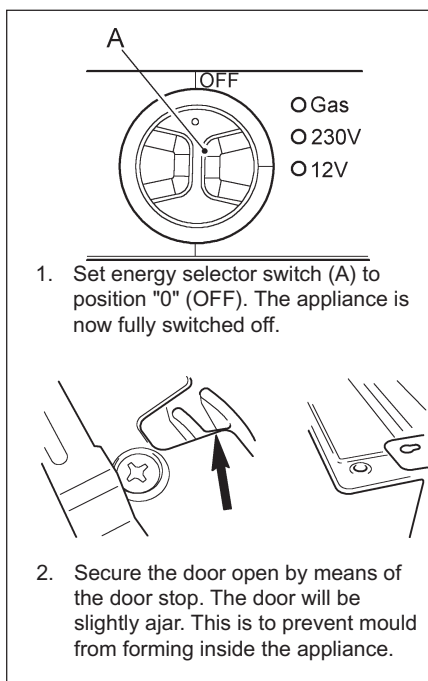


To fit the storage rack, the reverse order applies.

Door locking

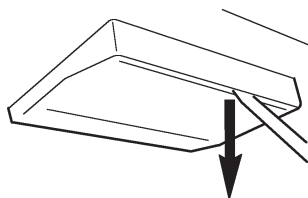


Switching off

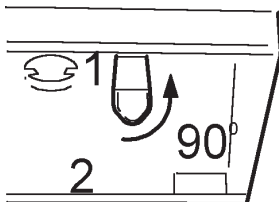


Note: Switching off gas operation. If the refrigerator is to be taken out of service for an extended period of time, the on-board shut-off valve and the cylinder valve must closed.

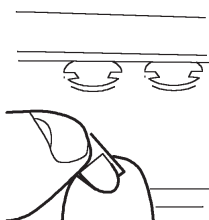
Changing the light bulb



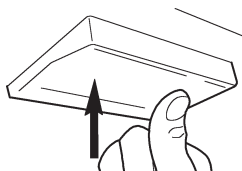
1. Remove cover



2. Detach defective light bulb



3 Fit new light bulb



4. Clip the cover back in place

Note:

For 12V DC:

1 light bulb 12V, 2W

Please contact Dometic Service Centres for replacement light bulbs.

Energy saving tips

- At an average ambient temperature of approximately 25 deg C, it is sufficient to operate the refrigerator at the middle thermostat setting (for both gas and mains voltage).
- Where possible, always store goods that have previously been cooled.
- Do not position the refrigerator in direct sunlight.
- Constant circulation of air must be supplied to the refrigerator unit.
- Defrost regularly.
- Open the door only for a short time when removing goods from the refrigerator.
- Run the refrigerator for about 12 hours before filling it.

Technical data

Model RM 7291L

Dimensions 821x525x541

Capacity 86 lit.

Usable capacity 10.5 lit.

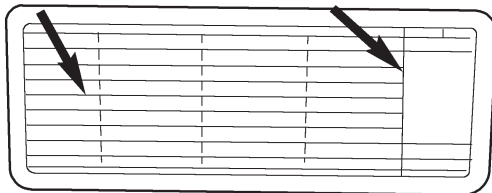
Connection 125W/120W

Consumption ca 2.6 KWh/260g

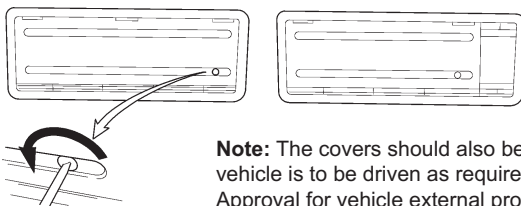
Weight 27 kg

Winter operation

1. Check that the ventilation grills and the extractor have not been blocked by snow, leaves or similar.



2. When the ambient temperature falls below +8°C, the optional winter covers should be fitted. This protects the unit from excessively cold air.



3. Affix the cover and fasten it.

Note: The covers should also be fitted when the vehicle is to be driven as required by European Type Approval for vehicle external projections.

We suggest that you also fit the winter covers when the vehicle is laid up during the winter months.

Troubleshooting

Before calling the authorised Service Department please check whether:

- The instructions in the section "Using the refrigerator" have been followed.
- The refrigerator is not tilted excessively.
- It is possible to operate the refrigerator with an available power source.

a) Gas bottle empty.

b) Is the supply cut-out device open?

c) Air in the gas pipe?

a) Change gas bottle.

b) Open the cut-out device.

c) Switch device off and on again 3-4 times to remove air from the gas pipe.

Failure: The refrigerator does not work on 12V.

Possible cause

a) On-board fuse defective.

b) On-board battery discharged.

c) Engine not running.

Action you can take

a) Fit new fuse.

b) Check battery, charge it.

c) Start engine.

Failure: The refrigerator does not work on 230V.

Possible cause

a) On-board fuse defective.

Action you can take

a) Fit new fuse.



Failure: The refrigerator does not work on 230V (continued)

Possible cause

- b) No connection to supply voltage.
- c) AES: gas operation despite connection to the supply voltage?

Action you can take

- b) Establish power connection.
- c) Appliance switches to gas operation due to insufficient supply voltage (automatically switches back to 230V operation).

Failure: The refrigerator does not cool sufficiently.

Possible cause

- a) Inadequate ventilation to the unit.
- b) The thermostat setting is too low.
- c) There is too much ice on the condenser.
- d) Too much warm food put inside.
- e) Appliance running for a short time.

Action you can take

- a) Check that the ventilation grilles are not covered.
- b) Turn the thermostat to a higher setting.
- c) Check that the refrigerator door seals when shut.
- d) Let food cool down first.
- e) Wait several hours, check again.

Maintenance

- Works on gas components and electrical installation may only be carried out by authorised personnel. We recommend to contact your Dometic Service Centre.
- EN 1949 stipulates that the appliance's gas equipment and its associated fume system must be inspected after installation and a certificate issued.
Afterwards a qualified technician must inspect according to EN 1949 every two years and a certificate issued.
It is the user's responsibility to arrange for inspections after purchase.
- It is recommended that the gas burner be inspected and cleaned as necessary at least once a year.

We recommend maintenance following an extended shutdown of the vehicle.



TRAVEL CATCH

All models are fitted with a travel catch to keep the refrigerator door securely closed when the vehicle is on the move.

FURTHER DETAILS

Consult the accompanying literature to obtain the full benefit of your refrigerator.

In the event of failure, contact the Refrigerator Service Department, details of which can be found in your Yellow Pages Directory.



THETFORD CASSETTE C-200 CWE TOILET

Introduction

The Thetford Cassette C-200 CWE is functional and incorporates modern styling with home like features. The unit is an integral part of the motorhome bathroom.

The Thetford Cassette C-200 CWE is constructed of high quality plastics for durability and has a high gloss finish that is easy to clean and maintain. The unit consists of two sections, a permanently installed toilet system and a slide out waste holding tank - the Cassette.

The toilet section includes a rotatable bowl, a removable seat, and a control unit with a flush button and a waste level warning device. The valve blade handle is located under the bowl.

The cassette is located underneath the toilet and is removed for emptying from the outside of the vehicle through an access door. A rotating pour-out spout, automatic holding tank vent, air release valve, valve blade, carrying handles and hand grips are incorporated into the cassette. A sliding cover guarantees optimum hygiene.

Features:

- Removable seat and cover.
- Rotatable bowl.
- Valve blade handle: opens and closes valve blade manually.
- Flush button: activates flush.
- Waste level indicator: indicates when cassette requires emptying.
- Rotating pour-out spout: makes emptying cassette easy and convenient.
- Automatic cassette vent: vents the cassette when inserted in the toilet. This prevents over pressure in the cassette.
- Upper-carrying handles: makes carrying and emptying easy.
- Sliding cover: opens and closes automatically when sliding the cassette in and out. Guarantees optimal hygiene.
- Valve blade and blade seal.

- Vent button: vents the cassette to avoid splashing while emptying.
- Handgrip.
- Valve blade opener.
- Access door. Locks from outside the motorhome.

Preparing for use

Following is a brief illustrated step by step guide. For more detailed information please refer to manufacturers literature.

CAUTION (step 4): Warmer weather or longer intervals between emptying the waste tank may require additional toilet fluid. Use only Thetford toilet fluid to achieve the best results. Never add toilet fluid directly into the toilet bowl.

CAUTION (step 14): Do not depress air release valve button until pour out spout is facing downwards.

Emptying the waste holding tank

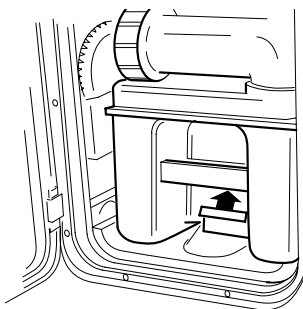
The cassette capacity is approx. 17 litres and the tank should be emptied when the waste-level warning device comes on. This will occur when the tank contains more than 15 litres of waste.

Note: After the warning device comes on, the capacity remaining is equal to approximately 5 uses.

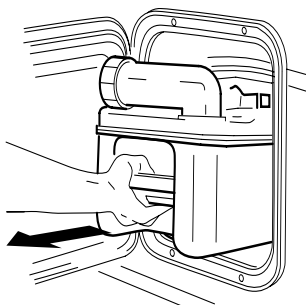
CAUTION: Do not allow the waste cassette to become overfilled. See trouble shooting section for emergency emptying procedure.

Note: Some vehicles are equipped with water pumps supplying high water pressure, which can result in having an over flushing problem. It is possible to use the flow restrictor supplied with the toilet (packed together with the instruction manual) by installing it in the water tube at the connection level.

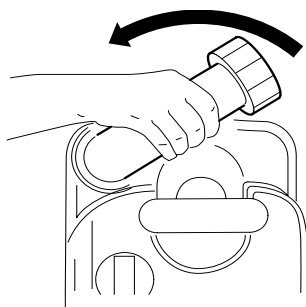
Rinse the holding tank with clean water. Prepare the cassette for use again by following steps 1 to 6. Replace the holding tank and lock the access door.



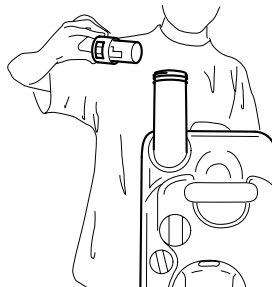
1 - Open access door and pull retaining clips upward.



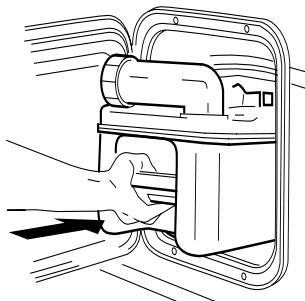
2 - Remove cassette by pulling straight out. When cassette hits stop, tilt downwards



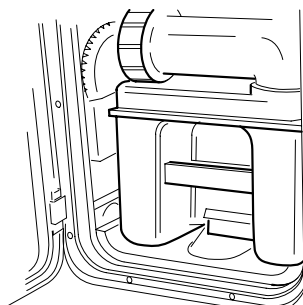
3 - Position tank vertically and swivel pour-out spout upwards.



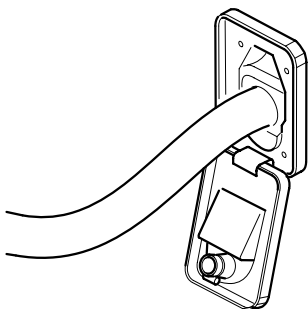
4 - Remove dosage cap and pour-out spout. Add toilet fluid in the dosage cup. Add approx. 2L of water through spout to cover tank bottom. Replace cap, return pour-out spout to original stored position.



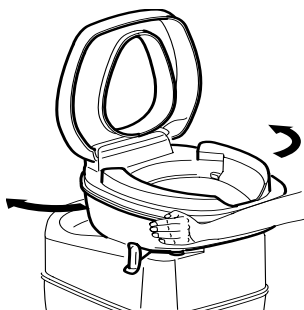
5 - Slide the holding tank into position through access door. Never force insertion as this can cause damage to the toilet.



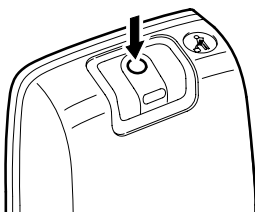
6 - Make sure the retaining clip secures the holding tank. Close and lock the access door.



7 - Open water fill door and add 50ml. of Aqua Rinse. Then fill the tank with fresh water using a jerry can or hose. Tank capacity is 7 litres.



8 - Turn the bowl into the most comfortable position, when necessary.



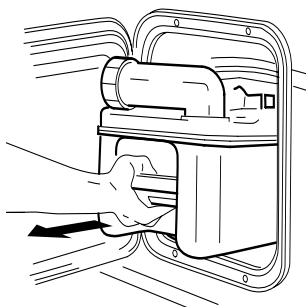
9 - Before using the toilet, we recommend to add some water to the bowl by pressing the flush button. Release button to stop.



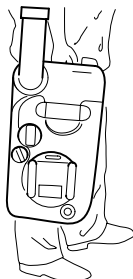
10 - After use, open the blade, by pushing the blade handle in an anti-clockwise direction and press the flush button.



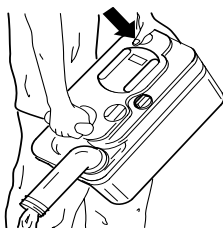
11 - After flushing, close the blade by pushing the blade handle clockwise. The toilet may also be used with the valve blade open, which allows the waste to pass directly into the holding tank.



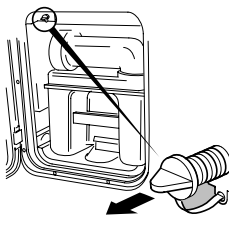
12 - Open access door and remove holding tank. The holding tank can only be removed when valve blade is closed.



13 - Carry the holding tank to a normal household toilet or authorised disposal point. Place holding tank in vertical position and rotate pour-out spout upwards.



14 - Remove measuring cap. Grasp unit by upper carrying handle nearest pour-out spout. Place other hand on upper rear hand grip so that the vent button can be depressed with thumb while emptying. This ensures a smooth outflow of tank contents.



15 - Once the pump has been cleared of water place appropriate size container under the drain plug. Empty any remaining water from the fresh water tank by taking out the drain plug. Clean the seals and lubricate them where appropriate after drying.

Winterising/Storage

The Thetford Cassette C-200 CWE is easily winterised for storage. If the toilet is connected to a separate water tank, drain the tank. When the motorhome water tank is empty, press the flush button until the water stops flowing. Empty the cassette. If the toilet is connected to a central water tank, open the electric valve by pushing the flush button while draining the water supply system of the motorhome. Empty the cassette. Leave the blade of the cassette open. Do not replace cap on spout, this helps to keep the cassette dry.

Cold weather use

The cassette can be used in cold weather when the motorhome is heated. When the vehicle is not heated for more than a day (or a night), winterise the cassette.

High Altitude and hot weather use

Changes in altitude during driving, and large temperature variations give no problems as long as the cassette is inserted into the toilet. The automatic cassette vent will depressurise that tank when there is over or under pressure. High temperatures may require additional Thetford toilet fluid.

Cleaning and maintenance

To clean the seal and blade, the use of Thetford bathroom cleaner and rinse with water is recommended. Alternatively, use a luke warm solution of diluted washing up liquid. Do not use household cleaners as they may damage the seals and other toilet parts.

Dry the seal and blade thoroughly and spray economically with silicone spray, alternatively use olive oil. Do not use Vaseline or other vegetable oil products.

The toilet bowl, seat, cover and the exterior of the toilet unit and cassette can be cleaned with a mild detergent/water mixture.



Toilet unit malfunctions

Contact your dealer or a Thetford Service Centre.

We advise draining the fresh water tank prior to travelling. Antifreeze should not be required if the motor home is heated. If you do wish to use antifreeze, brands containing the following properties may be used in the fresh water tank:

- * **Ethylene glycol**
- * **Mono-Ethylene glycol**
- * **Propane-diol**
- * **Glycerol**
- * **Ethane-diol**
- * **Glycol**

Never use alcohol based antifreeze, i.e. Methanol, Ethanol, and Iso-propanol.

OMNI-STEP ELECTRIC STEP

An electrically operated rear step is fitted, which is operated by the switch located adjacent to the entrance door..

Note: When extending the step, hold the switch until the step is completely extended. NEVER MOUNT THE STEP IF RETRACTED OR IF NOT FULLY EXTENDED, because then the blocking is not working and the motor can be damaged.

Caution: In the event of the rear step being left extended, a buzzer, positioned behind the dashboard, will sound (when the ignition is switched on) - and the step will self-retract. The step automatically retracts when the ignition is switched on.

Maintenance

Dirt and frost can prevent the step from operating properly. In this case the moving parts should be cleaned or defrosted. All points of movement are layered in maintenance-free bearings.

Consult manufacturers literature for further maintenance details.



INTERNAL LAYOUT

General

These vehicles are designed as two or four berth models, offering either two single beds or a large transverse double bed, formed without utilising the front seats. A further double berth is available in the overcab Luton, if specified.

Cab Seats

Both the reclining cab seats have full forward and rearward movement by releasing the catch on the front of the seat and sliding it to the required position.

Both front seats are fitted with a swivel mechanism, which is operated by a lever on the inside of the seat.

Ensure that the seat is locked in the forward facing position before travelling.

Accommodation Seating

The Surrey model features a forward facing rear seat with two seating positions, both fitted with seat belts. An infill seat base, with base board, and a backrest cushion are supplied to fit between the forward facing seat and the front seat in order to make a settee. The offside has a longitudinal settee with under seat storage. The backrests can be reclined to suit individual requirements.

The Northants model has inward facing settees on each side instead.

Please note: Auto-Sleepers advises against the retro fitting of additional seat belts. The rear forward facing seat does not have ISOFIX points and hence is not suitable for use with child seats which rely solely on this type of fixing. For further advice please consult the child seat manufacturers.

Security

Passengers are reminded that it is a legal requirement to wear the seat belts provided whilst the vehicle is in motion.

Table

Two tables are supplied with this vehicle. A large table with folding legs can be positioned between the settees in the lounge area. A smaller table can be placed in position adjacent to the entrance door for use

in conjunction with the swivelling passenger seat. The leg for this table is stored in the wardrobe, and fits into a socket and bracket on the bulkhead.

Caution: The tables must be stored in the wardrobe when this vehicle is in motion.

Kitchen Area

The kitchen is positioned at the rear of the vehicle, this comprises of a Spinflo cooker, which has three gas hobs and a single 230V AC electric hotplate. Adjacent to this is a stainless steel sink and drainer concealed by a glass lid, which may be used as a chopping board. The kitchen area is illuminated by an individually switched fluorescent light mounted underneath the overhead locker. Beneath the sink/drainage there is a full width folding door, which gives access to storage space. A separate cutlery drawer is also provided. All kitchen shelves are coated with a plastic material which is easily cleaned should a spillage occur.

For extra serving space there is a 'worktop extension'. This is positioned below the existing fridge worktop, and slides out on runners.

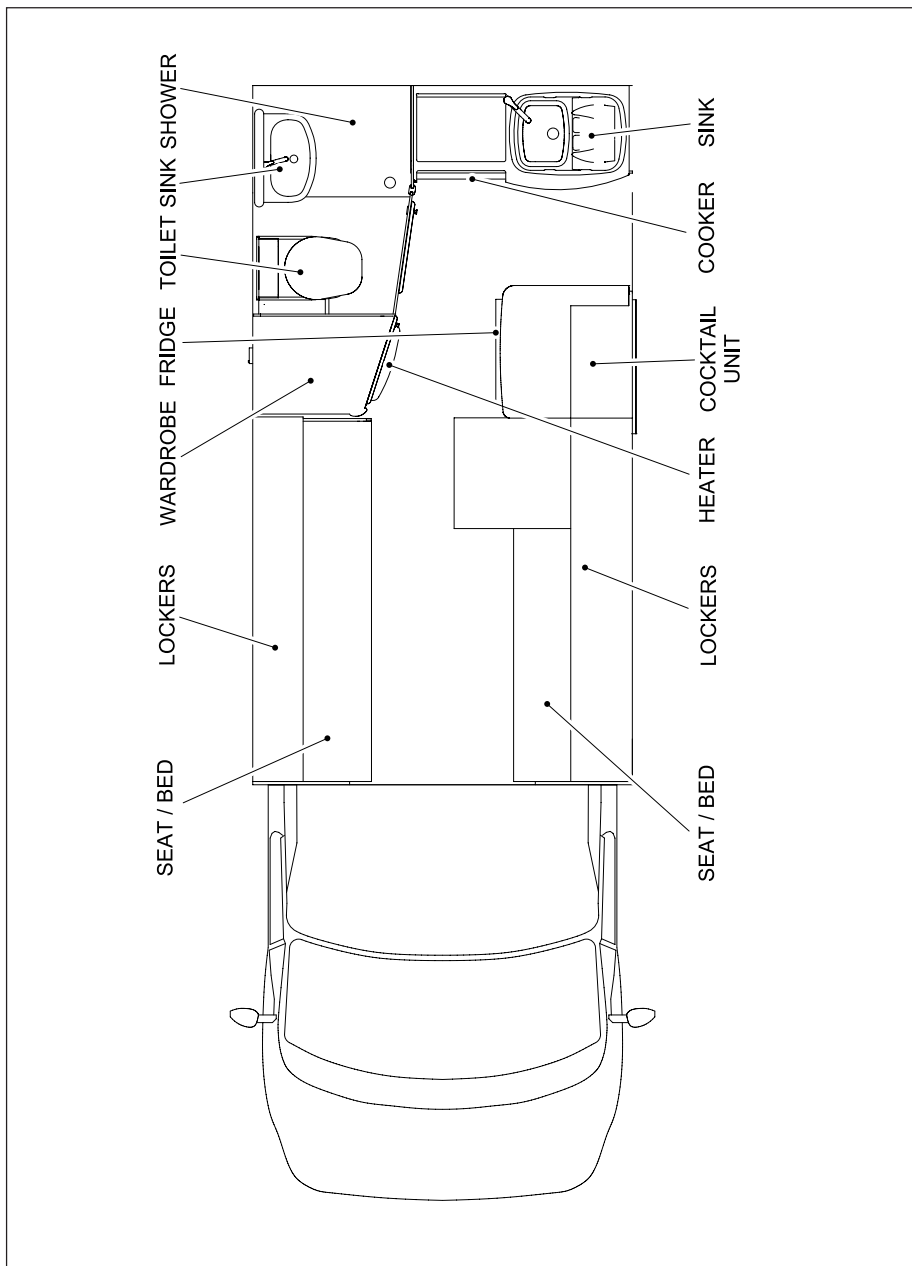
The Dometic 7291 tilt-tolerant refrigerator is located adjacent to, and forward of, the caravan door. On the left hand side of the fridge unit is a handle to assist entry, a courtesy light to illuminate the stepwell, and the switch for the electric step. A slide out larder storage unit is fitted to the right hand side of the fridge. Above the fridge is a shelving unit which houses the microwave oven, and also incorporates two 230 volt sockets for use with mains electrical hook up, and also a 12 volt socket with TV aerial socket. Above this, in the overhead locker is the cocktail cabinet with four glasses and two bottle clips.

Above, and to the left, of the entrance door is the electrical control panel with LCD display and programmable control of all the vehicle's electrical services. It incorporates a fresh water level indicator and master switches for the water pump and 12 volt circuits.

A red warning light on the refrigerator will illuminate when the refrigerator is operating on 12 volt.



ARRANGEMENT OF EQUIPMENT





The fire extinguisher and smoke alarm are found on the fridge bulkhead adjacent to the rear door.

Shower Compartment

The shower compartment consists of an electric flush toilet, washbasin with mixer tap, a towel rail, a soap dispenser opened by a plastic key on the keyring, a cupboard with mirror doors and a swing out shower with mixer tap. A plastic shower mat prevents damage to the shower tray when not in use. Twin fluorescent lights are fitted into the roof along with a four-way ventilator with flyscreen. There is a blown warm air outlet duct fitted near the floor, and an access door to the wardrobe is provided.

Wardrobe

The wardrobe, with hanging rail and table storage clips, is situated adjacent to the shower compartment and has a storage drawer fitted below it.

Below the drawer, in the base of the wardrobe is located the water heater (Ultrastore) powered by LPG or mains electricity. The control unit is fitted to the front panel of the wardrobe between the drawer and the space heater.

The Trumatic space heater, incorporating the mains blown air facility (Ultraheat), is found in the front lower part of the wardrobe compartment.

On the rear wall of the wardrobe, behind the drawer, is a unit containing the 230 volt Residual Current Breakers (RCBs), the Miniature Contact Breakers and the mains electricity switches for the space heater, cooker electric hotplate and water heater.

Lounge area

The lounge area at the front of the vehicle comprises the inward facing settee on the offside, whilst the nearside of the Surrey can be arranged as a settee or two separate seats. The Northants has an inward facing settee instead. These seats have slatted bases which can be lifted up to provide access to the under seat storage. (In order to make lifting the seat base easier, it is recommended that the backrest is first laid flat against the seat cushion).

Lighting throughout the vehicle is provided by fluorescent lights contained in the top of the overhead lockers (which also serve to illuminate the inside of the lockers), and three individually switched fluorescent lights in the Luton roof area. Additional lighting in the lounge area is provided by four spotlamps, individually switched, fitted to the underside of the overhead lockers.

Crockery for four people is stored in one of the overhead lockers on the nearside of the vehicle..

Storage

Storage is provided by the cupboards, lockers and within the seat bases. Additional storage is available in the overcab bed area and also in the external underfloor locker on the nearside of the vehicle. Access to the offside under seat storage is provided via the lockable exterior hatch door.

Heavy items must not be stored in any overhead locker, nor in any storage area from which they could come free and cause injury to the occupants of the vehicle. Ensure all cupboards are securely fastened before moving off (i.e. that the push buttons are in the 'locked' position).

Ensure any articles stowed below the cab seats will not come loose when the vehicle is being driven.

Caravan Door

A Seitz caravan door is fitted which incorporates an opening double glazed window with concertina blind and flyscreen, and is linked to the vehicle central locking system.



LOCATION OF KEY FACILITIES	
Control/thermostat for Ultraheat space heater	On bulkhead adjacent to entrance door
Electric step switch	On bulkhead adjacent to entrance door
Fuses, 12V DC	On Electrical Control Unit front panel
Gas control for Ultrastore water heater	On bulkhead adjacent to entrance door
Gas isolation taps	In the back of the wardrobe
Halogen reading lights	Under overhead lockers in lounge area, all individually switched
Mains electrical switch for Ultrastore water heater	In the back of the wardrobe
Mains electrical switch for Ultrastore water heater	In the back of the wardrobe
Main 12V control panel	On bulkhead adjacent to entrance door
Main 12V switch for lighting	Control panel on bulkhead adjacent to entrance door
Miniature Circuit Breakers (MCBs)	On Electrical Control Unit front panel
Radio isolation switch	Not available with modern vehicle wiring
Radio rear speakers	In rear ceiling, volume may be balanced side to side
Residual Current Device (RCD)	On Electrical Control Unit for panel
Safe	Set into floor under offside settee
Smoke alarm	On ceiling above entrance door
TV Aerial socket	On lounge side of nearside cupboard wall
Water heater safety / drain plug	Under offside settee
Water pump / Filter	In the base of the wardrobe
12V DC socket	On lounge side of nearside cupboard unit
230V sockets	2 off on side of nearside cupboard unit 1 off in base of cupboard above refrigerator



SLEEPING ARRANGEMENTS

SURREY

Single bed

Nearside - With the nearside arranged as a sofa, remove the two backrest and seat cushions nearest the front of the vehicle. Lift the support board from its normal position and re-position it flat in front of the forward facing seat. Replace the two backrests vertically against the side of the vehicle, and position the seat cushions in front of them to make the bed.

Offside - Pull the bench seat base cushion towards the centre of the vehicle sufficiently to allow the back rest cushion to drop vertically into position between the base cushion and the side of the vehicle.

Transverse double bed

On the nearside of the vehicle, lift the forward facing seat cushion and reposition it towards the centre of the vehicle so that the rectangular infill cushion can be positioned between it and the side of the vehicle. Pull the other two seat cushions towards the centre of the vehicle so that the backrests can be laid flat between them and the side of the vehicle.

On the offside, pull the bench seat cushion towards the centre of the vehicle, until it touches the nearside cushions, and lay the backrest cushion flat in the space between it and the side of the vehicle.

NORTHANTS

Single bed

Nearside & Offside

Pull the bench seat base cushion towards the centre of the vehicle sufficiently to allow the back rest cushion to drop vertically into position between the base cushion and the side of the vehicle.

Transverse double bed

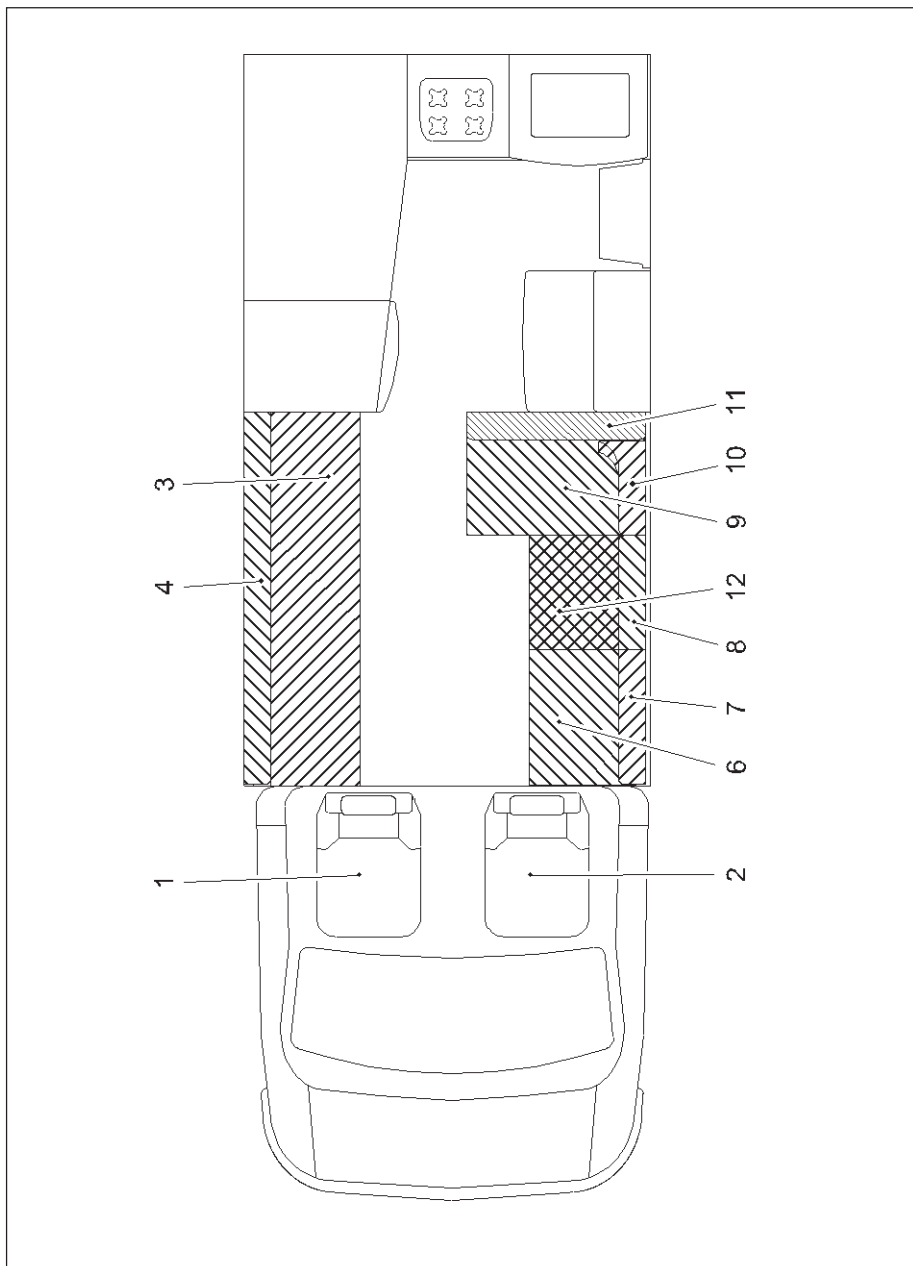
On each side of the vehicle, pull the bench seat cushions towards the centre of the vehicle until they touch each other, and lay the backrest cushions flat in the space between them and the side of the vehicle.

Luton bed

To use this bed, release the retaining mattress board from its vertical position and fold flat by pulling it forward. To gain access to the 'Luton area' use the ladder supplied ensuring that it is securely fixed into the retaining clips. Slide the mattresses across so that they fit tight to the front, then make up the bedding before lifting up the attached bunk net and clipping it into position.

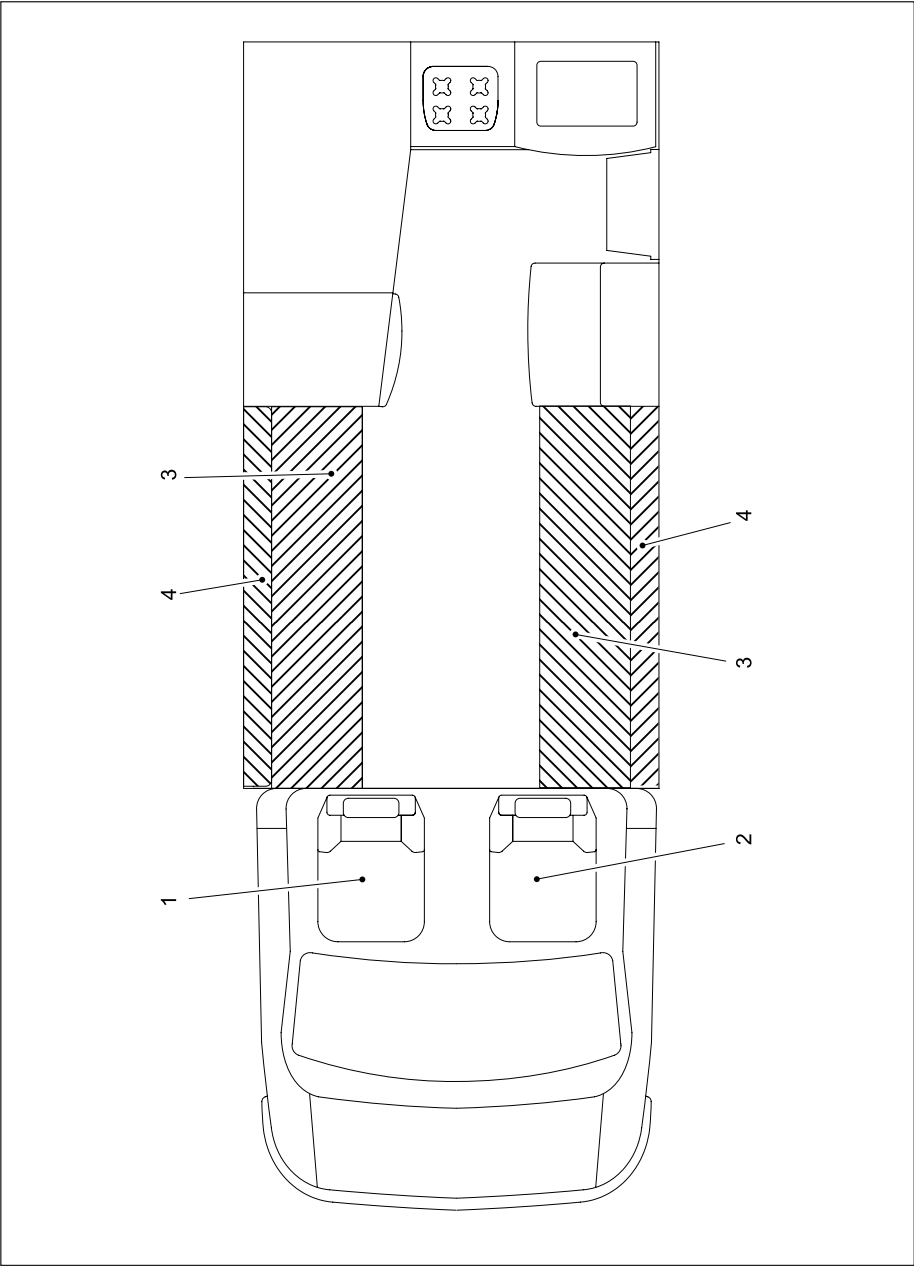
When bunks are used by children, especially under six years of age, care shall be taken against the risk of falling out.

NORMAL SEATING ASSEMBLY (SURREY)



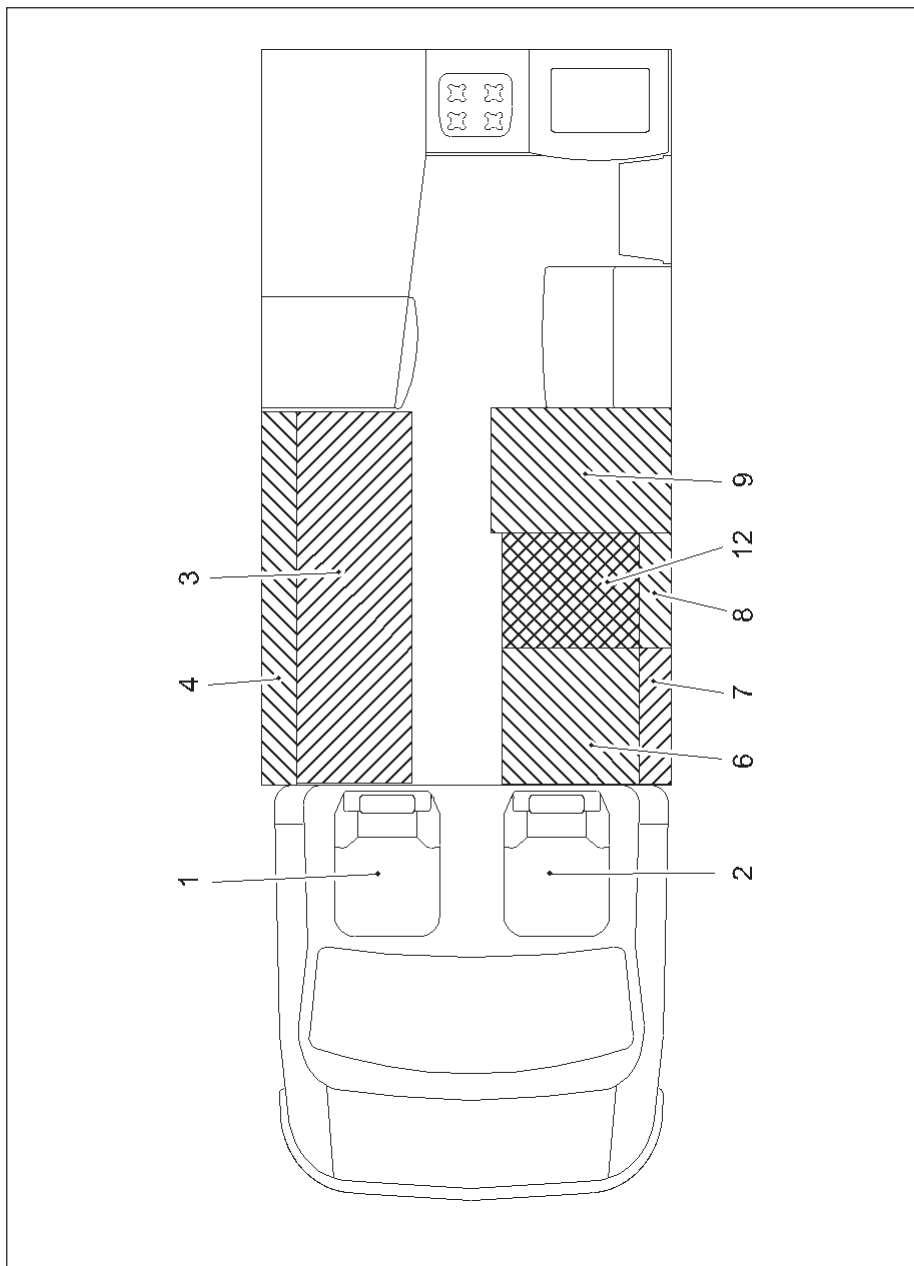


NORMAL SEATING ASSEMBLY (NORTHANTS)



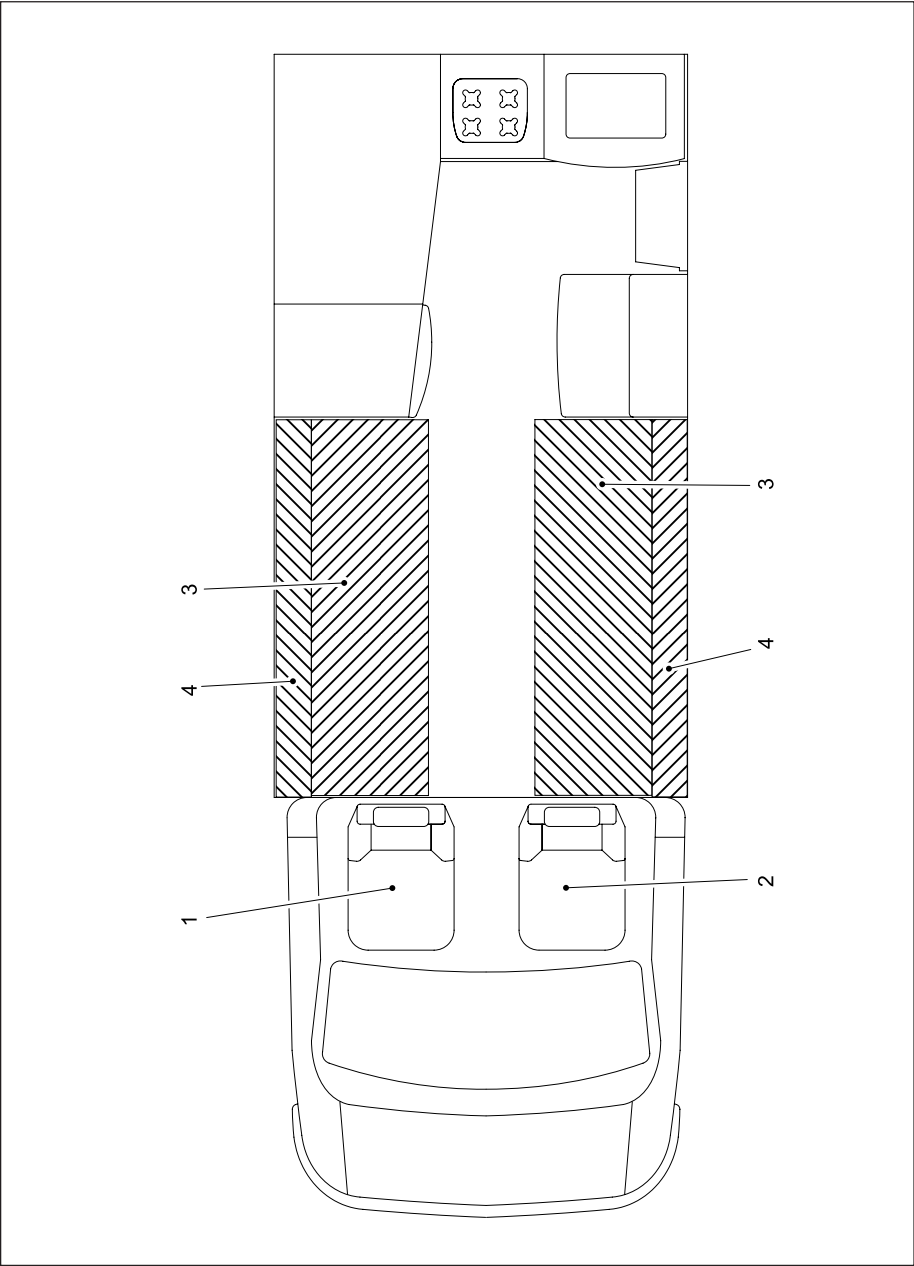


SINGLE BED ASSEMBLY (SURREY)

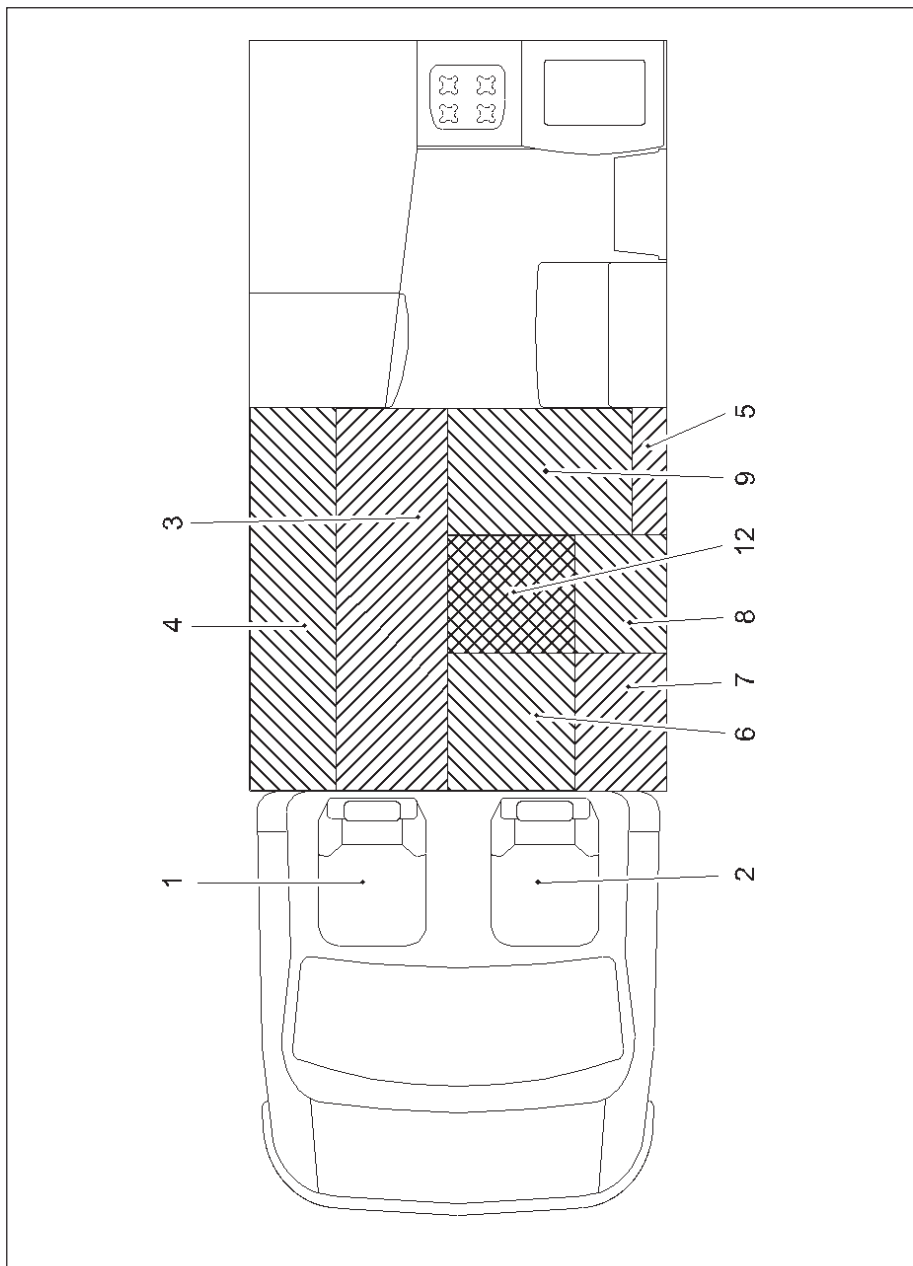




SINGLE BED ASSEMBLY (NORTHANTS)

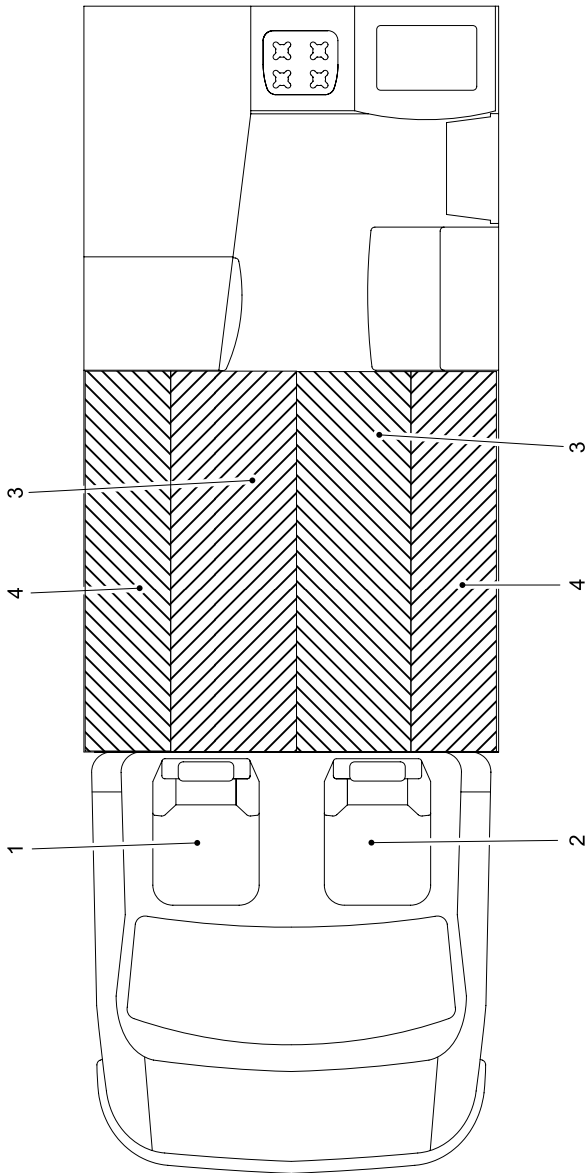


DOUBLE BED ASSEMBLY (SURREY)





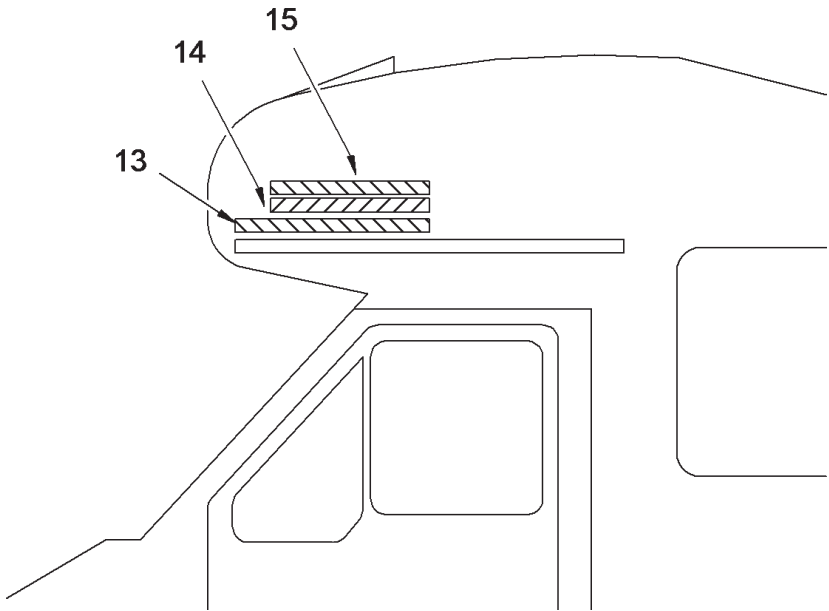
DOUBLE BED ASSEMBLY (NORTHANTS)





OVERCAB BED

STORED POSITION OF OVERCAB BED



**PARTS LIST (SURREY)**

Item	Part No	Description/Cushion type	Qty	Notes
1	CS0161	CAB SEAT RH	1	-
2	CS0161	CAB SEAT LH	1	-
3	CS0325	BENCH SEAT BASE CUSHION	1	-
4	CS0325	BENCH SEAT BACK REST	1	-
5	CS0325	F/FACING SEAT INFILL CUSHION	1	-
6	CS0325	SIDE FACING BASE SEAT	1	-
7	CS0325	SIDE FACING BACK REST	1	-
8	CS0325	SIDE FACING BACK REST	1	-
9	CS0325	F/FACING SEAT BASE CUSHION	1	-
10	CS0325	F/FACING SIDE INFILL	1	-
11	CS0325	F/FACING BACK REST	1	-
12	CS0325	LARGE INFILL CUSHION	1	-
13	CS0329	ROOF MATTRESS	1	-
14	CS0329	ROOF MATTRESS	1	-
15	CS0329	ROOF MATTRESS	1	-

PARTS LIST (NORTHANTS)

Item	Part No	Description/Cushion type	Qty	Notes
1	CS0161	CAB SEAT RH	1	-
2	CS0161	CAB SEAT LH	1	-
3	CS0312	BENCH SEAT BASE CUSHION	1	-
4	CS0312	BENCH SEAT BACK REST	1	-
13	CS0329	ROOF MATTRESS	1	-
14	CS0329	ROOF MATTRESS	1	-
15	CS0329	ROOF MATTRESS	1	-



EQUIPMENT ARRANGEMENT

Windows and Ventilation

Double glazed acrylic windows are fitted as standard to all lower caravan windows.

These top hinged windows allow excellent ventilation and are secured by locking over centre catches. They may be kept open in a variety of positions by use of the ratchet. To unlock the catch, depress the button in the centre of the handle stays and turn.

The top hinged acrylic windows must be locked closed, or in their intermediate travelling position, whilst the vehicle is in motion.

Ventilation

A Seitz mini Heki roof light is fitted in the kitchen area, another in the Luton area above the overcab bed, and a small MPK type in the shower compartment. A larger Seitz Heki 3 roof light is fitted in the roof above the lounge area.

MPK Roof Light

The MPK roof light is fitted with a hinged cover which incorporates a roller night blind and a fixed flyscreen. Opening the hinged cover gives access to the adjustment handles for the five way opening facility. Grasp the handles and push upwards to fully open or tilt in the required direction.

Heki Roof Light

To operate the mini Heki roof light, press the button and pull the handle to raise the cover. Use the slotted channels to hold the roof light open in the desired position.

The Seitz Heki 3 roof light is operated by a rotating handle which means that it can be opened to any required position. It incorporates a separate sliding flyscreen and night blind which can operate even if the ventilator is left open.

When the vehicle is being driven the roof ventilators should be fully closed. Wind noise may be reduced by closing the night blind.

The roof ventilators are designed to flow a certain amount of air even when fully closed. Do not obstruct them - your safety depends on them.

Insulation

These models are insulated largely in polystyrene, a material with high insulation qualities. This is used in the construction of the floor, body sides, rear panel and ceiling, and contributes greatly to the insulation qualities.

Stainless Steel Sink and Drainer

The stainless steel sink and drainer should only be cleaned with light detergent. Under no circumstances should bleach be used since this will react adversely with the stainless steel and may cause small holes in the metal. Immediately beneath the sink is a slide-out cutlery drawer. The chrome mixer tap has a small rubber end cap to eliminate water droplets marking the work surface whilst in transit. A waste bin is incorporated beneath the sink unit with a stainless steel spice rack fitted on the adjacent wall.

Storage

Above the fridge, a pull-out flap may be extended, designed as an extra work surface, television platform etc. It is retained in its stowed position with an internal catch. It is not recommended to travel with this worktop extended nor of course with any items thereon.

Habitation Battery

This is located beneath the front passenger seat. The battery is a 100 AH 12V, low maintenance, leisure battery which should only require attention at the annual habitation service. If a replacement battery should be required then it is important that the replacement be of the same type and specification as that originally fitted.

WARNING: Switch off all appliances and lamps before connecting or disconnecting the habitation battery.



Electronic Control System/Battery Charger

A Sargent EC325 Power Control System is fitted. It features a built in intelligent 'offline' battery charger, a system monitoring circuit and a digital control panel with scrolling menus. For a full description of this unit including operating instructions and fault finding, refer to the Connection of Services section.

Electrical - General

Two 230V AC sockets are fitted, more suitable for medium demand components such as televisions and hairdryers. Safety/ overload protection is provided by the MCBs in the electrical control box in the back of the wardrobe.

A 12 volt socket and TV coaxial socket is provided in the unit above the fridge. The TV socket is connected to the roof mounted TV aerial which is fitted as standard to this vehicle.

The mains hookup cable, provided as standard with the vehicle, is stored under one of the seats.

Factory Fitted Options

The following optional items are available at the time of build:

- Omnivent Extractor Van in kitchen area.
- Flat screen television.
- Status TV aerial with booster.

Retrofit Options

Whilst this list is not comprehensive, below are listed suitable retrofit options. Contact either your local Auto-Sleeper dealer or the Motorhome Service Centre, Willersey for further details.

- Cycle Rack. The Fiamma Pro C cycle rack is recommended, the rear panel of the vehicle being reinforced with bonded timbers at the appropriate mounting points.

- Top Box. The Fiamma Ultra 2 top box may be retrofitted; securing straps utilising the roof rack are suggested rather than penetrating the roof with fixing bolts.
- Air Conditioning. The Dometic B2200 is recommended for air conditioning in the living area.
- Fiamma Back Box. The Fiamma Ultrabox 360 is recommended utilising the rails on the Pro C cycle rack for support.
- Rear Ladder. A double folding aluminium ladder, the Omni-ladder deluxe 19101200, made from oval section anodised aluminium with stainless steel fittings, is recommended for use on this vehicle.



GENERAL

In order to keep your Auto-Sleeper in first class condition, periodic maintenance will be required to both the bodywork, windows, upholstery and other parts of the conversion. This maintenance should be carried out as follows:

Servicing

Servicing of the conversion is the responsibility of your local franchised Auto-Sleeper dealer to whom all queries should be referred. Your local base vehicle commercial dealer should carry out servicing of the base vehicle.

GLASSFIBRE BODYWORK AND ACRYLIC WINDOWS

General Cleaning

At regular intervals, you should wash the fibreglass bodywork with a recognised cleaner for use on fibreglass gel coats. Should marks remain, use a cleaner with chemical and abrasion agents formulated for use on gel coats.

Discolouration

Fading or discolouration of the gel coat is a natural ageing process caused by ultraviolet light. To overcome this, use a mild abrasive, which removes a thin layer of the discoloured surface. This will restore the bodywork to its original colour and surface lustre. Since discolouration develops gradually, it should not be necessary to carry out this procedure more than every three years. Frequent use of abrasive materials can reduce the thickness of the gel coat, to a potentially harmful extent.

Removing Scratches from Bodywork

Scratches can be removed from both gel and painted surfaces. The method depends upon the depth of the scratch, as care has to be taken to avoid penetrating the paint or gel coat. Very fine, hairline scratches can be removed by rubbing across the line of the scratch with rubbing compound. Slightly deeper scratches should be lightly wet sanded first using very fine (1200 grit or finer) abrasive paper. Rubbing compound will then

remove the flattening marks created by the abrasive paper. For deep gouge type scratches, where the paint or gel may have been penetrated, you should first seek the advice of your supplying Auto-Sleeper dealer.

Removing Scratches from Acrylic Windows

All windows, except the chassis cab and Luton, are manufactured in acrylic. Over time these become scratched and their clarity impaired. An Acrylic Window Polish removes unwanted scratches and blemishes leaving a clear, haze free finish. Minor scratches can be polished out directly.

Recommended Materials

G3 Paste Compound: This is a cutting compound and polish, recommended for use on painted surfaces and GRP. It is ideal for removing the traffic film that builds up on glassfibre coachwork and not only restores it to its former glory, but adds a high level of polish as well.

G10 Extra Fine Grade Liquid: This is again ideal for polishing surfaces and removes swirl marks and very fine scratches. It is less abrasive than G3 yet has the same polish properties and cleans and restores discoloured surfaces. It is ideal for use on dark colours.

Black Top Hand Glaze: This is ideal for use on stains, vinyls, body mouldings and provides a long lasting high gloss finish. It is resistant to car wash and abrasive solvents and is easy to apply. Economical in use, only a small amount is needed to give a very fine finish.

Finishing Cloths: These are very fine grade cloths, woven and thus easily washable that are recommended by Farecia for use with their materials.

The above can be purchased from our Service Centre, Willerly (01386) 853511.



UPHOLSTERY MAINTENANCE

Cleaning

Upholstery should be brushed or vacuumed regularly. Fabrics should be wiped every six to eight weeks with a lint free cloth and fabric cleaning fluid. Velour materials may be dry-cleaned.

Fabric Care

Fabric snags caused by sharp objects such as toys, nails, etc., should be trimmed off immediately. Never attempt to pull them off since this could cause the snag to run.

Whenever possible, avoid exposing the upholstery to direct sunlight which might eventually cause the colour to fade.

Fabrics with a velour type pile finish will develop crush marks in use - this is unavoidable and does not affect the quality of the product in any way.

Stain Removal

A proprietary dry cleaning fluid will remove most household stains. However, stubborn stains, such as coffee, wine or ice-cream may need pre-treatment with a mild soap and distilled water.

Small marks in velour type fabrics can usually be removed by stroking along the pile using a small brush and warm water.

We strongly recommend that before commencing any treatment an inconspicuous piece of material is tested for colourfastness and shrinkage. If in doubt, please contact a professional dry cleaning company. Do not apply cleaning solvents to velour piping, otherwise the flock will be removed.

Work Surfaces

Laminated work surfaces are fitted to the tops of all furniture units. Whilst these are hard wearing, hot pans should not be placed directly on these surfaces, since damage may result.

STAINLESS STEEL COMPONENTS

External

In the event of discolouration of the stainless steel ladder, this should be removed with T-Cut or any other mild abrasive and the surface protected with WD40 or a similar product.

Internal

Do not clean stainless steel fittings, i.e. splash plate and sinks with bleach since this reacts with the stainless steel and may lead to corrosion.

Furniture

Furniture should be cleaned with a proprietary furniture polish periodically. Any watermarks that may occur on the hardwood edging of the furniture units should be removed by use of fine grade wire wool and furniture wax.

Heavy stains may need to be sanded out and the edging re-polished with a proprietary varnish (Ronseal etc.). The high gloss finish is achieved by using wire wool and wax.

GAS INSTALLATION

All gas vents and flue pipes should be periodically checked for damage and should be kept free from dirt.

Blocking of vents or flues is extremely hazardous and should be avoided at all times.

Gas Appliance Igniters

It is advisable, periodically, to check visually the igniters on hobs, grills and ovens are sparking correctly.

Annual Inspection

The gas installations should be inspected annually by qualified personnel. If in doubt contact your supplying Auto-Sleeper dealer. Modifications to the gas systems should not take place unless carried out by qualified technicians.



SEAT RESTRAINTS

WARNING: In the event of any impact of 25 mph or over in which seat belts have been worn, they must be replaced before the vehicle is used again.

WATER SYSTEM

Fresh Water Tank

At regular intervals, and at least every three months, the fresh water system should be flushed through with fresh water. Furthermore it is advisable that prior to using your Auto-Sleeper, the fresh water system is thoroughly flushed with fresh water.

Waste Water Tank

Since the waste water tank can hold foreign matter, it should be regularly flushed with fresh water. To prevent odours working back through the shower and sink outlets, flush the waste tank through with a small amount of mild disinfectant.

Depending on the use of the waste tank, it is possible that this will collect solid waste matter, which in some instances may build up and block the waste tank outlet tap. In this case it will be necessary to drop the tank for cleaning. Access is through a large diameter fitting in the tank top. Once removed this will allow the tank to be flushed out in an inverted position and all solids removed.

WINTERISATION

General

This section contains information on the winterisation of your Auto-Sleeper, particularly when you may wish to lay up your vehicle for the winter months.

Water System

The water system should be fully emptied and the drain taps on both the fresh water tank and waste water tank left in the open position. Likewise, all internal taps should be left open and the water pump run until the last traces of water have come out of the taps. Purely as a precaution, against very severe freezing conditions, the water filter that is attached to the water pump on the outlet side should be removed and cleared of all water. In doing so it will give you the opportunity of cleaning it, if necessary, ready for the coming season. Remove all sink plugs to allow the water system to breathe.

Flush fully the waste water tank to remove any excess debris and waste material. Flush through again with disinfectant as part of the final drain. Leave drain tap open.

Upholstery

We advise that any detachable upholstery is removed and taken indoors during prolonged winter storage, particularly detachable upper bed mattresses and scatter cushions.

Curtains/Blinds

To prevent uneven bleaching, and possible excess sunlight onto the furniture and fabrics, we recommend that either the curtains or blinds are left drawn.

Refrigerator

Leave the refrigerator door open, on its intermediate lock position; this will allow the refrigerator to breathe and prevent any unpleasant odours in the storage department.

Ventilation

There is fixed upper and lower ventilation in your Auto-Sleeper which is built-in in the interests of safety. There is therefore no need to leave any windows or roof ventilators ajar -



indeed the roof ventilators have sufficient fixed ventilation to allow the interior of the vehicle to breathe satisfactorily.

Exterior

Fit, where appropriate, the Electrolux winter covers to the fridge ventilators. Give your Auto-Sleeper a good wash and polish before laying up, and apply a small film of protective oil to the stainless steel roof rack, ladder and any other external polished metal components.

Electrical

Turn the electrical system off at the control panel. To maintain the habitation battery in good condition it is recommended that it is trickle charged about once a month.

Mercedes recommend that if the vehicle is to be parked up for a long period that the vehicle electrical system is switched off at the battery isolating switch. For full instructions on the procedure, refer to the Mercedes hand book supplied with the vehicle and look in the index at the front of the book for the section entitled 'Battery/Isolating switch'. If this advice is followed, bear in mind that the remote central locking will not function, although it will still be possible to unlock and lock the doors manually using the key.

To maintain the vehicle battery in good condition it is recommended that it is fully charged prior to storage and then recharged every 3 months. For full instructions, refer to the Mercedes hand book and look in the index for the section entitled 'Battery/Charging'

Windows

Open all windows fully. Check all window seals are intact and shut firmly. Ensure locks and over centre catches are applied as appropriate.

Automotive

Follow the advice laid down by the base vehicle manufacturer. In particular,

- Secure the vehicle using chocks.
Release the handbrake to prevent the brake linings from seizing on.

- Increase the tyre pressure (by approximately 2 bar above the standard pressure) to prevent the tyres from becoming flat.

WARNING: Do not exceed the maximum pressure noted on the sidewall of the tyre.

Alternatively, jack up the vehicle to relieve the load on the tyres.

- Cover the tyres to protect from sunlight, as they will deteriorate rapidly in ultra-violet light. A light proof cover will help to prevent cracking of sidewalls and premature ageing.
- Check coolant for antifreeze protection, correct as required.
- Check windscreen and headlamp cleaning systems for antifreeze protection, correct as required.



TROUBLESHOOTING

The following are a series of fault finding charts to which you should refer in the event of problems you may have regarding 230/12V, LPG and water. This should be used as a guide only, and in the case of an electrical fault, where a fuse has blown or an MCB tripped out, the fault must be located before replacing the fuse. If a fault is suspected with the LPG system, consult a CORGI registered technician.

If in doubt consult a qualified technician or your local Auto-Sleeper dealer.

12V TROUBLESHOOTING CHART

Symptom	Cause	Remedy
Habitation 12V does not operate	Main 20A fuse blown	Check/Replace
	Battery Discharged	Recharge
	Switch on control panel in off position	Switch to on
	Vehicle ignition 'on'	Switch 'off' ignition
Habitation battery not charging	Main 20A fuse blown	Check/Replace
	Relay fault	Refer to dealer
	Contacts dirty/loose on battery terminals	Clean and check for tightness
	Poor earthing	Check earthing to chassis point
Battery does not hold its charge	Failed battery	Check cells with hydrometer change electrolyte if necessary
	Current being drawn	Check all appliances are off when not in use
Battery discharges over a short time with appliances operating	Poor battery cell condition	Check cells with hydrometer
	Failed battery	Change battery
	Battery not fully charged	Fully recharge battery
No power to one or more 12V appliances	Circuit fuse blown	Find fault and replace fuse with same rating
Lights dull/only one tube illuminating	Low battery charge	Check battery
	Faulty light unit/tube	Replace/Check
Water pump not operating	Switch on panel 'off'	Switch it 'on'
	Pressure switch on pump not operating	Refer to dealer
	Fuse 4 blown	Find fault and replace fuse with same rating
No power on 12V socket outlet	Fuse 9 blown	Find fault and replace fuse with same rating
	12V plug incorrectly connected/wired	Check plug

**12V TROUBLESHOOTING CHART (continued)**

Symptom	Cause	Remedy
Water Heater not operating/cuts out	Fuse 11 blown	Find fault and replace fuse with same rating
	Low battery charge	Recharge battery
	Unit fault	Refer to dealer
Cooker ignition not operating	Fuse 11 blown	Find fault and replace fuse with same rating
	Spark unit fault	Refer to dealer
	Fault on cooker unit	Refer to dealer
Fridge gas ignition not operating	Fuse 11 blown	Find fault and replace fuse with same rating
	Ignition control switch fault	Refer to dealer
Fridge ignition switch flashes but gas does not ignite	Fault on fridge unit	Refer to dealer
Ignition can be heard to be sparking but no flashing on fridge switch	Faulty fridge ignition switch	Refer to dealer
Fridge does not operate on 12V when engine is running	Fuse 3 blown	Find fault and replace fuse with same rating
	Fuse 7 in EM50 interface box blown	Find fault and replace fuse with same rating
	Fault on fridge relay	Refer to dealer
	Fault on fridge unit	Refer to dealer

230V TROUBLESHOOTING CHART

Symptom	Cause	Remedy
230V system inoperative	No site power	Check site supply
	RCD/MCB switches tripped out	Reset circuit breakers
RCD/MCB keeps tripping out	Fault on 230V supply	Check supply including polarity
	Faulty appliance	Turn off all appliances, reset circuit breakers, turn on appliances until fault occurs. Isolate faulty appliance
	Overload on current consumption by appliance	10A maximum available do not use appliance
Water heater does not operate on 230V	No power	Switch on isolator switch/ check MCB is on
	Overtemperature trip activated	Reset thermal cut-out (refer to operating instructions)
Battery charger does not operate	Charger switched off	Switch on at control box/ check MCB is on
Refrigerator does not operate on 230V	Switch on refrigerator thermostat dial not 'on'	Check position of thermostat dial
	Element fault	Refer to dealer
Cooker Hotplate not heating up	No power	Check MCB is on

**LPG TROUBLESHOOTING CHART**

Symptom	Cause	Remedy
Appliance will not light	No gas	Change the cylinder
		Check cylinder is turned on
		Check isolation valve is open
	Low battery (auto ignition)	Charge battery
Appliance lights but goes out immediately the FSD override is released	Flame supervision device (FSD) is not functioning correctly	Refer to dealer
Odour	Gas leak	Turn off the gas at the cylinder and do not use the gas system until the problem has been rectified
		In the event of a leaking cylinder, if possible, position the cylinder in an open area away from any sources of ignition. Contact the site warden and/or the local gas supplier
Yellow flame	Lack of primary air. please note yellow tipping to the flame is normal	Refer to dealer
Orange flame	Particles of dust or dirt in the mixing tube being carried through the burner ports	Reduce the amount of dust in air
	Burner ports partially blocked	Refer to dealer
Floating flame	Lack of secondary air	Check all vents are clear (air inlet to vehicle)
	Blocked retention ports	Check retention ports are clear
	If in an oven	Check the flue way is clear



WATER TROUBLESHOOTING CHART

Note: For more help with water pump issues, please refer to page 7-3 of this handbook.

Symptom	Cause	Remedy
Continuous running of water pump	1. No water	1. Fill tank
	2. Major leak	2. Switch off immediately and check system
Intermittent operation of water pump	Minor leak in water system	Check push fit joints
	Water pump pressure release valve reasserting itself	No action - part of pump design
Water pump does not operate	Fuse 4 blown	Find fault and replace fuse with same rating
Water gauge does not operate	Probe fault	Refer to dealer (check probe connections)
No hot water (mains system)	Water heater tripped	Check and press re-set button
No hot water (gas system)	Gas module not lighting	Refer to dealer
	Igniter not working	Check 12V switched on
Slow drainage from sink/shower tray	Blocked breathers in waste tank	Drop tank and clear breathers
Tip-up handbasin slow to drain	Blocked drain hole	Remove basin and clear
Unsatisfactory operation of water pump	Filter blocked	Clean filter



DATA RECORD

We suggest that you record key details in the spaces below should you accidentally mislay your keys or other vital documentation.

Vehicle Type

Vehicle Model

Auto-Sleepers Production Number

Keys

Ignition Key

Door Key (if applicable)

Fuel Filler (if applicable)

Water Filler

Gas Compartment Key

Toilet Compartment Key

Alarm Code (if fitted)

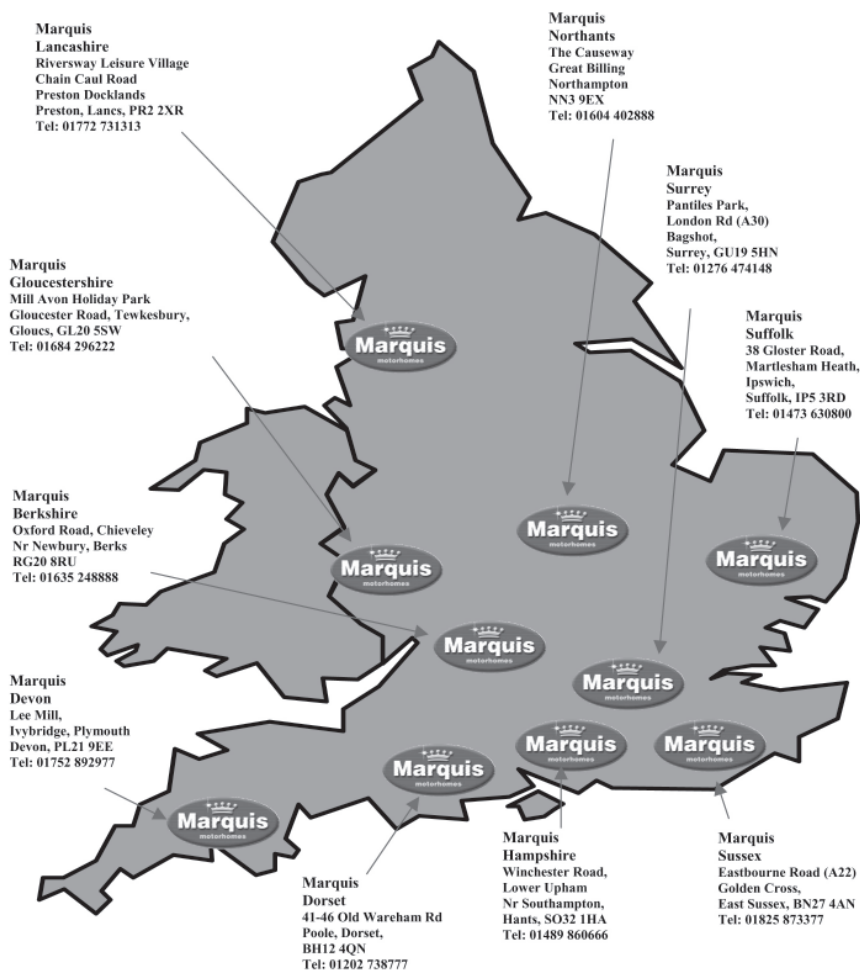
AA/RAC/etc. Membership Number

Radio Security Code

Supplying Dealer Contact Number



Superior craftsmanship within your reach - at a dealer near you





RECOMMENDED ANNUAL SERVICE CHECK FOR MOTOR CARAVAN BODIES AND CONVERSIONS

It is recommended that the annual service is carried out by an approved motorhome service centre.

Introduction

This entire section offers guidelines for the checking of a motorhome's habitation area and to ensure continual compliance with EN1646-1.

It does not cover any part of the base vehicle, although there may be minor overlapping (such as tyre pressures, cab seats, internal lights, battery and windows) in a van conversion. The base vehicle must be serviced in accordance with the chassis manufacturer's instructions.

Reference should also be made to:

- Any owner's manual or equivalent supplied with the vehicle by the motorhome converter.
- Appliance manufacturer's instructions.
- Driver's handbook or equivalent supplied by the chassis manufacturer.
- A vehicle is accepted for service at the dealer's discretion.
- Any defects, repairs, adjustments, cleaning or lubrication required will be noted on the checklist. The customer's approval will be obtained before any work is done.

Not all of the equipment mentioned in this manual is fitted as standard to every motorhome.

This guide is published as an aide de memoir for dealers. Any work carried out following the check, and the sufficiency of the work in the check itself, is subject to the contract between the customer and the dealer.

SECTION 1 - BODY MOUNTING

Body to Chassis

Examine all fixings retaining the body to the chassis - this may be direct or through a sub-frame. Where practical, all fittings should be checked to ensure they are all present and correctly secured.

Body to Cab

Examine joint between body and cab for signs of movement and soundness of sealing media.

Body Retention (dismountables)

Check serviceability and tightness of body retaining gear.

Check serviceability of body support struts and mountings. (Note: whether it will be necessary to demount the body to check the body supports must be agreed between dealer and customer).

SECTION 2 - WINDOWS

Windows

Check window glazing rubber or sealing for cracks and general condition. Check for satisfactory operation and closing.

Check fixing of top hinge rail on top hung windows.

Check for good weather seal when window is closed and latched.

Check catches and stays for satisfactory operation.

SECTION 3 - DOORS

EXTERNAL DOORS

Not including base vehicle doors.

Security:

- Check that hinges and catches are satisfactory and that, when latched, doors are held securely shut.
- Check that the keys or internal latches lock the doors correctly.
- Check that any device fitted to hold a door in the open position is satisfactory.



Sealing:

- Check all door seals for cracking and general condition.
- Check correct closing to give a weather-tight seal.

Childproof Lock:

- Where a door is fitted with a childproof lock check that an appropriate warning notice is fixed adjacent to the door. Appropriate warning notices are available from motorhome manufacturers.

INTERNAL DOORS

Security:

- Check that hinges and catches are satisfactory and that, when latched, the door is held securely shut.

Safety:

- Check that any device fitted to hold a door in the closed position can be operated from both sides to open the door in an emergency.

SECTION 4 - ATTACHMENTS TO CHASSIS OR UNDERBODY

Corner Steadies

Check that attachments to chassis are secure.

Ensure steadies work freely and satisfactorily.

Lubricate screw to ensure correct operation.

Folding/Retractable Steps

Check that step pivots are satisfactory and not worn. Check that, when closed, the retaining mechanism holds the step securely. If fitted, check device is working.

Underfloor Water Tank Mountings

Check mounting frames are secure to body. Any fastenings that require releasing to remove the tank should be free of rust and operate freely. (Removal, flushing, cleaning and replacing of tanks will be carried out at the prior request of the customer or will be done subsequently with other work).

Spare Wheel

Remove spare wheel. Check for damage. Check tyre pressure.

Check mounting frame for security to body and for secure retention of spare wheel.

Wheel Boxes

Check for damage, corrosion, water seepage, signs of tyre scrubbing.

SECTION 5 - ATTACHMENTS TO BODY EXTERIOR

Roof Lights

Check security, general condition, and that sealing has not deteriorated.

Roof Racks and Ladders

Check security to body and general condition.

Check roof for damage adjacent to rack.

Mouldings, Trims

Check security. Check sealing has not deteriorated.

Flue Terminals, Air Vents

Check security. Check sealing has not deteriorated.

Check that these are not blocked.

SECTION 6 - INTERNAL

Body Seepage Check

Examine for moisture/water staining of areas under windows, at side of roof and at corners, which could indicate water seepage problems. A moisture meter should be used where appropriate.

Furniture

Check furniture is securely fixed.

Check door hinges, catches and stays for satisfactory operation.

Dinette Seats/Beds

Check seat bases for security of fixings and for damage.

Make up beds according to manufacturer's instructions and check for rigidity and safety.



Upper Bunks

Check there is a secure means of access to upper bunks and that, where applicable, protection against falling out and entrapment is provided.

Curtains/Blinds/Nets

Check track is secure and curtains draw freely without snagging.

Check blinds and/or nets for correct operation.

Check flyscreens in roof lights and air vents.

Cab Seats

Where cab seats form part of the living area and/or bed layout they should be checked for security of attachment, smooth and easy operation of seat slides, swivels and seat back operation.

Fire Extinguisher

Check condition and expiry date. If an extinguisher is not fitted, inform the customer of the advisability of such equipment

Fire Blanket

Check position (should be near cooker).

If one is not present, inform the customer of the advisability of such equipment.

Advice to Occupiers/Warning Notice

Check presence and condition and advise customers accordingly.

The wording and layout of the notice should be set out as follows:

ADVICE TO USERS

VENTILATION

Do not obstruct the ventilators which are fitted; your safety depends on them.

IN CASE OF FIRE

1. Get everyone out.
2. Turn off outside gas valve and/or oil valve (if fitted).
3. Disconnect the mains electricity supply.
4. Raise the alarm and call the fire brigade.
5. Tackle fire if safe to do so.

FIRE PRECAUTIONS

Children: Do not leave them alone.

Means of Escape: Make sure you know the location and operation of the emergency exits, keep all escape routes clear.

Combustible Materials: Keep them clear of all heating and cooking appliances.

Fire Fighting: Provide, at least, a 1kg power fire extinguisher, that complies with BS5423 by the main exit door, and a fire blanket next to the cooker. Make yourself familiar with the instructions on your fire extinguisher and the fire precaution arrangements on the caravan park.

Portable or Open Flame Heating Equipment

Check for its presence. The customer must be advised against its use.



SECTION 7 - ELEVATING ROOFS

Solid Side Wall

Check sides and end panels fold up and down correctly, that they seal against each other where appropriate and that retaining mechanisms are satisfactory. Check all hinges for security and freedom from strain.

Locking of Roof

It is important to ensure that, when the roof is in the travelling position, it is safely and positively locked down. Any locking retaining mechanism should be carefully examined.

SECTION 8 - GAS SYSTEMS

Cylinders, Regulators and Feed Hoses

Establish that the cylinder and feed hose is compatible.

Since the introduction of BS EN1949 the gas pressures for Butane (blue) cylinders and propane (red) cylinders have been harmonised across Europe. The gas system pressure is now 30mbar for both gases.

The gas regulator is now fitted as standard equipment by Auto-Sleepers. Your supplying dealer will need to supply you with the correct hose compatible with the cylinder to be fitted.

Check cylinder compartment vents and gas drop hole in floor are free from obstruction.

Check seals on internal doors.

Hose and Piping

Check any flexible hose is of an approved type. Check its condition and any evidence of cracking.

The maximum permissible hose length is 400mm, longer hoses should not be used. The hose length is the length of the flexible portion of the hose assembly. Do not use external cylinders and or extension hoses.

Check piping for condition, damage and correct support.

Carry out an overall leak test.

Appliances

In general, the checking of gas appliances can be divided into the following:

1. Cleaning.
2. Operation of controls.
3. Correct flame structure.
4. Flues.
5. Flame failure device.
6. Security.

Cleaning

- Where appropriate, remove cover(s) to gain access to heat exchanger. Clean away any fluff or foreign matter. Reassemble and test. Clean flame viewing window.

Controls

- Check that all knobs etc. work smoothly and are secure on their spindles. If gas taps require greasing to ease stiffness, use only approved LPG grease. Check that appliances can be brought into service using the normal controls.

Correct Flame Structure

- Check that all pilot flames burn quietly and clearly.

Refrigerator: With the refrigerator gas control turned to maximum, the colour of the flame should be predominantly blue.

Instantaneous Water Heating: The main burner flame should be of even height and blue in colour. A flame burning yellow will allow sooting to occur.

Ovens: The oven flame should burn quietly and be of even height, mainly blue/green in colour. If the gas is propane, the flame will normally develop yellow tips as the burner heats up. If the gas is butane, a small amount of yellow tipping will be seen immediately after lighting, increasing as the burner heats up.

Grill Burners: It is normal for the flames on this type of burner to develop yellow tips as it heats up, particularly on butane.

General: A flame lifting away from the burners is an indication of too high a



pressure, although it may happen with grill burners whilst the frets are heating up. A yellow flame will cause sooting and is an indication of too low a pressure. Providing the regulator and piping have been checked and found satisfactory, the above faults should not appear.

Flues:

- Flues should be examined for security of fixing and for correct attachment to appliances and flue terminals. They should be free from damage and corrosion. Check for leakage of flue gases into the vehicle.

Flame Failure Device (FFD):

- Where fitted, FFD should be checked to ensure satisfactory operation. After the appliance has been successfully checked, allow time for the thermocouple to cool. Attempt to relight the appliance by turning it on without pushing in the gas control knob. (Do not override the FFD). If appliance does not light, FFD is satisfactory.

Security:

- Check appliance is securely fixed to the vehicle/furniture and will be free from rattles. Where applicable, check that water pipes are satisfactorily attached with no sign of leakage.

Protection of adjacent surfaces:

- Check that surfaces adjacent to open flame cooking appliance have adequate protection.

Inspections:

- It is recommended that inspections are carried out by a qualified fitter trained to, for example, CORGI (Confederation of Registered Gas Installers) or Calor standards.

SECTION 9 - WATER SYSTEM

Before operating the water system, a visual check of the following items may show up an obvious leak source...

Fresh Water Tank

Check condition, fill tank and check for leaks.
Check the external filler and filler pipe to tank.
Check for satisfactory venting.
Check condition and presence of filler cap.

Waste Water Tank

Check drain tap is clear and working.
Check condition and presence of drain hose.
(The water tank will be drained, flushed, cleaned and charged with a measure of toilet fluid/disinfectant at the prior request of the customer).

Pump Filter

When applicable, remove filter and replace.

Check the in-line pump for security and condition. Remove the submersible pump from tank, check condition.

Check pump inlet and outlet are clear and not obstructed.

Check delivery hose and electric cable are secure and satisfactory.

System Check

Operate pump. Check all piping for leaks.

Operate taps and shower. If a hot water system is fitted, it can be checked for leaks etc., using cold water. (Note: Aerated water from tap could be due to a leak on the suction side of the pump).

Waste Water System

With water running through the drain pipes, check for leaks and satisfactory draining of water from sinks etc.

Couplings and Fluids

Check that the appropriate markings are used - blue for fresh water, grey for waste water. Ensure a sealing off cover is supplied for each coupling.

Check that filler positions are designated



“petrol”, “diesel” or “water” as appropriate.

Toilet Waste Tank

Check that any fixed tank intended to receive discharge from a toilet is fitted with either a level or full indicator.

SECTION 10 - ELECTRICAL SYSTEMS

Extra Low Voltage 12 Volts (excluding vehicle)

Battery/ies:

- Check battery/ies for condition.
- Check connections, wires, fuses and relays appertaining to the habitation electrics.

Wiring:

- Examine all visible wiring.
- Check all connections and joints are sound and satisfactory.

Fuses/Fuse Holders:

- Ensure that fuses and fuse holders used to protect the habitation electrics are satisfactory and that fuse ratings are compatible with the circuit appliances being protected.

Appliances:

- Inspect all appliances for damage, signs of overheating and secure fixing.
Function test all appliances.

Mains 230 Volt System

It is recommended that the inspection and certification of the 230 volt system be carried out by a qualified electrician who is an approved contractor of the NICEIC (National Inspection for Electrical Installation Contracting) or in membership of the Electrical Contractors Association 17th Edition Wiring Regulations.

SECTION 11- VENTILATION

High Level

Check all high level ventilators, including roof lights, are free from obstruction and allow a free flow of air.

Low Level

Check all low level ventilators are free from obstructions and allow a free flow of air. If the ventilator is manually adjustable then ensure the mechanism is free and operating correctly.



AUTO-SLEEPERS SERVICE CENTRE ANNUAL HABITATION CHECK

Introduction

It is recommended that every 12 months the habitation side of your motorhome is inspected by qualified technicians. Attached to this brief, is a list of all the points that are checked.

A few customers are of the belief that this check includes rectification of faults. It is stressed that this is not the case, the annual service is a check only of the habitation aspect of the motorhome.

If faults are found, the technician will advise you, the customer, of the fault and the recommended course of action to resolve this.

Servicing is not included in this check.

All facilities are run and tested through their operational envelope. For example, the flame propagation on the refrigerator and other main gas appliances (where visible) is checked. If the flame is burning a wrong colour or burning too far from the jet, we again advise you, the customer, as to how this should be rectified.

We also recommend and are only too happy to arrange for the refrigerator of your Auto-Sleeper to be checked here at the Service Centre by a qualified Dometic engineer. In this instance we call upon Leisure Appliances and Repairs of Hereford who come, by appointment, to carry out the necessary work.

The only component that is changed during the course of the annual check is the flexible gas hose, the hose that leads from the bulkhead fitting in the gas compartment to the gas regulator.

A further aspect of the test is a gas pressure test.

You will see also that we check that key components are serviceable (fire extinguishers etc) and furthermore that where appropriate, items are lubricated and checked for serviceability.



MOTOR CARAVAN ANNUAL HABITATION SERVICE CHECK

CHECK SHEET CUSTOMER COPY

Vehicle Reg. Mark Make & Model Year of Manufacture Recorded Mileage	A Class Coachbuilt High top conversion Elevating Roof Dismountable
---	---

CHECK ITEM	Manual	OK	Remarks - Advice to Customers
SECTION 1: BODY MOUNTING			
BODY TO CHASSIS			
BODY TO CAB			
BODY RETENTION			
SECTION 2: WINDOWS			
WINDOWS			
SECTION 3: DOORS			
EXTERNAL			
INTERNAL			
SECTION 4: CHASSIS			
CORNER STEADIES			
FOLDING STEP			
WATER TANK MOUNTS			
SPARE WHEEL			
WHEEL BOXES			
SECTION 5: BODY EXTERIOR			
ROOF LIGHTS			
ROOF RACK AND LADDER			
MOULDINGS AND TRIM			
FLUE TERMINALS, AIR VENTS			
SECTION 6: INTERNAL			
SEEPAGE CHECK			
FURNITURE			
DINETTE SEATS/BEDS			
CURTAINS, BLINDS, NETS			
CAB SEATS			
FIRE EXTINGUISHER			
FIRE BLANKET			
WARNING NOTICE			
HEATING EQUIPMENT			



SERVICE DETAILS



CHECK ITEM	Manual	OK	Remarks - Advice to Customers
SECTION 7: LIFT UP ROOFS			
LIFTING MECHANISM			
CANVAS SIDE WALLS			
SOLID SIDE WALLS			
LOCKING			
SECTION 8: GAS SYSTEM			
CYLINDERS & REGULATOR			
HOSE & PIPING			
APPLIANCES			
SECTION 9: WATER SYSTEM			
FRESH WATER TANK			
WASTE WATER TANK			
FILTER PUMP			
SYSTEM CHECK			
WASTE WATER SYSTEM			
COUPLINGS & FLUIDS			
SECTION 10: ELECTRICS			
12 VOLT SYSTEM			
BATTERIES			
WIRING			
FUSES, FUSE HOLDERS			
APPLIANCES			
MAINS 230 VOLT SYSTEM			
SECTION 11: VENTILATION			
HIGH LEVEL			
LOW LEVEL			

DEALER:	SIGNED:
	DATE:



<div>DEALER STAMP</div> <div>DATE: / /</div>	<div>DEALER STAMP</div> <div>DATE: / /</div>
<div>DEALER STAMP</div> <div>DATE: / /</div>	<div>DEALER STAMP</div> <div>DATE: / /</div>
<div>DEALER STAMP</div> <div>DATE: / /</div>	<div>DEALER STAMP</div> <div>DATE: / /</div>
<div>DEALER STAMP</div> <div>DATE: / /</div>	<div>DEALER STAMP</div> <div>DATE: / /</div>
<div>DEALER STAMP</div> <div>DATE: / /</div>	<div>DEALER STAMP</div> <div>DATE: / /</div>
<div>DEALER STAMP</div> <div>DATE: / /</div>	<div>DEALER STAMP</div> <div>DATE: / /</div>

**A**

Annual Service Checks	12-1
Awnings	6-1

B

Bed Assembly	9-37, 9-38, 9-39, 9-40
Bed, Overcab	9-41

C

Cleaning	
General	10-1
Stainless Steel	10-2
Upholstery	10-2
Codes of Conduct	2-1
Cooker	9-1
Cycle Rack	4-1

D

Data Record	11-1
-------------------	------

E

Electricity	7-10
Instructions for Electricity Supply	7-10
Overseas Connection	7-11
Power Control System	7-13
Electronic Control System	9-44
Equipment Arrangement	9-31, 9-43

F

Fan, Extractor	9-6
----------------------	-----

G

Gas	7-5
Connection	7-8
Gas Bottles	7-5
Gas Safety Advice	7-6, 7-7, 7-9
Gas System	7-5

I

Internal Layout	9-30
-----------------------	------

L

Levelling	5-1
Loading of Weight	3-1
Location of Facilities	9-33

M

Marker Lights	4-1
Microwave	9-1

R

Refrigerator	
RM7291	9-17
Roof Rack Bars & Ladder	3-1

S

Safety	6-1
Air Bags	6-1
Awnings	6-1
Children	6-1
Fire Extinguishers	6-1
In case of fire	6-1
Ventilation	6-1
Seat Swivel	4-2
Seating Arrangement	9-30, 9-35, 9-36
Site Regulations	5-1
Siting your Motorhome	5-1
Sleeping Arrangement	9-34
Smoke Alarm	6-3
Space Heater	9-13
Step, Electric	9-29

T

Technical Data	8-1
Toilet	
Thetford C200 CWE	9-25
Travel Catch	9-24
Troubleshooting Chart	10-5

V

Ventilation	6-1, 7-7
-------------------	----------

W

Warranty	1-3
Water Heater	9-8
Water System	7-1
Weight & Dimension Data	8-3
Weights	8-1
Wheel Changing	4-1
Wheel, spare	4-1
Winterisation	10-3
Wiring Diagram	
12V/230V	7-27

