



ORION

Alu-Tech Bodyshell

Owners Manual



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horizons with Orion*

www.baileyorion.co.uk



Model _____

Vehicle Identification Number V.I.N. _____

Owner's Name _____

Address _____

Tel. No. _____

Key Nos: All Doors _____

Retailer's Name _____

Address _____

Tel. No. _____

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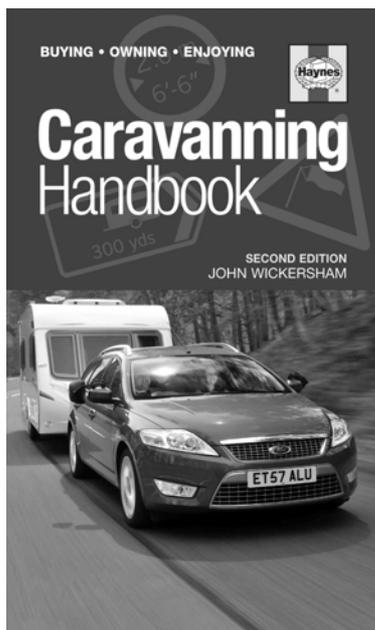

THE
CARAVAN
CLUB

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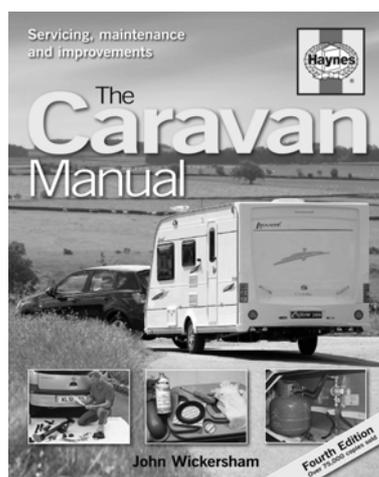
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Price: £12.99.



The Caravan Manual. Now in its 4th edition, this full colour manual is the ultimate guide to repairs and maintenance. Using the guidance and step-by-step illustrations, many jobs can be carried out by a competent owner. On the other hand this book is used by caravanners who want to find out how things work and to learn about tasks carried out by servicing specialists. Trevor Watson, Director General of The Caravan Club wrote: "This remarkable book covers just about all you will need to know to get the most from your caravan."

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1.1 INTRODUCTION

Bailey of Bristol welcome you to the ranks of Bailey Owners.

This Handbook has been designed to enable you to derive the maximum benefits and enjoyment from your caravan, its information will be of benefit to both experienced and new caravanners alike.

It should be used in conjunction with the Caravan Service Manual and Quick Start Guide supplied in the Caravan Information Pack. Supplementary user guides for certain components featured in this manual can also be found in the Brochure & Handbook section of the company web site @ www.bailey-caravans.co.uk.

All enquiries regarding your caravan must be addressed in the first instance to the dealer from whom the caravan was first purchased.

Your caravan is designed to give many years of use, regular maintenance is however necessary to ensure trouble free service. Your Bailey Retailer is equipped to offer service facilities, repair work and any spare parts you may require.

Always consult your Bailey Retailer before additional equipment is fitted to ensure appropriate fixing support is available.



- ▲ In any correspondence the caravan V.I.N. should always be quoted, this can be found on the offside chassis member and is etched into all major windows.

Manufactured by:
BAILEY CARAVANS LIMITED,
South Liberty Lane, Bristol BS3 2SS, England.

helpline@bailey-caravans.co.uk

1.2 WARRANTY

Any claims under warranty must be made through the Retailer from whom the caravan was purchased.

It is with the retailer that the purchaser's Contract of Sale exists and consequently Bailey Caravans cannot enter into any discussions with the purchaser.

Bailey retailers sell our products of their own choice and not as agents. They are, therefore, unable to bind Bailey Caravans Ltd or make any representation or undertaking whatsoever on behalf of Bailey Caravans Ltd.

All Bailey products are classified as "portable". All work under warranty requires that the caravan be delivered to and collected from the Bailey retailer.



- ▲ Whilst every effort is made within this Handbook to accurately reflect and describe our home market caravans (those purchased and stored on the mainland) our policy of continued improvements and change in market and supply conditions mean that we reserve the right to alter specifications without further notice. Some materials used in the production of our caravans can result in variations to the figures quoted in respect of measurements and weights.

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1.3 ORION CARAVAN WARRANTY COVER

Total customer satisfaction is top priority at Bailey and the quality ethos extends to the after sales service and market leading manufacturer's warranty package that comes with every new Bailey Orion caravan. In this way we not only ensure long-term peace of mind but also enhance the re-sale value of your investment.

1.3.1 6 Year Body Shell Integrity Guarantee

The Bailey Alu-Tech Orion caravan is covered by a six (6) year Bodysell Integrity Guarantee from the initial date of purchase. This cover extends to any structural degradation to the bodysell that arises as a result of water ingress through any permanently sealed seams or joints (with the exception of exclusions stated in the terms and conditions.)

Warranty Extension

An additional four (4) year extension to the standard Bodysell Integrity Guarantee warranty cover (making 10 years cover in total) is available as a cost option. Please ask your supplying Bailey Retailer for more information.

1.3.2 3 Year Manufacturers Warranty

For a period of twenty-four (24) months from the initial date of purchase Bailey of Bristol offer a comprehensive warranty on all parts and components as well as full coverage for any manufacturing faults forming part of the original specification of the vehicle. The manufacturer's warranty then extends to an additional twelve (12) months on the following items

Chassis: all chassis members including corner steadies

Suspension: axle suspension and braking system (excluding any damage to or faults in brake drums and shoes that are caused through misuse of the braking system or from normal wear and tear)

Running Gear: road wheels (excluding tyres)

Towing Mechanism: all mechanical components fitted to vehicle (excluding electrics)

Cooker: the cooker unit including burners, grill, oven, hot plate, flame failure device and igniter
Refrigerator: door seal condenser, gas control valve, gas igniter, flame failure device, 230v heater elements, gas thermostat, thermostat and temperature control switch

Water System: water heater (gas or electric), fresh water tank, water pump, water gauges, taps and shower head

Electrical System: mains hook up input connector, ELCB, and interior lighting units (excluding bulbs and LED's)

Cassette Toilet: the cassette toilet is covered (excluding seals, valves and glands)

Heating System: thermostat, motor, switches, control unit, gas heater, flame failure device and igniter (excluding ducting and fittings)

Windows: the functionality of the opening and closing system (stays, handles and catches) and a warranty against the cracking of the acrylic

Upholstery: zips, seams and colour fastness

1.3.3 Warranty Extension

An additional three (3) year extension to the standard Manufacturer's Warranty cover (making 6 years cover in total) is available as a cost option. Please ask your supplying Bailey Retailer for more information.

1.3.4 Customer Support

In the unusual event of something going wrong your first contact should always be your supplying retailer. Approved Bailey Retailers enjoy industry-leading after sales support service from the manufacturer and they should be able to offer all the help you need to rectify any problems that may exist.

1.3.5 Terms and Conditions

The Bailey Warranty Cover set out above is offered subject to the following simple terms and conditions:

Cover

1 During the term of the Warranty Cover, subject to these terms and conditions, Bailey will, through an Authorised Service Centre, at its option repair or replace all parts and components of the Orion caravan that are included in the Warranty Cover and which suffer a defect in manufacture or workmanship. An Authorised Service Centre means either Bailey itself, a Bailey Approved Retailer or a Bailey Approved Service Centre. Any part which is replaced becomes the property of Bailey. Any replacement parts are covered for the unexpired term of the Warranty Cover.

Term

2 The initial duration of the Bodyshell Integrity Guarantee is six (6) years and the duration of the Manufacturer's Warranty is three (3) years in both cases starting from the original purchase date of the vehicle. It is a condition of the warranty that an annual service is performed on the vehicle in accordance with the service plan. Failure to comply with this term will invalidate the warranty.

3 The unexpired term of the Warranty Cover on your vehicle may only be assigned, transferred or novated to subsequent owners with Bailey's consent (not to be unreasonably withheld) and on payment to Bailey of a transfer fee of £35. Transfer can only be made within the first three months (3) of subsequent ownership and full documentary evidence that the vehicle has been serviced annually must be provided at the time of assignment in accordance with the terms and conditions detailed above.

Repairs

- 4 The Orion caravan must undergo a full annual service and inspection, including a moisture survey, carried out, subject to paragraph 5 below, by an Authorised Service Centre. The final annual service in the warranty period must be carried out before the end of that warranty period, but all other annual services may be carried out within six (6) weeks either side of each anniversary of the original purchase date. The original VAT invoices must be retained as proof that these annual inspections have been carried out.
5. During the first three (3) years of the Warranty Cover, all annual inspections and repairs must be carried out either by Bailey itself or an approved Bailey Service Centre or Agent. Thereafter, due to the technical nature of an Alu-Tech constructed caravan, annual inspections and repairs may be carried out by any workshop or repair centre approved by the National Caravan Council that has attended Alu-Tech training courses at the Bailey factory.
6. Where an annual inspection identifies that repairs to the vehicle are necessary, the Orion caravan must be made available for repair within six (6) weeks of the date of inspection for the purpose of carrying out the repair work.
7. No repairs, including the fitting of any replacement unit, may be undertaken or commenced under the terms of the Warranty Cover unless prior written authorisation is obtained from Bailey via an authorised Bailey Retailer or Service Centre. No liability will exist with regard to any warranty claims not authorised in this way.
8. Bailey reserve the right to examine the vehicle before any repairs commence or any replacement part is fitted.

Registration & Use

- 9 The Warranty Registration Form must have been sent to Bailey within six (6) weeks of the original purchase date. It is the responsibility of the Bailey Retailer to forward this information to Bailey. This is part of the terms of trading that the Bailey Retailer has with Bailey.
- 10 The Orion caravan shall:
 - (a) only be used for its ordinary and intended purpose and shall not be subjected to any treatment or conditions which could reasonably be foreseen to cause or result in damage to the vehicle or excessive wear and tear;
 - (b) only be towed by a private car or private 4 x 4 vehicle; and
 - (c) not be put out to hire, reward or any other commercial use, nor used in any race, competitions or rallies whether timed, official or otherwise.

Exclusions & Liability

- 11 Bailey's liability under this warranty shall be limited to supplying the reasonable costs of labour and materials required for the repair or replacement of faulty parts or components. Bailey shall be entitled to charge for any repair work which is necessitated by virtue of any loss or damage caused by your negligence or default or incurred as a result of any modifications you have made to the vehicle. This warranty does not cover repair costs other than labour and materials.
- 12 The Warranty Cover does not include:
 - (a) repair or replacement of parts, components, seams or panels which are not part of the original construction of the Orion caravan, or which have been tampered with or undergone unauthorised modifications, or which have been repaired otherwise than by an Authorised Service Centre;

- (b) parts or components other than those specifically listed in the Bodyshell Integrity Guarantee and Manufacturer's Warranty descriptions set out above;
 - (c) general maintenance or components failing due to fair wear and tear or normal deterioration;
 - (d) repairs necessitated by lack of routine or regular maintenance. Particular attention is drawn to the Owner's Manual and Service Handbook supplied with the caravan and any maintenance instructions or notices published from time to time by Bailey relating to the proper care and maintenance of vehicles; or
 - (e) structural degradation or other damage caused by water ingress through non-permanently sealed seams or joints (such as, without limitation, around windows, hatches, doors and rooflights), beyond the initial 24 months of the Manufacturer's Warranty.
- 13 No liability will be accepted for:
- (a) damage caused by neglect or abuse, corrosion, intrusion of foreign or deleterious substances, lack of servicing, over-heating, freezing, or the continued use of the vehicle after a fault has become evident;
 - (b) any loss or damage caused by parts not covered by this Warranty Cover, including soft furnishings or trim;
 - (c) any accidental or fire damage or any losses incurred by accident or fire; or
 - (d) transport costs to and from point of repair.
- 14 Bailey will only be liable for costs which are incurred as a direct consequence of the event, defect or fault leading to the claim being made under this warranty. No liability will be accepted for any other loss or damage (such as loss of income or revenue, or loss of business or profits), costs, expenses or other claims for compensation howsoever arising which was not reasonably foreseeable by both parties when the caravan was originally purchased. Bailey will not be liable for any loss or damage suffered by third parties, nor for bodily injury not caused by our negligence.
15. Nothing in this warranty shall limit in any way our liability: for death or personal injury caused by our negligence; for fraud or fraudulent misrepresentation; or for any matter for which it would be illegal for us to exclude, or attempt to exclude, our liability.
16. The purchaser has statutory rights in addition to this warranty and this warranty does not affect those statutory rights.
17. This warranty shall be governed by and construed in accordance with the laws of England and the parties irrevocably submit to the non-exclusive jurisdiction of the courts of England.

The name and address of the warranty and guarantee provider is: Bailey Caravans Limited, South Liberty Lane, Bristol, BS3 2SS



1.4 CARAVAN REGISTRATION AND IDENTIFICATION SCHEME (C.R.I.S)

This caravan has been security marked and recorded under the Caravan Registration and Identification Scheme that is organised by the Caravan Industry.

Shortly after purchasing this caravan you should receive your Touring Caravan Registration Document. It will be sent by post to your home address.

Your Touring Caravan Registration Document will include a 17 character V.I.N. (Vehicle Identification Number), shown in the top right hand corner. This 17 character V.I.N. will be die stamped into the caravan drawbar and chemically etched on up to a maximum of 10 eye level windows.

To protect yourself and your touring caravan, never leave the Registration Document in the caravan. For security reasons keep it in a safe place.

If you sell the caravan please follow the instructions on the Touring Caravan Registration Document.

If you do not receive a Touring Caravan Registration Document, lose it, or any of the details recorded are incorrect, please contact:

CRIS
Dolphin House
New Street
Salisbury
Wiltshire SP1 2TB
Tel: 01722 411430

1.5 SAFETY

This handbook contains the information that you will require for safe enjoyment of your tourer. All of the information contained herein is important. However to draw your attention to specific items we have prefixed them with the following symbols to indicate a warning, caution or note respectively:

Warnings  are items that if ignored can cause the user(s) physical harm.

Cautions  are items that if ignored can result in the caravan becoming damaged.

Notes  are reminders that should be understood.

-  ▲ To ensure all the occupants of your caravan enjoy a safe and relaxed environment please observe the following
- ▲ Ensure all occupants are aware of their escape routes in the event of a fire.
 - ▲ Always keep escape routes and exit points clear from obstruction and debris.
 - ▲ Provide one dry powder fire extinguisher of an approved type or complying with ISO 7165 of at least 1kg capacity by the main door, and a fire blanket next to the cooker. Familiarise yourself on your fire extinguisher and the local fire precaution arrangements.
 - ▲ Ensure the caravan is serviced and maintained in accordance with this manual and the appliance manufacturer's recommendations. Also, that any replacement parts for an appliance conform to the appliance manufacturer's specifications and should be fitted by them or an authorised agent.
 - ▲ Your tourer is a compact living environment, and appliances should be treated in the same way as those in the home to prevent any accidental burning scalding - keep young children away from hot surfaces.
 - ▲ Your tourer is supplied with a EN1645 approved caravan step. Always take care when entering or exiting your tourer, ensuring that the step is securely located and safe before use. Do not use a broken or damaged step.
 - ▲ The torque setting of the caravan's wheel bolts should be checked after the first 30 miles after collection of the caravan from the retailer. Thereafter, the wheel bolts should be checked before every journey. The torque settings and tightening sequence are detailed on page 2-10 of this handbook.
 - ▲ Never attempt to lift the tow hitch with your hands when hitching the caravan to the tow vehicle or at any other time. Always raise or lower the tow hitch by winding the handle on the jockey wheel.
 - ▲ Always ensure that the green button located on the leading edge of the coupling head is raised before towing.

2.1 INTRODUCTION

Choosing the right car and caravan combination for safe and stable towing is both an art and a science. It may seem complicated to the newcomer, but a few minutes spent understanding the basic principles, common terms and definitions in use will be worthwhile in ensuring your enjoyment of our product.

2.2 CARAVAN AND TOWING VEHICLE TERMS

Maximum technically permissible laden mass: As stated by the vehicle manufacturer. This mass takes into account specific operating conditions including factors such as the strength of materials, loading capacity of the tyres etc. It is the maximum that the caravan can weigh on the road.



- ▲ Under no circumstances should the maximum technically permissible laden mass of this caravan be exceeded.

Mass in running order: Mass of the caravan equipped to the manufacturer's standard specification and certain items of essential habitation equipment.

User payload: The difference between the maximum technically permissible laden mass and the mass in running order.

User Payload includes:-

Personal effects: Those items which a user can choose to carry in a caravan and certain items of habitation equipment which are not included in the Mass in Running Order or Optional Equipment.



- ▲ Personal effects will include the wheel lock, jack and television if supplied as standard with the caravan.

Optional equipment: Items made available by the manufacturer over and above the standard specification for the caravan.

The masses relevant to your model of caravan can be found in the service handbook.



- ▲ Please take care to ensure that you have allowed for the masses of all items you intend to carry in the caravan. E.g. optional equipment, essential habitation equipment and personal effects such as clothing, food, bicycles, sailboard, sports equipment etc. The actual laden mass of the caravan as towed should thus not exceed the maximum technically permissible laden mass. The actual laden mass can be measured on a public weighbridge.

N.B. Beware weighbridges although regularly checked can give varying (inaccurate) results.

Nose Weight: That part of the weight of the caravan supported by the rear of the towing vehicle. This is sometimes defined as the "static load at the coupling head". The maximum nose weight for a caravan will be limited by either the towing vehicle tow hitch limits or the maximum load to which the caravan hitch is specified.



- ▲ The towing vehicle and towing hitch handbooks/manufacturers must be consulted for their specification prior to towing.



- ▲ The maximum static nose weight for all Bailey caravans is 100Kg. This should never be exceeded regardless of whether the towing vehicle's upper limit is greater.

It is recommended that the nose weight should be varied to find the optimum for towing dependent upon the actual laden weight of the caravan. Experience has shown that the nose weight should be approximately 7% of the actual laden weight (i.e. between 50 and 100 kg).

2.2.1 Measurement of nose weight

Nose weight may be measured using a proprietary brand of nose weight indicator. Such equipment is obtainable from your Bailey Dealer.

Another simple method is to use bathroom scales and a suitable piece of strong timber as a platform to rest the tow hitch on. The timber can be placed vertically between the caravan tow hitch and the bathroom scales. The timber should be of such length that when the caravan tow hitch is lowered onto it, using the jockey wheel, the caravan floor is horizontal. The weight can then be measured. When taking the measurement the jockey wheel should be raised and the corner steadies lowered until they are just clear of the ground.

Kerb Weight: The weight of the towing vehicle as defined by the vehicle manufacturer.

This is normally: With a full tank of fuel

With an adequate supply of other liquids incidental to the vehicles propulsion

Without drivers or passengers

Without any load except loose tools and equipment with which the vehicle is normally provided

Without any towing bracket

2.2.2 The caravan to towing vehicle weight ratio

This can be determined by calculation and is equal to:

$$\frac{\text{actual laden mass of caravan}}{\text{kerb weight of towing vehicle}} \times 100\%$$

As a general guide.

- i. Conventional petrol engines with a capacity up to approximately 1600cc petrol or 1800cc diesel should be adequate for towing a caravan weighing around 85% of the kerb weight of the towing vehicle.
- ii. Above 1600cc petrol or 1800cc diesel such engines should manage a caravan weighing up to 100% of the kerb weight of the towing vehicle and still give adequate performance.

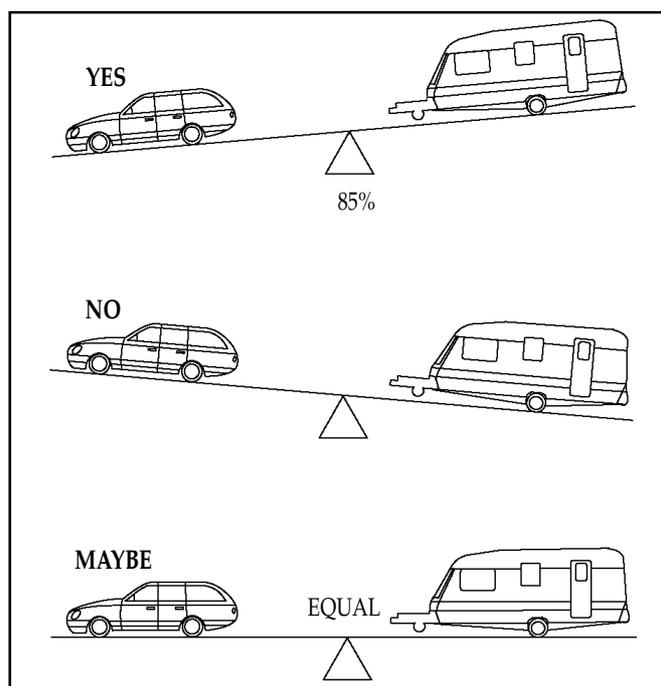
The towing vehicle manufacturer's towing limit is, in some cases, less than the kerb weight.

Vehicles with automatic transmission may need an oil cooler fitted or the SAE rating of the gearbox fluid increased when towing. The advice of the vehicle manufacturer should be sought.

The law requires that caravans & their towing vehicles & the loads they carry must be in such a condition that no danger or nuisance is caused. (Regulation 100 of the Road Vehicles [Construction and Use] Regulations 1986).

2.2.3 Towing vehicle's rear suspension

It is important that the towing vehicle's rear suspension is not deflected excessively by the noseweight on the tow ball. If it is excessive the steering and stability will be affected and at night the headlight beam is likely to dazzle other drivers which is illegal.



The greater the towing vehicle's tail overhang (the distance between the rear axle and the tow ball) the greater the effect the noseweight will have on the towing vehicle's rear suspension.

After trying out the caravan it may be found that stiffening of the rear suspension is necessary - but note that this may give the towing vehicle a firmer ride when not towing.

There are a number of suspension aids available and advice should be sought on which to use and how to fit.

It is important to ensure that the caravan is towed either level or slightly nose down. If it is not, then the car's towbar may be at the wrong height.



▲ Always consult your tow vehicle manufacturer for advice on towing and the loads that the vehicle is capable of towing.

2.2.4 Recommended tow ball height

The recommended tow ball height for Bailey Caravans is 415 +/- 35mm (i.e. between 380mm and 450mm).

2.2.5 Secondary braking cable (Break away device)

Purpose - To apply a trailer's brakes if it becomes separated from its towing vehicle. Having done this, the cable assembly is designed to part, allowing the trailer to come to a halt away from the towing vehicle.

Construction - A thin steel cable, coated in red plastic, and fitted with a means of attachment for connection to the towing vehicle.

Operation - In the event of the main coupling of the trailer separating from the towing vehicle, the cable should be able to pull tight, without any hindrance, engaging the trailer's brakes.



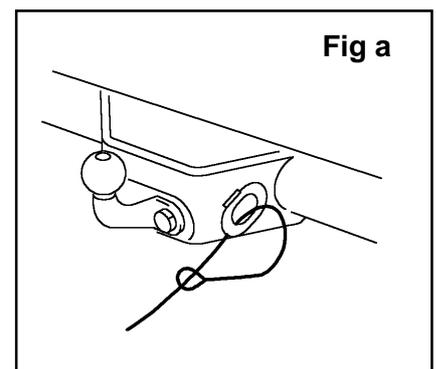
▲ The breakaway cable should never become taut during normal use.

Correct procedure for use:

- Regularly check the cable and clip for damage. If in doubt, contact your trailer or towbar supplier or your service agent.
- Make sure the cable runs as straight as possible and goes through a cable guide underneath the trailer coupling.
- Determine whether or not the towbar has a designated attachment point (i.e. a part specifically designated by its manufacturer for a breakaway cable).

Where a designated attachment point is provided on the towbar:

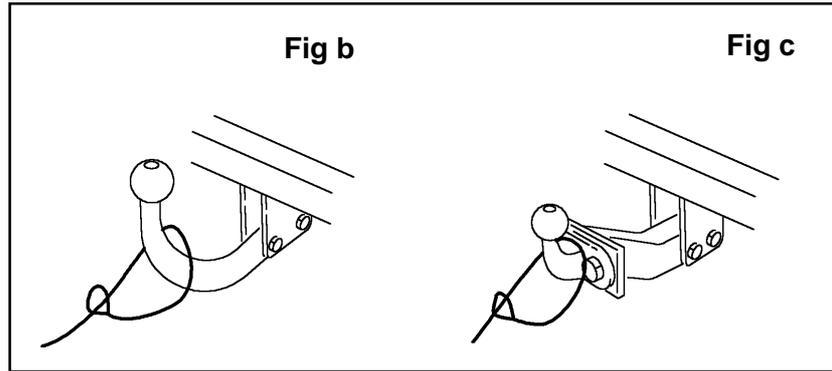
Pass the cable through the attachment point and clip it back on itself (Fig a).



Where no designated attachment point has been provided on the towbar:

Fixed ball - Loop the cable around the neck of the towball. If you fit the cable like this, use a single loop only. See Figs. b and c.

Detachable ball - You must seek guidance on procedure from the towbar manufacturer or supplier.



Other means of attachment:

In some instances it may be possible to attach the cable assembly:

Either:

a) to a permanent part of the towbar structure, as long as this meets the approval of the towbar manufacturer/supplier,

Or:

b) to an accessory sold for the specific purpose of breakaway cable attachment.

When the breakaway cable is attached, check to ensure:

a) that the cable cannot snag in use on the trailer coupling head, jockey wheel, or any accessory, e.g. a stabiliser, bumper shield, cycle carrier, etc.

b) that there is sufficient slack in the cable to allow the towing vehicle and trailer to articulate fully without the cable ever becoming taut and applying the brakes.



▲ For peace of mind you might wish to check the state of the cable by positioning the trailer and towing vehicle at extreme angles before setting off.

c) that it is not so slack that it can drag on the ground. If left loose, the cable may scrape along the ground and be weakened so that it subsequently fails to do its job. The cable may also be caught on an obstacle when in motion thus engaging the trailer brakes prematurely.

Having followed this advice, should you feel that a satisfactory coupling arrangement cannot be achieved, consult your trailer or towbar supplier or service agent.



▲ It is a legal requirement that the secondary break away cable is used when towing.

2.2.6 Loading and distribution of weight in the caravan and car

Equipment and personal effects should be loaded in the caravan so that any heavy items are low down near the floor and mainly over the axle(s).

The remainder should be distributed to give a suitable noseweight at the towing coupling (see illustration).

It should be noted that with certain layouts or models it may be necessary to load heavy items, such as awnings in the middle of the floor to achieve an acceptable and safe nose weight. It may not be possible to achieve the desired nose weight with all items stored 'out of sight' in lockers and bed boxes (bunks).



▲ Always load the caravan in such a way that maximises towing safety.

Incorrect caravan loading and/or overloading of the towing vehicles rear suspension will also result in poor towing stability.

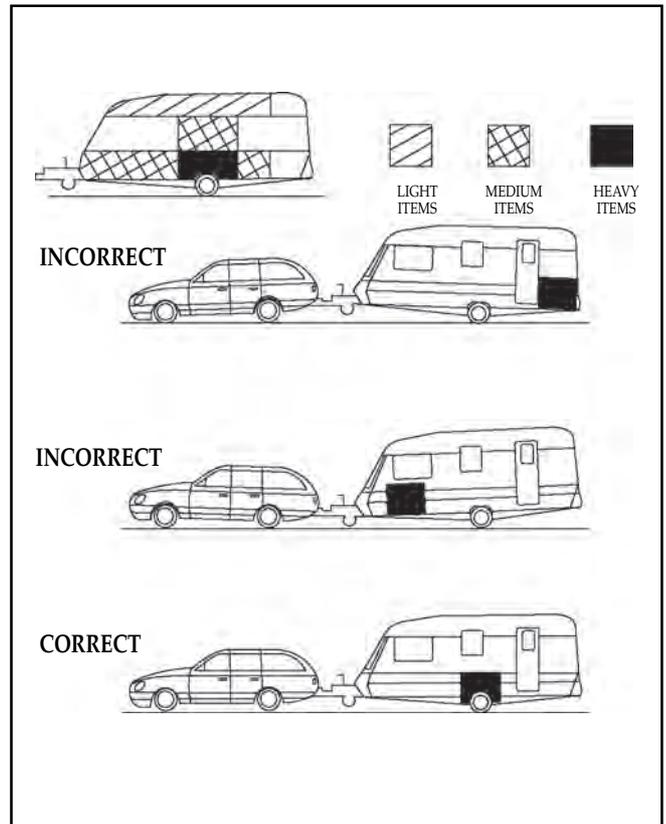
The weight should be distributed so that each side of the caravan carries, approximately, the same load.



▲ Please take care that you have allowed for the weight of all items you intend to load into the caravan.

2.2.7 Noseweight

It is recommended that the noseweight should be varied to find the optimum for towing dependent upon the actual laden weight of the caravan. Experience has shown that the noseweight should be approximately 7% of the actual laden weight (i.e. between 50 and 100kg). However, this may be limited by the towing vehicle or caravan manufacturer's limit noseweight. Check with the car and caravan handbook, or consult your retailer. The upper limit for the caravan coupling head is 100kg.



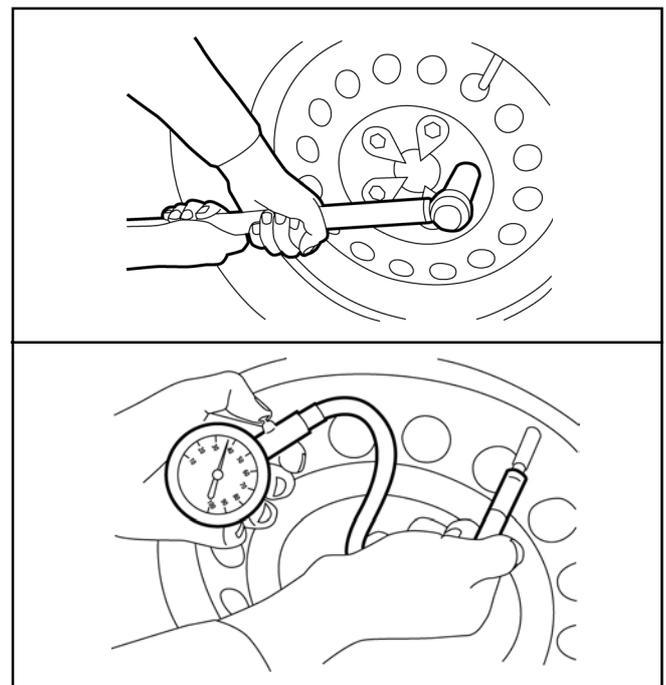
2.2.8 Hitching up

Before hitching up always check the following:

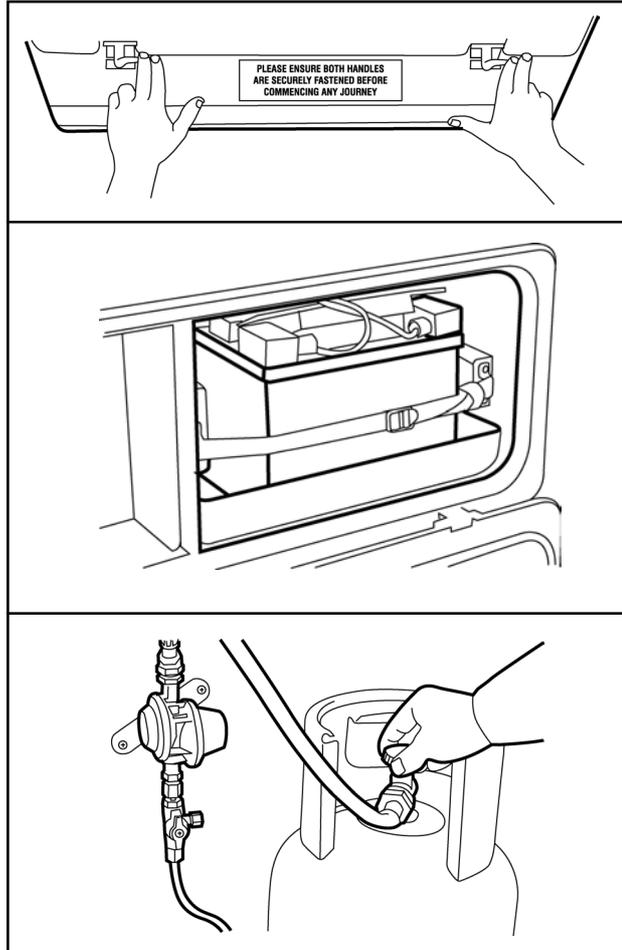
1. All wheel bolts are tightened to the correct torque. For alloy wheels the wheel bolts should be tightened to a torque of 160Nm (Newton Metres) (118 lb-ft), for steel wheels the wheel bolts should be tightened to a torque of 120Nm (88 lb-ft).
2. Inspect all wheels and tyres for signs of deterioration or damage.
3. Tyre pressures are correct according to the service handbook (remember to check the spare as well)
4. Ensure all loose articles are stowed securely



▲ Do not store heavy items in roof lockers. Televisions and other heavy items must always be secured at floor level when towing.



5. All lockers and cupboard doors are closed and secured
6. All bunks are secure
7. All rooflights, extractor fans and sunroofs are closed and secured
8. Tables are securely stored in their transit positions
9. Fridge is on 12v operation and door lock is set (if required)
10. All windows are fully closed and latched. Never tow with windows on night setting. Leave all curtains and blinds open to aid rear visibility
11. Gas cylinders are correctly positioned, secured and turned off, the gas box is shut and locked



- ▲ Ensure no loose items are stored in the gas box and it is not 'overstuffed' with equipment, as this may cause impact damage to the inside of the front panel.

12. Battery strap is connected and the battery is secure
13. All external doors, flaps and ventilation ducts are closed and secure with their relevant covers in place.



- ▲ Before commencing any journey always ensure that the Heki rooflight is closed and both handles are securely fastened.
- ▲ All gas appliances and the gas bottles must be turned off whilst towing
- ▲ It is recommended that a minimum of 2 people work together when hitching up the caravan to the tow vehicle.

2.2.9 Hitching the caravan to the tow vehicle

Ensure that the caravan is in a suitable position, and secure with the handbrake fully on.

Fully raise all four corner steadies.

Shut and lock the caravan exterior.

Gauge the height of the car's tow ball then raise or lower the height of the caravan's towing hitch to ensure that it is high enough to pass over it cleanly and not hit the tow ball. Rotating the caravan's jockey wheel handle can do this. Clockwise to lower, Anti-clockwise to raise.

The assistant should position themselves by the front near side of the caravan so that they can extend an arm horizontally to indicate the position of the caravan's towing hitch.

Remove car's tow ball cover and keep it in a secure place in the car.

Slowly reverse the towing vehicle towards the caravan.



- ▲ When reversing the towing vehicle towards the caravan always ensure that any pedestrians and your assistant are visible at all times.

When reversing aim the tow ball of the car directly at the caravan towing hitch.

When the car's tow ball is as close to the caravan's towing hitch as possible fully apply the car's handbrake, turn off the engine and leave the car in first gear (Park or 'P' Position for Automatics).

The final positioning should be carried out by manoeuvring the caravan by hand.

Carefully release the caravan handbrake.

Manoeuvre the caravan by hand to position the caravan's tow hitch directly over the car's tow ball.



- ▲ Always manoeuvre the caravan by pushing /pulling on the grab handles only. Not the body panels. When the caravan is in the correct position fully apply the handbrake.

Raise the handle on the caravan tow hitch until it clicks and remains at an angle.

Rotate the jockey wheel handle clockwise to lower the caravan hitch onto the car's tow ball. When the tow hitch clicks and the handle drops to the horizontal position it is engaged. The hitch head is fitted with a visual indicator on the front radius to show whether or not it is properly connected to the tow ball. A green band will show immediately below the red indicator button on the hitch head when a proper connection has been made.

Connect secondary braking cable as per the instructions in the previous section.

Test that the hitch is now fully engaged by slightly raising caravan hitch from car tow ball by winding the jockey wheel handle anti-clockwise. The hitch should not release from the car tow ball. Only raise the rear of the car enough to check the hitch is fully engaged.

Turn jockey wheel winding handle to lower caravan. When the wheel is fully retracted, release the clamp and raise the jockey wheel to its travel position.

Once the jockey wheel is at its travel position and the wheel is located in the recess in the hitch cover tighten clamp again.

All caravans are fitted with a single 13 pin lead. Where the connector for the car does not match that of the caravan an adaptor or replacement cable will be required. Please ask your supplying retailer for more information.

Connect the lead to the receiving socket on the car ensuring there is enough loose cable for cornering, but not too much so that it can drag on the ground.

Check all car and caravan road lights are working and the operation of the brake lights.

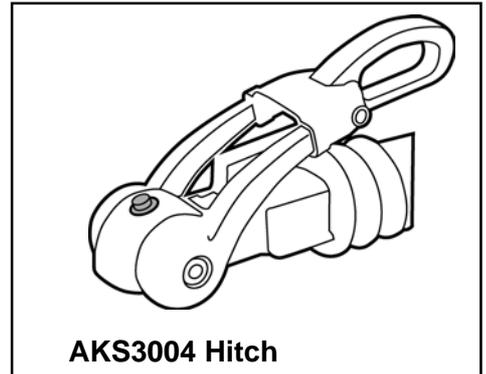
Pick up any levelling pads or levelling boards.

Check round the caravan for anything left behind.

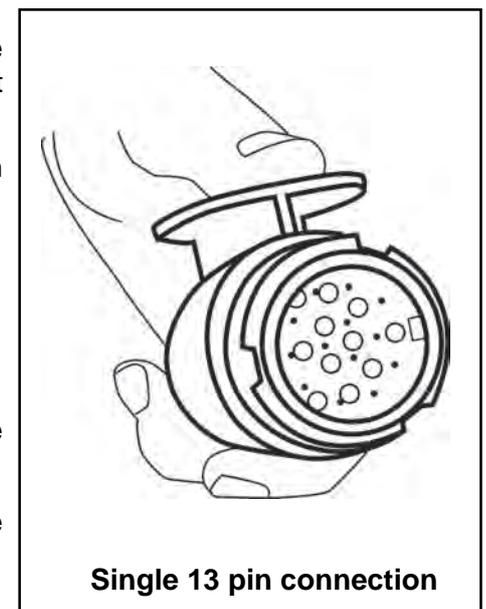
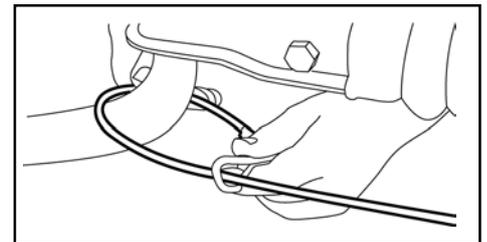
Fully release the caravan's handbrake.

Carry out a second check that the hitch is secure and the secondary braking cable is connected.

Adjust all of the car's driving mirrors from driving seat to ensure good rear wards visibility.



AKS3004 Hitch



Single 13 pin connection

2.3 TOWING

2.3.1 Speed limits

Where a lower limit is not in force, caravans may be towed at up to a maximum of 50 mph on single carriageways or 60 mph on dual carriageways and motorways.

2.3.2 Pulling away

Allow more engine speed to produce the power to move the additional weight of the caravan.

Let the clutch out smoothly.

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

Change gears smoothly.

Try not to jerk the clutch.

2.3.3 Caravan handling

Allow for the caravan being slightly wider than the car.

Allow additional distance from the kerb with caravan wheels so that they are not 'bumped'.

When passing other vehicles allow more than the normal clearance for driving solo.

Overtaking and stopping distances are increased when you are towing.

Always indicate in plenty of time before carrying out any manoeuvre.

Allow longer to accelerate up speed prior to overtaking.

Allow for the vehicle being twice its normal length.

Do not suddenly swing out.

Carry out all manoeuvres as smoothly as possible.

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

2.3.4 Reversing

Proficiency at reversing can only be achieved with practice and should be first attempted in a large open area. Consider taking a suitable training course.

2.3.5 Motorway driving

Caravans may not be towed in the outside lane of a three or four lane motorway. (Reg. 12(2) of the Motorway Traffic [England and Wales] Regulations 1982).

Reduce speed in high winds, cross winds, downhill or in poor visibility.

High sided vehicles such as lorries or coaches can cause air buffeting, so extra care must be taken when passing or being passed. Give as much space as is possible between your caravan and the high sided vehicle.

2.3.6 Mirrors

The Law requires the driver of the towing vehicle to have an adequate view to the rear.

If there is no rear view through the caravan windows it may be necessary to have additional exterior towing mirrors fitted to provide a view along both sides of the caravan. In some countries these additional mirrors are a legal requirement.

Any rear view mirror must not project more than 200mm outside...

- * the width of the caravan when being towed
- * the width of the towing vehicle when driven solo

Any additional rear view mirror fitted shall be of an approved European type and cover the field of view as stipulated by the regulations.

2.3.7 Passengers



▲ Passengers are forbidden to ride in a caravan at any time.

2.3.8 Snaking

This is a term used to denote an unstable car and caravan combination where the caravan 'weaves' from side to side often causing a similar swaying movement in the car itself. Possible causes are:

- i. Insufficient tyre pressures on either caravan or tow vehicle.
- ii. Tow vehicle too light or otherwise unsuitable.
- iii. Incorrect loading or weight distribution.
- iv. Excessive speed especially downhill.
- v. Side winds.
- vi. Overtaking.
- vii. Being overtaken by a high-sided vehicle.
- viii. Erratic driving.
- ix. Mixing radial and cross ply tyres.
- x. Nose of caravan is towing too high.
- xi. Insufficient noseweight.

For best stability aim at an 85% ratio of weights (see page 2-2).

2.3.9 Stabilisers

A stabiliser should never be used to try to improve a caravan/towing vehicle combination that has poor stability as instability may appear at higher speed.

However, a good stabiliser can make an acceptable caravan/towing vehicle combination more comfortable and easier to handle.



▲ Holes should not be drilled in either the coupling head or 'A' Frame members without prior consultation with the chassis manufacturers.

If you do find your outfit snaking, try to keep the steering wheel in a central position as far as possible, slow down gently and avoid braking if possible.

2.3.10 Road lighting

All caravans are fitted with a single 13 pin lead. Where the connector for the car does not match that of the caravan an adaptor or replacement cable will be required. Please ask your supplying retailer for more information.

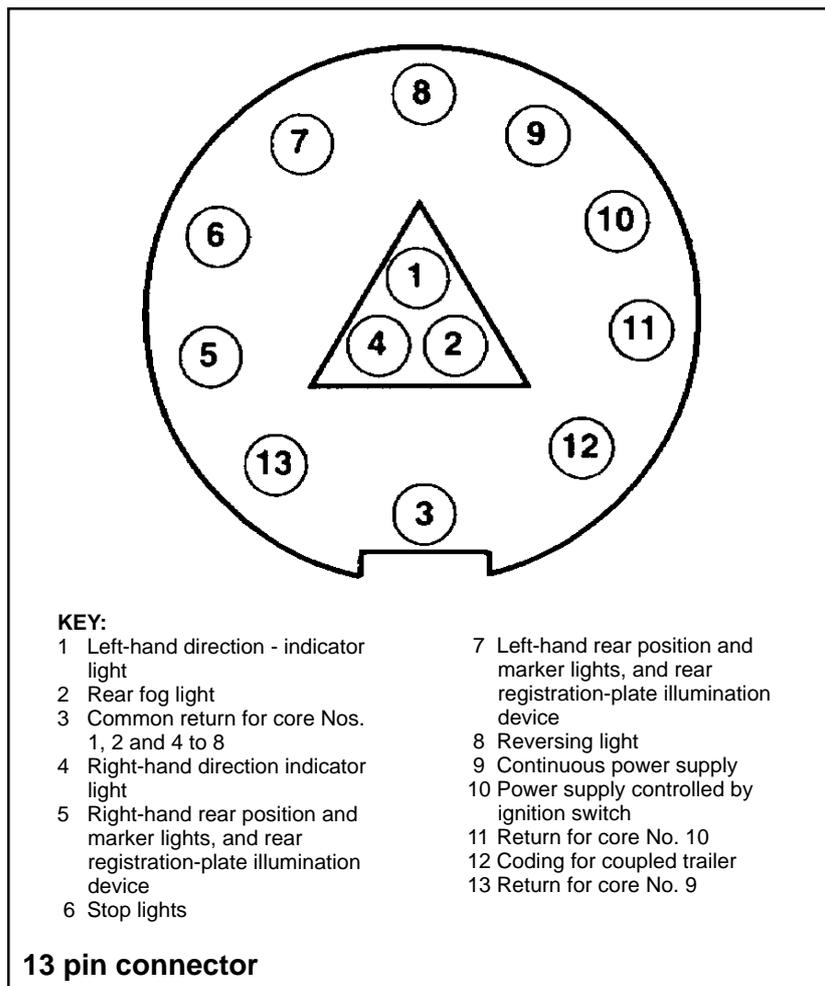


- ▲ Condensation can occur in the LED grab handle lights but will dissipate with no loss of performance or damage to lights.

2.3.11 Types of tyres fitted

The tyres fitted by Bailey Caravans are suitable for towing at sustained speeds of up to 81 mph (130 kph) to allow for use in countries which permit this speed.

Radial and cross ply tyres should never be mixed. It is dangerous and can cause snaking. Fit only tyres that are of the identical specification on each side.



2.3.12 Tyre Wear and Damage

The legal requirements for tread depth (1.6mm) on motor vehicles apply also to caravans.

In order to equalise wear it is suggested that wheels be balanced and changed around from time to time. When caravans are not in use for extended periods, wheels and tyres should be removed and stored in dry conditions and away from the outside elements. Alternatively caravans should be jacked up to relieve the load from the tyres.

It is dangerous to neglect tyre damage. Should you detect a blister, rupture or cut exposing the casing, or if it has suffered a violent impact (for example against a kerb), such that there is a risk of internal damage, it is advisable to have it examined by a tyre specialist as soon as possible.



- ▲ The caravan industry recommends that, for safety reasons tyres more than 7 years old from the date of manufacture be replaced, but preferably replaced at 4 years old. The tyres may have deteriorated by this time, regardless of tread depth.

The cleaning of tyres should only be carried out using soap and water. Petrol, diesel, paraffin and other solvents are not suitable.

If the caravan is not used for long periods of time (winter months) it is recommended that the wheels/tyres are removed and stored at normal inflation pressure in a cool, dry place protected from direct sunlight, sources of heat, ozone concentrations and fuel/oil contamination. They can be covered with a natural material (e.g. Hessian) for protection but not plastic materials. This will reduce the deterioration of the tyres and reduce cracking and flat spots caused by continuous loading and external conditions.

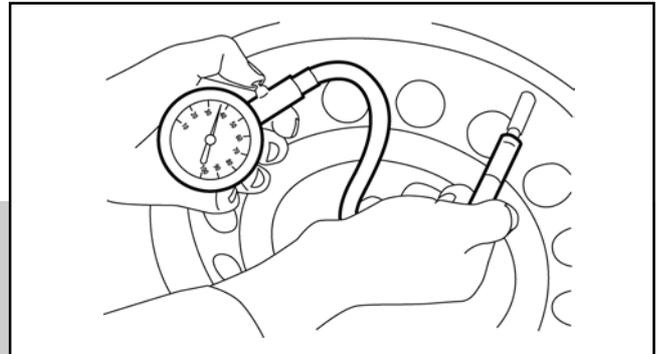
If it is not practical to remove the wheels it is recommended to routinely rotate the wheels to reduce the potential of cracking, flat spots etc.



- ▲ Check with your insurance company that you are still covered when wheels are removed.

2.3.13 Tyre pressures

Caravan tyres should be at the pressure recommended in the Service Handbook, pages 8-10. The towing vehicle tyres must be at the pressures recommended for towing or heavy loading. Towing stability may otherwise be affected. Check all pressures only when tyres are cold.



- ▲ Always check your caravan and tow vehicle tyre pressures when cold and prior to any journey. Also check tyre condition for blisters, ruptures or cuts exposing the casing and any damage to the wheel (violent impact / kerb damage) before/after any journey. (Inclusive of spare). If in doubt it is advisable to have it examined by a tyre specialist as soon as possible. Incorrect tyre pressures can seriously effect towed vehicle performance and the longevity of the tyre.

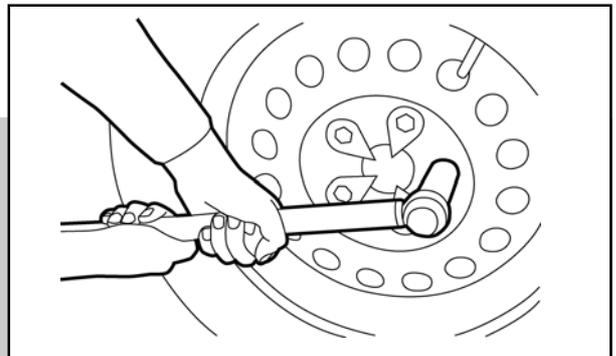
Consult your tow vehicle manufacture for the correct tow vehicle tyre pressures for towing.

2.3.14 Wheels

Caravan wheel bolts must always only be tightened to the appropriate setting by tightening each opposite fixing in succession to the correct torque. Always use a calibrated torque wrench. Do not use a corner steady brace, power or electric wrench. It is as dangerous to overtighten wheel bolts as it is to not tighten them sufficiently.



- ▲ The torque settings should be checked after the first 50 km/30 miles (see page 4-30). For *alloy wheels* the wheel bolts should be tightened to a torque of $160Nm$ (Newton Metres) (118 lb-ft), for *steel wheels* the wheel bolts should be tightened to a torque of $120Nm$ (88 lb-ft).



The condition of wheels should be checked regularly particularly for distortion of flanges and the wheel dish. Wheels damaged or distorted, or having the wheel bolt seating cracked or deformed must not be repaired.

If a wheel or tyre has to be changed it should be of the same type of construction and size as originally fitted.



- ▲ Only use a spare wheel and tyre recommended by Bailey Caravans, which should be of the same specification as those fitted to the caravan.
- ▲ Always ensure mating surfaces and bolt seating areas are clean and dry. Wheel bolts should never be lubricated.

2.3.15 Spare Wheels

Orion models are fitted with an ALKO spare wheel carrier together with a wheel and tyre as standard equipment. This is located just behind the caravan axle underneath the caravan.

To remove the spare wheel and tyre first extract the split pin on the end of the securing chain, completely remove the large black plastic nut that hold the assembly onto the chassis member. Lift the curved ends of the carrier out of the chassis member and lower the carrier to the ground. The carrier assembly can then slide out so that the tyre is clear of the chassis member and from there the nut securing the wheel to the carrier frame can be undone and the spare wheel and tyre removed. In some instances it may be necessary to raise the caravan using a jack to make it easier to remove the spare wheel from the carrier.

We strongly recommend that you familiarise yourself with this assembly and its operation.



- ▲ Alloy wheel bolts used on a steel spare wheel should be torqued to the same settings.



- ▲ Always ensure that the spare wheel carrier's black plastic nut is fully tightened and the split pin in place before towing.
- ▲ Always ensure that the sparewheel and tyre is secure before towing.

2.3.16 Changing a Wheel

- i. Always ensure that the tow vehicle and caravan are in a safe position before attempting to change the caravan's wheel. We recommend leaving the caravan hitched to the tow vehicle when changing the caravan's wheel. The tow vehicle should be left in gear (or 'P'/Park for an automatic) with the handbrake on both the car and caravan fully applied.
- ii. Lower the corner steadies as a safety measure to stabilise the caravan. Chock the un-punctured wheel on the opposite side of the caravan to prevent any movement.
- iii. Slacken off the wheel bolts by no more than one quarter of a turn on the wheel that requires changing. Do not fully undo them.
- iv. Place the jack plate under the axle tube as near as possible to the main longitudinal member. Where AL-KO Jack Brackets are fitted only use either an AL-KO Side Lift or Scissor Jack.
- v. Jack up the caravan until the wheel for removal is just off the ground.
- vi. Remove the wheel nuts and remove the wheel.
- vii. Fit the spare wheel, then reverse the above procedure. Ensure that the wheel bolts are all fitted, and tightened in the correct sequence to the right torque (see page 2-11 for tightening sequence and torque setting).
- viii. Remember to tighten all bolts to the correct torque and re-check after 50kms/30 miles.



- ▲ Under no circumstances should the corner steadies be used as a jack they are only a means of stabilising the caravan.

2.3.17 Unhitching

Do not pitch in a position in which your outfit will obstruct other people.

Try to choose an area that is dry, reasonably level and preferably with a hard base.

If you have no alternative but to pitch on a slope ensure that, for when you leave, you are facing down the slope.

It is good practice to chock the wheels of the caravan when parked on a slope even though the caravan brakes are applied.

Fully apply the caravan handbrake.

Unclamp and lower the jockey wheel to the ground.

Re-clamp it in this position. Operate the button on the hitch head and move the handle forward to release the mechanism. Operate the jockey wheel handle until the coupling head is clear of the towing ball.



- ▲ Serious damage will occur unless the button is depressed first and the handle lifted forward before the caravan is lifted manually. This prevents the noseweight being transmitted through the button.

Re-clamp jockey wheel if necessary.

Disconnect the secondary braking cable.

Disconnect the 13 pin plug and return it to its holder.

Replace towball cover.

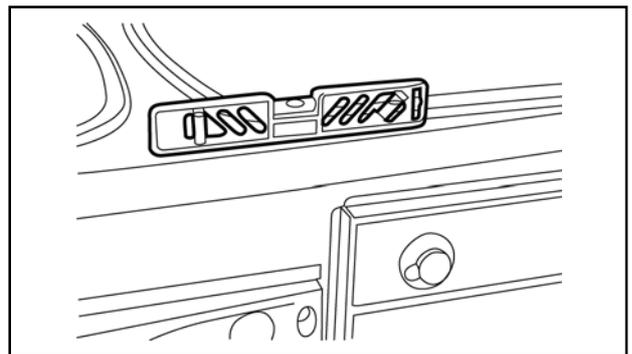
Park your vehicle alongside the caravan on the offside.

2.3.18 Levelling the caravan

Levelling must be carried out in both directions in order for the refrigerator and other equipment to function correctly.

The positioning of the jockey wheel can be used to help level the caravan.

Lower the corner steadies until they are in firm contact with the ground.



- ▲ Under no circumstances should the corner steadies be used as a jack as they are only a means of stabilising the caravan.

Levelling pads or boards should be used under the steadies where the ground is soft or uneven.



- ▲ In extreme cases where it is necessary to raise a wheel off the ground for levelling purposes, further adequate support should be applied under the wheel so that the corner steadies do not take any undue strain.

2.3.19 Towing brackets

All tow cars registered since 1 August 1998 must be fitted with a European type-approved towing bracket, by law. It is recommended that other cars not affected by this law use only towing brackets designed and tested to British Standard BS (AU) 114b, or ISO 3853.

2.3.20 Driving licences

A driver passing a test after 1 January 1997 is restricted to a car/caravan combination not exceeding 3500kg maximum laden weight, and where the maximum loaded weight of the caravan does not exceed the unladen weight of the car. New drivers outside these rules will need to take an additional driving test. Existing drivers who passed a test before 1 January 1997 are not affected.

3.1 THE WATER SYSTEM

3.1.1 Water Supply

All models are supplied with a 12 volt submersible pump, controlled by a pressure switch. The water inlet is located in the off-side exterior wall, protected by a lift up lid.

3.1.2 The Submersible Pump

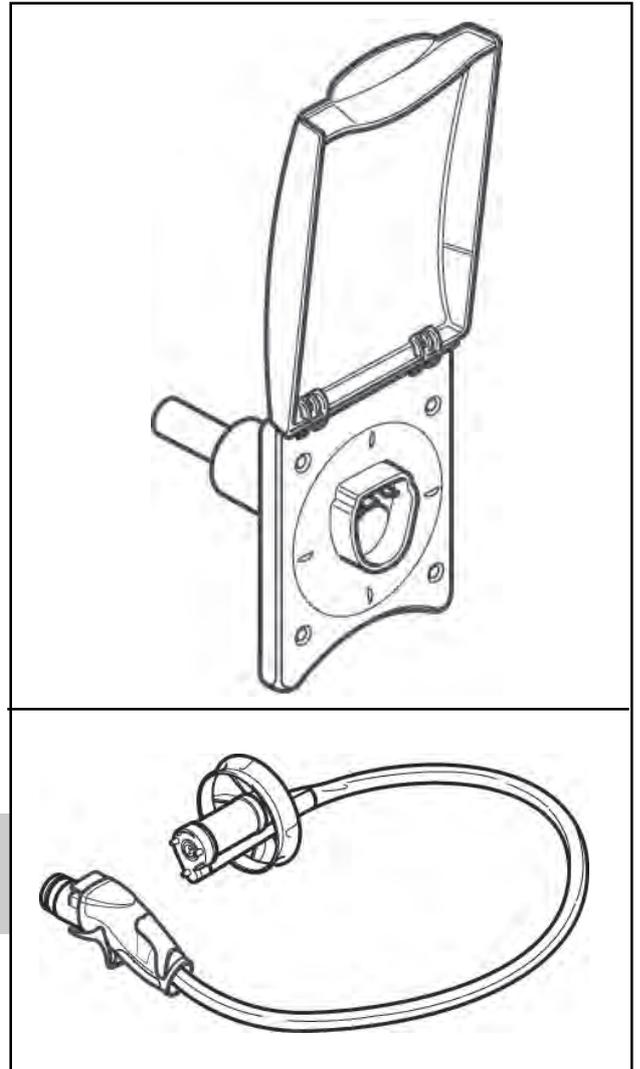
Operation

Ultraflow Compact

- Raise the lid, clean both the water socket and the plug of the pump assembly.
- Plug the pump connector into the socket. Turn the top security clip anti-clockwise and the bottom security clip clockwise to lock the plug into place.
- Place the pump into the water container, ensuring that it is fully submerged before operating the system. A dust cover is available to stop contaminants falling into the water container.
- To remove the pump assembly from the Crystal Compact Housing, release the security clips and pull the hose adaptor by using the finger grips provided.
- To remove the pump assembly, raise the lid to clear the plug shoulder from the lid recess, hold the pump at the plug whilst retracting it from the socket.



▲ Do not remove by pulling the hose or electric cable.



3.1.3 Troubleshooting

FAULT	CAUSE	SOLUTION
Pump doesn't run	No power to pump	Check power supply Attach leads/clean connections
	Fuse has blown	Replace fuse do not exceed recommended fuse size.
	Blockage in pipework	Check pipework for kinks.
Pump runs but no water appears	No water getting to pump	Check water tank is not empty. Remove each valve lever, tighten the nut located below the valve lever and replace the lever. Check all connections from tank to inlet of pump are secure, any air leaks will prevent prime. To test for air leaks hold showerhead underwater and operate pump. If air bubbles are visible coming from the showerhead an air leak is present.
	Water leaking at outlet side of pump	Check pipework/fittings for leaks and repair. Check system drain plugs are closed.
	Pump runs but will not switch off	Water leaking at outlet side of pump Check pipework/fittings for leaks and repair. Check system drain plugs are closed.
	No water	Check water supply level. Check and replace filter if clogged.
Pump cycles on and off periodically when all the taps are closed. (Normal with partially opened tap)	Water leaking at outlet side of pump	Check pipework/fittings for leaks and repair. Check system drain plugs are closed.
Pump cycles on and off excessively when tap/s are open	Excessive back pressure	Check pipework for kinks and filters etc., are clear. Check shower rose/taps for blockages and repair.
Low flow	Bore of pipework/connections too small	Check for kinks in pipework. Check pipework is not blocked.
	Power supply to the pump	Check battery is not discharged.
	Pipework/connections crushed due to overtightened jubilee clips	Replace damaged connections.
	Water leaking at outlet side of pump	Check pipework/fittings for leaks and repair. Check system drain plugs are closed.
	Pump internal filter clogged (if present)	Remove fitting connected to pump inlet, using point nosed pliers remove cylindrical filter mesh from inside pump inlet. Clean and refit filter and plumbing.

3.1.4 Routine Maintenance

- Ensure the hose adapter 'O' ring and the socket in the housing are kept free from dirt.
- Use only silicone or water based lubricant to inlet nipple 'O' rings on socket for lubrication.
- Drain system thoroughly during the winter months, (see separate winterisation instructions).
- Service inlet socket annually, (use Whale's AK8834 service kit containing all serviceable parts).
- Replace the WF3000 water filter annually.

3.1.5 Cleaning Containers and the System

- Cleaning instructions for both water containers and the water system are detailed in general maintenance section of the handbook.

3.1.6 Aquasource Direct Mains Water Connection

(This is not included as standard equipment, but is available from your nearest Bailey retailer).

- The Aquasource fits simply and securely to your Whale socket system.
- Comes with 7.5m of foodgrade layflat hose, which is compact for storage. (A further 7.5m extension hose is available as an optional extra to extend the hose).
- The system is pressure controlled to protect your caravan from sustaining damage to your water system (plumbing connections should be checked at the beginning of every season for frost damage or loose connections).



- ▲ When using an Aquasource system, do not sleep or leave the vehicle unattended without turning off the water source.

3.1.7 Draining and Winterisation of the Water System

Caravans may be in use all year round, but when not in use, even for short periods, this procedure should be followed. One night of freezing temperatures is all that is required for expensive, permanent damage to water system components.

- Open all taps, shower controls and shower rose on/off controls, lift ceramic ball mixer tap levers in central position to allow both the hot and cold water to drain.
- Remove shower heads
 - a) To remove shower heads, unscrew by hand, then shake out and store in a dry place.)
- Open drain plug on water heater.



- ▲ It is essential that the lever of ceramic ball mixer taps is fully raised and in the central position. Failure to do this will not allow both the hot and cold water system to fully drain and will result in frost damage.

3.1.8 Setting up the Water System

- Refit old filters:
 - a) Check all plumbing connections.
 - b) It is recommended at this point to sterilise your water container and flush the system through with a sterilising fluid.
- Renew old filter after flushing system through. It is also recommended that the water system is checked during annual service.



▲ Frost damage cannot be claimed under warranty.

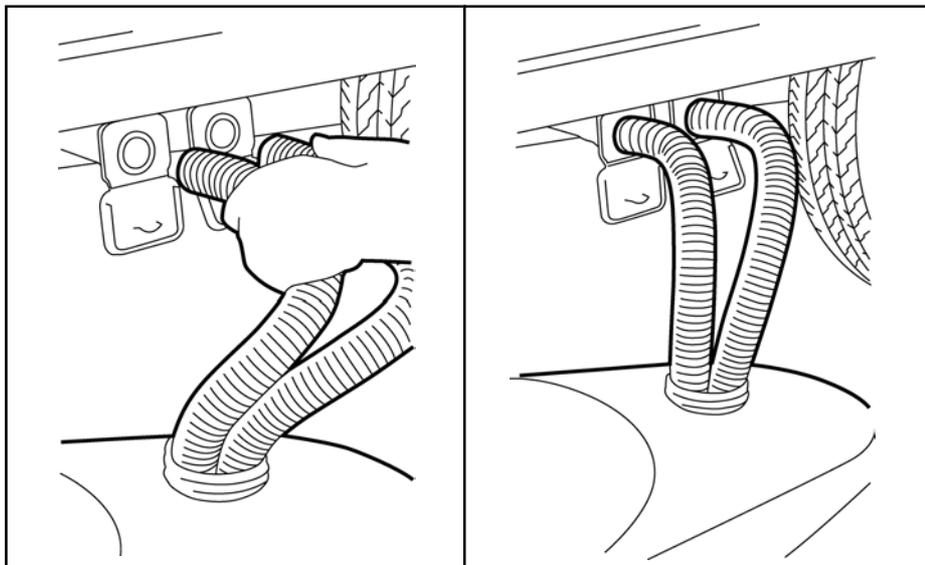
3.1.9 Shower tray

The shower tray cannot be expected to drain fully, some residual water may remain which will require “mopping up”.

3.1.10 Waste (Grey) Water System

The waste water (often referred to as ‘grey’ water) from the caravan’s sinks and shower tray are routed to two outlets just behind the offside wheel.

When setting up your caravan short pieces of waste pipe hose should be fitted to the wastewater outlets to direct the water into a suitable container. These are both available from your caravan retailer.



▲ Ensure that the exit ends of the waste water pipes, that direct the waste water into the holding container, cannot be submerged by the waste water in the holding container at any time.

Upon arrival at the caravan site advice should always be sought from the site manager as to where waste (Grey) water is to be disposed of.

3.2 THE GAS SYSTEM

All gas appliances fitted to your Bailey caravan are suitable for operation on both Butane and Propane without the need for adjustment.

3.2.1 General information

Gas Cylinders: Bottled Liquid Petroleum Gas (LPG) is the most convenient portable source of fuel for your caravan. The Orion is designed to be used with CalorLight gas bottles only. The gas locker compartment will accommodate one 7kg and 3.9kg bottle.



- ▲ Never allow modifications of the electrical or Liquid Petroleum Gas systems and appliances except by qualified persons.
- ▲ Never use portable cooking or heating equipment, other than electric heaters that are not direct radiant type, as it is a fire and asphyxiation hazard.

3.2.2 Types of gas

● Butane

Butane is supplied in the UK in Green or Blue bottles.

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

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

● Propane

Propane is supplied in red, or partly red bottles that have a female left hand threaded connector.

Scandinavian countries use the same connector.

Germany or Austria supply Propane with a male connection.

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

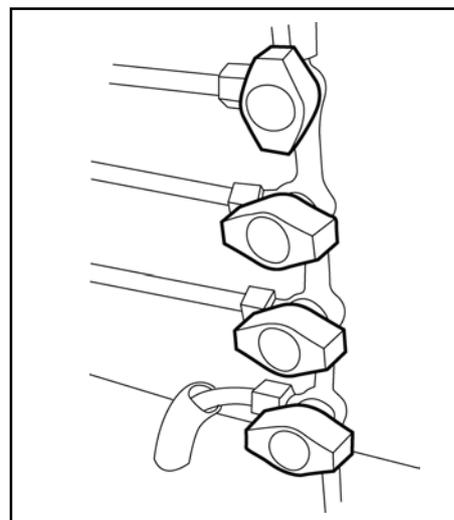
Make sure that heating, cooking appliances and gas cylinders are switched off before you move the caravan.

All gas appliances in your tourer can have their gas supply individually isolated by turning off the relevant tap. The tap is either located on the centrally positioned gas manifold or directly beside the appliance.

Regularly check flexible gas hose, joints and connections for tightness.

Finally make sure that each gas appliance is working efficiently to the recommendations of the appliance manufacturers.

The regulator is a governing device which adapts the bottle pressure to one that suits the equipment in the caravan.





- ▲ 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 caravan.

Propane and Butane gas regulators are not interchangeable.

- Always ensure that the gas system is inspected/maintained every 12 months.
- In the event of a fire ensure all occupants evacuate the caravan via the nearest escape route.
- If it is safe to do so turn off the yellow isolating valve located in the gas box directly below the regulator.
- If you suspect a gas leak then immediately turn off the supply of gas at the yellow isolation tap located below the regulator in the gas box. Then turn off the gas valve on the gas bottles. When this has been completed the system must be inspected by a competent person.
- Never use gas bottles located outside the caravan gas box. Do not use any gas extension hoses.
- Gas barbecue - always use gas appliances that are suitable for use at 30mbar.

Your caravan is fitted with a regulator as standard equipment. This is located in the caravan gas box mounted on the front bulkhead of the caravan between the gas bottles. 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.

3.2.3 Changing Gas Cylinders

Ensure that the cylinder is empty, then:

- Turn off the tap located by the gas regulator.
- Turn off cylinder valve and all gas appliances.
- Remove the gas hose regulator from the cylinder.
- Release retaining strap (where fitted).
- Remove cylinder from gas locker and stand on ground.
- Fit plastic protecting cap to cylinder.

With the full cylinder:

- Before placing cylinder in the cradle ensure that the tray is clean and free from any debris. Cleaning should be carried out only with warm soapy water.
- Place cylinder in cradle in gas locker.
- Remove plastic protector from cylinder.
- Connect the gas hose.
- Connect retaining strap (where fitted).
- Turn on cylinder valve and then systematically relight appliances as required.

3.2.4 Gas safety advice

LPG is not poisonous.

There is a danger if all air and oxygen were excluded. (Ventilation holes must be kept clear at all times and must not be obstructed).

The manufacturers have given LPG a smell in order to identify leaks.

3.2.5 Awning Space LPG Appliance Exhaust

There is no danger of pollution within an enclosed awning space from the exhaust of an LPG burning refrigerator that vents into it.

3.2.6 Gas 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 a 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 or soapy solution.

Do not operate any electrical apparatus whatsoever, especially light switches.

If the leak is not obvious, the caravan should be evacuated and a competent service engineer consulted.

Avoid naked lights when connecting or changing a cylinder. Ensure the gas valve is turned off.

Regularly inspect the flexible gas hoses for deterioration and renew as necessary with approved type (all hoses should be replaced before the expiry date marked on the hose or after a maximum of five years).

Remember the gas is heavier than air and therefore sinks to the lowest point.

Keep gas bottle containers outside (and protected against frost). If they must be kept inside make sure they are well away from heat.

3.2.7 Ventilation

All ventilation complies with 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.



▲ Under no circumstances should the caravan's ventilation be blocked or obstructed in any way

High level ventilation is via the roof lights. The low level ventilation is via the vents in the floor at the front of the caravan living area directly behind the front bulkhead. With multiberth layouts the rear sleeping compartments have their own low level ventilation. Please consult your caravan retailer for its location.

The mesh screens fitted should be kept free of obstructions by dust, leaves, insects etc. Inspect regularly and use a brush and soapy water as necessary. It may be necessary to remove the weather shield located on the underside of the floor of the caravan to gain access for cleaning.

All roof-mounted 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. Check that the external roof seal is seating correctly and the locknut is fully tightened.



- ▲ Do not make any additional openings in the floor.
- ▲ Never use portable cooking or heating equipment, other than electric heaters that are not of the direct radiant type in your caravan, as it is a fire and asphyxiation hazard.

Appliances such as cookers with naked flames should never be used for room heating.

No appliance shall be used inside when being connected to the external BBQ socket.



- ▲ It is recommended that any elevating roofs be raised when the leisure accommodation vehicle is used for habitation purposes.

3.2.8 Gas BBQ point



- ▲ The external gas BBQ point should be used as a connection outlet only and should not, as a matter of safety be used as a gas inlet.

3.3 THE ELECTRICAL SYSTEM – 230 VOLT

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

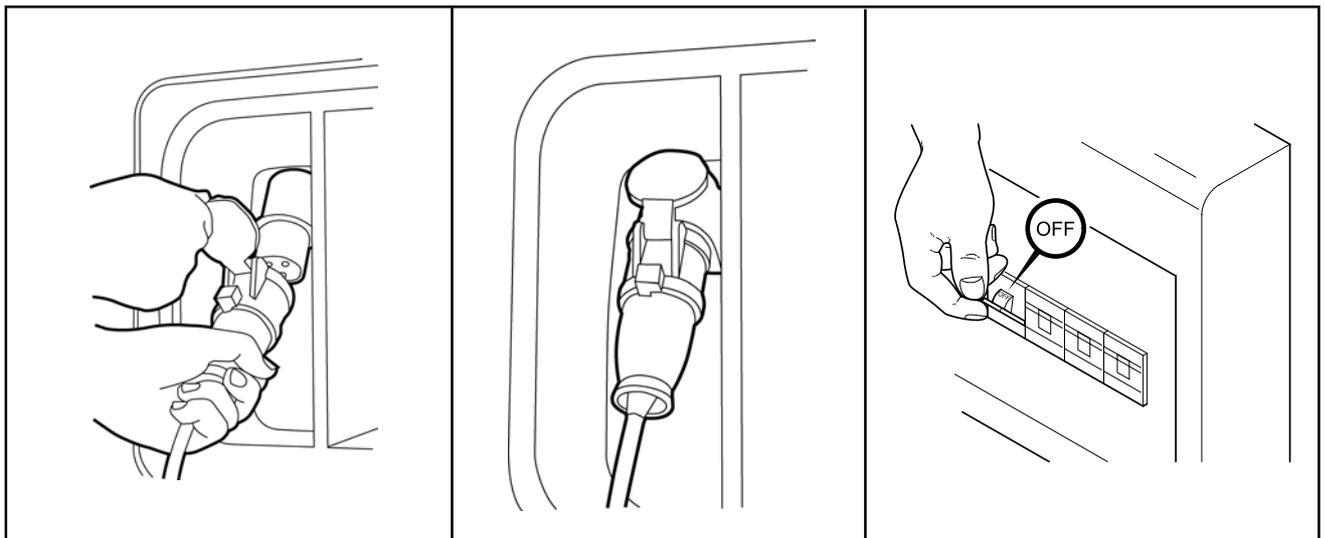
Your attention is drawn to the following notice as laid down by the Institute of Electrical Engineers.

Instructions for electricity supply - low voltage (230 v)

3.3.1 On arrival at caravan site



- ▲ Before connecting the caravan installation to the main supply:
 - ▲ Check that 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, frequency and polarity.
 - ▲ Check that your installations will be properly earthed. Never accept a supply from a socket outlet or plug having only two pins, or from a lighting outlet.
 - ▲ Check that any residual current device (earth leakage circuit breaker) in the mains supply to the caravan has been tested within the last month. After connection to site supply, test again.
- Make sure that the switch at the site supply point is off.
 - Make sure that the caravan RCD unit is switched off.
 - Remove any cover from the electricity inlet provided on the caravan, and insert the connector of the supply flexible cable.
 - Remove any cover from the socket outlet provided at the site supply point, and connect the plug at the other end of the supply flexible cable to this. Switch on the main switch at the site supply point.
 - Switch on the caravan RCD unit.



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

3.3.2 On leaving caravan site

- first switch off the site supply.
- switch off the caravan RCD unit.
- then disconnect the pitch lead.

In case of difficulty consult an approved electrical installation contractor (who may be the local electricity board). It is dangerous to attempt modifications and additions yourself.



▲ Lampholder-plugs (bayonet-cap adapters) should not in any circumstances be used.

- replace the cover of the socket outlet at the site supply point. It is dangerous to leave the supply socket or supply flexible cable live.

Every 12 months, the caravan electrical installation should be inspected and tested and a report on its condition obtained as prescribed in the Regulations for Electrical Installations, published by the Institute of Electrical Engineers.

3.3.3 Generators

- Switch off all appliances, the miniature circuit breakers and the residual current device.
- Start the generator and allow to run for a few minutes to stabilise.
- Connect the caravan to the generator.
- Switch on 16 amp miniature circuit breaker.
- Switch on the residual current device.
- Switch on the fridge (230 volt phase) or plug in a 230v light to one of the 13amp sockets. This is to provide a load on the generator and help remove any "spikes" in the supply which can damage the charger unit.
- Switch on the 5amp miniature circuit breaker and any other appliances you require.



▲ It is always advisable to have at least one other mains appliance switched on with the charger unit to minimise the chance of damage to it.



▲ Do not connect the 12 volt output of the generator to the battery terminals. The AC ripple must not exceed 10%.

3.3.4 Overseas connections



▲ 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.

A means of checking the polarity of the mains supply when overseas is useful.

There are available several proprietary makes of equipment for the purpose (e.g. Martindale tester unit).

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

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

3.3.5 Mains unit

The mains unit replaces the conventional fusebox. Similar, but larger units are often fitted in newer houses.

The unit gives overload and earth leakage protection for the 230v electrical supply in your caravan.

For normal operation all switches on the unit need to be in the ON position. The switches on the left of the unit are known as M.C.B.'s (miniature circuit breakers).

These take the place of the conventional fuse but are more convenient.

In the event of a fault the M.C.B. 'trips' i.e. automatically moves to the OFF position.

After elimination of the fault the M.C.B. can be re-set by switching to the ON position. (Against the spring pressure in an upwards direction).

If an earth fault develops or a person was to touch a live piece of equipment the leakage of current to earth should immediately operate the RCD (residual current device) and 'trip' the main switch, to the OFF position.

This switch is only re-settable after elimination of the fault.

To re-set, operate the switch as for M.C.B.'s.

Every time you connect to a site supply the RCD should be checked by operating the test button marked 'T'. The unit should immediately switch to the OFF position. If the unit does not switch off then a qualified electrician should be consulted.

If the unit does switch off, the test is complete and the switch can be reset restoring the supply back to normal.



- ▲ Having too many appliances switched on at the same time will trip the MCB. This is a safety measure.



- ▲ 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.
- ▲ Always disconnect the electrical connector between the towing vehicle and the caravan before connecting a 230v supply to the caravan and before charging the caravan battery by any other means.

It is possible that all of the 230v mains electrical equipment may not be able to be operated simultaneously. A typical UK caravan park mains hook up point provides a maximum output of 16 amps and on some continental sites the available output may be as low as 5 amps. If your loading exceeds the site supply it may trip the parks circuit breaker. Please check the available mains output with your site operator.

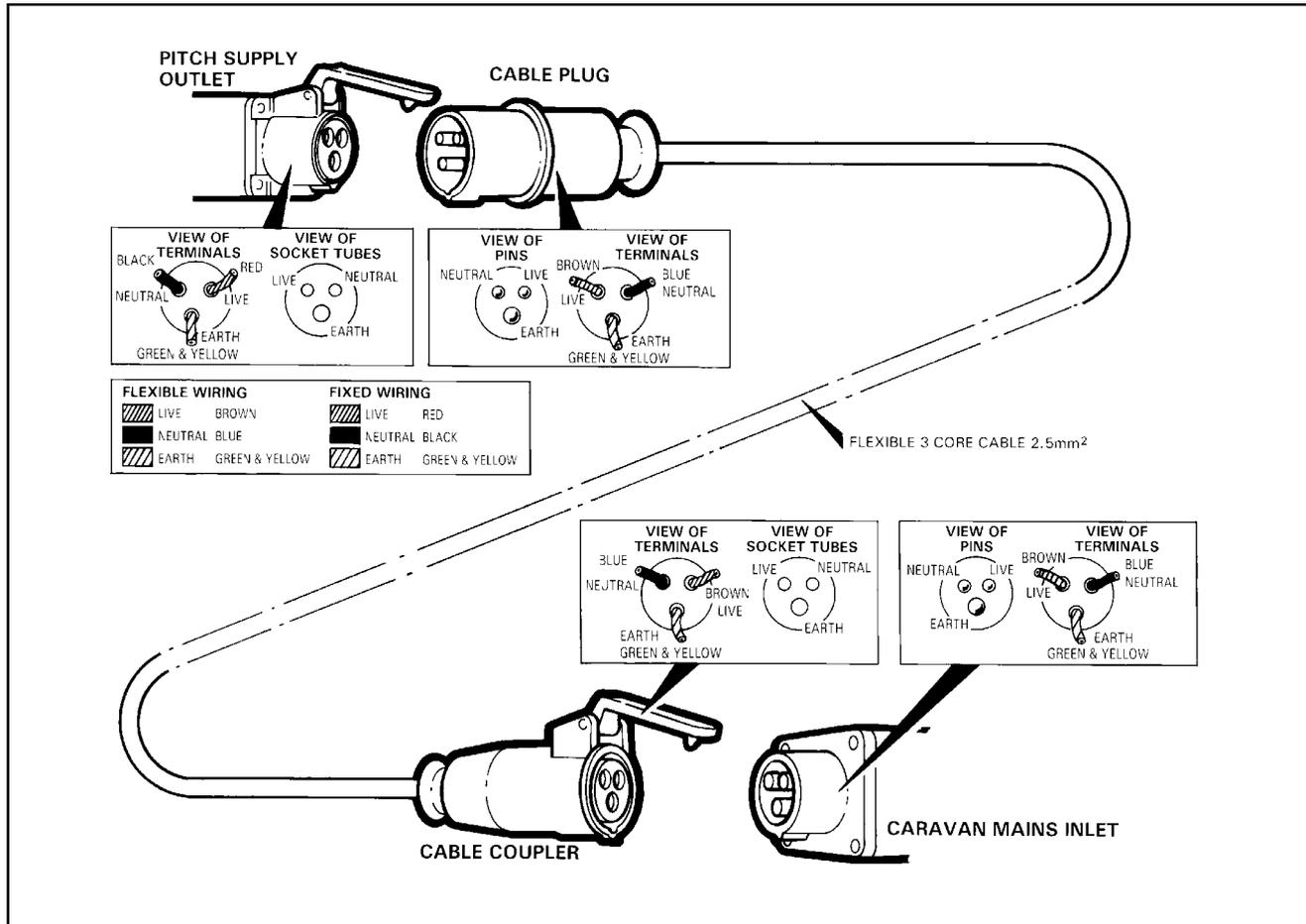
The following items need to be added together if used simultaneously.

230V Mains equipment typical consumption figures:

Fridge 0.5 amps
 Charger 1.0 amps
 Water heater 3.75 amps
 Blown/convection air heating 8.7 amps

Colour TV 2.5 amps
 Microwave 10 amps
 Air conditioning 4 amps

3.4 THE ELECTRICAL SYSTEM – 12 VOLT



Your caravan is fitted with a 12 volt charger as standard. This converts the 230 volt AC supply into 12 volt DC. This enables the 12 volt equipment in the caravan to function and charges the caravan leisure battery. A fully charged caravan leisure battery should read 13.8 volts on the voltmeter mounted in the control panel.

The charger is capable of charging leisure batteries and will not overcharge.

The 12 volt system is designed to operate with a leisure battery in circuit and should not be turned on without one connected. The 12 volt supply to the caravan services can be isolated via the 12 volt on/off switch on the control panel.

3.4.1 12-volt Control Panel

The system is fitted with an automatic relay to select the power source. When the car is connected via lead the car power will be used. When the car is not connected the battery and or the power supply will be used to power the caravan.

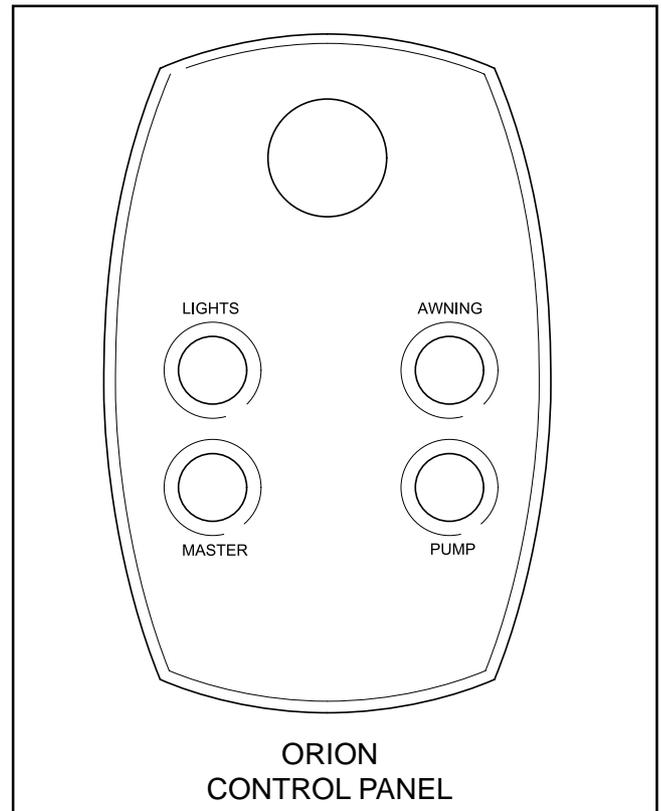
The control panel is fitted with a master 12-volt switch; this enables you to isolate the 12-volt supply in the caravan.

The control panel controls the operation of various 12V equipment

- Indicated charge level of the caravan battery (a good battery should indicate 13.8 volts)
- Water pumping light, is only activated when the pump is running
- All models have light isolation and awning switches fitted into the control panel.



- ▲ The appearance of the control panel may vary, but the functions are the same.



The 12-volt electrical system fuses are located in the caravan bed box. It has 14 fuses each having identification to their particular use. If a fuse is to be replaced it must be with one of the same rating as that removed.

3.4.2 Auxiliary Battery storage/mains inlet

The battery and 230V mains inlet are located in a special locker mounted in the side of the caravan. The door frame has a cable recess allowing the door to be locked when the mains cable is connected.

This locker will accommodate a battery up to 110 amperes/hours capacity.



- ▲ The battery must be placed in the tray provided in the battery storage compartment, and must be used at all times.

A battery of not less than 40-50 amperes/hours capacity is recommended, crocodile clips should never be used to connect the battery, terminals should be shrouded. Always switch off all appliances and lamps before disconnecting the auxiliary battery.

The battery should be secured to prevent movement when towing.

Metal objects should not be stored in the battery box.

Where a 12V extension is used between the towcar and caravan, this should not exceed 5 metres in length - minimum cable size 2.5mm to minimise voltage drop.

DIY modifications/additions to the wiring systems are not recommended, always consult your Dealer who will be pleased to carry out such work.

Do not continuously charge the battery when caravan is not in use.



- ▲ Switch off all appliances before disconnecting battery.



- ▲ Negative connections should always be disconnected first and reconnected last.

- ▲ Car type battery chargers are not suitable for charging a leisure battery and may damage it.



- ▲ When not using Orion models always ensure that the fridge control knob is turned to the 'off' position. Failure to do this will result in a flat battery due to 12V power drain from the fridge circuit relays.

4.1 THE TRUMA ULTRASTORE WATER HEATER

Operating Instructions

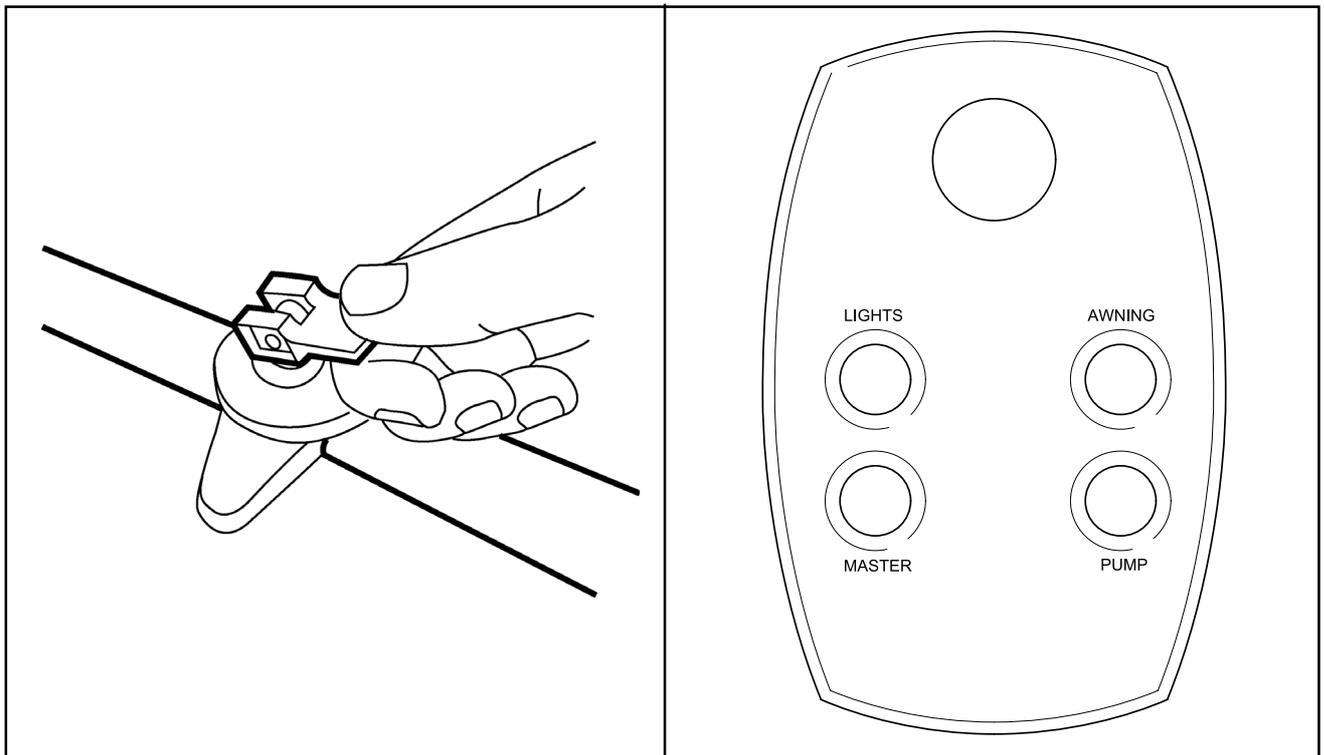
4.1.1 Filling the Truma Ultrastore with water

- Check that the safety/drain valve in the cold water intake is closed. The yellow lever should be in the horizontal position, position (e).
- Open the hot tap in bathroom or kitchen with pre-selecting mixing taps or single lever fittings set to hot.
- Switch on power for water pump (main switch or pump switch). 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 in a continuous stream.

Residues of frozen water can prevent filling if there is a frost. The water heater can be defrosted by switching on the heater on gas only for a short period (max. 2 mins). Frozen pipes can be defrosted by heating the room.



▲ Do not operate the Water Heater on 230V without it being full of water.

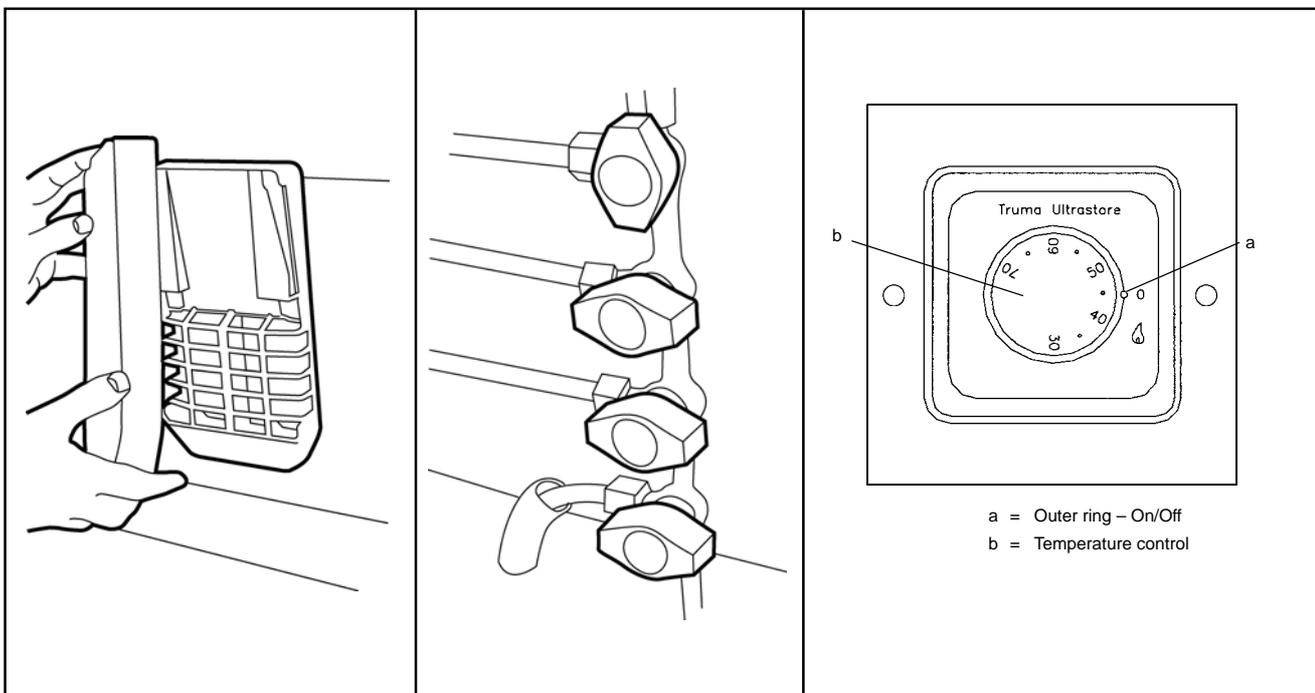


4.1.2 Gas operating instructions



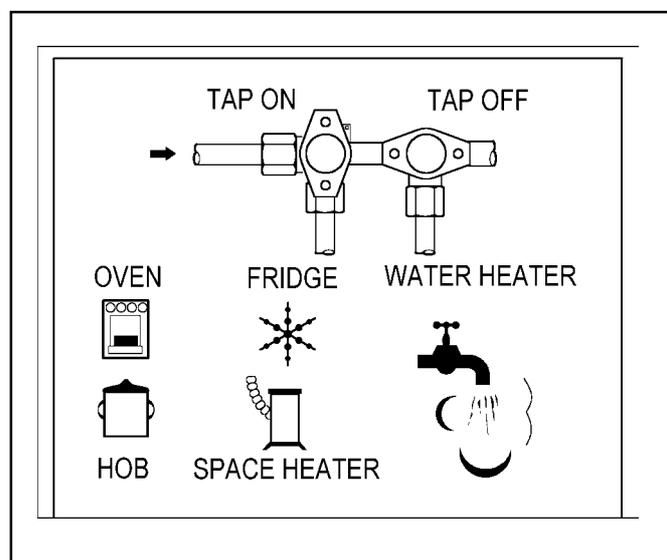
▲ Never operate the water heater without water in it!

- Remove exterior cowl cover.
- Open gas cylinder and open quick-acting valve in the gas supply line.
- Select required water temperature at rotary knob (a) infinitely variable from approx. 30° to 70° by rotating the inner ring (b).
- Switch on water heater by rotating the outer ring on the control panel to the position.
- If there is air in the gas supply line, it may take up to a minute to purge the system of air. If the gas fails to ignite on first attempt, switch off the appliance, wait two minutes and try again.



4.1.3 Switching off (gas operation)

Rotate the outer ring anti-clockwise to the off position. Fit the exterior Cowl cover. Drain the water from the system. Close quick-acting valve in the gas supply line if the appliance is not to be used for an extended period of time and close the gas cylinder.

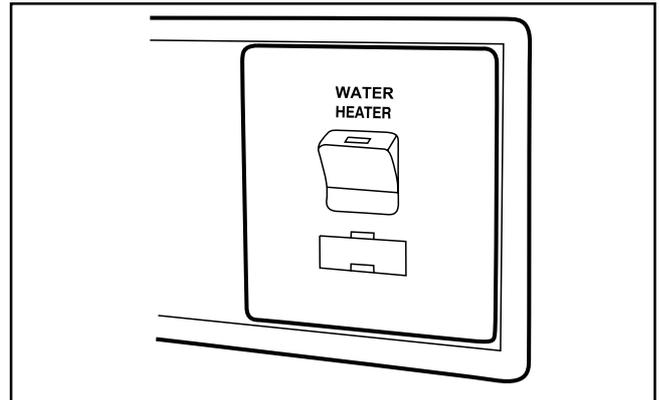


4.1.4 Electrical operating instructions (230v)

Ensure that the water heater is full then switch the isolation switch on. (Usually mounted on the bunk face adjacent to the gas control switch.)

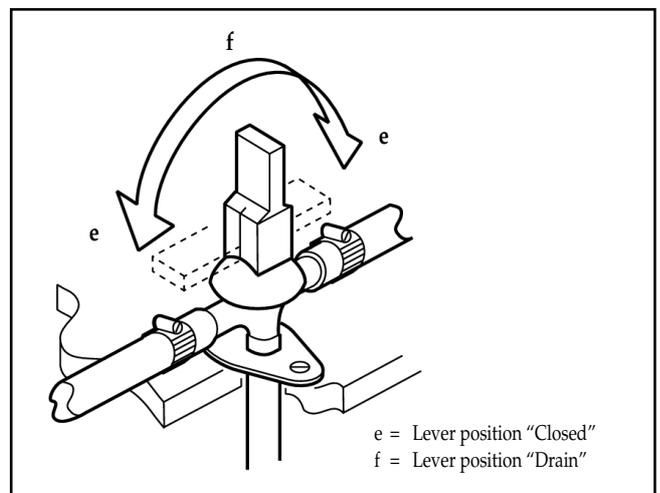


- ▲ The water temperature cannot be selected, temperature is automatically limited to 70°C. For a faster heating up the appliance can be simultaneously operated with gas and electrical power.



4.1.5 Draining the water heater

- Turn off the power supply to the water heater.
- Disconnect power for water pump (main switch or pump switch).
- Open hot water taps in bathroom and kitchen.
- Open the yellow drain valve located near the water heater to vertical position (f).
- The water heater is now drained directly to the outside via the safety drain valve. Check that the water contents have been completely drained (10 litres)



4.1.6 Maintenance

Use wine vinegar for de-scaling the water heater, this being 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 we recommend "Certsil-Argento". Other products particularly those containing chlorine are unsuitable. This should be carried out annually.

The water tank in the Truma-Ultrastore is of high quality food-grade stainless steel. The special equipment available below, water hose connections and the safety/drain valve fulfil the EC guideline for quality in plastic parts (90/396/EEC).



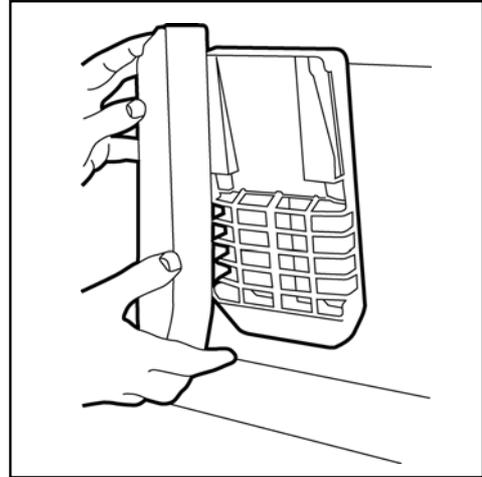
- ▲ In order to prevent the formation of micro-organisms, we recommend heating up the tank at regular intervals to 70°C and not using the water for drinking.

4.1.7 Important Operating Notes:

- If the cowl is positioned close to an opening hatch (window), keep this closed during operation . See warning plate.

Always mount the cowl cover if the heater is not being used. Non observation of this point can lead to the function of the appliance being impaired through water, dirt or insects.

- Always remove the cowl cover prior to operating the water heater on gas.
- Only use original Truma-Ultrastore parts.
- If just the cold water system is being used, without water heating, the header tank becomes more vulnerable to frost damage. Accordingly the contents should be drained by operating the safety/ drain valve. This also applies when the caravan is in storage.
- If the water heater is inadvertently operated empty the caravan will trip out. To reset, turn off 5 and 10 amp trips, turn off RCD consumer unit, then fill with water and turn 5 amp trip back on.
- The excess temperature thermostat will cut in on the heater on 230V if there is a fault. It will also reset if disconnected from the mains. However this may not happen if there is no water in the tank.



4.1.8 General Safety Notes:



- ▲ In the event of leaks in the gas systems or if there is a smell of gas:

- Extinguish all naked flames
- Do not smoke
- Switch off the appliance and the gas cylinder
- Open the windows
- Do not operate any electrical switches
- Have the entire system checked by an expert
- Repair jobs are only to be carried out by an expert.
- The following would invalidate the guarantee;
 - a. Any alteration to the appliance (including cowl)
 - b. The use of non-Truma spare parts/ accessories
 - c. Non observance of the operating instructions
- The operating pressure for the gas supply is 30mbar (or for 28mbar butane / 37 mbar propane) and must correspond to the operating pressure of the appliance (see name plate).
- Do not operate the water heater when refuelling the vehicle and when in the garage.
- During the initial operation of a brand new appliance (or after it has not been used for some time), a certain amount of fumes and a slight smell may be noticed for a short time. Remedial action here is to immediately run the heater at maximum output and to ensure adequate room ventilation.
- If the burner makes an unusual noise or if the flame lifts off, it is likely that the regulator is faulty and it is essential to have it checked.

4.1.9 Technical Data

Water contents:	10 litres	Gas and electrical operation ...	approx. 25 mins
Water pressure:	up to max. 2.8 bar	Power consumption	12V
Type of gas:	Liquid Gas (propane or butane)	Ignition:	0.17 A
Operating Pressure:	30mbar (or 28mbar butane, 37mbar propane)	Heating Up:	0.08 A
Rated thermal output:	1500W	Standby:	0.04 A
Gas consumption:	120g/h	Power Consumption	230V
Heating time up to approx.	70°C	Heating Up: (3-7A)	850W
Gas operation	approx. 34 mins	Weight (empty):	6.7 Kg.
Electric operation	approx. 45 mins		

4.2 WHALE SPACE HEATER

4.2.1 General Safety Notes

Observe all warnings.

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



- ▲ Extinguish all naked flames
- ▲ Do not operate any electrical switches
- ▲ Turn off all gas appliances
- ▲ Open windows and doors for ventilation
- ▲ Do not smoke
- ▲ Shut off gas connection

Get the system thoroughly checked by a Whale Approved Service Centre / Technician.



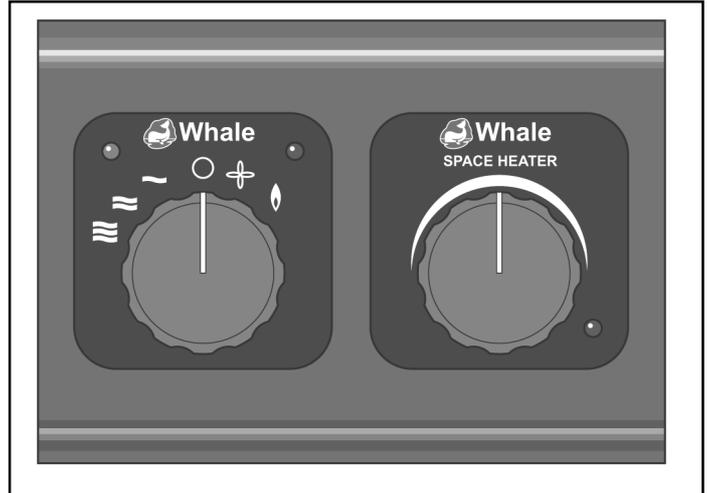
- ▲ The space heater shall not be operated in the following situations:
 - ▲ When refuelling the vehicle, the vehicle towing the caravan, or other appliances
 - ▲ When the vehicle in which the heater is installed is in motion.
 - ▲ When the vehicle in which the heater is installed is in a confined space such as a garage.
- ▲ This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- ▲ Ensure that a minimum of one of the hot air outlet vents is permanently open
- ▲ When operating using gas, the combustion air flue and outlet openings for the products of combustion (exhaust flue) shall never be obstructed. They should be checked regularly, and if necessary cleaned by the user (e.g. in winter, snow shall be removed from the combustion outlet and air intake).
- ▲ Where the open end of the exhaust flue terminates, three sides of the under-floor space are to be kept open and not obstructed, and not contain through floor ventilation openings.
- ▲ The heater, its gas supply and flues for the products of combustion are to be inspected in accordance with national regulations or if these do not exist, the manufacturer's recommendations, however, it is advised that this should be done at least annually.
- ▲ The Whale Space Heater should be checked periodically by a Whale Approved Service Centre / Technician, or competent person, at least annually. This should be completed according to the practice in the country where it is used and according to the Whale instructions. We recommend annual testing of gas soundness and combustion by an accredited LPG gas engineer. The appliance contains ESD sensitive components and therefore should only be opened by a Whale Approved Service Centre / Technician.
- ▲ When using operating switches provided by the installer or manufacturer, they are responsible for providing user instructions and identification of symbols on the control panel. The inlet vents of the heater should never be blocked and at least one hot air outlet vent is to be permanently open.

4.2.2 Operating Instructions

For operation of the heater, a 12 V d.c. supply must be connected at all times. To operate the heater's electric elements, it must also be connected to a suitable 230V a.c. supply.

Fan only operation. Turn the selector knob to the fan on (⊕) position.

Gas operation. Turn the selector knob to the gas on (flame) position. There will be a pre-purge pause of approx. 30 sec's to allow any un-burnt gas to leave the flue. A green LED will light upon successful flame ignition. If there is air in the gas supply line it may take a few attempts for the gas to ignite. See section 9 for gas lockout re-setting. If the ignition is not satisfactory the red LED will flash, refer to the trouble shooting guide.



Electric operation. The space heater is equipped with 3 power settings 500W / 1000W / 2000W. Turn the selector knob to low power setting (⊖) for 500W. Turn the selector knob to medium power setting (≅) for 1000W. Turn the selector knob to high power setting (≡) for 2000W. When operating on low and medium electric power settings the blown air fan runs at a reduced speed to minimise noise and current draw.



- ▲ The electric elements will still operate if the appliance is in gas ignition lock-out.
- ▲ The appliance cannot be operated with both gas and electric.

Switching appliance off. Turn the selector knob to the Off position (p). Note that the fan will continue to run for 3 minutes to allow the heater to cool down.

Adjusting the temperature. Turn the temperature control knob clockwise to increase and anti-clockwise to reduce the room temperature. The heater will automatically turn itself on and off to maintain the desired ambient temperature.



- ▲ Note that the controls incorporate a low frost protection setting. This can be activated by turning the temperature control knob fully anti-clockwise.

4.2.3 Maintenance

If the heater has not been used for some time dust may have settled inside the heater and the ducting. Run the heater on the "Fan only" setting until it clears. The outside of the appliance should not normally require cleaning. If it does, isolate the electrical supplies and wipe down with a soft, damp cloth only. Allow to fully dry before reconnecting the electrical supplies.

The Whale Space Heater should be checked periodically by a Whale Approved Service Centre / Technician, or competent person, at least annually. This should be completed according to the practice in the country where it is used and according to the Whale instructions. We recommend annual testing of gas soundness and combustion by an accredited LPG gas engineer. The appliance contains ESD sensitive components and therefore should only be opened a Whale Approved Service Centre / Technician.

4.2.4 Troubleshooting

The heater is equipped with an electronic diagnostic system which will detect fault conditions ranging from poor gas or d.c. supply to internal heater malfunctions. In the unlikely event of a failure, the red light on the control panel will flash a number of times, pause, and repeat until switched off. Count the number of flashes and refer to the table below.

Number of flashes	Fault	Remedy
1	No flame detected	Check gas supply making sure there is gas in the bottle and no blockage in the gas. Ensure propane is used at temperatures below +5 C. Clear lockout as described below.
2	Overheat	Check the air ducts and vents are not blocked or restricted. We recommend you wait at least 5 to 10 minutes to allow the heater to cool before clearing lockout as described below.
3	Low/high supply voltage	Minimum operating voltage is 10v, maximum is 15v, when measured at the heater. Check battery voltage. If between 10v and 15v, check connections between heater and battery. Check alternator or external battery charging. Clear lockout as described below.
4	Combustion air fault	Check combustion air flue and exhaust flue for blockages.
5	Other/internal fault	Attempt to clear lockout as shown below. If this fails, contact a Whale Approved Service Centre / Technician.

4.2.5 Gas Lockouts

Gas lockouts must be cleared by turning the selector knob from gas on (flame) position to off position then back to the on position. The complete sequence of switch movements must be completed within 2.5 seconds for a lockout to be successfully cleared. If there is air in the gas line, e.g. after a gas bottle change, the space heater may require several attempts before it lights.

4.2.6 Other Lockouts

If the lockout is caused when the unit is operated on electric, the lockout can be cleared by turning the selector knob from electric on position to off position then back to the on position. The complete sequence of switch movements must be completed within 2.5 seconds for a lockout to be successfully cleared.

Note: A cycling of the power supply to the unit will not clear a lockout. Some gas lockouts, e.g. ignition lockout and combustion air faults will still permit use of the appliance in electric only operation.

If the problem persists contact **Whale Support on +44 (0)845 217 2933**

4.2.7 Winterising

When using the heater in winter ensure the flues are not blocked by snow or fallen leaves etc. When the Space Heater is not going to be used for a long period of time, we recommend that the open end of the combustion air and exhaust flue are covered to prevent ingress of leaves etc.

4.3 THE COUNTRY LEISURE COOKING APPLIANCES

Operating Instructions

Ensure the gas cylinder is turned on.

In the event of a gas smell turn off at the cylinder and contact supplier.

The use of a gas cooking appliance results in the production of heat and moisture in the room in which it is installed. Ensure that the kitchen is well ventilated, keep natural ventilation holes open or install a mechanical ventilation device (mechanical extractor hood).

Prolonged intensive use of the appliance may call for additional ventilation, for example opening a window, or more effective ventilation, for example increasing the level of mechanical ventilation where present.

4.4 THE LINEAR HOB

4.4.1 Hotplate Burners

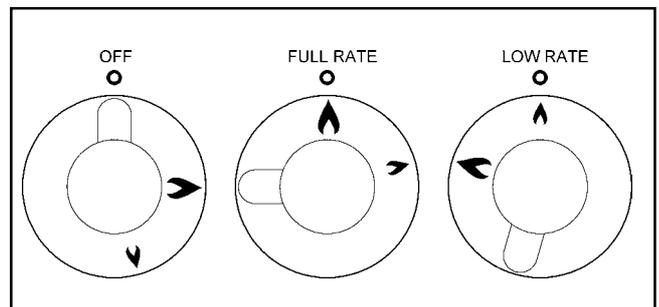


▲ Glass lids may shatter when heated. Turn off all burners before shutting the lid.

▲ The glass lid has a tendency to snap shut towards the lowered position. Make sure all fingers are removed from appliance when closing 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.

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, if fitted, press the ignition button located on the oven control fascia. It is necessary to hold the knob depressed during ignition and for approximately fifteen seconds after the burner has lit to allow the 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 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.

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.

4.5 THE MIDI OVEN & GRILL

4.5.1 Grill



- ▲ Accessible parts may be hot when the grill is used! Young children should be kept away.
- ▲ The heater deflector below the fascia should be pulled out prior to grill operation.
- ▲ Whilst the grill is operating never adjust the deflector without using hand protection.
- ▲ Only use the grill with the door open and always remove the handle from the pan when in use.

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 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 1 minute before a further attempt to ignite the burner.



- ▲ 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.

4.5.2 Oven

1. Ensure the gas cylinder is connected and turned on. In the event of a gas smell turn off at gas cylinder and contact supplier.
2. Remove all accessories and packing that may be in the oven and clean the interior before using it for the first time. Use warm soapy 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 1 minute before a further attempt to ignite the burner.
5. Place the oven shelf in the required position and close the door. Set the 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.
6. Although the oven does heat up quickly, it is recommended a 10 minute preheat be allowed. The oven should reach full temperature in about 15-20 minutes.
7. **To turn off** : turn the control knob until the dot 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. **Oven shelf** : the oven shelf is designed to allow good circulation at the rear of the oven and is fitted with a raised bar to prevent trays or dishes making contact with the back of the oven. Additional shelves are available through our local caravan retailer.

4.5.3 Temperature Control

The temperature control in the oven is controlled by a thermostatic gas tap and is variable over the range 130°C to 240°C. Approximate temperatures for the settings on the control knob are shown in the table below. 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 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.

GAS MARK		TEMPERATURE		
		6000/6100		
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 custards
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
puff	8	2	15-30 mins
flaky	7	2	15-30 mins
shortcrust	6	2	15-55 mins
shortbread fingers	3	2	25-30 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

4.5.4 Cooking Guidelines



- ▲ The pan supplied with the appliance is multi functional, for use in grill or oven. Always remove the handle when in use.

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.

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** allow the lower door to crash onto the floor. Lower it by hand.
- Do Not** under any circumstances use the oven as a space heater.



- ▲ Ensure that the ceramic ball mixer tap arm is clear from the sink or oven glass lid before raising it. Failure to do so could accidentally switch on the tap when lifting the glass lid.

4.5.5 Maintenance & Servicing

This appliance needs little maintenance other than cleaning. All parts should be cleaned using warm soapy water. Do not use abrasive cleaners, steel wool or cleansing powders. When cleaning the burner ring it is essential to ensure that the holes do not become blocked. The control knobs are a push fit and can be removed for cleaning. They are interchangeable without affecting the sense of operation.



- ▲ All servicing must be carried out by an approved competent person. After every service the appliance must be checked for gas soundness.

4.6 THE FIRE SENTRY SMOKE ALARM

The Smoke Alarm is operational once the battery is connected. When products of combustion are sensed, the unit sounds a loud pulsating alarm until the air is cleared.

4.6.1 False Alarms 'Hush' Control

Units with the 'hush' feature have the capability of temporarily disabling the alarm circuit for approximately 7 minutes. This feature is to be used only when a known alarm condition, such as smoke from cooking activates the smoke alarm. The smoke alarm is deactivated by pushing the "Alarm Hush" button on the Smoke Alarm cover. The alarm will silence immediately and 'chirp' every 30-40 seconds for approximately 7 minutes to indicate the alarm is in the temporary 'hush' condition. The smoke alarm will automatically re-activate after approximately 7 minutes and sound the alarm if particles of combustion are still present. The 'hush' feature may be used repeatedly until the air has cleared.

Dense Smoke will override 'HUSH' control feature and sound continuous alarm.



- ▲ Before using the alarm 'HUSH' feature, identify the source of smoke and be certain that safe conditions exist.

4.6.2 Testing

Test by pushing test button on cover and holding button down for 2 seconds minimum. This will sound alarm if all electronic circuitry, horn and battery are working. If no alarm sounds, the unit has a defective battery or other failure. You can also test alarm by blowing smoke into it. Test alarm weekly to assure proper operation. Erratic noise or low sound from alarm may indicate a defective alarm. Return it for service.

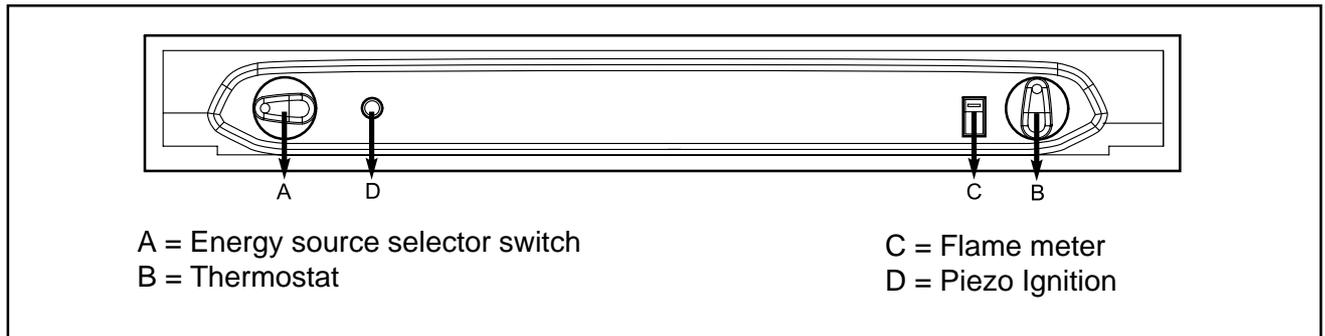


- ▲ Test smoke alarm operation after caravan has been in storage, before each trip and at least once per week during use.

4.7 THETFORD REFRIGERATOR MODEL N112

4.7.1 Switching on the refrigerator

- Clean the inside of the refrigerator before you switch it on.
- Let the refrigerator cool for at least eight hours before you place food in it for the first time.
- The freezer compartment should be cold one hour after switching on the refrigerator.



4.7.2 Igniting and starting your refrigerator

- The refrigerator can be powered by the mains (230V), direct current (12V) or liquid gas. Select the energy source that you want by means of the energy source selector switch (A). The switch has four settings:

- | | | | |
|-----------------------|--|----------------|--|
| - direct current (DC) | | - gas | |
| - mains supply | | - switched off | |

- The thermostat controls the refrigerator temperature on gas and 230V. Turn the knob fully clockwise for maximum setting.
- The flame meter shows whether the flame is burning. The flame is burning when the meter comes into the green area.

4.7.3 Electrical operation

The refrigerator can be powered by electricity in two ways:

- 12 V DC: Set the energy source selector switch (A) to
- set the thermostatic control to the required setting.
- the refrigerator will now be powered by the 12v circuit of the tow vehicle.



- ▲ Always use the gas connection or mains voltage to start up the refrigerator for the first time and to cool it. Power from the battery of your vehicle is suitable only for maintaining the temperature of the refrigerator and its contents once it has been refrigerated. When powered by a vehicle battery the refrigerator works without temperature control (i.e. constant operation).

- Mains voltage (230 V): set the power selector switch (A) to
- Set the temperature by means of the thermostat, rotary switch (B). Position 5 is the coldest temperature setting.

Open the valve of the gas bottle and the gas taps. Set the gas control button to the maximum position. Set the energy source selector switch (A) to ignite the gas flame.

4.7.4 Power with gas

- 1 Open the valve of the gas bottle and the gas taps.
- 2 Set the thermostat button (B) to the maximum position.
- 3 Set the energy source selector switch (A) to .
- 4 Press the gas control button, rotary switch (B), and keep it depressed.
- 5 Depress the piezo ignition button so that it clicks. This produces a spark to ignite the gas burner. Do this continually until the flame meter turns green and then release the gas control button.
- 6 If the flame goes out wait for 2 minutes then repeat step 5 again.
- 7 Set the desired refrigeration level by means of the gas control button, rotary switch (C). Position 5 is the coldest setting.

4.7.5 Switching off the refrigerator

1. Set the energy source selector switch (A) to .
2. The refrigerator is now completely switched off.
3. Use the door locking mechanism to lock the open door. This prevents unpleasant odours and mould in the refrigerator.

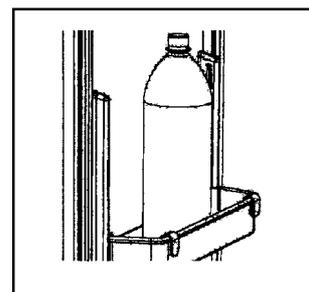


- ▲ If you are not going to use the refrigerator for a prolonged period, close the valve of the gas bottle and the gas taps.

4.7.6 Securing products for driving

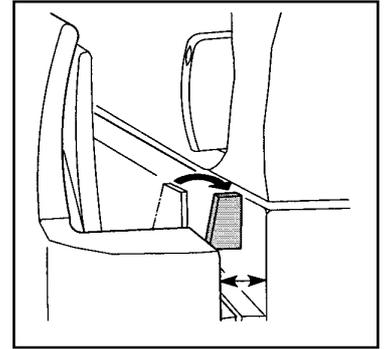
One of the racks in your refrigerator has a system for securing products during driving. The system consists of a simple click-and-slide plastic strip. To secure products on the rack while driving, push the plastic strip as tightly as you can against the products on the rack.

In the storage space on the inside of the refrigerator door, there is the unique Thetford flexible bottle slide. The slide prevents bottles from sliding around during driving. Push the slide against the products in the door or place the products between the bottle slide.



4.7.7 Door locking mechanism

The refrigerator door has an automatic locking mechanism. The door locks automatically when you press it shut firmly. The lock releases unnoticed when you open the refrigerator with your hand. This automatic locking mechanism also keeps the refrigerator door shut during driving. For some models an additional security device is fitted below the refrigerator. By pushing the locking bar over the closed refrigerator door you can make doubly sure that the door does not come open during your journey.



If you are not going to use the refrigerator for a prolonged period of time, you can use the special hook of the door locking mechanism to prevent odours. Turn the hook a quarter of one rotation to position it at right-angles to the refrigerator. In this position, the hook prevents the door from closing.

4.8 THETFORD CASSETTE C-250 TOILET

4.8.1 Introduction

The Thetford Cassette Toilet is a high quality product. The toilet forms an integral part of your caravan or camper bathroom, thanks to its functional design which combines modern styling and ease of use. The C-250 Cassette Toilet is manufactured from high quality synthetic materials which makes it a durable, user and maintenance friendly toilet.

The toilet is made up of two parts: a permanently fixed part and a Waste Holding Tank that is accessible from the outside. The removable Waste Holding Tank is located under the toilet bowl and can be removed via a door on the outside of the caravan or camper. The Thetford Cassette Toilet is the solution to the sanitary problem in your caravan or camper!

The operating instructions cover Thetford Cassette Toilet models C-250S, C-250CS (models connected to the vehicle's central water tank) and C-250CWE (model with its own flush-water tank). There are differences in the use of these models. Please ensure that you follow the instructions that apply to your toilet model.

PARTS

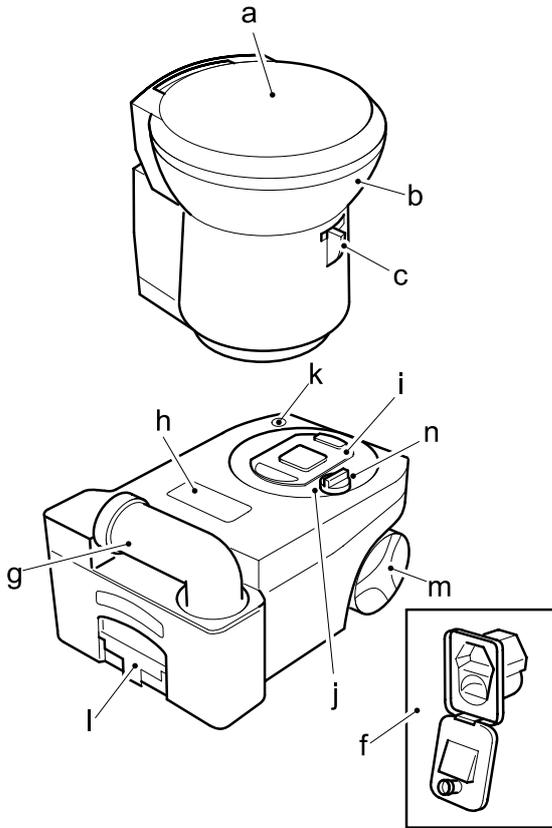
- a) Removable Seat and Lid
- b) Swivelling Toilet Bowl
- c) Blade Handle
- d) Flush Button
- e) Waste Holding Tank Level Indicator
- f) Water Filling Door (only if toilet has own flush-water tank)
- g) Rotating Emptying Spout
- h) Automatic Pressure Release Vent
- i) Sliding Cover
- j) Removable Mechanism
- k) Vent Plunger
- l) Pull-out Handle
- m) Wheels
- n) Blade Openener
- o) Access Door to Waste Holding Tank

Optional Features

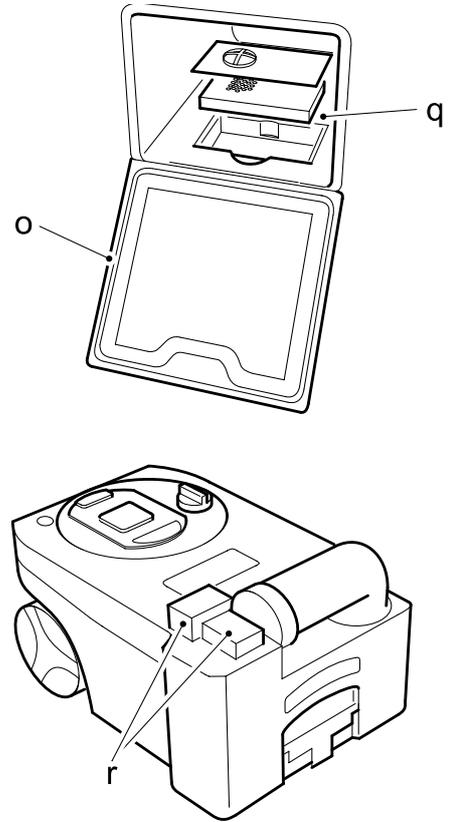
- p) Electric Blade
- q) Automatic Ventilator
- r) Waste Pump-Out System
- s) Waste Holding Tank Multi-Level Indicator
- t) Flush-Water Tank Level Indicator (only if toilet has its own flush-water tank)

Note. Optional features can be bought from Thetford dealerships.

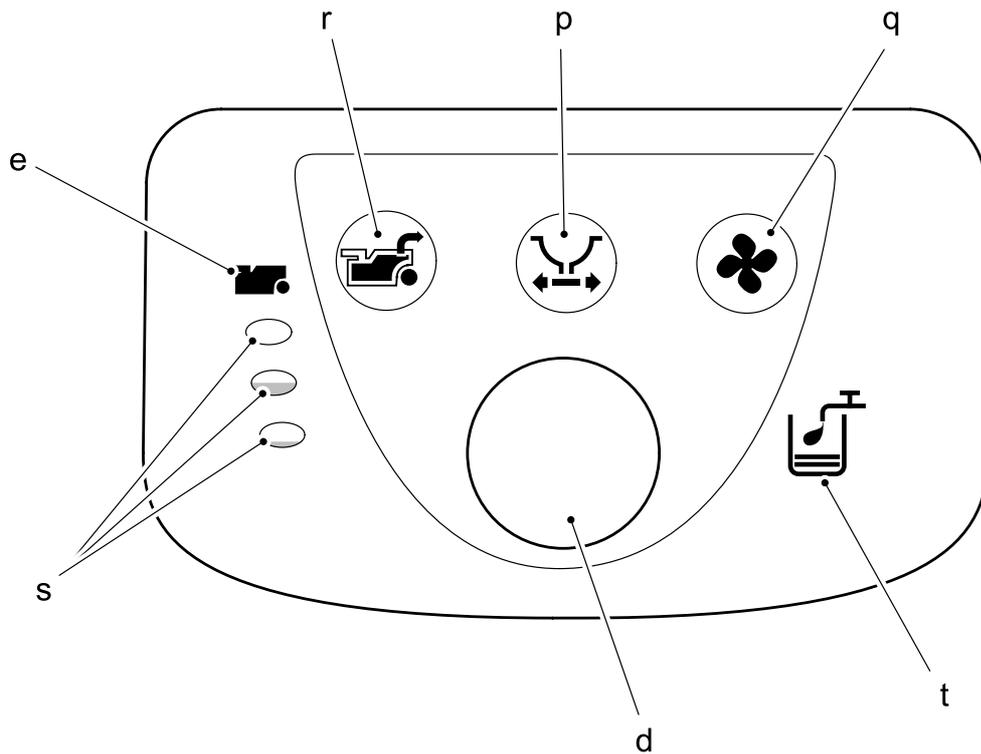
Standard C250



Optional features C250



Control panel (with optional features)



4.8.2 Preparing for use (standard)

1. Open the access door on the outside of your caravan or camper.
2. Remove the Waste Holding Tank by pulling the safety catch (which holds the tank in place) upwards.
3. Pull the Waste Holding Tank outward to the stop. Tip it slightly and take the tank fully out.
4. Place the tank upright and turn the rotating emptying spout upwards. The emptying spout ensures that the tank can be easily and hygienically emptied.
5. Remove the cap, with the measuring cup inside, from the emptying spout and pour the correct dosage of Thetford toilet fluid (see product label) into the holding tank. This avoids unpleasant smells and keeps the inside of the tank clean. Next add approximately 2 litres of water - enough to ensure that the bottom of the Waste Holding Tank is covered. Screw the cap back onto the emptying spout and turn back to its original position.



- ▲ The Emptying Spout Measuring Cap is supplied in the same packaging as this manual.



- ▲ Never add toilet fluid directly via the blade or the toilet bowl as this could damage the lip seal of the Waste Holding Tank. Always pour the fluids via the emptying spout.

6. Slide the Waste Holding Tank back into its original position via the access door. Make sure that it is secured with the safety catch. Close the access door and lock it. Your Thetford toilet is now ready to use.



- ▲ Never use force if you cannot get the tank back into place easily. This may cause serious damage. If blockage occurs, always check if the blade handle is in the correct (closed) position.

7. For toilets with own Flush-Water Tank: Open the water filling door and fill the flush-water tank with the correct dosage of Aqua Rinse. This Thetford toilet fluid keeps the flush water fresh and improves the flushing. Next, fill up the flush-water tank with clean water (approximately 8 litres) using a ferry can or hose. Your toilet is now ready to use.

4.8.3 Using the toilet (standard)

8. Turn the bowl to the desired position with the lid closed and using both hands.
9. To activate the control panel, press the flush-button once. The control panel display will stay activated for approximately 5 minutes. Run some water into the bowl by pressing the flush button again briefly.
10. The toilet may be used with the blade open or closed. To open the blade, slide the blade handle under the toilet bowl sideways. After use, open the blade (if still closed) and flush the toilet by pressing the flush button for several seconds (if necessary re-activate the control panel). Close the blade after use.



- ▲ If your toilet has its own flush-water tank, please make sure that you do not travel with a flush-water tank that is too full. Do not travel with water in the toilet bowl. Failure to adhere to this notice may result in water damage to your caravan or motor home.

4.8.4 Emptying

The Waste Holding Tank has a capacity of 18 litres and requires emptying when the red light (LED) on the toilet control display lights up, when the Waste Holding Tank only has capacity for approximately 2 more litres, which is no more than two to three further uses.

Make sure that the blade is closed. Open the access door located outside the vehicle, pull the safety catch upwards and remove the Waste Holding Tank.

11. Place the Waste Holding Tank in an upright position (Pull-Out Handle at the top, Wheels at the bottom). Slide the handle sideways - to the front of the tank - until it snaps out of its locked position.
12. Pull the handle up and wheel the Waste Holding Tank to an authorized waste disposal point.
13. Push the handle back into its locked position. Turn the emptying spout upwards and remove the cap from the spout. Hold the Waste Holding Tank in such a way that during emptying you can operate the vent plunger with your thumb. To empty the tank without splashing, depress the vent plunger while emptying the tank. After emptying, rinse the tank and blade thoroughly with water.



- ▲ Do not seriously shake the tank or use high pressure water cleaners. This may cause damage to the tank's interior.



- ▲ The vent plunger should only be depressed once the emptying spout is pointing downwards. Prepare the toilet for re-use if required. Slide the Waste Holding Tank into the toilet and close the access door.

4.8.5 Emptying with Optional Features

14. Waste Holding Tank Multi-Level Indicator: The lower lamp indicates that the Waste Holding Tank is almost empty; the middle lamp indicates that it is more than half full; when the upper lamp lights up, the tank needs emptying as it can only take 2 - 3 further uses.



- ▲ The Waste Holding Tank Level Indicator will flash when the holding tank is not present. In this case the toilet will not flush.

15. Waste Pump-Out System: When activating the control panel this feature automatically lights up. When the Waste Holding Tank Level Indicator illuminates, press the Waste Pump-Out button to pump out the waste from the holding tank into the vehicle's waste tank. The button will flash while the waste is being pumped and will stop automatically (after approximately 5 minutes) when all waste has been transferred. If the vehicle's waste tank is full, the Waste Pump-Out light will flash rapidly and no pump-out will be possible until the central tank is emptied. (Check the level of the vehicle's waste tank on the vehicle's central console). After the Waste Holding Tank has been emptied, there will be approximately 1.5 litres of waste left in the tank. This is normal. Add 2 litres of water and a correct dosage of Thetford toilet fluids to the Waste Holding Tank.



- ▲ It is vital that the correct amount of toilet fluid is added to ensure the proper breakdown of the waste in the holding tank. Only use the system when the tank is full. Using the system too often on an empty tank can cause damage to the pump, which could cause the system to fail.

4.8.6 Cleaning and Maintenance

The toilet should be cleaned and maintained regularly, depending on the amount of use. To clean Thetford toilets, we advise using water and Thetford Bathroom Cleaner.



- ▲ Never use bleach, vinegar or other powerful household cleaners that contain these substances. These may cause permanent damage to the seals and other toilet components.

Toilet Bowl

- Squirt Thetford Bathroom Cleaner into the toilet bowl.
- Flush the toilet bowl with water and wipe down the rest of the toilet with a damp cloth.
- Clean seat and lid The seat and lid can easily be removed: Lift the seat and lid assembly and pull the round pins (inside the assembly) outwards from the pin holes. After cleaning, replace the seat and lid by positioning the round pins in front of the pin holes and push the lid and seat downwards.
- To keep your flush water fresh and to prevent deposits from forming in your toilet bowl, add a correct dosage of Aqua Rinse in your flush water tank, if present, on your toilet.

Tip! For a really shining toilet, dry with a soft dry cloth after cleaning.

4.8.7 Waste Holding Tank

To keep your Waste Holding Tank fresh and clean, Thetford has developed a number of different toilet fluids. Thetford toilet fluids suppress smells, reduce formation of gas, promote breakdown of toilet waste and increase the life span of a mobile toilet. We advise a thorough cleaning of the Waste Holding Tank once each season. Next to using Thetford's Cassette Tank Cleaner, the powerful cleaning agent for the periodical cleaning of the Waste Holding Tank of your toilet, we suggest the following: -

- Remove the removable mechanism from the Waste Holding Tank by turning it anti-clockwise and rinse it under a tap.
- Remove the cover plate from the Automatic Pressure Release Vent by prising it up using a small screwdriver. Use one hand to push the Automatic Pressure Release Vent open while holding the float of the Automatic Pressure Release Vent on the inside of the tank with the other hand. Push the float upwards, turn it 180 degrees and remove it from below. Remove the rubber seal underneath the float. Rinse the float and rubber seal under a tap. Replace the rubber seal and float for the Automatic Pressure Release Vent using the same method in reverse.

The rubber seals in the toilet (the lip seal, the mechanism seal, the automatic pressure release vent seal and the cap seal) should be regularly cleaned with water and treated with Thetford High Grade Seal Lubricant. This will ensure that the seals remain flexible and in good condition. If the toilet is not to be used for any length of time, it is important to treat the seals with Thetford High Grade Seal Lubricant after cleaning.



- ▲ Never use Vaseline or any vegetable oil except olive oil. These may cause leakage or malfunction. The lip seal is a part of the toilet that is subject to wear. Depending upon the extent and manner of use, the seals will become less effective and will need replacing periodically.

4.8.8 Winter operation

You can use your Thetford Cassette Toilet as normal in cold weather as long as the toilet is situated in a heated location. If there is a risk of freezing we advise that the toilet is drained by following the instructions under 'Storage'. For environmental reasons the use of antifreeze, such as that used in car radiators, is not recommended.

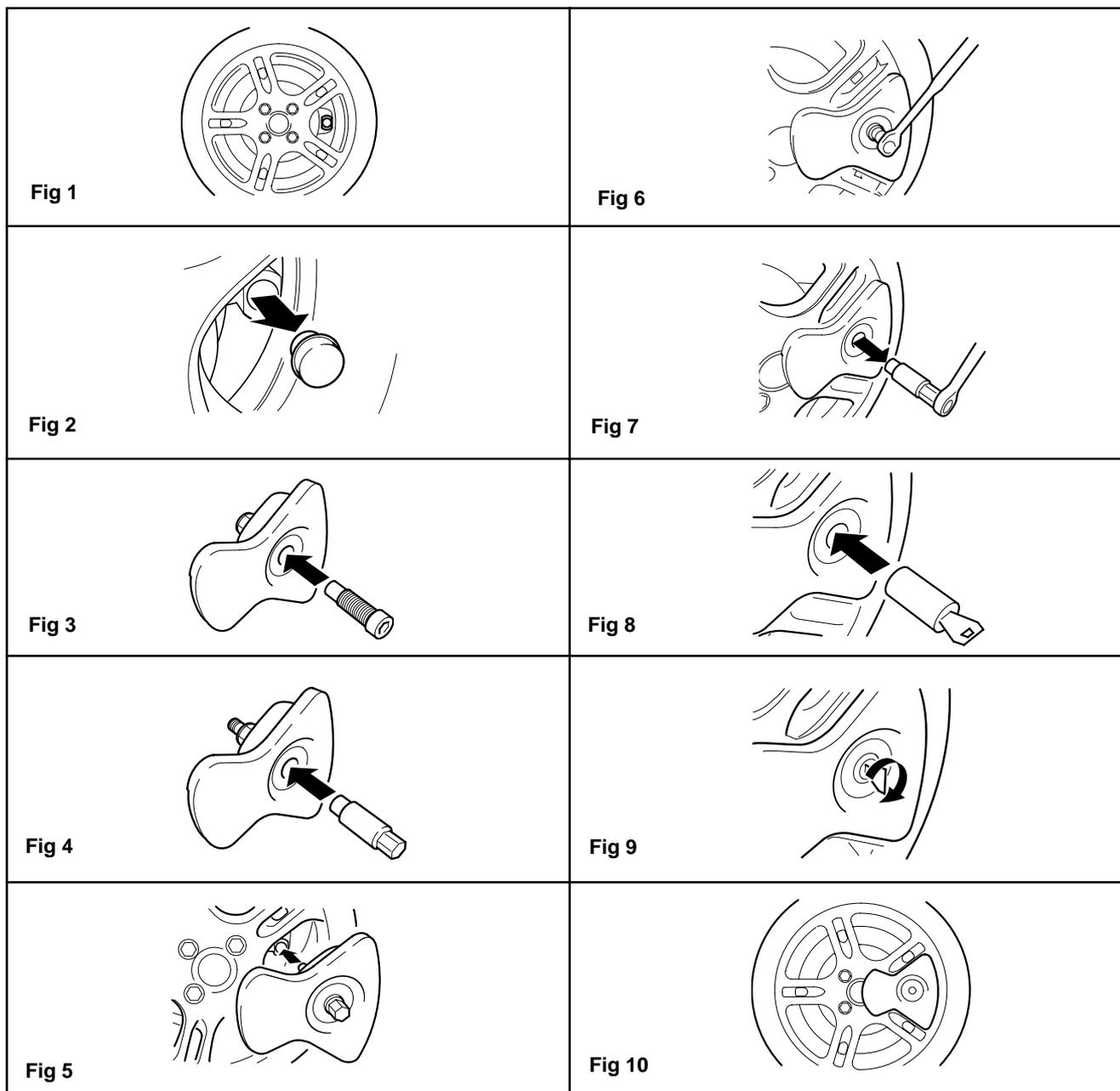
4.8.9 Storage

It is important that you follow the instructions below if you do not expect to use your Thetford toilet for a long (winter) period.

- Activate the Control Panel by pressing the flush button. Open the blade and press the flush button until water stops flowing into the bowl. Close the blade. Open the access door on the outside of your caravan or camper and empty the Waste Holding Tank at an authorized waste dump. Follow the instructions for cleaning and maintenance. To allow the Waste Holding Tank to dry, do not place the cap back on the emptying spout of the tank.
16. If the toilet has its own flush-water tank, place a sufficiently large bowl under the drain tube to catch the remaining water from the flush-water tank and remove the drain plug. When no more water exits, put the drain plug on the drain tube, put it back in its original position and close the access door. If the toilet is connected to the vehicle's water tank, please follow your vehicle's instructions for draining the central water system. If your toilet is optionally featured with a Waste Pump-Out System, take out the Waste Holding Tank and completely clean it (see Cleaning and Maintenance). After cleaning, fill it with water, put it back and empty it via the waste pump-out system. Repeat this twice.

4.9 AL-KO SECURE WHEEL LOCK (optional extra)

- Align the wheel so that the receiver can be seen in the centre of the rim opening. DO NOT use the rim opening in which the tyre valve is fitted (Fig 1).
- Unscrew the plastic cap from the receiver and store in the tool kit box. (When AL-KO Secure is not in use, always screw the plastic cap in place). (Fig 2).
- Insert the locking bolt into the rim specific insert (Fig 3).
- Insert the locking bolt socket key (Fig 4).
- Line up the locking bolts and assembly with the receiver (fig 5).
- Tighten the locking bolt socket using the wheel spanner provided (or torque wrench as shown) to wheel torque (ideally 86 Nm). (fig 6).
- Remove the locking bolt socket key. (fig 7).
- Insert barrel lock (Fig 8).
- Hold the lock fast and lock (Fig 9).
- The AL-KO Secure is now fitted (fig 10).



4.10 THE ALKO CARAVAN CHASSIS

4.10.1 Chassis members

The recommended tow vehicle coupling height is 415 +/- 35mm from the ground to the centre of the ball.

Manufactured from high quality steel, the chassis has extra deep sections to provide strength at points of maximum stress. Large elongated holes are punched in the longitudinal and towbar, ('A' frame) members, to reduce weight to a minimum. Each hole incorporates a return flange to maintain the required strength and provide rigidity in the extra deep sections.

The chassis frame is of a bolted construction which, should the need arise, allows replacement of individual parts.

The chassis is Hot Dipped Galvanised. This is regarded as one of the best forms of corrosion protection. It does however require minimal maintenance in certain circumstances.

When new the chassis is of a bright and shining appearance. As the galvanising cures during the initial 2 to 3 month period, this will gradually change to a medium to dark grey colour. This grey finish is the ideal, giving the correct protective coating. During this curing period the surface should be protected to avoid possible wet storage stain, in the form of a soft, light coloured, porous, oxidation layer. If the chassis members are in contact with any salt deposits from roads this should immediately be washed off with a high pressure washer. Salt attracts moisture allowing the surfaces to remain wet, this prevents curing and also allows formation of wet storage stain.



- ▲ It is recommended that the chassis be washed off, using a pressure washer on an annual basis (particularly after winter usage) to avoid undesirable build up of salt and dirt deposits.

The galvanised chassis should not be painted or subjected to any other protective treatment.

Should the galvanising become superficially damaged exposing the steel core, this should be cleaned and treated with a cold galvanising spray obtainable from vehicle accessory outlets.

Damage to chassis members through impact etc. must not be straightened or welded. Damaged chassis members must be replaced.

4.10.2 Drilling or welding of parts or accessories



- ▲ This chassis is designed and built to precise tolerances and must not be drilled or welded.

4.10.3 Independent suspension

The ALKO rubber suspension is designed and developed to suit all types of road conditions and is maintenance free. Three rubber elements are contained within a hexagonal axle tube. These provide suspension and have inherent damping characteristics. (Only the hubs and wheel brakes require attention - see axle booklet Part No. 580458).

4.10.4 Coupling head

The ball couplings are entirely automatic in operation and designed for one hand operation to suit the 50mm international ball recommended by the British Standards Institution, National Caravan Council and the Society of Motor Manufacturers and Traders.

4.10.5 Secondary braking (Breakaway cable)

Please refer to details in Section 2.2.5, page 2-3.

4.10.6 Uncoupling

Having lowered the jockey wheel to the ground, operate the handle as previously described. Lift the coupling clear of the towing ball either manually or by operating the telescopic jockey wheel.

4.10.7 Brake drum/hub assembly

The Euro Axle fitted to your Bailey caravan comes complete with maintenance-free wheel bearings greased and serviced for life. Adjustment is not required during the design life of the sealed bearing (100,000 km).



- ▲ If replacement of the brake drum or shoes is required, this must be carried out by authorised AL-KO Service Centres. Specialist tools and equipment are required. The rear hexagonal bolt covered by a black plastic cover must NEVER be touched.

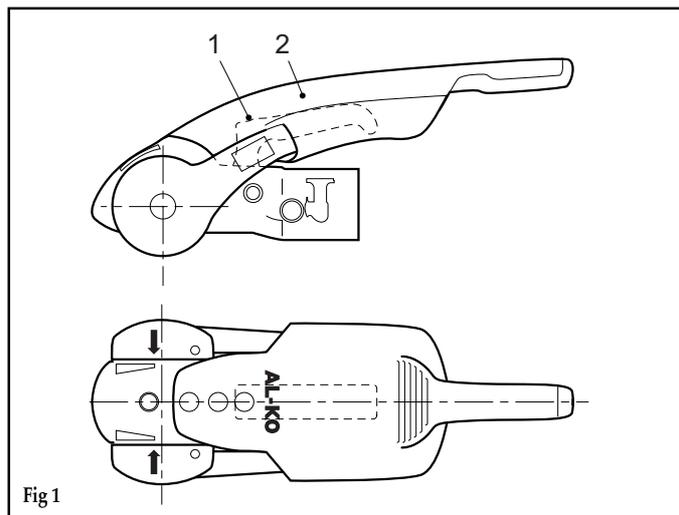
4.10.8 Operating instructions

Coupling handle (Fig. 1/Item 1), Stabiliser Lever (Fig. 1/Item 2)

The Stabiliser lever (Fig. 2/Item 2) must be in the uppermost position (open).

4.10.9 Coupling

1) Pull the coupling handle (Fig. 3/Item 1) up in the direction of arrow. The coupling mechanism has an open position ie. as long as the AKS 3004 is not placed on the ball, the handle will remain open. Put the opened coupling onto the clean towball. The handle must now make an audible click and return to the flat position.



- ▲ The coupling is correctly engaged when the green edge of the safety indicator button is visible (Fig. 4/Item 3).
- ▲ Always ensure that the jockey wheel is fully raised and secure before commencing any journey.

4.10.10 Stabiliser Unit:

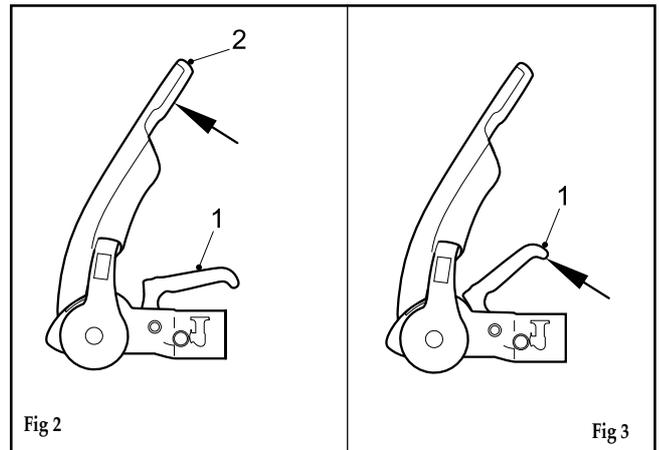
- 2) To operate the Stabiliser (once coupled to the towball), simple press the stabiliser lever down as far as it will go (Fig. 4/Item 2).

4.10.11 Uncoupling

- 1) Pull the stabiliser lever handle up as far as it will go, open the coupling handle and lift the AKS 3004 from the towball. With larger nose loads, coupling and uncoupling can be made easier by using the jockey wheel to assist lifting.

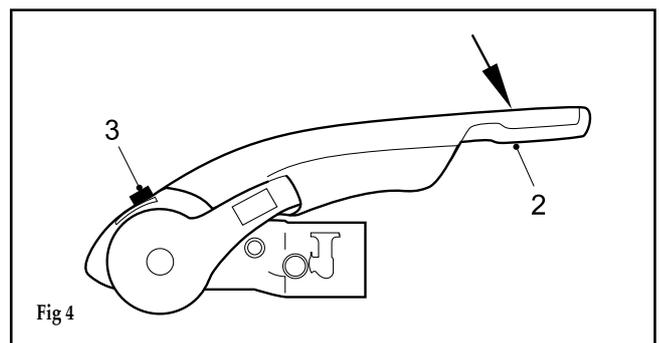


- ▲ The friction pads are pressed against the towball and hence generate a stabilising/damping force. These pads are therefore subject to wear over time, however they will have a long service life (circa. 30,000 Miles), provided they are well maintained and kept free of grease/dirt.



4.10.12 Checking the efficiency of the left/right friction pads:

- 1) Couple up AKS 3004
- 2) Open Stabiliser lever (Fig. 5/Item1).
- 3) Close Stabiliser lever until resistance is felt (ie friction pads are in contact with the ball but not yet under pressure).
- 4) If the arrow on the arm (Fig. 5/Item 4) is before or on the marked area (Fig. 5/Item 2) the friction pads are still as new (See A)
- 5) The arrow on the arm should lie between the marked area on the soft dock (See B)
- 6) If the arrow on the plate reaches or passes the marked area on the soft dock then the friction pads need replacing (See C).



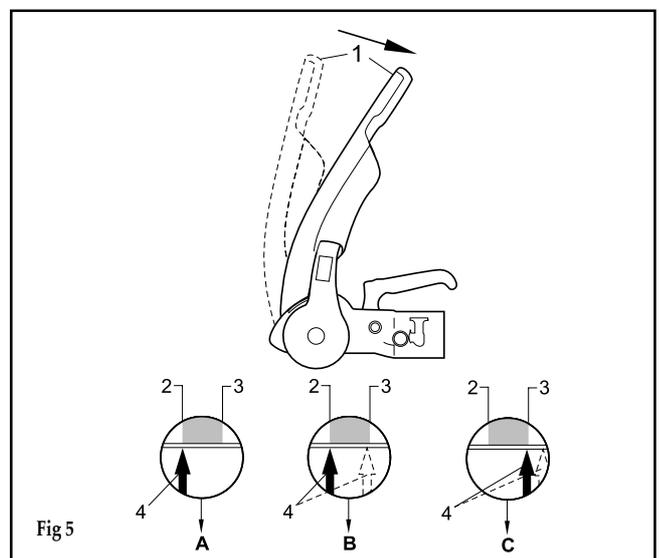
- ▲ It is not necessary to adjust the friction pads

4.10.13 Manoeuvring operation

For easier manoeuvring (on campsites etc), pull the stabiliser lever to the 'up' position.

Please do not use the stabiliser lever as an manoeuvring handle. Please use the handles on the Caravan or fit the AL-KO manoeuvring handle to your jockey wheel (available separately).

- 1) During opening or closing, the AKS must only be operated by one person. 2) Press stabiliser lever



down by hand force only DO NOT use your foot or an extension bar, this will damage the components (Fig. 6).

- 3) When opening or closing the stabiliser lever, please ensure your hand does not touch the coupling handle - you may accidentally trap your fingers! (Fig. 6).

4.10.14 Noises whilst driving

As a rule, the friction pads of the AKS 3004 do not make a noise during driving. Any clicking, creaking or squeaking noises that do arise may be due to the following:

- a) Foreign bodies or dirt between the friction pad and tow ball. b) Dry operation of the drawshaft inside the overrun device. c) A detachable towball which has too much play in the locking mechanism.

4.10.15 Remedial Action

- a) Clean the tow ball and friction pads by lightly rubbing the surface (100-120 grit emery paper)
- b) Lubricate the drawshaft sleeve via the grease nipples. In addition, push the gaiter forward and grease (DIN 51 825 KTA 3K) the exposed part of the shaft (Fig, 7).
- c) Visit a specialist workshop to have the ball holding area checked for damage and the locking mechanism for function. If necessary, change the towball.

4.10.16 Storing

To reduce the possibility of contamination of component parts of the AKS 3004 the stabilising handle should be closed.

4.10.17 Towing ball

The automobile towing ball should measure 50mm maximum and 49mm minimum diameter (DIN 74058). If the ball is below 49mm diameter it should be replaced immediately.

4.10.18 Overrunning device

The device housing is packed with grease on assembly, but will require periodic maintenance to ensure smooth operation of the braking system.

- i. Regrease the shaft bearings via the grease nipples provided at 3000 mile intervals, and before storage.
- ii. Ensure correct functioning of all pivot pins and levers and oil regularly.
- iii. Ensure correct functioning of handbrake ratchet and oil regularly.

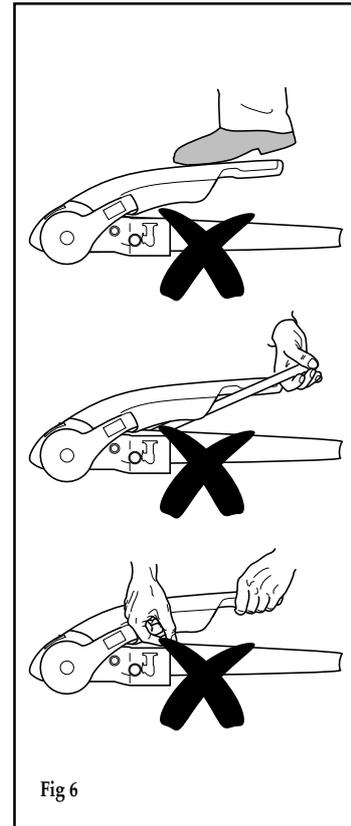


Fig 6

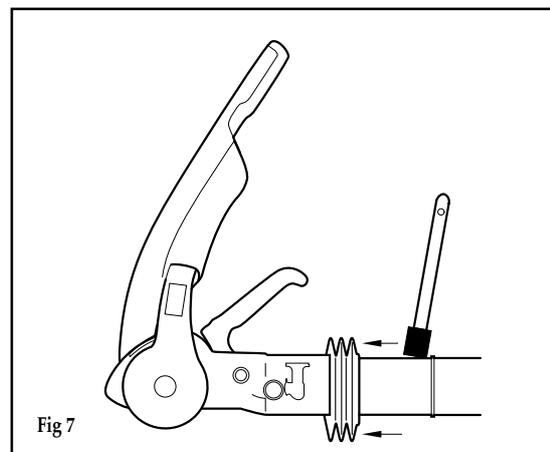


Fig 7

4.10.19 Jockey wheel

Lubricate wheel and screw thread periodically with grease.

4.10.20 Brake linkage

All moving parts should be lubricated periodically to ensure their satisfactory operation.

4.10.21 Corner steadies

The screw and pivot pins should be lubricated periodically to ensure their satisfactory operation.

4.10.22 Braking system adjustment

(At 500 miles, then every 3,000 miles or 1 year)

- i. Ensure the towing shaft with coupling heads is pulled fully forward (fig. 8).
- ii. Release the handbrake to the fully off position. If the handbrake will not go down the whole way because of the fairing or any other obstruction; then the fairing must be cut away and/or the obstruction removed to achieve this desired position. It will not be possible to set up the braking system properly when the handbrake is not in the fully off position (fig. 8).

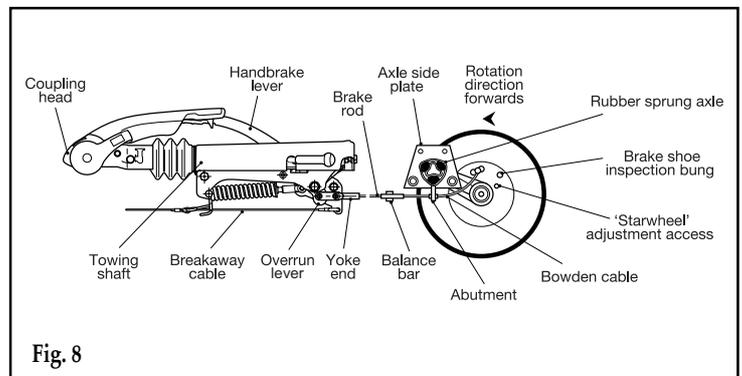


Fig. 8

- iii. Jack up one side of the caravan (see Jack Operation Instructions).
- iv. Remove the inner plastic bung from the backplate to expose the 'starwheel' adjuster access (figs. 8 & 9).
- v. Always rotating the road wheel in the forward direction - never backwards; adjust the starwheel with a suitable screwdriver, in the direction of the arrow embossed on the backplate until there is resistance in the wheel rotation (fig. 9).
- vi. Slacken off the starwheel adjuster until the road wheel turns freely in the forward direction (fig. 9).
- vii. Check the adjustment at the end of the brake cable where it is secured to the abutment (bracket) welded to the centre of the axle. When the inner cable is pulled out it should extend between 5 and 8 mm (fig. 8). (On tandem axles a double abutment is fitted to the front axle only).

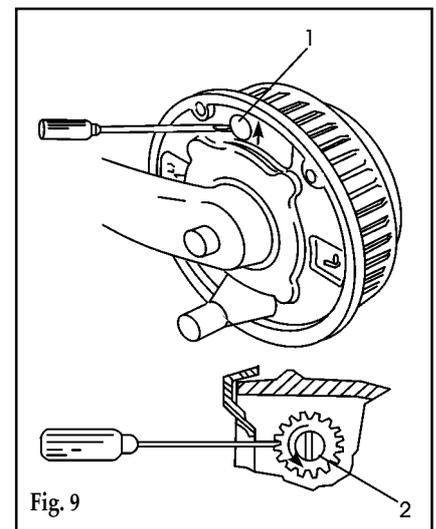


Fig. 9

- viii. Repeat for other wheel or wheels.
- ix. On tandem axles the brake cables from the rear axle should pass over this axle and cross over each other before being connected to the abutment on the front axle.
- x. Ensure the balance bar (compensation) is being pulled evenly. This bar (double on tandem axles) should always be paralleled with the axle tube when pulled (figs. 8 & 10). Adjust M8 lock and ball nuts, if necessary, to achieve correct parallel position (fig. 10).

- xi. Check the brake rod support bracket, (fixed to the floor) is supporting the brake rod evenly. The brake rod must always run straight, never bent or curved under any fittings. On tandem axles, using the double balance bar, a brake rod support tube (Part No. 228827) must always be fitted on the end of the brake rod, passing through the centre aperture on the abutment.

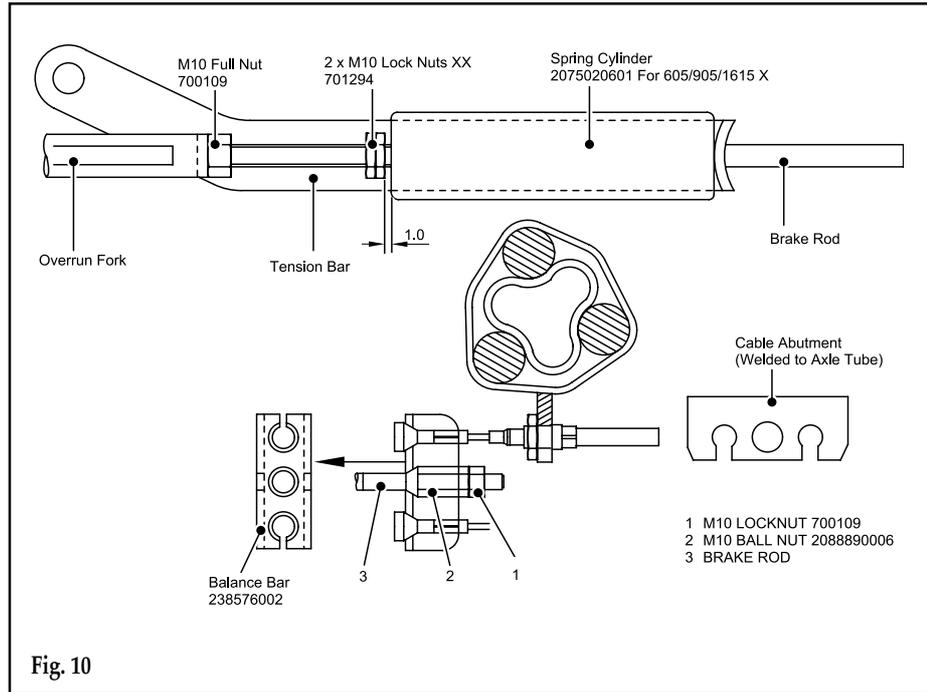


Fig. 10

- xii. Remove the slack in the brake rod by adjusting the long ball nut, rear of the balance bar, ensuring the overrun lever makes contact with the end of the towing shaft.

Over adjustment to the long ball nut (Fig 10), could induce movement of the inner brake cable, reducing the effective clearance of the brake shoes. If the over run lever will not make contact, it is possible the two lock nuts, forward of the spring cylinder, are incorrectly adjusted. Loosen the nuts and adjust the brake rod as above (Figs 8 & 10).

- xiii. Adjust the two locking nuts, forward of the spring cylinder (fig. 10), (on some chassis a single Nyloc nut is used) to give 1mm of clearance on the spring cylinder. This cylinder (the energy store for the handbrake operation) must be able to rotate only, not slide on the brake rod.

(See Fig. 10). If the overrun assembly is fitted with a gas strut handbrake then no spring cylinder is fitted - therefore ignore this paragraph).

- xiv. Correct adjustment of the linkage is checked by operating the handbrake lever so that when the second or third tooth is engaged, a slight braking force is felt on the road wheels.

- xv. Over adjustment of either the wheel brakes or linkage, will result in difficult reversing causing the wheels to 'lock-up'.

- xvi. When parking, the handbrake lever must always be engaged into the fully upright position (90°). This is to compress the spring within the spring cylinder and thereby create an energy store, which will automatically engage the brakes further should the caravan move.

If difficulty is experienced in this operation, try easing the caravan backwards with one hand while engaging the handbrake fully with the other. This manoeuvre should not be attempted on a rearwards facing slope. In this case wheel chocks should be used combined with the handbrake.

- xvii. Finally, if alloy road wheels have been removed, re-tighten using a calibrated Torque Wrench to 160 Nm (118 lb-ft), for steel wheels the wheel bolts should be tightened to 120Nm (88 lb-ft) - on all M12 wheel bolts - in sequence, i.e. North, South, East, West not clock or anticlockwise. Remember to overtighten is just as dangerous as to under-tighten, as this can distort the wheel rims. Avoid the use of power wrenches.



- ▲ The torque settings should be rechecked after 50km / 30 miles. Wheel bolts should never be lubricated.



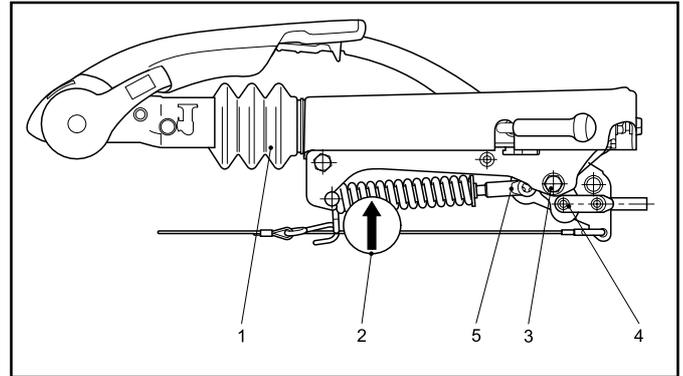
▲ In order to operate the Al-Ko braking system correctly adequate traction of caravan wheels is required when reversing. Therefore surface conditions that would result in a lack of traction should be avoided. Example: Peas, shingle/loose gravel.



▲ Care should be taken when traversing ramps or other obstacles in order to prevent damage to the caravan under gear. When approaching such obstacles reduce towing speed appropriately.

4.10.23 Chassis Lubrication Points

1. Grease the drawbar in the area of the bellows.
2. Grease the bearing bush through the grease nipples on the housing and the cartridge.
3. Grease the pivot bolt of the overrun lever and handbrake levers through the grease nipple.
4. Grease the joint of the brake rod and fitting.
5. Oil the joints of the spring cylinder in the handbrake lever.



Lubricant type: Multi-purpose grease to DIN 51825 KTA 3K4.

4.11 HEKI 2 ROOFLIGHT

Operating Instructions



▲ Before commencing any journey always ensure that the Heki 2 rooflight is fully closed and both handles are securely fastened.

4.11.1 To open in the tilted position

- a) Press the knob in the toggle catches on either side of the glass and turn through approx. 90 deg.
- b) Grasp the metal bar in the middle, snap it out of its holder, swivel down and press the glass dome upwards. (Glass dome is held by the two gas springs after approx. 150mm).
- c) Swivel the metal bar towards the glass down and snap into its holder.

To close the glass dome, proceed with steps (a - c) in reverse order.

4.11.2 To open in the intermediate position

- a) Open the toggle catches on either side of the glass.
- b) Grasp the metal bar in the middle, snap it out of its holder, swivel down and press the glass dome outwards. (Glass dome is opened automatically after approx. 150 mm by the two gas springs).
- c) Open both fasteners and swivel the metal strap toward the intermediate position and pull the glass dome down until the metal strap is stopped by the fasteners.
- d) Safeguard the metal strap with both fasteners.

To close Heki 2, proceed with steps (a - d) in reverse order.

4.11.3 To open in the ventilation position

- a) Open the toggle catches on either side of the glass.

b) Using both hands on the two toggle catches, press the glass dome up about 2 cm and fasten the toggle catches in the corresponding setting.

To close Heki 2, proceed with steps (a - b) in reverse order.

4.11.4 Closing the blinds

a) To close the blinds, take hold of the end rod (without rocker) in the recessed grip and engage in the opposite end rod (with rocker).



- ▲ In extremely bright sunshine, the black-out blind must only be closed two-thirds, and the pane must be set in the "continuous airing" position.

b) Select the required position (black-out / flyscreen) by moving *both* joined end rods together.

4.11.5 Opening the blinds

a) Move blind (end rod with rocker) right to the outside.

b) Hold the recessed grip with one hand; with the other hand, press the rocker and move the blind back (do not let it recoil).



- ▲ Do not stand on the acrylic glass dome.
- ▲ Close Heki 2 completely before moving off.
- ▲ Do not leave your vehicle when Heki 2 is open.
- ▲ Please consult your local dealer if you have any problems or defects.
- ▲ Remove any snow/ice or dirt before opening the roof.
- ▲ Do not open when it rains or when there is a strong wind.

4.11.6 Care Instructions

Please clean the acrylic panes with the Seitz Acrylic Cleaner.

Stains and light scratches on the acrylic pane can be removed by using the Seitz Acrylic Polish and the Seitz special polishing cloth.

Only use water and mild soap suds to clean the blinds.

The guarantee becomes null and void if these instructions are not followed.

4.12 STATUS 530 DIRECTIONAL TELEVISION & FM RADIO ANTENNA

	Frequency Range	UHF 470-860 MHz VHF 40-230 MHz FM 88 - 108 MHz
	Antenna Forward Gain	7db
	Amplifier Gain	18 db*
	Gain Adjustment	15 db
	Flatness	± 1.52 db
	Noise Figure	3 db
	Output Impedence	75 ohms
	Output	98 dbuv
	Power Supply	12-24V DC
	Power Consumption	35 ma
	TV lead	2 metres

4.12.1 Travelling

Do not travel:

With the Antenna raised.

With the Antenna set for vertical signals.

With the Telescopes extended.

When travelling adjust the antenna so that it points to the rear of the vehicle to reduce the possibility of damage when travelling.

The RED SPOT on the bottom of the mast indicates the front of the Antenna.

4.12.2 Operating the System

Firstly determine the approximate location of the nearest transmitter and whether the signals are horizontally or vertically polarised. For assistance ask your site operator or check other antennas in the vicinity.

1. Loosen the Mast Locking Collar and Wall Bracket and raise the antenna. Turn the mast to direct the antenna towards the TV transmitter. The RED SPOT on the bottom of the mast indicates the front of the Antenna.
2. When receiving vertically polarised signals, rotate the Winder anti-clockwise to cant the antenna through 90°. DO NOT over tighten or use undue force on the winder.
DO NOT cant for vertically polarised signals with the TELESCOPICS EXTENDED.
3. Switch ON the power pack and the red LED will illuminate.
4. Check the gain control switch is set to normal - 'NML'.
5. Tune your television into the strongest signal. You may need to adjust the direction of the mast to achieve the best picture quality.
6. Secure by tightening the Mast Locking Collar and Wall Bracket.

4.12.3 VHF Television Reception (Overseas Only)

1. Extend the two telescopic antennas.
2. Tune your Television into the strongest signal. You may need to adjust the direction of the Antenna to achieve the best picture quality.
3. For fine tuning of VHF you may also need to adjust the length of the telescopes.

IMPORTANT - VHF TV transmissions are ONLY horizontally polarised.

4.12.4 Fault Finding

The following are some of the key areas we suggest you check which generally solve the most common problems encountered with the operation of the Status antenna.

Coaxial Plugs

It is critical that all coaxial plugs in the system are fitted correctly. Please check each individual plug ensuring it is wired correctly. Secondly please ensure only quality plugs have been used.

Coaxial Cable

Sharp bends, kinks and hot surfaces can easily damage coaxial cable and should be avoided. An inspection of the cable routing is recommended to ensure all is correct. Coaxial cable, if placed in close proximity to electrical cables, transformers or other pieces of electrical equipment, may pick up electrical interference causing picture quality to deteriorate, especially in poor reception areas. Excess cable should be removed and NOT coiled as this may cause picture distortion.

Gain Control Switch

This switch should be set to the normal 'NML' position for general use. The Low setting may be used when situated close to TV transmitters where strong signals may be affecting the quality of the picture.

Red LED Light

Should the red LED on the Power Pack not light, first try unplugging the cable connected to the Antenna Dome from the 'ANT-IN' socket. If the LED then illuminates the fault lies with either the coaxial plug or the coaxial cable, please refer to these areas described earlier.

If the LED is still not lit, contact our office for further assistance.

Short Hook up Test

This test isolates parts of your system leaving only the TV and the Status antenna linked directly together.

Firstly, unplug the coaxial plugs from the 'TV-FM' sockets of the Power Pack which will be connected to a TV outlet socket.

With your TV fly lead, connect your TV direct to the Power Pack, plugging into one of the 'TV-FM' sockets.

Ensure the antenna dome is plugged directly into the 'ANT-IN' socket of the Power Pack and switch on. Tune in your TV for the strongest signal.

If the picture quality is improved the fault lies with the wiring of the system between the Power Pack and the TV outlet socket.

Antenna Dome Coaxial Cable

Check the routing of the coaxial cable from the Antenna Dome to the Power Pack. Check to ensure there are no kinks or trapped cable or if there are loops of surplus cable which could be affecting performance.



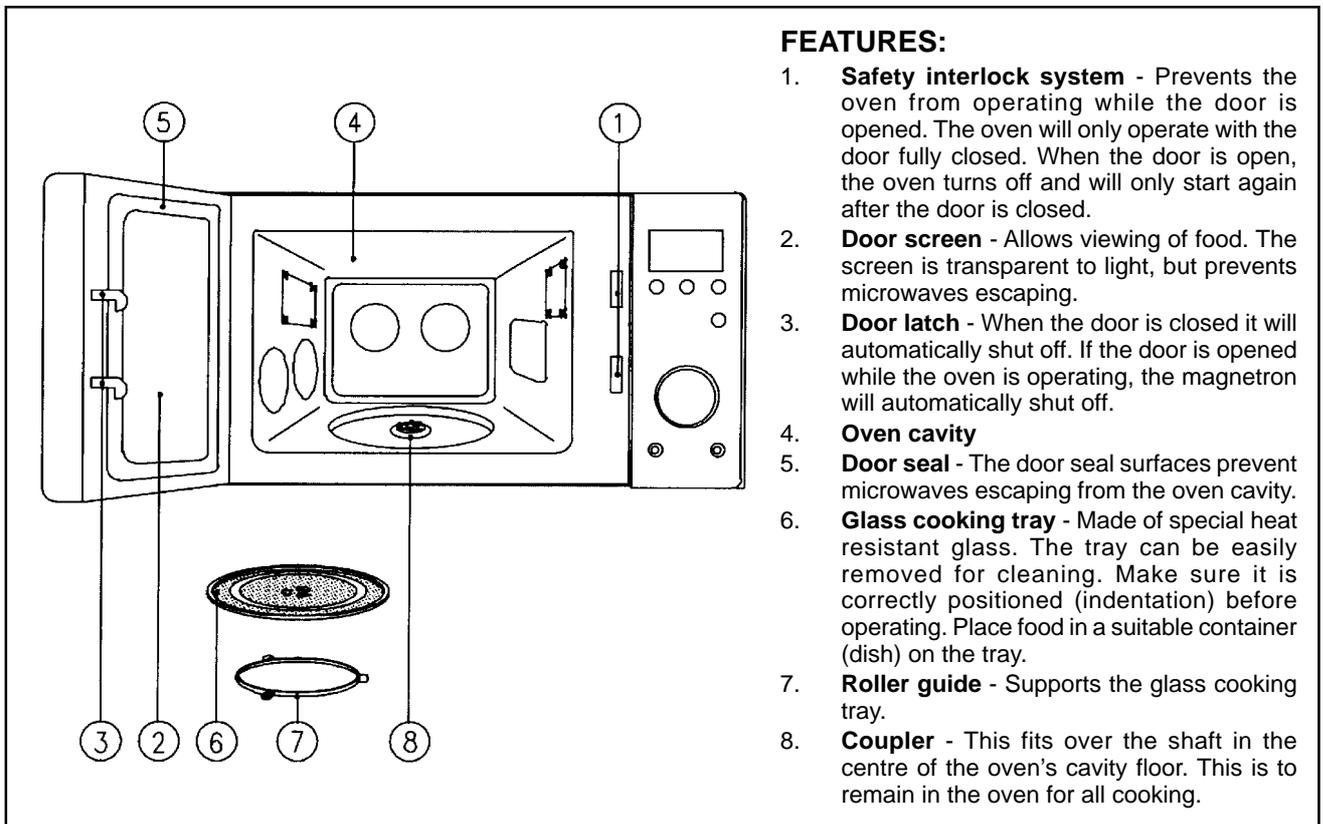
- ▲ It is the responsibility of the caravan owner to make sure that the directional aerial is fully retracted before the caravan is moved. Any damage as a result of neglect, i.e. not retracting the aerial, caused by crash damage, vandalism or incorrect operation will NOT be covered by the manufacturers warranty.

4.13 DAEWOO MICROWAVE OVEN

4.13.1 Precautions to avoid possible exposure to excessive microwave energy

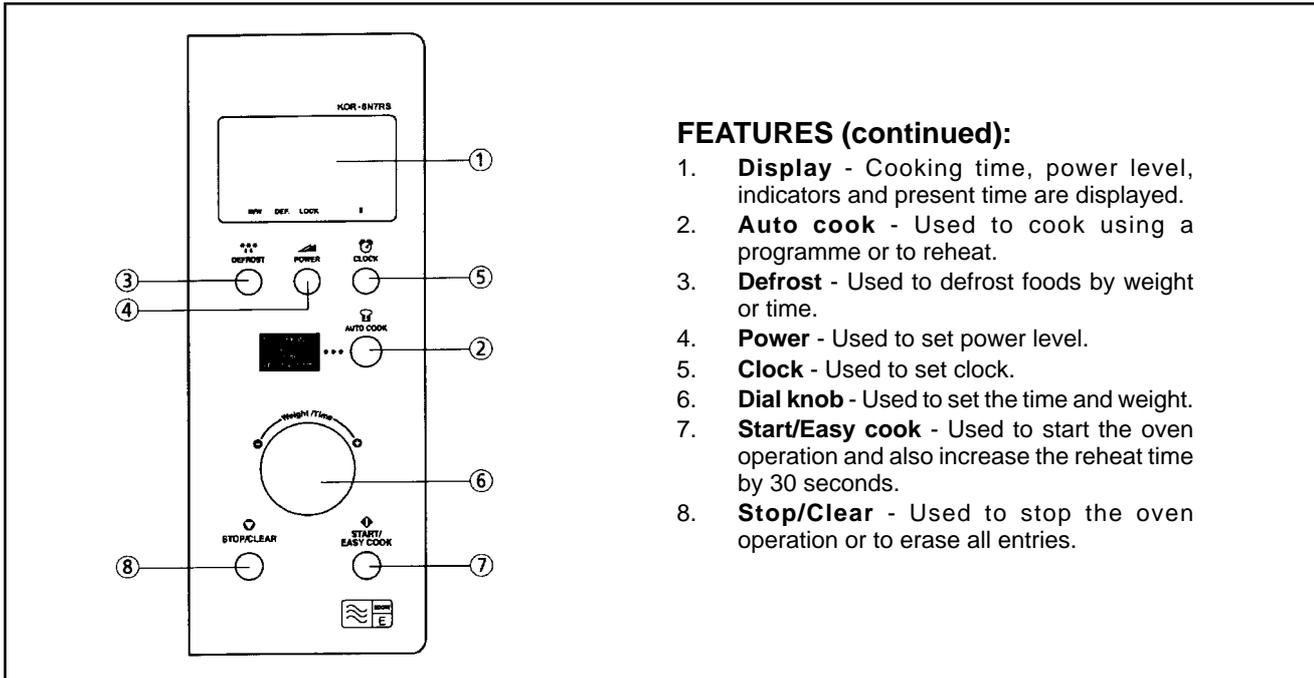


- ▲ Do not attempt to operate this oven with the door open since open-door operation can result in harmful exposure to microwave energy. It is important not to remove or tamper with the safety interlocks.
- ▲ Do not place any object between the oven front face and the door or allow soil or cleaner residue to accumulate on sealing surfaces.
- ▲ If the door or door seals are damaged, the oven must not be operated until it has been repaired by a competent person: (1) door (bent), (2) hinges and latches (broken or loosened), (3) door seals and sealing surfaces.
- ▲ It is hazardous for any one other than a competent person to carry out any service or repair operation which involves the removal of a cover which gives protection against exposure to microwave energy.
- ▲ Liquids or other foods must not be heated in sealed containers since they are liable to explode.
- ▲ The appliance is not intended for use by young children or infirm person without supervision. Young children should be supervised to ensure that they do not play with the appliance.
- ▲ Only allow children to use the oven without supervision when adequate instructions have been given so that the child is able to use the oven in a safe way and understands the hazards of improper use.



FEATURES:

1. **Safety interlock system** - Prevents the oven from operating while the door is opened. The oven will only operate with the door fully closed. When the door is open, the oven turns off and will only start again after the door is closed.
2. **Door screen** - Allows viewing of food. The screen is transparent to light, but prevents microwaves escaping.
3. **Door latch** - When the door is closed it will automatically shut off. If the door is opened while the oven is operating, the magnetron will automatically shut off.
4. **Oven cavity**
5. **Door seal** - The door seal surfaces prevent microwaves escaping from the oven cavity.
6. **Glass cooking tray** - Made of special heat resistant glass. The tray can be easily removed for cleaning. Make sure it is correctly positioned (indentation) before operating. Place food in a suitable container (dish) on the tray.
7. **Roller guide** - Supports the glass cooking tray.
8. **Coupler** - This fits over the shaft in the centre of the oven's cavity floor. This is to remain in the oven for all cooking.



FEATURES (continued):

1. **Display** - Cooking time, power level, indicators and present time are displayed.
2. **Auto cook** - Used to cook using a programme or to reheat.
3. **Defrost** - Used to defrost foods by weight or time.
4. **Power** - Used to set power level.
5. **Clock** - Used to set clock.
6. **Dial knob** - Used to set the time and weight.
7. **Start/Easy cook** - Used to start the oven operation and also increase the reheat time by 30 seconds.
8. **Stop/Clear** - Used to stop the oven operation or to erase all entries.

4.13.2 Operational Procedure

This section includes useful information about oven operation.

1. Connect the mains lead to an electrical outlet.
2. After placing the food, in a suitable container, open the oven door and put it on the glass tray. The glass tray and roller guide must always be in place during cooking.
3. Shut the door. Make sure that it is firmly closed.
4. The oven light is on only when the microwave oven is operating.
5. The oven door can be opened at any time during operation by touching the door release button on the control panel. The oven will automatically shut off.
6. Each time a button is touched, a BEEP will sound to acknowledge the touch.
7. The oven automatically cooks on full power unless set to a lower power level.
8. The display will show “:0” when the oven is plugged in.
9. Time clock returns to the present time when the cooking time ends.
10. When the Stop/Clear button is touched during the oven operation, the oven stops cooking and all information retained. To erase all information (except the present time), touch the Stop/Clear button once more. If the oven door is opened during the oven operation, all information is retained.
11. If the Start button is touched and the oven does not operate, check the area between the door and door seal for obstructions and make sure the door is closed securely. The oven will not start cooking until the door is completely closed or the programme has been reset.



- ▲ Make sure the oven is properly installed and plugged into the electrical outlet.

4.13.3 Wattage Output Chart

The power-level is set by pressing the power button. The chart shows the display, the power level and the percentage of power.

Touch Power button	Power level (Display)	Approximate Percentage of Power
once	P-HI	100%
twice	P-80	80%
3 times	P-60	60%
4 times	P-40	40%
5 times	P-20	20%

4.13.4 Controls

Setting the Clock

When the oven is first plugged in, the display will flash “:0” and a tone will sound. If the AC power ever turns off, the display shows “:0” when the power comes back on.

1. Press Clock button. This is a 12 hour clock system.
2. Press Clock button once more. This is a 24 hour clock system.
3. Turn the dial knob to adjust hour.
4. Press Clock button.
5. Turn the dial knob to adjust minute.
6. Press Clock button.



▲ This oven has multiple clock systems. If you want 12 hour clock system omit this step.

If you selected 12 hour system, the display will show the hours from “1” to “12”.

If you selected 24 hour system, the display will show the hours from “0” to “23”.

The adjusted hour starts blinking.

The minute stops blinking and “00” starts blinking.

The display will show the minutes from “0” to “59”.

The adjusted minute starts blinking.



▲ When you press Clock button, the minute stops blinking, and the colon starts blinking. If you selected 12 hour clock system, this digital clock allows you to set from 1:00 to 12:59. If you selected 24 hour clock system, this digital clock allows you to set from 0:00 to 23:59.

4.13.5 Weight Defrosting

“Weight Defrost” lets you easily defrost food by eliminating guesswork in determining defrosting time. The minimum weight for “Weight Defrost” is 200 gram and the maximum weight is 3,000 grammes. Follow the steps below for easy defrosting.

1. Press Defrost button (The DEF indicator and “0” appear and the g indicator starts blinking).
2. Turn the dial knob to adjust the defrosting weight (The display will show what you selected).
3. Press Start button.

When you press Start button, the g indicator disappears and the DEF indicator starts blinking to show the oven is in the DEFROST mode. The display counts down the time to show you how much defrosting time is left in the DEFROST mode. The oven beeps during the defrosting cycle to signal that the food needs to be turned or rearranged. When the defrosting time ends, you will hear 3 beeps.

4.13.6 Time Defrosting

When TIME DEFROST is selected, the automatic cycle divides the defrosting time into periods of alternating defrost and stand times by cycling on and off.

1. Press Defrost button (The DEF indicator and “0” appear and the g indicator starts blinking).
2. Press Defrost button once more (The g indicator disappears and “0” is displayed).
3. Turn the dial knob to adjust the defrosting time (The display will show what you selected).
4. Press Start button.



- ▲ Your oven can be programmed for 60 minutes 00 seconds (60:00).

When you press Start button, the DEF indicator starts blinking to show the oven is in DEFROST mode. The display counts down the time to show you how much defrosting time is left in the DEFROST mode. The oven beeps during the defrosting cycle to signal that the food needs to be turned or rearranged. When the defrosting time ends, you will hear 3 beeps.

4.13.7 Cooking in One Stage

1. Press Power button (select the desired power level). The M/W indicator appears and the display will show what you selected. If step 1 is omitted, the oven will cook at full power.
2. Turn the dial knob to adjust the cooking time. The display will show what you selected. (You oven can be programmed for 60 min 00 sec (60:00)).
3. Press Start button.

When you press Start pad, the M/W indicator starts blinking to show the oven is cooking. The display counts down the time to show how much cooking time is left. When the cooking time ends, you will hear 3 beeps.



- ▲ Using lower power levels increases the cooking time which is recommended for foods such as cheese, milk and slow cooking of meats.

4.13.8 Cooking in Two Stages

All recipes require frozen foods to be defrosted fully before cooking.

This oven can be programmed to automatically defrost foods before cooking.

1. Press Defrost button (The DEF indicator and “0” appear and the g indicator starts blinking).
2. Turn the dial knob to adjust the defrosting weight (The display will show what you selected).
3. Press Power button (Select the desired power level x3). The M/W indicator appears and the display will show what you selected. This example shows power level 6.
4. Turn the dial knob to adjust the cooking time (The display will show what you selected).
5. Press Start button.

When you press Start button, the DEF and M/W indicators come on to confirm the power levels selected. The DEF indicator starts blinking to show you that the oven is in DEFROST mode. The display counts down the time remaining in DEFROST mode. When the oven beeps, turn over, break apart and/or redistribute the food. At the end of DEFROST mode, the oven will beep and start M/W cook. The DEF indicator disappears and the M/W indicator starts blinking. The display counts down the time remaining in M/W mode. When M/W cook ends, you will hear 3 beeps.

4.13.9 Easy Cooking

EASY COOK allows you to reheat for 30 seconds at 100% (full power) by simply pressing the Easy Cook button.

1. Press Easy Cook button (When you press Easy Cook button, “:30” appears. After 1.5 seconds, the oven starts reheating. When the cooking time ends, you will hear 3 beeps.

4.13.10 Auto Cook

AUTO COOK allows you to cook or reheat many of your favourite foods by repeatedly touching Auto cook button.

1. Press Auto cook button (When you press Auto Cook button once, “AC-1” is display. By repeatedly pressing this button, you can select one of the four menu programmes as shown in the chart below).
2. Turn the DIAL KNOB to adjust the desired quantity (This display will show what you selected).

Food	Press Autocook button	Display	Weight	Directions
Dinner Plate	once	AC-1	350g-450g	Put foods on the microwave plate and cover with vented plastic wrap.
Soup	twice	AC-2	350g-450g	Pour soup in microwave bowl or mug. Stir before serving.
Beverage	three times	AC-3	1 Cup (200ml) 2 Cups (200ml x2) 3 Cups (200ml x3)	Pour beverage in microwave mug and place it on turntable. Do not cover. Stir before serving.
Fresh vegetable	four times	AC-4	200g-400g	Wash and put in casserole. Add no water if vegetables have just been washed. Cover tender vegetables with lid and stir after cooking.

3. Press Start button (When you press Start button, the display changed into cooking time and the oven starts cooking. When the cooking time ends, you will hear 3 beeps.

4.13.11 Child Safety Lock

SAFETY LOCK prevents unwanted oven operation such as by small children. To set, press and hold Stop/Clear button for 3 seconds. Lock indicator appears and a beep sound. To cancel, press and hold Stop/Clear button for 3 seconds. Lock indicator disappears and a beep sounds.

4.13.12 To Stop The Oven While The Oven Is Operating

1. Press Stop/Clear button.

- You can restart the oven by pressing Start button.
- Press Stop/Clear button once more to erase all instructions.
- You must enter in new instructions.

2. Open the door

- You can restart the oven by closing the door and pressing Start button.



▲ Oven stops operating when door is opened.

4.13.13 Microwave Specifications

Power supply	230V AC 50Hz Single Phase with Earthing
Power consumption	1200W
Output Power	800W
Frequency	2450 MHz
Outside dimensions (W x H x D)	465 x 279 x 360mm
Cavity dimensions (W x H x D)	290 x 220 x 306mm
Net weight	Approx 12.2kg
Timer	60 min. 00 secs.
Power levels	5 Levels

4.13.14 Before You Call For Service

Refer to the following checklist, you may prevent an unnecessary service call.

• *The oven doesn't work*

1. Check that the power cord is securely plugged in.
2. Check that the door is firmly closed.
3. Check that the cooking time is set.
4. Check for a blown circuit fuse or tripped main circuit breaker in your house.

• *Sparking in the cavity:*

1. Check utensils. Metal containers or dishes with metal trim should not be used.
2. Check that metal skewers or foil does not touch the interior walls.

If there is still a problem, contact the service station.

4.13.15 Questions and Answers

Q: I accidentally ran my microwave oven without any food in it. Is it damaged?

A: Running the oven empty for a short time will not damage the oven. However, it is not recommended.

Q: Can the oven be used with the glass tray or roller guide removed?

A: No. Both the glass tray and roller guide must always be used in the oven before cooking.

Q: Can I open the door when the oven is operating?

A: The door can be opened anytime during the cooking operation. Then microwave energy will be instantly switched off and the time setting will maintain until the door is closed

Q: Why do I have moisture in my microwave oven after cooking?

A: The moisture on the side of your microwave oven is normal. It is caused by steam from cooking food hitting the cool oven surface.

Q: Does microwave energy pass through the viewing screen in the door?

A: No. The metal screen bounces back the energy to the oven cavity. The holes are made to allow light to pass through. They do not let microwave energy pass through.



▲ Do not attempt to service the oven yourself!

5.1 GENERAL MAINTENANCE

5.1.1 Exterior

The exterior of your caravan is very durable and easy to clean owing to its high gloss properties. To maintain a showroom finish one needs only to wash the caravan regularly with a car shampoo, rinse with cold water and chamois leather off. Do not forget to clean the roof. A good quality non metallic and non-coloured car wax that does not contain white spirit may be applied, which will make washing easier.



- ▲ Under no circumstances use any abrasive agents, methylated spirit, white spirit, other solvents or washing up liquid to the exterior of your caravan.
- ▲ No touch up painting should be carried out prior to consulting with a Bailey Service Centre for approved methods.

All items stored in the gas bottle storage locker must be secured to prevent impact damage to the inside of the front body panel when the caravan is being towed.



- ▲ Do not allow any chemicals, toilet or otherwise, to spill or leak onto the gas box floor. Before placing items in the cradle ensure that the tray is clean and free from any debris. Cleaning should only be carried out with warm soapy water.
- ▲ The use of high pressure water jets to clean your caravan will invalidate your warranty.

5.1.2 Acrylic Windows

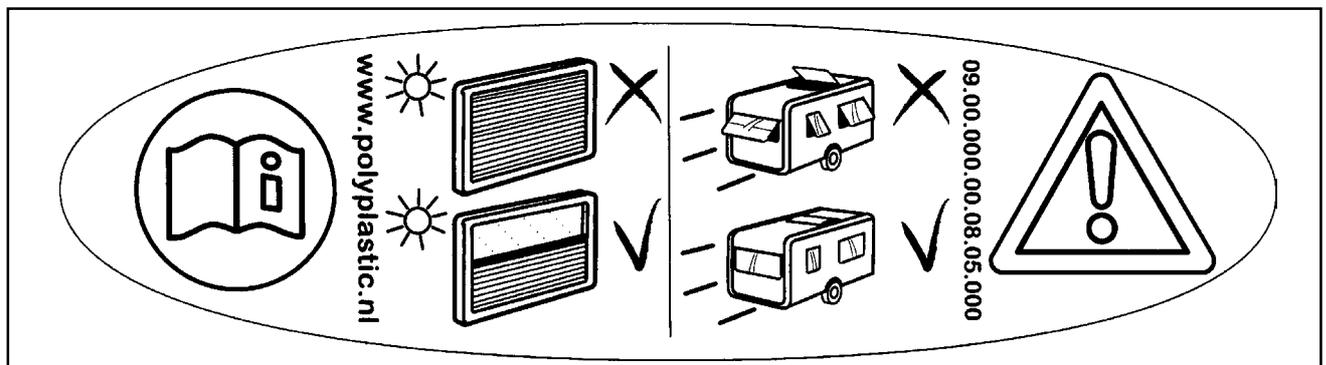
The windows fitted to your Bailey caravan are manufactured from high quality acrylic using the latest plastic processing methods.

For cleaning, use only generous amounts of water to wash away dust and road grit etc. Then use a soft cloth and warm soapy water and gently remove the remaining dirt. Avoid abrasive cleaning materials and detergents.

As with all plastic materials, acrylic should not be allowed to come into contact with chemicals such as paint remover, fly spray, acetone, dish washer detergent and car cleaning detergent.



- ▲ Never polish with a dry cloth.
- ▲ During high sun do not close the window blinds completely and open the windows into the ventilation position.
- ▲ While the caravan is in motion please ensure that the windows are fully closed (this information is also detailed on the stickers in the windows).



- ▲ Dependant on the temperature inside the caravan to that outside, condensation may be experienced between the window panes. This is a perfectly normal occurrence as the windows are not sealed units. To disperse condensation remove the small bungs, using a pair of blunt end tweezers, in the corners of the window unit (preferably on a warm day) until the condensation disperses and then replace the bungs.

5.1.3 Window Catches and Stays

Turn catch arm to the vertical position to open. A night vent position is available by depressing the locking knob and locating the catch into the outer catchplate slot.

The windows are held open by an adjuster knob, tightening off the knob in a clockwise direction will hold the window open in the desired position.

Always ensure knob is unscrewed before closing the window. Failure to do so may cause damage to the window stay arm.



- ▲ Always ensure that windows are fully closed during wet weather and not on night vent setting.

5.1.4 Interior walls

The interior walls have a GRP/PVC lining which should not require cleaning too often. A wipe over with a damp cloth and a very mild detergent is all that is needed to keep it immaculate.

5.1.5 Furniture

Moisture in air can cause damage to furniture as the wood expands or contracts with an increase or decrease in the relative humidity. A relative humidity of between 40% - 60% is tolerable. If values are maintained outside this range for a sustained period damage to the furniture may occur.



- ▲ To prevent damage, assure the relative humidity of air is not too high for a long period by either ventilating the caravan, or by using either a dehumidifiers or water absorbent crystals.

To ventilate your caravan, on dry days open as many windows and roof lights as possible to allow air to move through the vehicle. Try to do this as often as possible (at least once a week), but keep windows and roof lights closed on wet days as damp air may increase indoor humidity.

Humidity levels can also be controlled by reducing the level of activity that generates moisture in the air, e.g. taking showers, cooking and washing dishes.



- ▲ It is recommended that you use protective covers to prevent damage to the furniture surfaces from high temperatures.
- ▲ The use of some detergents or chemical cleaners on your furniture may damage the finish.
- ▲ Do not leave furniture surfaces wet with beads of standing water

5.1.6 Mattresses

Mattresses are made from fire retardant fabric and are C.M.H.R. foam filled.

Cotton print cushion covers are removable for dry cleaning only. (Zips along back edge.)

It is recommended that mattresses be stored on edge during winter.

5.1.7 Care of your upholstery

In the manufacturing of the fabrics used on the soft furnishings of your caravan a silicone coating is applied to help resist dirt and liquids.

However if a liquid is spilt the following actions are required:

- Remove as much excess as possible with a dry clean cloth.
- Sponge the affected area with warm soapy water taking care not to soak the material.
- Leave to dry in normal conditions.

These actions will not affect the FR treatment of the fabric.
 Heavy soiling will require professional cleaning.

5.1.8 Curtains

All fabrics will fade to some degree if exposed to direct sunlight, particularly natural fibres such as cotton etc.



▲ Curtains should not be left closed during daytime otherwise some fading will be experienced.

Dry cleaning only recommended.



▲ No Ethylene based cleaning material must be used.

5.1.9 Hinges and Catches

Lightly oil occasionally.

Carpets

Vacuum periodically to remove grit and to ensure long life.

5.1.10 Free Standing Table

● Maximum load on the table is 50kg.



▲ Do not at any time sit or stand on the table.

5.1.11 Shower/Vanity Units

Care instructions

Exposure of this product to cleaning products or material containing concentrated perfumes, body oils, linseed oil, gritty or abrasive substances, solvents (white spirit, antifreeze etc) may result in permanent damage to the material.

Cleaning should be carried out immediately after use using warm soapy water and a soft cloth. Stubborn stains may be removed using diluted lemon juice.

Thetford bathroom cleaner is suitable for cleaning the shower and vanity unit plastic items (sinks, shower trays, thetford toilets etc).



▲ Domestic cleaning products are not to be used to clean the shower/vanity unit plastic items.

▲ Some mouth washes can cause plastic items to crack and for this reason should not be used.

5.1.12 Guidance on Cleaning Portable Water Tanks and the Water System and in Touring Caravans

The water systems, and in particular storage tanks, in caravans are susceptible to contamination by bacteria if care is not taken with their use and cleaning. The symptoms caused by bacterial contamination are not purely limited to gastro-intestinal diseases, but may also manifest themselves as ear, nose, throat, eye or skin infections. It is therefore important that you carry out the following procedure prior to using the caravan each time, even if you boil or filter all water you use for drinking.

5.1.13 For Containers

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

5.1.14 For Systems

1. Drain down the system. Open all taps and valves to allow air in enabling the system to drain quickly.
2. Remove any water filters fitted, and replace with a short length of hose or empty filter cartridge (this will ensure the filter is not affected by the disinfectant/sterilant solution).
3. Fill the system by using the pump with a disinfectant/sterilant solution. (Check that the solution at full strength appears at all taps/showers.) Allow to stand for the recommended period of time.
4. Drain the system down completely.
5. Thoroughly clean the outside of all taps/connections with a cloth soaked in the disinfectant/sterilant.
6. Flush the system through with clean drinking water until no traces of disinfectant/sterilant can be detected at any tap.
7. Replace the filter

Suitable sterilising chemicals are available from your caravan dealer, accessory shop, chemists or home-brew shops. It is not, however, recommended to use bleach or sodium metabisulphite.

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

5.2 FIRE AND SAFETY PRECAUTIONS



- ▲ Your attention is drawn to the notice affixed in the caravan advising on fire prevention, ventilation and what to do in case of fire. Ensure that the occupants are familiar with escape routes, in case of a fire.

5.2.1 Children



- ▲ Do not leave children alone in the caravan in any circumstances. When in the caravan ensure that children are supervised at all times. Keep potentially dangerous items out of reach as at home, e.g. matches, medicines etc.

5.2.2 Fire Extinguishers

Provide one dry powder fire extinguisher of an approved type or complying with ISO 7165 of at least 1 kg capacity by the main exit door, and a fire blanket next to the cooker. Familiarise yourself with the instructions on your fire extinguisher and the local fire precaution arrangements.

A fat pan fire should not have an extinguisher aimed at it but be smothered with a fire blanket. It is advisable not to cook with a fat pan or deep fryer in the enclosed space of a caravan.

Extinguishers containing vaporising liquids should not be used by a person inside the caravan or from outside whilst other persons are in the caravan. Dry powder extinguishers will deal with fat or electrical fires and water type extinguishers should not be used for this type of fire.

5.2.3 In Case of Fire

- Get everyone out of the caravan as quickly as possible using whichever exit is quickest including windows. Do not stop to collect any personal items.
- Raise the alarm - Call the Fire Brigade (in the UK dial 999).
- Turn off gas container valve if safe to do so.

5.2.4 Smoke Alarms



- ▲ Your caravan is fitted with a smoke alarm. The operation of the alarm should be tested after the vehicle has been in storage, before each trip and at least once per week during use.

5.2.5 Ventilation

All ventilation complies with 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.

High level ventilation is via the roof lights. The mesh screens fitted should be kept free of obstructions by dust, leaves, insects, etc. Inspect regularly and use a brush and soapy water as necessary.



- ▲ Under no circumstances should the caravan ventilation be covered, blocked or tampered with in any way.

5.2.6 Petrol/Diesel Fumes

The fitting of a tail pipe deflector to your exhaust will reduce the possibility of fumes entering your caravan through the front fixed ventilation points. However, an extension fitted to an exhaust tail pipe will be illegal if it projects excessively beyond the vehicle body or bumper.

5.2.7 Original Equipment Appliances

See sections devoted to individual appliances.



- ▲ Replacement parts for any appliance shall conform to the appliance manufacturer's specification; and should be fitted by them or an authorised agent.

5.2.8 Portable Appliances



- ▲ 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.

5.2.9 Modifications

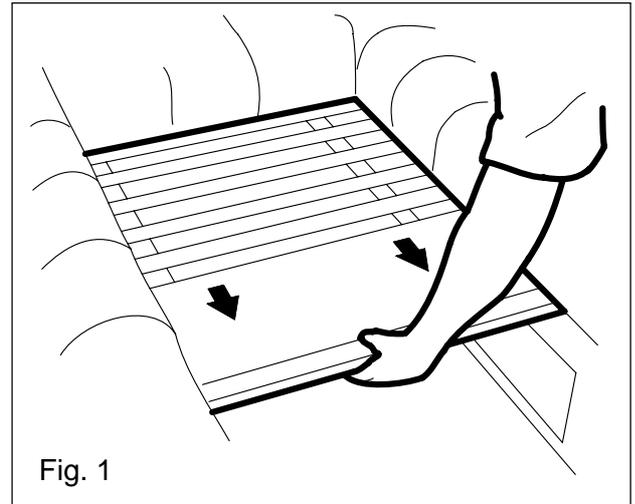


- ▲ Never allow modification of electrical or LPG systems and appliances except by qualified persons.

5.3 BUNK ASSEMBLY

5.3.1 Slatted Bed (Fig. 1)

- i. Grasp the leader board.
- ii. Walk backwards holding the leader board until bed is fully extended.
- iii. Arrange seat cushions to suit.



5.4 WATER SYSTEM - FAULT FINDING

5.4.1 FAULT - *Water not flowing from any tap when operated but pump runs*

Cause	Cure
Water source empty	Check water level and re-fill if necessary
Pump wired in reverse	Check wiring, refer to pump manufacturers' instructions
Pump not primed	Refer to pump manufacturers' instructions
Pipe inlet or outlet pipe disconnected	Check connections
Pump pipes restricted by kinking	Check pipe runs
Blockage in pump inlet or outlet pipe	Check, starting inside freshwater tank
Blocked in-line filter or pump filter	Replace filter
Air leak in suction line to pump	Check for bubbles & secure with a clip

5.4.2 FAULT - *Pump does not run*

Cause	Cure
Pump or tap incorrectly wired	Refer to pump/tap manufacturers' instructions
Pump fuse blown	Check wiring connections and then replace with fuse of correct rating
Battery disconnected	Check connections
Pump seized or overheated	Refer to pump manufacturers' servicing instructions
If a pressure pump is being used, pressure sensing switch may have failed	Refer to tap manufacturers' servicing instructions
If a switched tap is being used, the switch have failed	Refer to pump manufacturers' servicing may instructions

5.4.3 FAULT - *Water flows from cold tap but has reduced flow from hot*

Cause	Cure
Feed pipe to water heater incorrectly connected to the heater outlet	Refer to installation instructions
Blockage in hot pipeline	Disconnect pipes and inspect
Heater inlet or outlet pipes kinked preventing flow	Check and re-route if necessary. Ensure that hose is Carver recommended type
Hot tap not connected	Refer to installation instructions
Hot tap failed or blocked	Disconnect and inspect
Heater non-return valve jammed	Seek service attention

5.4.4 FAULT - *Water flows from hot tap but has reduced flow from cold*

Cause	Cure
Cold water pipe kinked preventing flow	Check and re-route if necessary
Blockage in cold pipe line	Disconnect pipes after 1st Y connector and check up to tap
Cold tap not connected	Refer to installation instructions
Cold tap failed or blocked	Disconnect and inspect
If a Carver Crystal water service unit is fitted the cartridge is exhausted	Replace cartridge

5.4.5 FAULT - *Reduced flow from both hot and cold taps*

Cause	Cure
Battery condition low causing pump to run slowly	Check battery state of charge refer to electrical supply note
If new taps have been fitted they may be restricting flow	Disconnect and check that they have at least Ø (6.3mm) bore
Pump needs servicing	Refer to pump servicing instructions
Partially blocked pump filter or in-line filter, if fitted	Replace filter
Pump outlet pipe kinked restricting flow	Check and re-route if necessary
Water leak	Check all water connections

5.4.6 FAULT - *Reduced flow from either taps*

Cause	Cure
'Y' connector(s) fitted incorrectly	Refer to installation instructions
Pipe kinking restricting flow	Check and re-route if necessary
Bore size difference in taps	Use taps of equal bore size

5.4.7 FAULT - *Water Heater pressure relief valve venting water*

Cause	Cure
Pressurised water system pump switching pressure too high	Refer to water supply note
Switched tap water system pump flow rate is greater than tap flow rate capacity	Refer to water supply note

5.4.8 FAULT - *Water heater difficult to drain*

Cause

Hot taps not open preventing air entering hot system to let water out.

Air bleed pipe kinked or blocked.

Cure

Open taps

Unkink or unblock pipe.

5.5 ROOM HEATER - FAULT FINDING

5.5.1 FAULT - Heater will not light

Symptoms	Cause	Cure
<i>Spark visible</i>	No gas. Bottle temperature too low	Check bottle and taps. See gas supply notes.
	Regulator malfunction.	See gas supply notes.
	Overgassed. Refer to lighting instructions.	Turn off. Wait 3 mins.
<i>No spark.</i>	Piezo failure. HT lead shorting to earth or broken.	Seek service attention. Check and insulate or repair.

5.5.2 FAULT - Heater lights

Symptoms	Cause	Cure
<i>Goes out when knob is released.</i>	Knob released too soon or not fully depressed.	Refer to lighting instructions.
<i>Goes out after a time.</i>	Thermocouple or valve failure.	Seek service attention.
	Bottle temperature too low.	See gas supply notes.
<i>Goes out when door is slammed.</i>	Chimney intake or flue partly blocked.	Check and clear.
	Flue disconnected or damaged.	Turn heater out immediately. Seek service attention.

5.5.3 FAULT - Blown Air

Symptoms	Cause	Cure
<i>Not working.</i>	Supply fuse blown.	Replace.
<i>Running slowly.</i>	Hair or dust in fan wheel. Check balance of blown air system and close/open to balance system	Electrically isolate and clear with brush.
<i>Blowing on one leg of system only.</i>	Pipe disconnected.	Check all pipe connections.
	Fan paddle not positioned	Check position of paddle to ensure air flows in one direction.

5.6 BRAKE FAULT FINDING CHART - AL-KO

5.6.1 FAULT - *Braking is one-sided*

Cause	Cure
Incorrect adjustment at wheel.	Adjust as described.
Brake cable seized.	Free off cable or replace.
Brake lining contaminated with grease.	Replace brake shoe assemblies.

5.6.2 FAULT - *The trailer brakes during mild decelerations*

Cause	Cure
Shock absorber in overrun device weak or ineffective.	Examine and replace if necessary.
Brakes overadjusted.	Re-adjust as described.

5.6.3 FAULT - *The trailer brakes snatch when braking*

Cause	Cure
Brakes overadjusted.	Re-adjust as described.
Brake cable sticking.	Examine, free off cable or replace.
Brakes under adjusted.	Check complete brake transmission system and re-adjust if necessary.
Shock absorber weak or ineffective.	Replace.
Drawshaft sticking.	Check over full stroke, lubricate if necessary.

5.6.4 FAULT - *Brake judder*

Cause	Cure
Linings contaminated with grease.	Replace brake shoe assemblies.
Failure of bond between lining and shoe.	Replace brake shoe assembly.
Distorted/cracked drum.	Replace.
Drums have rusty patches on braking surface.	Clean up with sandpaper and wipe out with meths.

5.6.5 FAULT - *Trailer brakes lock up when reversing*

Cause	Cure
Brakes overadjusted.	Re-adjust as described.
Reverse lever not functioning.	Check action and rectify.
Ground surface too soft or slippery.	Cover immediate area with matting or similar firmer product.

5.6.6 FAULT - *Trailer brakes inoperative*

Cause

Brakes underadjusted.
Lining contamination.
Seized cables.
Linings worn out.

Cure

Check action and rectify.
Replace brake shoe assemblies.
Free off or replace.
Replace brake shoe assemblies.

5.6.7 FAULT - *Hot brakes*

Cause

Brakes overadjusted.
Pull-off spring broken.
Seized cables.

Cure

Re-adjust as described.
Replace spring.
Free off or replace.

5.6.8 FAULT - *Handbrake will not hold trailer on slope*

Cause

Incorrect adjustment at spring cylinder.

Cure

Re-adjust as described.

5.7 REFRIGERATOR - FAULT FINDING

5.7.1 FAULT - *No 230V fridge operation*

Cause

230V socket that the fridge is plugged into not connected or switched on.

Cure

Usually located either under the oven or in the front bunk. Check plug is located correctly and turn on the switch.

5.8 FREQUENTLY ASKED QUESTIONS

Q Does the battery charge when connected to the car or mains supply?

A Yes.

Q Does the master switch need to be in the “ON” position for this?

A Irrespective of the position of the 12V switch the caravan battery should automatically charge whilst in transit.

Q How do I remove the rear lights to replace the bulbs?

- A
1. Push the flat head screwdriver into the recess at the base of the light.
 2. Gently prise the bottom of the light unit out whilst pulling in a downward movement on the top of the light.
 3. The complete unit will now pull away from the rear panel.
 4. To refit is simply the reversal of the removal process.

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