# WARRANTY

# Warranty

All the illustrations and descriptive matter in this handbook are intended to give a general idea of the caravan. Changing market and supply situations and our policy of continuous product development may prevent us from maintaining the exact specifications detailed in this handbook. We therefore reserve the right to alter specifications as materials and conditions demand.

Dealers are not agents of Swift Group Limited, the manufacturer of Swift Group caravans, and have absolutely no authority to bind the manufacturer by any express or implied undertaking or representation.

## WARRANTY AND GUARANTEE COVER

All Swift Group caravans have a 6 year body shell integrity guarantee and a 3 year SuperSure manufacturer's warranty from the date of purchase (or hire purchase), which are subject to a chargeable annual service, inspection and moisture survey ('Annual Service') being carried out at an authorised Swift Group Service Centre. Original VAT invoices must be retained as proof of Annual Services being carried out.

In the unusual event that a fault develops and you need to claim under this Warranty and Guarantee, your first contact should normally be made through the dealer from whom the caravan was purchased.

In certain circumstances, arrangements can be made to have the claim dealt with by a different authorised Swift Group Service Centre – see final paragraph below for details. It is the responsibility of the Purchaser to deliver the caravan to and collect the caravan from the Service Centre for all warranty work.

During the warranty period, subject to the exclusions set out in this section of the handbook and provided the warranty claim is authorised by the manufacturer, Swift Group Limited, the authorised Swift Group Service Centre will repair (or at the option of the manufacturer, replace) all defective parts of the caravan at the expense of the manufacturer. Swift Group Ltd reserves the right to examine the caravan prior to commencement of repairs or replacement of parts.

## 6 YEAR BODY SHELL INTEGRITY GUARANTEE ('GUARANTEE')

**The Guarantee extends to the following items:**

Body leaks and delamination: water ingress through any permanently sealed seam joints or delamination of panels and floor, being part of the original manufacturer's construction.

The manufacturer will honour the Guarantee for 72 months from the date of purchase, provided that the caravan has had an Annual Service, within 90 days before or 60 days after each anniversary of the original date of purchase (or hire purchase). The sixth Annual Service must, however, be carried out before the expiry of the 72 month period from the original date of purchase (or hire purchase).

**Specific exclusions from the Guarantee:**

Seams and panels requiring repair must be part of the original construction of the caravan and must not have been tampered with or repaired otherwise than by Swift Group Ltd or an authorised Swift Group Service Centre.

Also see general terms and conditions.

## 3 YEAR SUPERSURE MANUFACTURER'S WARRANTY ('WARRANTY')

The manufacturer will honour the Warranty for 36 months from the date of purchase (or hire purchase), provided that the caravan had an Annual Service within 90 days before or 60 days after each anniversary of the original date of purchase (or hire purchase).

The third Annual Service must, however, be carried out before the expiry of the 36 month period from the original date of purchase (or hire purchase).

**In the first 12 months the Warranty will cover:**

Faults arising from a manufacturing defect but not those which are a result of normal wear and tear or those which relate to replacement light bulbs.

Also not covered under the first year are faults resulting from accidental damage or damage caused by misuse of any component part of the caravan.

**In years 2 and 3 the warranty will cover:**

- Water system; heater, fresh water tank, water pump, water gauges, taps and shower heads
- Heating system and components
- Main proprietary items i.e fridge, toilet, cooker
- Chassis and associated parts
- Auxiliary electrics, excluding bulbs
- Windows, excluding window furniture and blinds

**In years 2 and 3 the warranty will specifically exclude:**

- All soft furnishings
- Audio equipment
- Microwave
- TV

## GENERAL TERMS APPLYING TO ALL THREE YEARS OF WARRANTY PERIOD.

Provided that the caravan is used only for its ordinary and intended purpose and has not been subject to any treatment or conditions which could not be reasonably foreseen by Swift Group Ltd, the Warranty and Guarantee will be honoured subject to the following General Terms and Conditions which apply to all three years of the Warranty period and all six years of the Guarantee period. The caravan is not covered for:

- The failure of a component for reasons of fair wear and tear.
- Damage resulting from accidents.
- Damage resulting from freezing, over-heating or fire.
- Misuse or abuse of the caravan or of any component.
- Tyres, wheels and jockey wheels
- Cosmetic finishes to kitchen sinks, cooker tops, vanity units, shower trays.
- Normal deterioration, corrosion, intrusion of foreign or harmful bodies, lack of servicing or negligence of any person other than the Swift Group Limited which causes stoppage of or impairment to the function of any component of the caravan.
- Replacement of parts which have reached the end of their effective working life because of age and/or usage.
- Cleaning or adjustment of any assemblies.
- Towing other than by private cars or 4x4 vehicles used in place of cars.
- The cost of transporting, towing or moving the caravan by any means (or consequential costs relating to transportation), to or from the place of repair, which is the responsibility of the owner.
- Routine maintenance items which are part of the Annual Service including brake shoes, one shot nuts, lubricants, AKS pads, rubber gas hose, the cleaning of the heater and fridge flues, the replacement of gas jets, the resealing and/or replacement of shower room sealant, and the adjustment and lubrication of locks.

The Warranty and the Guarantee will be invalidated if the caravan has been neglected, misused, modified, used for hire or reward or any commercial use, or has been used in competitive events. The caravan will be deemed to have been neglected if it has not had an Annual Service or has otherwise not been serviced and maintained as required by this handbook.

# Warranty

The Warranty and the Guarantee only apply to caravans purchased and used within the UK, and for continuous journeys abroad of no longer than 90 days per journey.

If any repairs are identified as being necessary during an Annual Service, the caravan must be made available to an authorised Swift Group Service Centre within 6 weeks for the work to be carried out. All new caravans must be registered with the Swift Group Ltd within 6 weeks of purchase as new.

The benefit of this Warranty and Guarantee may be transferred to a new owner if the caravan is sold, provided that the caravan has been serviced by an authorised Swift Group Service Centre in accordance with the requirements of this handbook, and details of the change of ownership have been supplied to Swift Group Ltd using the change of ownership form set out in this handbook. Failure to notify Swift Group Ltd of a change of ownership within 30 days of such a change will invalidate the Warranty and Guarantee.

You have legal rights under UK law governing the sale of consumer goods.

This Warranty and Guarantee does not affect your legal rights.

The name and address of the warranty and Guarantee provider is:

Swift Group Limited,
Dunswell Road,
Cottingham,
East Yorkshire,
HU16 4JX.

To make a claim under this Warranty or Guarantee, contact the Swift Group Service Centre which supplied your caravan.

Alternatively, details of your nearest authorised Swift Group Service Centre can be obtained by contacting the Swift Group Customer Care Department on 01482 875740 or enquiring on our website: www.swiftleisure.co.uk

## WHAT TO DO IF YOU REQUIRE ASSISTANCE

Congratulations on purchasing your new caravan. We are confident that you will enjoy many happy holidays. However, should you have an enquiry or require assistance with a problem, we hope that this guide will be of assistance to you.

**If you have a problem, or enquiry with regards to your new caravan, please follow these steps:**

1. Check the Owners Handbook, paying particular attention to the fault finding advice at the back of the book.
2. Contact your supplying dealer for assistance.**If you need to contact the Swift Group, please be aware of the following:**

1. When contacting Swift Supercare, please quote your name, postcode and serial number of your caravan.
2. In most instances, the Customer Care Team will involve your dealer in resolving the issue you are experiencing.
3. If you are contacting the company by email, letter or fax, the Customer Care Team will respond to you within five working days from the date of receiving the correspondence.
4. If you are calling the Customer Care Team, please avoid where possible, Mondays and lunch times.
5. Please be aware that the Swift Group cannot send parts direct from the factory. In all cases, without exception, your dealer must place the order for you.

## TOURING CARAVANS - ANNUAL SERVICE/INSPECTION RECORD

In order to comply with the warranty, you must have your caravan inspected and serviced by an authorised Swift Group Service Centre at least once per year.

It is important that the Owner's Handbook is stamped on the appropriate page by the authorised Swift Group Service Centre. Failure to do this will invalidate the warranty and the transfer of the warranty on the change of ownership.

The inspection should take approximately two to four hours and will cover the areas dealt with in the annual service check list. Any areas requiring service and/or maintenance will be highlighted by your dealer and we recommend that you authorise any necessary work to be carried out.

NB. It is essential, to validate the warranty, that an annual inspection be carried out by an authorised Swift Group Service Centre covering the items listed.

1. Damp and lamination test.
2. Coupling head and breakaway cable.
3. Jockey wheel.
4. Chassis and chassis to body security.
5. Corner steadies.
7. Tyres and tyre pressures.
8. Torque wheel nuts.
9. Brake rods and linkages.
10. Hub bearings, brakes and brake shoes.
11. Handbrake operation and performance.
12. Suspension and shock absorbers (if fitted).
13. 13 pin plug and cables.
14. Road lights, wiring and reflectors.
15. Internal lights and 12V DC system.
16. Water heater - gas and 230V AC (if fitted).
17. Hob, grill and oven (if fitted).
18. Refrigerator 230V AC, 12V DC and gas.
19. Gas system.
20. Water pump, taps and water system.
21. Mains 230V AC system.
22. Windows and fittings.
23. Smoke alarm and battery.
24. Roof lights.
25. Furniture hinges/stays etc.
26. Exterior locks and hinges.
27. Grab handle security.
28. All internal vents.
29. Oil seals.
30. Blinds and fly screens (if fitted).

# THE TOWING CODE



# The Towing Code

## THE CARAVAN TOWING CODE

**This Code of Practice contains recommendations jointly reviewed and agreed by the following organisations:**

The National Caravan Council
The Caravan Club
The Camping and Caravanning Club
The Caravan Writers Guild
The Department for Transport

**Scope of the Code**
The Code applies to all trailer caravans of maximum laden weight not exceeding 3500 kg (7,700 lbs), overall width not exceeding 2.3m (7ft 6in approximately) and overall length not exceeding 7m (23ft approximately), excluding the drawbar and coupling.

This is legally the maximum size of trailer that can be towed by a motor vehicle with a maximum gross weight of less than 3500 kg.

## CARAVAN TERMS

**Mass in Running Order:**
The mass of the caravan as stated by the caravan manufacturer, as new with standard fixtures and fittings.

**Note:** Because of differences in the weight of materials supplied for the construction of caravans, a tolerance has been allowed for in the Mass in Running Order weight.

**Maximum User Payload:**
The maximum allowable weight to be put into the caravan whilst it is being towed. This is made up of 3 sections:

Personal effects, optional equipment and essential habitation equipment.

The user payload is the difference between the Maximum Technically Permissible Laden Mass and the Mass in Running Order.

**Essential Habitation Equipment:**
Those items and fluids required for safe and proper functioning of the equipment for habitation as defined by manufacturer of the caravan.

**Personal Effects:**
Those items which a user can choose to carry in a caravan and which are not included as Essential Habitation Equipment or Optional equipment.

**Optional Equipment:**
Items made available by the manufacturer over and above the standard specification of the caravan.

**Maximum Technically Permissible Laden Mass:**
The maximum weight for which the caravan is designed for normal use when being towed on a road, laden. This mass takes into account specific operating conditions including factors such as the strength of materials, loading capacity of tyres etc.

**WARNING: Under no circumstances should the maximum technically permissible laden mass of this caravan be exceeded.**

**Upgrading of maximum technically permissible laden mass:**
The standard/declared MTPLM quoted in the specification handbook and on new caravan weightplates maybe of lower value than the maximum possible. If extra user payload is required, an upgrade maybe available (model dependant), this must be requested via your dealer.

If required you will be issued with the following:

(i) New weightplate giving upgrade weight detail

(ii) New NCC Certificate (declaring the upgraded MTPLM

(iii) Manufacturers letter confirming the upgrade for that Vehicle Identification Number

**Note:** Tyre pressures may increase when upgrading

**Nose weight:**
That part of the static mass of the caravan supported by the towing device on the rear of the towing vehicle.

**Notes:**

(i) When measuring the noseweight it is important that the caravan is fully loaded. Do not place extra items indiscriminately into the caravan after this adjustment has been made.

(ii) The caravan is intended to be towed slightly nose heavy. The nose weight can be adjusted by distribution of the load within the caravan. The nose weight should be approximately 7% of the actual laden weight (but not greater than the hitch capacity) and at the same time suit the towing vehicle. See section on Measurement of Nose Weight.

(iii) It is not recommended that you tow with just a battery, spare wheel and gas bottles as this may exceed the the permitted nose weight. Additional payload must be placed behind the axle to compensate for this.

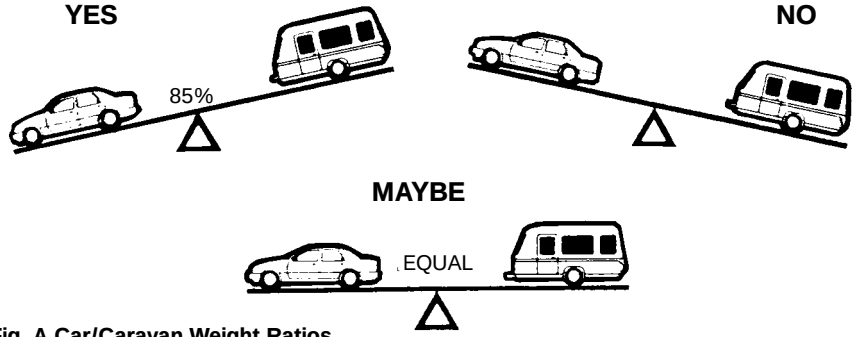



**Fig. A Car/Caravan Weight Ratios**

## TOWING VEHICLE TERMS

**Kerb weight (Mass of Vehicle in Running Order):**
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 liquids incidental to the vehicles propulsion, without driver or passengers, without any load except loose tools and equipment with which the vehicle is normally provided and without any towing bracket.

**Caravan to Towing Vehicle Weight Ratio:**
The towing vehicle to caravan weight ratio can be determined by calculation and is equal to:

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

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 and Vehicles [Construction and Use] Regulations 1986).

**Power to weight ratio:**
No hard and fast rules can be stated but, here is a general guide.

(a) Conventional petrol engines with a capacity up to approximately 1500 cc should be adequate for towing a caravan weighing around 85% of the kerb weight of the towing vehicle.

(b) Above 1500 cc 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 Code

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

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

**Mass in Running Order:**
Caravanners can use a public weighbridge to establish the mass in running order.

**Note:** Weighbridges have varying weight tolerance levels.

**Maximum Permissible Towing Mass:**
The weight defined by the vehicle manufacturer as being the maximum that the vehicle is designed to tow.

**Train Weight (Combination Weight):**
The maximum combined weight of the towing vehicle and trailer combination as specified by the towing vehicle manufacturer.

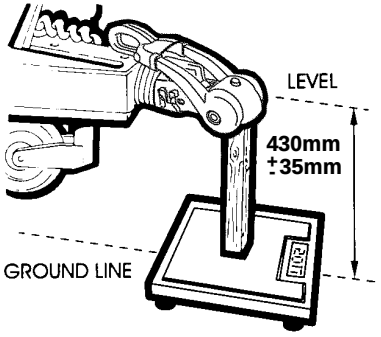



**Fig. A Measuring Noseweight**

## MEASUREMENT OF NOSEWEIGHT

Noseweight may be measured using a propriety brand of noseweight indicator.

Such equipment is obtainable at your Caravan Dealer.

**Note:** These indicators have a varying tolerance level.

Another simple method is to use bathroom scales under the coupling head with a piece of wood, fitted between the coupling head and the scales, of such length that the caravan floor is horizontal with the jockey wheel raised clear of the ground. (Fig. A)

Noseweight can be adjusted simply by distribution of weights in the caravan.

Always lower jockey wheel before entering the caravan and then raise before measuring again. (See **Loading**).

**Note:** The height of the towball on the towing vehicle, when laden, is also critical.

**WARNING: Do not lift the coupling head by hand when hitching the caravan to the car. Always raise and lower the coupling head by winding the handle on the jockey wheel up and down.**

## TYPE OF DRIVING LICENCE HELD

In order to be able to tow a caravan a driver must hold a Category B licence. Those car drivers who passed their tests prior to 1 January 1997 would have automatically obtained Category B+E. However, anyone who passed their test after 1 january 1997 will need to take a further test in order to obtain a Category B+E if they wish to tow a car and caravan combination whose train weight exceeds 3,500kg, or up to 4,250 if the caravan is less than 750kg or if the caravan's Maximum Technically Permissible Laden Mass exceeds the unladen weight of the car.

**Note:** The unladen weight of a car is normally less than the kerbside weight.

## GLOSSARY & CHECKLIST

**Awnings** - Can consist of just a simple top sheet but may extend to a five sided frame tent attached to the side of the caravan.

**Fire blanket** - approved to BS 6575 is ideal for dealing with 'fat pan' fires.

**Fire extinguisher** - It is strongly recommended that a fire extinguisher is carried in the caravan. (For suitable types see **Safety and Security**).

**Gas bottles** - Bottled L.P. gas is the most convenient portable source of fuel. Two bottles are required for a constant supply. An initial deposit is payable on each cylinder. We recommend the use of 5kg or 6kg Propane or 7kg Butane bottles. One position for use and one for storage only. (For detailed information see **Services - Gas**).

**Jack** - A suitable jack is essential (screw, scissor, side mounted or air jack type). Many car jacks are unsuitable.

**Levellers** - Levellers help level the caravan from side to side before unhitching. Proprietary products can be purchased from your caravan dealer and need to be positioned as indicated by a spirit level.

**Spare Wheel** - It is always advisable to carry a spare wheel with your caravan.

**Spirit Level** -A spirit level is extremely useful when siting the caravan.

**Stabiliser** -Stabilisers help to dampen the side to side movement of the caravan. One end fits to the car's towing bracket and the other end to the caravan. (See **Stability**)

**Torque Wrench** - A torque wrench is the only way that the exact recommended torque can be achieved for wheel nuts and bolts. (See **Preparing for the Road**).

**Towing Bracket** - Never use cheap alternatives, obtain one manufactured by a reputable company complying with the relevant standards.

Any light passenger vehicle registered in the UK on or after August 1st 1998 (S registered plate) will require a type approved towbar and towball (to 94/20/EC). Failure to fit a homologated towbar and towball could result in a prosecution and invalidation of your insurance cover. Always check with your car manufacturer or towbar manufacturer if in doubt.

**Wooden Blocks** - Wooden blocks typically 25cm. square and 2cm. thick are ideal for placing under corner steadies and jockey wheel when the ground is uneven or soft.

**Water Containers** - Two containers are required, one to carry fresh water to the caravan and one for waste water, which needs to be disposed of properly. Several types are available including jerry cans, folding cans and wheeled containers.

**12N & 12S Sockets** - Two sockets designated 12N and 12S are fitted to your car to accept corresponding plugs from the caravan. These are necessary to energise the road lights and caravan auxiliary circuits respectively.

**13 Pin Sockets (alternative to 12N & 12S)** - One socket fitted to the car this energise the Road lights and caravan auxiliary circuits.

**12 Volt Battery** - A deep cycling, heavy duty rechargeable leisure type battery should be purchased to provide back-up power for lights and other electrical appliances. (See **Battery**). The securing arrangements for the battery compartment require a leisure battery complying with EN 60095-2 in particular those with ledges for fastening to the lower edge of the long sides and having a maximum height of 190mm and width of 175mm.

**WARNING: Your caravan dealer should be consulted if additional equipment is to be fitted as strong points may or may not be provided in the design.**

**Note:** Fitting additional equipment will reduce the caravan allowable payload.

**Useful memory aid for other items.**

**Car**
- Distilled water
- External mirrors
- Fan belt
- Fire extinguisher
- Jack
- Jump leads
- Petrol can
- Socket set
- Spare bulbs
- Spare keys
- Spare wheel
- Tool kit
- Towball cover
- Tow rope
- Tyre pressure gauge
- Warning triangle
- Tyre Pump

**Caravan**
- Awning pegs and poles
- Awning ground sheet
- Battery 12 volt charger
- Bucket
- Corner steady brace
- Corner steady pads
- Coupling lock
- Door mat
- Fire blanket
- Fire extinguisher
- Fresh water container
- Gas cylinder
- Gas regulator
- Jack
- Levelling boards
- Mallet
- Site/caravan mains lead
- Spare bulbs (Mandatory in E.C.)
- Spare 12v fuses
- Spare gas hose
- Spare wheel
- Spirit level
- Toilet fluid
- Waste water container
- Wheel brace

**Personal**
- After sun cream
- First Aid Kit
- Flannels
- Hairbrush and comb
- Make up. etc.
- Raincoats
- Toothbrush
- Toothpaste
- Scissors
- Shampoo
- Shaving kit
- Shoe cleaning kit
- Soap
- Sun tan oil
- Wellington boots

**Domestic**
- Adhesive tape
- Air freshener
- Aluminium foil
- Ashtrays
- Bin liners
- Binoculars
- Bottle opener
- Breadboard
- Breadbin
- Brush and dustpan
- Butter dish
- Camera and films
- Carving knife
- Cassette recorder
- Chairs
- Clock
- Clothes brush
- Clothes line
- Coat hangers
- Coffee percolator
- Coolbox
- Colander
- Crockery
- Cruet
- Corkscrew
- Cutlery
- Dish cloth and brush
- Dusters and polish
- Disposable cloths
- Egg cups
- Electrical extension lead
- Floor cloth
- Fly spray
- Food
- Food mixer
- Frying pan
- Glasses
- Grill pan
- Jugs
- Kettle
- Kitchen roll
- Kitchen tools
- Litter bin
- Matches
- Measuring jug
- Milk jug
- Mixing bowl
- Needles and thread
- Oven gloves
- Pegs
- Piezo Gas lighter
- Potato peeler
- Pressure cooker
- Radio
- Rubbish bin
- Salad shaker
- Saucepans
- Scissors
- Sieve
- Sugar bowl
- Shopping bags
- Sleeping bags
- Tea pot
- Tea strainer
- Tea towels
- Table cloths
- Table mats
- Television
- Tin opener
- Tissues
- Toilet paper
- Torch
- Towels
- Toys & Games
- Vacuum cleaner
- Washing up bowl

**Documents**
- Bail Bonds (some Euro countries)
- Bank and credit cards
- Caravan Certificate
- Cheque book
- CRIS document
- Driving licence
- Green Card Insurance (some Euro countries)
- Maps and guides
- Money
- MOT Certificate
- Vehicle Registration Documents

# The Towing Code

## PREPARING FOR THE ROAD

**PRE-LOAD CHECKLIST**
**Caution: Never enter the caravan without first lowering the four corner steadies with the brace provided.**

**BEFORE LOADING CHECK:**

- loose articles are stowed securely. Do not stow tins, bottles or heavy items in overhead lockers prior to towing.
- all lockers and cupboard doors are closed and secured.
- all bunks are secure.
- all rooflights are closed and secured.
- main table is stored in its transit position.
- fridge is on 12V operation and door lock is set.
- all windows are fully closed and latched. Never tow with windows on night setting. Leave all curtains and blinds open to aid rear visibility.
- gas cylinders are correctly positioned, secured and turned off.
- battery is secure and mains connecting cable is disconnected and stowed.
- 12V distribution panel selector switch is set to the van position.

**WARNING: The fridge will only operate in transit when the 12V distribution panel selector switch is in the 'VAN' position.**

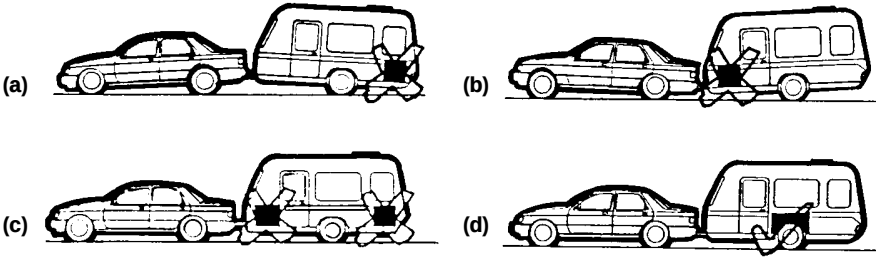



**Fig. A Loading your caravan**

**WARNING: Turn off gas appliances except those heating appliances designed to function while the vehicle is in motion.**

**WARNING: Do not travel with televisions or microwaves in overhead lockers unless the appliance was supplied fitted to your caravan by the manufacturer.**

**LOADING AND DISTRIBUTION OF WEIGHT IN THE CARAVAN**
Do not exceed recommended maximum loading for your caravan.

1. Load heavy items low down near the floor and mainly over or just in front of the axle(s) (Fig. A).
2. Load evenly right to left so that each caravan wheel carries approximately the same weight.
3. Do not load items at the extreme front or rear since this can lead to instability due to the 'pendulum effect'.
4. Load remainder to give a suitable noseweight at the towing coupling.

   Check noseweight.

**Note:** Do not overload car boot.

**Note:** Please take care to ensure that you have allowed for the masses of all items you intend to carry in the caravan.

**WARNING: All heavy and/or voluminous items (e.g. TV, radio etc) must be stored securely before travelling.**

**Sensible Loading:**
How to apportion it

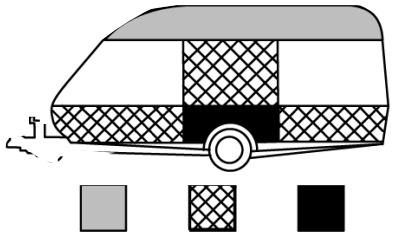



**Fig. A**

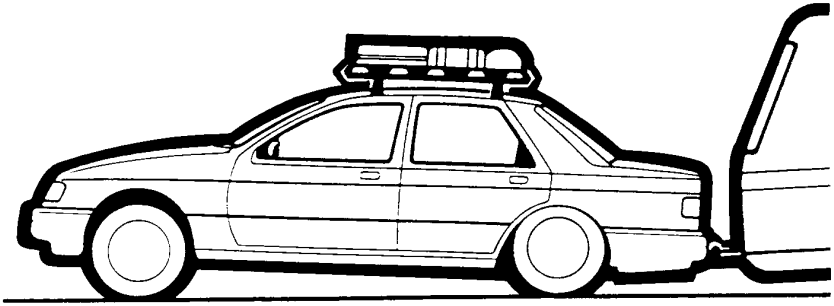


**Fig. B Illustration of excessive deflection of vehicle's rear suspension**

**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. (Fig. B)

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 a 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 you have any doubts about the suitability of your towbar for towing a caravan consult the towing bracket manufacturer.

DO NOT exceed the:

- Gross Vehicle Mass (G.V.M. on car plate).
- Maximum Technically Permissible Laden Mass (M.T.P.L.M.) on the caravan.
- Gross Vehicle Combination Mass (Train Weight) (G.V.C.M. on car plate).
- Maximum Permissible Towing Mass.
- Vertical Static Load on the caravan coupling.
- Maximum Vertical Load on the car towball as specified by towing vehicle manufacturer.

**STABILITY**
All our models are of a well balanced design and should be exceptionally good towers. Most models have an AL-KO stabiliser fitted as standard. The common causes of poor stability include:

(a) Worn springs or loose spring fixings on the towing vehicle.

(b) Towing vehicle springs too soft.

(c) Insufficient noseweight.

(d) Nose of caravan is towing too high.

# The Towing Code

**Galvanised steel chassis**
Drilling of the galvanised steel chassis will invalidate the warranty and must not be done.

**Towball**
The AL-KO stabiliser is designed to be used with a swan neck, fixed or detachable towball. If you use a 'bolt on type' towball you may need to replace your towball with a special extended neck towball.

If you have a bolt on type towball you should ask your dealer to check clearance around the towball to allow for the stabiliser to articulate.

The AL-KO extended neck towball (available from your dealer) is approved and marked with the approval number EC94/20. Failure to provide enough clearance around the towball may invalidate your stabiliser warranty.

**AK160 coupling head**
If your caravan is fitted with an AK160 coupling head the Towball must be lightly greased.

**Stabiliser friction pads**
The AL-KO stabiliser uses 'friction pads' inside the coupling head to clamp the towball. These pads must be kept free from grease and contamination from the towball. The friction pads should last approximately 50,000km (30,000 miles) under normal use, if correctly maintained.

**Suitable towing vehicles**
The caravan is manufactured for towing behind normal road cars and is not suitable for towing behind commercial vehicles. It is strongly recommended that whenever a caravan is to be towed over rough terrain, e.g. a farmer's field or track, great care should be taken to ensure that no undue stress is placed upon the caravan via the hitch mounting, i.e. reduce speed. If in doubt, please consult the chassis manufacturer and the towing vehicle manufacturer who will advise. Touring caravans based on standard AL-KO chassis can be towed by four wheel drive off road leisure vehicles providing the unit is used to tow in a like manner to a conventional road-going car and driven in the same considered manner.

Towbar manufacturers should be consulted before towing an uncompensated twin axle caravan.

**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.

**Causes:**
i) Unsuitable or unbalanced outfit.
ii) Incorrect loading or weight distribution.
iii) Excessive speed especially downhill.
iv) Side winds.
v) Overtaking.
vi) Being overtaken by a large fast moving vehicle.
vii) Erratic driving.
viii) Insufficient tyre pressures.
ix) Mixing radial and cross ply tyres.

**Cures:**
Cases of persistent snaking can be alleviated by the use of a stabiliser.

**On the road**
If you do find your outfit snaking, try to keep the steering wheel in a central position as far as possible, decelerate and avoid braking if possible.

**Types of tyres fitted**
The original tyres fitted by the manufacturer are suitable for towing at maximum speed of up to 81 mph (130 kph).

## TYRES

Caravan manufacturers choose the type, size, profile, load carrying capacities and speed ratings to match the design masses of there vehicles, adjusting the tyre pressures to suit. Only change the type of tyres on your caravan on expert advice from the caravan manufacturer, or tyre manufacturer.

**TYRE MAINTENANCE**

**Tread depth**

Pay special attention to the amount of tread remaining on your tyres, and measure them regularly. Always replace tyres before they reach the minimum legal limit of 1.6mm.

Periodically tyres should be rotated to equalise wear in the same manner as car tyres.

**Pressures**

The caravan manufacturers plate (fixed adjacent to exterior door) and Technical handbook contains information about caravan loading and the required adjustments to tyre pressures, which should be followed for safety. Tyre pressures should always be checked and corrected prior to each journey. It is vital that tyre pressures are maintained at the levels recommended by the manufacturer to ensure maximum tyre life, safety and handling characteristics.

Over or under-inflating tyre is likely to seriously impair their performance and may prejudice the safe use of the vehicle.

Over-inflation increases overall tyre diameter, decreases the amount of tread in contact with the road, decreases sidewall flexibility and affects road-adhesion.

Under-inflation decreases overall tyre diameter, increases sidewall flexing, generates higher tyre operating temperatures and difficult vehicle handling characteristics. Running an under-inflated tyre may cause premature tyre failure. Both over and under-inflation adversely affect tyre life.

**Treads**

Keep tyre treads clean of stones and other foreign bodies, and check regularly for damage to the tread and sidewalls. It is vitally important that any damage is checked out by a tyre expert and any necessary repairs or replacements are carried out immediately.

**Tyre valves**

Check tyre valves carefully. Ensure the caps are in place free from dirt/ debris and that there is no evidence of cracking or damage to the valve stem

**Tyre Aging**

Rubber compounds used in tyres contain chemicals that help to slow down the natural aging process of untreated rubber. However, tyres do deteriorate with age, which increases the risk of tyre failure, and there are many ways in which this can be spotted:

- Cracking/crazing on the side wall of the tyre, caused by its flexing
- Distortion of tyre tread
- Deformation of the carcass of the tyre

There will also be a deterioration of the ride quality caused by vibrations through the tyre. This may signify the tyres performance has been affected by age and should be investigated as soon as possible

**IT IS RECOMMENDED THAT TYRES ARE REPLACED AFTER 5 YEARS SERVICE INCLUDING THE SPARE.**

Tyres that display signs of aging should be removed and not put to further use.

The effects of aging can be brought about prematurely in several conditions. Tyres fitted as spare wheels may age prematurely. If tyres on caravans are not in regular use they should be inspected before every journey, several cleaning products may also harm the chemicals in the rubber. However, the age of a tyre will affect its safety and increase the risk of failure, and you should inspect tyres for the signs of aging regularly.

**THE TYRE LAW**

**Tyre pressures**

Tyre pressures should be maintained at or within a very close tolerance of the recommended pressures.

**Tyre tread depth and damage**

When tyres become worn or damaged they must be replaced. There must by law, be at least 1.6mm of tread depth across the centre 3/4 of the width of the tread throughout the entire circumference of the tyre. There must be no damage to the tyre body - sidewalls or tread, no bulges or cuts.

**Tyre types**

It is illegal to mix tyres of a different construction on the same axle.

# The Towing Code

**Note:** Although the caravan may be fitted with the same type of tyre as the towing vehicle, the pressures specified are different. All charts show values for cars and are therefore not applicable for caravans. Pressures displayed on tyre walls apply ONLY in North America and Canada.

**Wheels**
Caravan wheel bolts should be tightened to a torque of 88Nm (65lb/ft) on steel wheels or 115Nm (85lb/ft) on alloy wheels and should be checked with the use of a torque wrench regularly. Only use a spare wheel and tyre of the type and size provided with you caravan.

**Wheel rims**
Both steel and Alloy wheel rims are the 5.5J size incorporating a double safety hump which conforms to European safety standards.

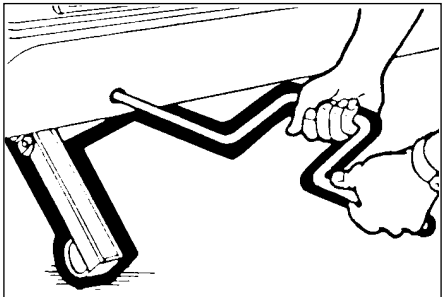


**Fig. A Winding Corner Steady**

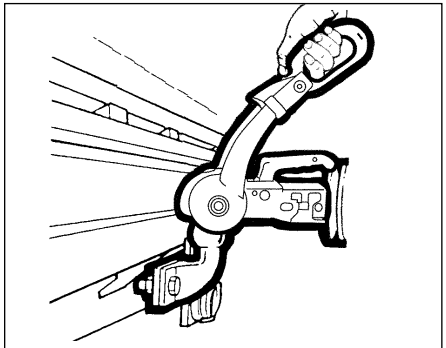


**Fig. B Safety Catch and Handle**

If in any doubt, have your wheels checked by a competent tyre supplier.

**Hitch head load capacity**
The maximum vertical static load which can be put upon the hitch head when connected is 100kg. Please refer to the technical data in your handbook.

(But see also vehicle manufacturer's weight limits on towball loading.)

**PRE-TOW CHECKLIST AND HITCH-UP FOR AK 3004 STABILISER**

Check Gas Locker, Battery Locker and Cassette Toilet doors are secure.

Check wheelnuts, tyre pressures and tyre conditions.

Fully raise all four corner steadies. (Fig. A).

Pick up any levelling pads or levelling boards.

Check rooflights/vents are securely closed.

Switch off gas supply and change over to electricity if required.

Lock the caravan exterior door.

An assistant can help in the hitching operation by standing on the left hand side of the drawbar (facing rear of car) and extending an arm horizontally to indicate position of the coupling. When reversing aim the towball of the car directly at the caravan drawbar. Remove towball cover and keep in car.

Adjust the jockey wheel to ensure the cup is high enough to slide over the towball.

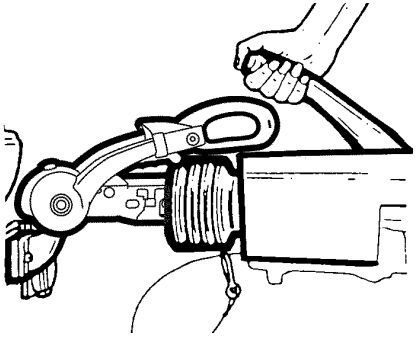


**Fig. A Handbrake**

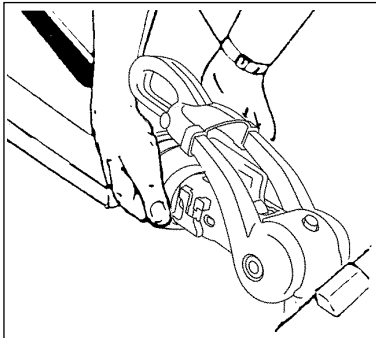


**Fig. B Checking Secure Attachment**

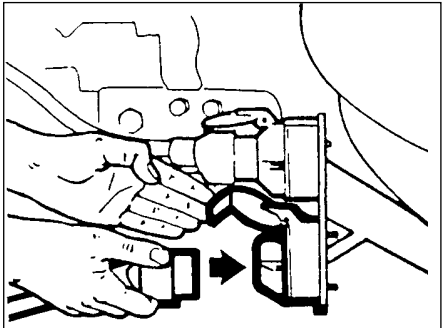


**Fig. C Connections - 7 pin Plug**

Release caravan handbrake.

Position cup over the ungreased towball, release and lift forward the large red stabiliser handle (Fig. B) lift forward the exposed smaller black handle (Fig. B) until it clicks up.

The hitch head is fitted with a visual indicator to show whether or not it is properly connected to the towball. A green band will show immediately below the red indicator button on the hitch head when a proper connection has been made. (See Fig. D)

**WARNING: If the green band is showing when the hitch head is not connected to the towball there is a fault - contact your Dealer.**

Adjust jockey wheel to lower cup on to the ball. A click indicates it is fully engaged. Ensure black handle has returned to its free position.

Secure caravan handbrake. (Fig. A)

Connect breakaway cable as described on page 27.

Ensure that the jockey wheel is fully wound up and properly located in the slots, then release the clamp handle, lift the whole unit as high as possible and retighten the clamp handle.

**Note:** Ensure jockey wheel locates in recess provided. Carelessness could result in damage to the A frame cover.

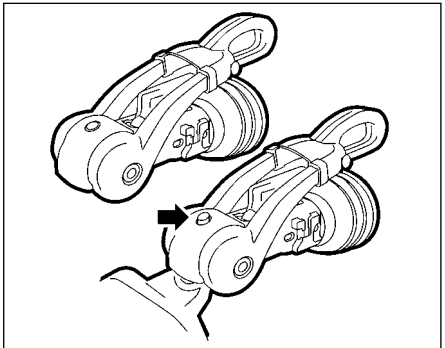


**Fig. D Hitch Head Visual Indicator**

# The Towing Code

Take hold of the caravan under the rubber gaiter behind the coupling and lift to ascertain whether the caravan is properly attached. (Figs. B & D.)

Ensure the hitch is secured by checking the visual indicator (see page 23).

Connect 7 pin plugs to car sockets ensuring there is enough loose cable for cornering, (Fig. C) ensuring they wont drag on the ground.

Check all car and caravan roadlights are working. Check round the caravan for anything left behind.

Release caravan handbrake, adjust all mirrors from driving seat and proceed.

**PRE-TOW CHECKLIST AND HITCH-UP FOR AK 160 COUPLING HEAD**

Check Gas Locker, Battery Locker (if fitted) and Cassette Toilet (if fitted) door/s are secure.

Check wheelnuts, tyre pressures and tyre conditions.

Fully raise all four corner steadies. (Fig. A, Page 22).

Pick up any levelling pads or levelling boards.

Check rooflights/vents are securely closed.

Switch off gas supply and change over to electricity if required.

Lock the caravan exterior door.

An assistant can help in the hitching operation by standing on the left hand side of the drawbar (facing rear of car) and extending an arm horizontally to indicate position of the coupling. When reversing aim the towball of the car directly at the caravan drawbar. Remove towball cover and keep in car.

Adjust the jockey wheel to ensure the cup is high enough to slide over the towball.

Release caravan handbrake.

Position cup over greased towball, release safety catch and lift handle (Fig. B). The hitch head is fitted with a visual indicator to show whether or not it is properly connected to the towball. A green band will show immediately below the red indicator button on the hitch head when a proper connection has been made. (See Fig. D, Page 23)

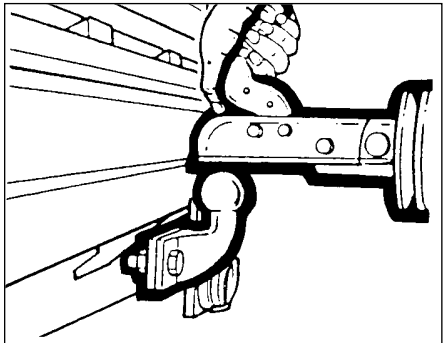


**Fig. B Safety Catch and Handle**

**WARNING: Serious damage will occur unless the locking button is depressed first and the handle lifted forward before the caravan is lowered manually. This prevents the noseweight being transmitted through the locking button.**

**WARNING: If the green band is showing when the hitch head is not connected to the towball there is a fault - contact your Dealer.**

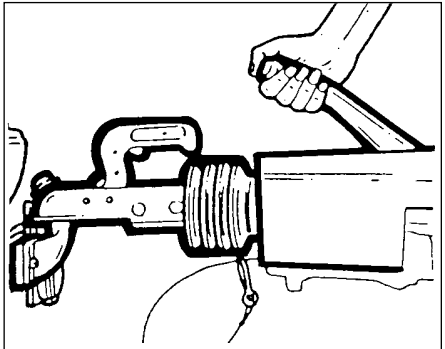


**Fig. A Handbrake**

Adjust jockey wheel to lower cup on to the ball. A click indicates it is fully engaged. Ensure locking button has returned to its free position.

Secure caravan handbrake. (Fig. A)

Connect breakaway cable (emergency braking device) in the form of a noose to suitable anchorage point on towbar. DO NOT attach to towball. (See page 27)

Ensure that the jockey wheel is fully wound up and properly located in the slots, then release the clamp handle, lift the whole unit as high as possible and retighten the clamp handle.

**Note:** Ensure jockey wheel locates in recess provided. Carelessness could result in damage to the A frame cover.

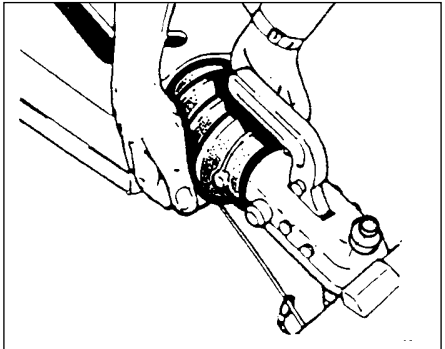


**Fig. B Checking Secure Attachment**

Take hold of the caravan under the rubber gaiter behind the coupling and lift to ascertain whether the caravan is properly attached. (Figs. B & D.)

Lock hitch if possible (see Safety and Security, page 36).

Connect 7 pin plugs to car sockets ensuring there is enough loose cable for cornering. (Fig. C, Page 23)

Check all car and caravan roadlights are working. Check round the caravan for anything left behind.

Release caravan handbrake, adjust all mirrors from driving seat and proceed.

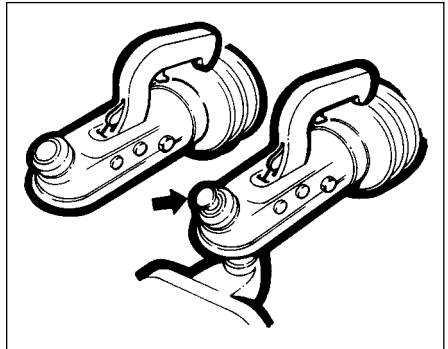


**Fig. D Hitch Head Visual Indicator**

# The Towing Code

**ROAD LIGHTING**

For your information the wiring diagram of the 12N and 12S connectors is shown opposite. These should be checked regularly and if in any doubt consult a qualified electrician.

For cars equipped with 12N/12S sockets, an adaptor may be required when a 13 pin plug is fitted to the caravan. If so consult your dealer or qualified electrician.

The wiring diagram of the 13 pin connectors is shown opposite. This should be checked regularly and if in any doubt a qualified electrician consulted.

For cars equipped with 13 pin sockets, an adaptor may be required if the caravan is fitted with a 12N AND 12S plug fitted to the caravan. If so consult your dealer or qualified electrician.

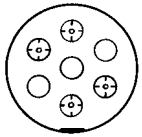
The wiring allocations were changed in 1998 and it is important that you check the car to caravan connections are compatible prior to coupling up to the car.

**WARNING: Always disconnect the electrical connector between the towing vehicle and the caravan before connecting a low voltage supply to the caravan (mains) and before charging the battery (EN 1648-1).**

- All road lights must be in working order.
- Lenses and reflectors must be in good condition

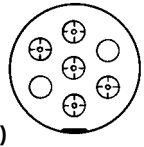
## 12N AND 12S VIEWED FROM REAR OF PLUG

TUBES ○
PINS ⊕
PINS ●
STRIPS )



### 12N (BLACK)

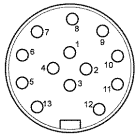
| TERMINAL | COLOUR | 12N PLUG |
|---|---|---|
| 1 | YELLOW | L/H INDICATOR |
| 2 | BLUE | REAR FOG LAMP |
| 3 | WHITE | COMMON RETURN (1-7) |
| 4 | GREEN | R/H INDICATOR |
| 5 | BROWN | R/H SIDE TAIL & No PLATE LIGHT |
| 6 | RED | STOP LAMP |
| 7 | BLACK | L/H SIDE TAIL & No PLATE LIGHT |



### 12S (GREY)

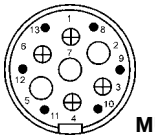
| TERMINAL | COLOUR | 12S PLUG |
|---|---|---|
| 1 | YELLOW | REVERSING LIGHT |
| 2 | BLUE | NO ALLOCATION |
| 3 | WHITE | NEGATIVE PIN 4 |
| 4 | GREEN | CONTINUOUS POWER SUPPLY |
| 5 | BROWN | NO ALLOCATION |
| 6 | RED | FRIDGE |
| 7 | BLACK | RETURN FOR FRIDGE |

## VOLTA/JEAGER & MULTICON FEDER 13 PIN PLUGS (viewed from rear)

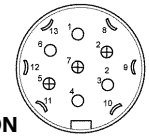


### VOLTA/JEAGER

| PIN NO | COLOUR | DESCRIPTION |
|---|---|---|
| 1 | YELLOW | LEFT FLASHER |
| 2 | BLUE | FOG HAZARD LIGHT |
| 3 | WHITE | EARTH FOR 1-8 |
| 4 | GREEN | RIGHT FLASHER |
| 5 | BROWN | RIGHT TAIL LIGHT |
| 6 | RED | STOP LIGHTS |
| 7 | BLACK | LEFT TAIL LIGHT |
| 8 | ORANGE | REVERSE LIGHTS |
| 9 | BROWN/BLUE | CAR + |
| 10 | BROWN/RED | FRIDGE |
| 11 | WHITE/BLACK | EARTH FOR 10 |
| 12 | | NOT YET ALLOCATED |
| 13 | WHITE/GREEN | EARTH FOR 9 |



### WEST



### MULTICON FEDER 13K

| PIN NO | COLOUR | DESCRIPTION |
|---|---|---|
| 1 | YELLOW | LEFT FLASHER |
| 2 | BLUE | FOG HAZARD LIGHT |
| 3 | WHITE | EARTH FOR 1-8 |
| 4 | GREEN | RIGHT FLASHER |
| 5 | BROWN | RIGHT TAIL LIGHT |
| 6 | RED | STOP LIGHTS |
| 7 | BLACK | LEFT TAIL LIGHT |
| 8 | ORANGE | REVERSE LIGHTS |
| 9 | BROWN/BLUE | CAR + |
| 10 | BROWN/RED | FRIDGE |
| 11 | WHITE/BLACK | EARTH FOR 10 |
| 12 | | NOT YET ALLOCATED |
| 13 | WHITE/GREEN | EARTH FOR 9 |

- Bulbs must be of correct wattage for the application (see Service handbook).

**WARNING: Do not cause any road lighting to be obscured by the addition of any options or accessories to your caravan.**

**PASSENGERS**
Passengers are forbidden to ride in a caravan.

**BREAKAWAY CABLES**
UK law requires that all caravans are fitted with a safety device to provide protection in the unlikely event of separation of the main coupling while in motion. A device referred to as a 'breakaway cable' fulfils this requirement and when fitted as on your caravan is mandatory.

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

**Identification**
A thin steel cable with a red plastic coating fitted with a means of attachment for connection to the towing vehicle. Located directly beneath the coupling head.

**Operation**
In the event of the main coupling of the caravan separating from the towing vehicle, the cable should be able to pull tight,

without any hindrance, engaging the caravan brakes. **The breakaway cable should not become taut during normal use.**

**Correct procedure for use**
Regularly check the cable and clip for damage. If in doubt contact your Swift Group dealer.

Make sure the cable runs as straight as possible and goes through the cable guide fitted underneath the caravan coupling head.

Determine whether or not the towing vehicle towbar has a designated attachment point (i.e. a part specifically designated for a breakaway cable).

Where a point is designated on the towbar:

- Pass the cable through the attachment point and clip it back on itself (figure 1).
- Do not clip directly onto the designated point (figure 2) since the clip is not designed for use in this way.

Where there is no designated attachment point on the towbar:

- Fixed ball: Loop the cable around the neck of the towball in a single loop only. See figure 3A and 3B, Page 28.
- Detachable towball: You must seek guidance on procedure from the towing vehicle towbar manufacturer or supplier.

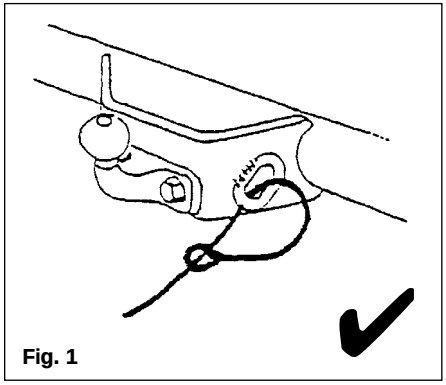


**Fig. 1**

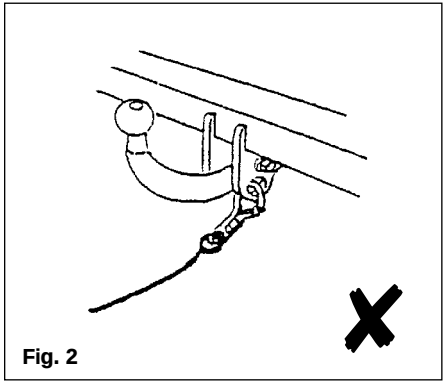


**Fig. 2**

# The Towing Code

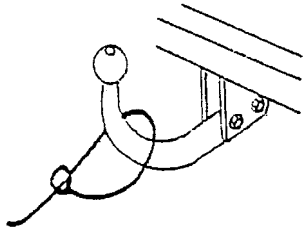


**Fig. 3A**

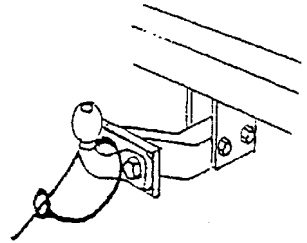


**Fig. 3B**

When the breakaway cable is attached, check to ensure:

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

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

c) that it is not slack and 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 caravan brakes prematurely.

Having followed this advice, should you feel that a satisfactory coupling arrangement cannot be achieved, consult your Swift Group dealer or towbar supplier.

**MIRRORS**

The driver of the towing vehicle must have an adequate view of the rear.

If there is no rear view through the caravan it is essential that additional exterior towing mirrors are fitted. This is mandatory in some European countries and drivers can face instant fines if extension mirrors are not fitted.

**Caution: Any rear view mirror must not project more than 200 mm outside:**

a) the width of the caravan when being towed.

b) the width of the towing vehicle when driven solo.

**Note:** Any rear view mirror fitted shall be ‘e’ marked and cover the field of view as stipulated by type approval requirements (Regulation 33 of the Road Vehicles [Construction and Use] Regulation 1986).

## MOVING OFF

Let the clutch in smoothly.

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

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

Change gears smoothly.

Try not to jerk the clutch.

## REVERSING

When the towing vehicle is reversing, the overrun device shaft is pushing in, applying the brakes via the overrun lever, brake rod system, bowden cables and the expander mechanism.

The backwards rotation of the brake drum causes the secondary brake shoe to collapse cancelling out the braking effect, allowing the trailer to move backwards. At the same time the transmission lever swings back and compensates for the entire travel.

When reversing up a slope or on a loose surface the brakes may apply themselves, Correct maintenance and set up of the brakes will help prevent this. Incorrect adjustment of the wheel brakes or Linkages will result in making reversing difficult.

Proficiency at reversing can only be achieved with practice and should be first attempted in a large open area (Fig. A).

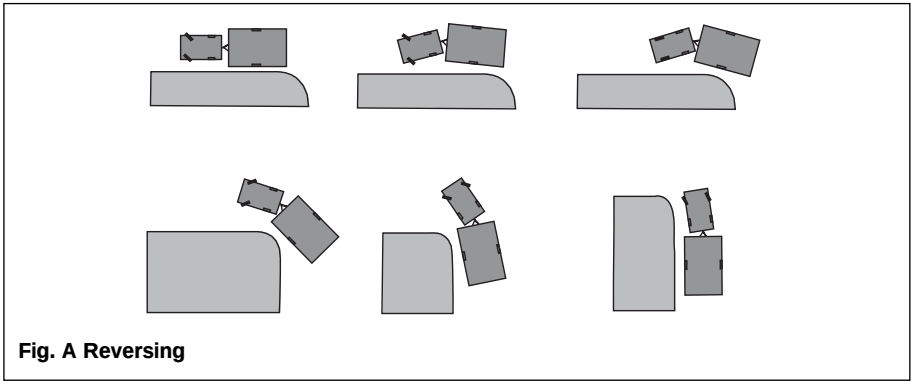


**Fig. A Reversing**

## SPEED LIMITS

**Normal road towing: 50mph**

**Motorways (including dual carriageways): 60mph**

## CARAVAN HANDLING

Allow for caravan being wider than car.

Do not bump kerb with caravan wheels.

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

Allow longer to get up speed to pass.

Allow for the outfit 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.

**WARNING: Take care not to foul or ground caravan chassis whilst traversing ramps or other obstacles.**

## IMPORTANT POINTS ESPECIALLY FOR MOTORWAY DRIVING

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

## ALKO SPARE WHEEL CARRIER TIPS

The caravan needs to be jacked to the maximum lifting height.

**NOTE: The side-lift jack has a maximum lifting height of 375mm and the scissor jack a maximum lifting height of 340mm.**

Ensure that the spare wheel fixing plate is moved along the telescopic arms so that the spare wheel sits as close to the inside of the chassis as possible.

Undo the small nuts and slide the side bracket along

Slide the bracket along and re-tighten nuts

This should be done without interfering with any pipe etc. that may be present on the underside of the vehicle.

- Providing the above two things are done, you should have ample clearance to remove the spare wheel.
- Customers should also ensure that the telescopic arms are kept well greased at all times to guarantee ease of operation.

*Problem:* Wheel does not clear chassis when withdrawn.

Ensure the correct wheel carrier is being used by referring to the Technical Data Sheet. If this is correct check the position of the wheel as above.

*IMPORTANT NOTE:* if it becomes necessary to completely remove the carrier from the chassis remember that the washers and split pins are on the inside of the chassis as well as the outside.

## CHANGING A WHEEL

1. Leave caravan hitched to towing vehicle and ensure handbrake is applied.
2. Lower corner steadies (as safety measure) on the side that the wheel is being changed to stabilise the caravan.
3. Use wheel brace to slacken off wheel nuts on the wheel to be changed.
4. Position jack under the axle at the appropriate jacking point (see fig. B)
5. Jack up the caravan until the wheel for removal is just off the ground.
6. Remove the wheel nuts, wheel trims and remove the wheel.
7. Fit spare wheel and reverse the above procedure.

   Ensure clean, dry mating surfaces and clean, dry bolt/nut sealing areas.
8. Tighten all five bolts, according to Fig. A, to 88Nm (65lb/ft) for steel wheels or 115Nm (85lb/ft) for alloy wheels using a torque wrench or have checked as soon as possible.

   Ensure the correct wheel fixings are used, as supplied with your caravan

**IMPORTANT**
When a wheel has been removed and replaced the torque of the wheel nuts should be re-checked after approximately 15 miles of running. (See 8 above).

**WHEEL BOLT TIGHTENING**

When refitting a wheel it is ESSENTIAL that the wheel bolts are tightened to the recommended torque figure and in the correct sequence.

The sequences necessary to correctly carry out this work on a 5 stud wheel is as follows:

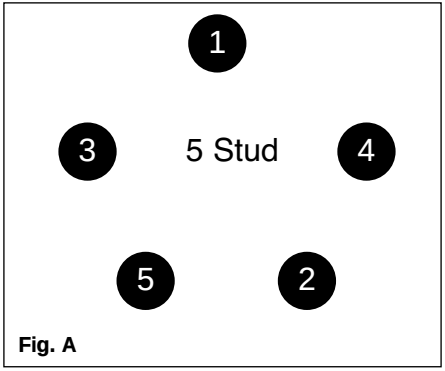



**Fig. A**

**Fig. B Side Lift Jack**

## JACKING POINTS

**WARNING: Only jack up your caravan when it is coupled up to the car with its handbrake applied and in 1st gear (engine off).**

Ensure that the jack is located in the correct position, i.e. on the jacking bracket on the chassis for the AL-KO side mounted jack (Fig.B). Alternatively the reinforced axle mounting plate can be used as an alternative but the chassis member itself MUST NEVER be used as a jacking point.

All caravans are provided with the facility to fit AL-KO side jacking points and although a scissor, trolley or bottle jack may be used, it is recommended that the side mounted AL-KO Jacking System should be used.

## STOPPING ON A HILL

Pulling off again can sometimes present a problem. The easy solution is

(i) Carry a good sized wedge shaped piece of wood with a rope or light chain attached.

(ii) Attach the other end of the rope to the nearside rear grab handle.

(iii) Place the wood behind the nearside caravan wheel.

(iv) Carefully reverse the car slightly back down the hill, the caravan will stop against the wedge and turn.

(v) Drive forward since this attempt to move up the hill will now not involve pulling the full weight of the caravan until the car has gained some traction.

## ARRIVAL ON SITE

**Note:** Check and observe site regulations.

### MANOEUVRING YOUR CARAVAN BY HAND

**Note:** Care must be taken when manoeuvring your caravan into position. Pressure placed on unsupported parts of front and rear GRP/ABS panels may cause surface damage cracks to appear “Use the grab handles provided”.

**1. Selecting a pitch**
Do not pitch in such a position that your outfit will obstruct others coming in.

Try to choose an area which 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.

**2. Levelling the caravan**
Levelling must be carried out in both directions in order for the refrigerator and other equipment to function correctly. This should be done before unhitching the caravan. Levelling boards (Fig. C) can be used to raise one side of the caravan by driving or reversing the caravan onto the boards. Apply the handbrake and chock the wheels.

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.

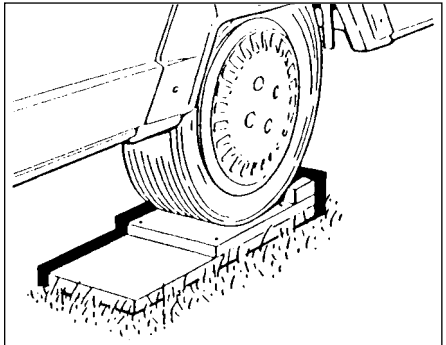


**Fig. C levelling Board**

**DO NOT use the steadies as a jack 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 so that the steadies do not take any undue strain.

**Exterior Door**
To prevent distortion of the body, the caravan must be always correctly sited and levelled. Failure to site the caravan correctly may prevent the exterior door from closing properly.

**3. Unhitching**
Apply the caravan handbrake.

Lower the jockey wheel to the ground.

Disconnect the breakaway cable and road lighting plugs.

**AKS3004**

Release the stabiliser by lifting the red handle. Then lift the exposed black handle forward until it clicks up, at the same time winding down the jockey wheel, to lift the caravan clear of the towing vehicle.

**AK160**

Operate the handle by depressing the locking button on the lever mechanism and lift the handle upwards and forwards, at the same time winding down the jockey wheel, to assist in lifting the caravan clear of the towing vehicle.

When this operation is complete, replace towball cover and secure the 12N+12S or 13 pin cables in their storage cup(s).

Park your vehicle alongside the caravan on the offside.

# SAFETY AND SECURITY

## FIRE

**Important:** Your attention is drawn to the notice affixed inside the caravan advising on fire precaution, ventilation and what to do in case of fire.

**IN CASE OF FIRE**

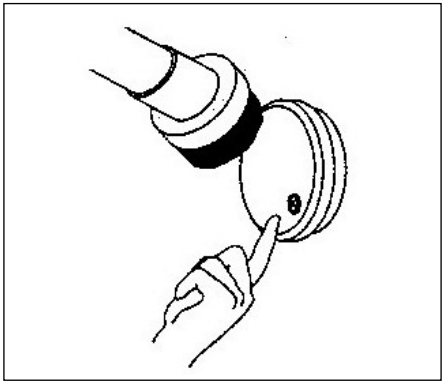
1. Get everyone out of the caravan as quickly as possible using whichever exit is the quickest, including windows. Do not stop to collect any personal items.
2. Raise the Alarm. Call the Fire Brigade.
3. Turn off the gas supply valve if it is safe to do so.
4. Turn off the electricity supply at supply point.

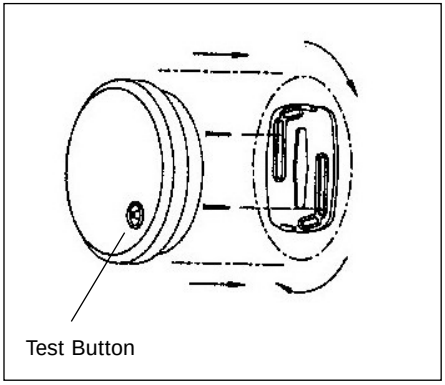
**SMOKE ALARM**

This is approved by The National Caravan Council. The NCC requires that all new or used holiday homes sold by its members are fitted with a smoke alarm featuring an alarm silence facility.

**Maintenance**

Test the smoke alarm every week, e.g. when doing the vacuuming, by pressing the test button for at least 10 seconds. The alarm signal is a penetrating, rapidly pulsating signal. The alarm sounds as long as the test button is pressed or there is smoke in the detector. When the alarm goes off, always check carefully to see that there is no fire and never remove the battery from the alarm except when changing it!






Always test the alarm immediately after a long period of absence. Under the test button, there is a red control lamp which twinkles once a minute. This shows that the battery is correctly connected. If the alarm does not sound when testing, the battery must be replaced. The alarm should be dusted and cleaned regularly with a slightly damp cloth. In connection with annual battery change or when required, e.g. false alarm, clean and vacuum the alarm carefully using a soft brush.

**Removing and Replacing the Alarm**

Carefully twist the alarm anti-clockwise.

Replace as diagram above.

**Battery Replacement**

The battery lasts approximately one year. About a month before the battery is completely flat, the alarm emits a short signal once a minute, this is the signal that the battery needs changing. The alarm works as normal during this time.

The battery should be 9 Volt batteries GP 1604,S,A, Eveready 522,216, Duracell MN1604. Always test the alarm after changing the battery.

**WARNING: Ensure that batteries are correctly installed. Positive terminal to positive contact (marked +), negative terminal to negative contact. Reversing a battery in its compartment will immediately drain the battery and could damage the smoke alarm.**

**WARNING: The electronic test button provides a full test of the unit's functionality. DO NOT try to test the alarm with a naked flame, as this may present a potential fire hazard.**

**WARNING: 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.**

**WARNING: Appliances such as cookers must not be used for heating.**

## CARBON MONOXIDE ALARM

**WHERE A CARBON MONOXIDE ALARM HAS BEEN FITTED, READ THE FULL USER INSTRUCTIONS PROVIDED WITH THE UNIT AS USER INSTRUCTIONS VARY.**

**What to do if the alarm sounds**

If the alarm sounds:
Call the emergency services.

Immediately move to fresh air-outdoors or by an open door/ window. Do a head count to check that all persons are accounted for? Do not re-enter the nor move away from the open door/ window until the emergency services have arrived and the vehicle has been aired out. The alarm returns to its normal condition.

Never restart the source of a CO problem until it has been fixed.

**NEVER IGNORE THE ALARM**

**NEVER REMOVE THE BATTERY WITHOUT REPLACING.**

**CO ALARMS DETERIATE WITH AGE AND MUST BE REPLACED NO LATER THAN EVERY 5 YEARS**

**CARBON MONOXIDE**

Known as the silent killer, Carbon Monoxide is an invisible, odourless and tasteless gas,

What are the symptoms of carbon monoxide poisoning?

Early symptoms of carbon monoxide (CO) poisoning can mimic many common ailments and may easily be confused with flu or simple tiredness. Symptoms to look out for include: tiredness, drowsiness, headaches, giddiness, nausea, vomiting, pains in the chest, breathlessness, stomach pains, erratic behaviour, visual problems.

**ANYONE WITH THESE SYMPTOMS SHOULD IMMEDIATELY TURN OFF ALL APPLIANCES AND SEEK MEDICAL ATTENTION.**

**MAINTAINANCE**

The alarm should be cleaned using a vacuum or soft brush.

No detergents should be used to clean the casing

**FIRE EXTINGUISHER**

It is recommended that a 1kg (2lb) minimum capacity dry powder fire extinguisher be carried inside your caravan at all times.

When using a dry powder extinguisher it is suggested that the caravan be evacuated until the powder has settled, to avoid inhalation.

A fat pan fire should not have a fire extinguisher aimed at it. It should be smothered with a fire blanket.

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

**ESCAPE PATHS**

It is important that you do not block escape paths to emergency exits with obstructions or hazards.

## CHILDREN

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

## VENTILATION

All caravans comply with BS EN 721. The ventilation points on your caravan are fixed points of ventilation which are required by the European Standards.

All caravans have ventilation at high level and low level which have been calculated to suit the individual needs of your caravan.

High level ventilation is achieved by means of the roof lights and washroom roof ventilators. The low level ventilators are positioned underneath the oven housing. Some models with sliding doors have two vents located underneath the sliding doors.

Under no circumstances must these vents be blocked or obstructed.

It is advised that fixed ventilation points are checked and cleaned (if necessary) on a regular basis using a small brush and a domestic vacuum cleaner.

Additional night time ventilation is obtained

**Fig. A Chassis Number**

by releasing the window catches and placing them in the second groove. Note the windows are not sealed from rain in this position.

As the ventilation levels are calculated to suit each models requirements there should be no modifications made which may result in reduced ventilation levels.

**WARNING: Do not obstruct ventilation.**

**Petrol/Diesel Fumes**

The fitting of a tail pipe to your car exhaust will reduce the possibility of fumes entering your caravan through the ventilation points.

**Note:** Never allow modification of electrical or LPG systems and appliances except by qualified persons at an authorised Swift Group dealership.

## SECURITY

**Caravan theft**

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

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

**Chassis number**

Record your caravan chassis number which can be found on the **front offside section of the drawbar (Fig. A) or any of the eye level windows.**

Make a note of this number in the space provided at the front of this handbook and make a separate note of the number to keep safe at home.

**Additional security**

Consider fitting any device which might deter or prevent intrusion by thieves.

A hitch lock cover prevents towing of the caravan.

A wheel lock prevents towing of the caravan and removal of the wheel.

Customers are advised to identify their caravan with a method for subsequent identification if other forms of identification have been altered or removed.

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

**Phantom satellite monitoring system**
Depending on model and specification, your caravan may be fitted with a Phantom Tracker security device. This device is fitted in a concealed location, and linked to the alarm within the caravan. No maintenance of the unit itself is required.

Should the device be activated by the alarm or other trigger, the system will alert a dedicated call centre. The call centre will then contact you via agreed telephone numbers, and if appropriate may request you to obtain a crime number from the local police force. The call centre will then directly with the police officer in charge in the relevant control centre to retrieve the caravan as quickly as possible.

It is important that separate documentation relating to the installation is reviewed when you receive your new caravan, to ensure that the device is properly registered and correct contact details are held by the call centre. Please be aware that an annual subscription charge is applicable to the continued use of the device and call centre, and that any change of ownership or contact details should be passed to Phantom without delay.

For reference the contact phone number for Phantom is 0800 1074663.

**NOTE: To ensure operation of the Tracker, a leisure battery in a good state of charge must remain connected to the caravan at all times.**

**SECURITY CHIPS**

A special security chip is concealed within the body of every caravan. This chip contains the individual identity of your caravan and can only be read by using a special decoder. Your local police can obtain the use of a decoder by contacting C.R.I.S. on telephone no: 01722 411430

**CARAVAN INSURANCE**

It is recommended that the caravan and its contents should be insured against theft.

It is essential to check with your car insurance company to ensure you are covered when towing your caravan.

**AL-KO SECURE IMMOBILISER**

The AL-KO immobiliser is fitted as standard on some models, optional on others. When fitted the 4 part kit specified below is supplied with your caravan. Your kit will contain : -

**Part A**
Box containing security components. consisting of:

- 1off High security locking bolt
- 1off High security locking bar socket key
- 1off Barrel lock
- 2off Barrel lock keys
- Instruction manuals in CD and paper format.
- Security registration card and reference number

**Part B**
Wheel specific insert assembly consisting of:

- Red coloured wheel insert lozenge assembled with the locking bar and circlip

**Part C**

- 1off Wheel spanner

**Part D**

- Kit bag.

# Safety & Security

**YOU MUST REGISTER YOUR KEY WITHIN ONE MONTH OF THE DATE OF PURCHASE. SHOULD YOU FAIL TO DO THIS, YOU WILL NOT BE ABLE TO ORDER A SPARE KEY!**

- Within your AL-KO kit will find an exclusive security number.
- Please register your card by telephoning 0870 7576788 or 0044 1926 818500.
- You will need to provide a password and provide an answer to a prompting security question.
- Make a note of your password and keep it in a safe place.
- Keep your registration card safe.
- Take your registration card with you when you are travelling with the caravan.
- Always keep your registration separate from the lock.

SAFETY INFORMATION

- Always secure the caravan against rolling away (chock or couple to a towing vehicle).
- Never leave Secure parts (key, adaptor, registration card) in the caravan.
- Always remove AL-KO Secure before moving the caravan.
- After any attempt of theft has been made on a locked AL-KO Secure, the caravan must be inspected at an AL-KO Approved Service Workshop.
- Always keep the key in a safe place.
- Keep the lock set and registration card separate from the key.
- The lock parts and key do not have a registration number, therefore keep the registration card in a safe place.
- Caravans with twin axles have two locks, keep each lock set in a separate place. The sets are not interchangeable!

**AL-KO OPERATING INSTRUCTIONS**

- READ THE AL-KO OPERATING INSTRUCTIONS AND ACT IN ACCORDANCE WITH THEM.
- INSTRUCTIONS FOR GENERAL USE.
- FOLLOW ALL SAFETY INSTRUCTIONS AS WELL AS THE WARNING INFORMATION.
- IT IS RECOMMENDED FOR EASE OF FIT THAT A SIDE-LIFT JACK BE USED.
- KEEP THE OPERATING INSTRUCTIONS

**THE AL-KO SIDE LIFT JACK**

(SUPPLIED AS STANDARD ON SPECIFIC MODELS ONLY)

The AL-KO Side Lift Jack has been specifically developed to aid the often difficult process of changing a wheel on caravans. It is suitable for fitment to the AL-KO chassis, from, appropriate bracket mounting holes have been pre-punched into the longitudinal members as standard.

**OPERATION**

To operate the jack, insert the metal Jack Collar into the lower edge of the bracket

# SERVICES

## WATER

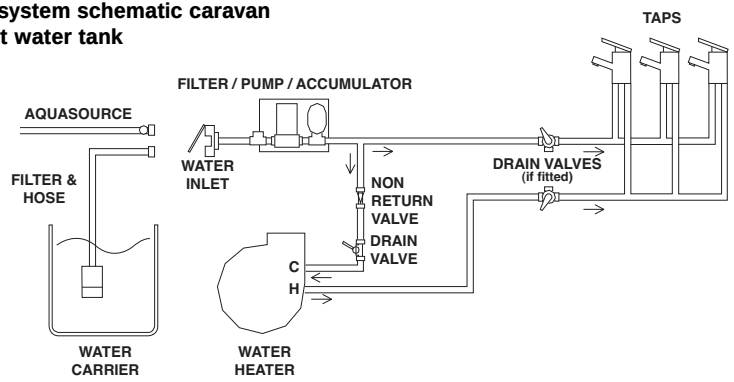
Connection of services is dealt with under the separate headings.

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

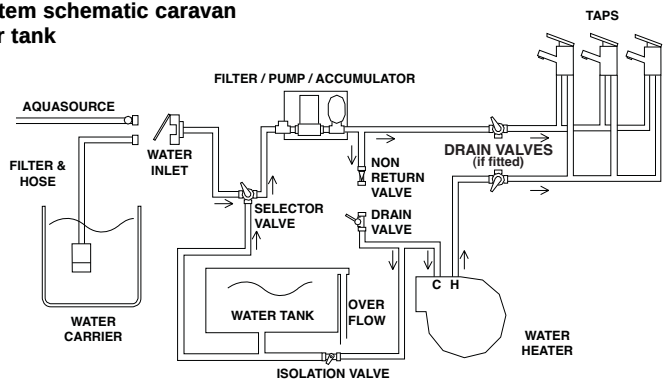
Advice and leaflets, if not supplied with the caravan, can be obtained from the suppliers of the equipment.

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

**Water system schematic caravan without water tank**




**Water system schematic caravan with water tank**

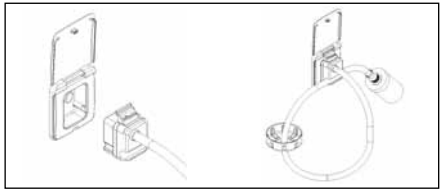


## WHALE FRESH WATER INLET (IF FITTED)

The hose and carbon filter assembly supplied with your caravan, is to be connected to the water inlet on the exterior of your caravan, to draw water from an external container.

Place carbon filter fitted to hose, into water container.

Insert plug into wall socket and close lid to lock plug in place (see image)



Adjust dust cover over water container opening. Please note dust cover cover should not be secured to water container as air must be allowed to enter container to replace water being drawn out.

Ensure drain valves in water system and at water heater are in closed positions (See page 40 for more detail)

Open one hot tap (kitchen sink) within caravan.

With 12V power available to appliances within the caravan, switch the pump 'ON/OFF' switch on the control panel to the 'ON' position.

Water will flow from the open tap after filling the water heater. This can take a few minutes if the heater is empty. The water may be at first grey in colour which is quite normal, the discolouration is due to harmless media being flushed out of the new filter cartridge.

When water is flowing smoothly close hot tap and open cold tap to expel any remaining air in the system. Repeat this at each tap / shower mixer in the caravan.

The system is now ready for use. Hose can be inserted into plug groove (see image) to keep filter off ground while refilling water container. Keep socket lid shut at all times when plug is removed.

When the caravan is left unattended or water supply has been allowed to empty, to prevent the pump running continuously (which can cause pump damage) turn the pump switch on the control panel to the 'OFF' position.

A pack containing two replacement filters (product code WF3000) is available. Filters will need to be replaced after filtering 3000 litres (approx. 33 days of normal use). These filters are not designed for removing bacteria and should not be used on water supplies of an unknown bacterial quality.

Take care to retain the o-ring seal when replacing filters.

## FLOJET AUTOMATIC WATER SYSTEM PUMP

### FEATURES

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

### SPECIFICATIONS

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

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

### OPERATION

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

**TROUBLESHOOTING**

**WARNING: BEFORE SERVICING PUMP, TURN OFF PUMP AND DRAIN WATER FROM SYSTEM!**

**Failure to prime**
**Motor operates, but no pump discharge**
Restricted intake or discharge line
Air leak in intake line
Debris in pump
Punctured pump diaphragm (pump leaks)
Crack in pump housing

**Motor fails to turn on**
Loose wiring connection
Pump circuit has no power
Blown fuse
Pressure switch failure
Defective motor

**Pulsating flow**
Restricted pump delivery. Check discharge lines, fittings and valves for clogging or undersizing

**Pump fails to turn off after all fixtures are closed**
Empty water tank
Insufficient voltage to pump (low battery)
Punctured pump diaphragm (pump leak)
Defective pressure switch

**Low flow and pressure**
Air leak at pump intake
Accumulation of debris inside pump and plumbing
Worn pump bearing (excessive noise)
Punctured pump diaphragm (pump leaks_
Defective motor

**SYSTEM CARE AND MAINTENANCE**
**Winterizing**

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

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

For specific winterizing and drainage procedures refer to page 49.

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

1. Drain the water tank (if fitted). Open tank drain valve. You may use the pump to drain the tank by opening all the faucets in the system. Allow the pump to operate until) the tank is empty. Do not operate the pump more than 15 minutes continuously
2. Open all faucets and purge the water from the plumbing system. Turn power to the pump off. Be sure that all the water from the drain lines are drained

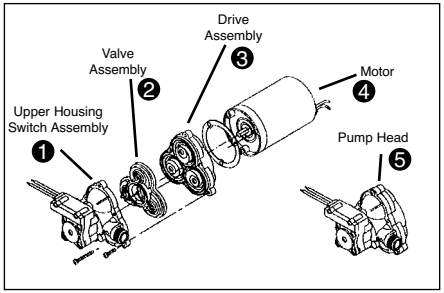
Remove quick connect inlet and outlet fittings from the pump and turn the pump on to pump out remaining water from the pump head. Be sure to have a catch pan or a rag under the pump to prevent water from spilling. Turn the pump off once the plumbing is empty. Leave the fittings disconnected from the pump until the system is ready to be used again. Make a note on your tank filler that the plumbing is not connected.

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

**Sanitizing**

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

## SHURE FLO PUMP AND ACCUMULATOR ASSEMBLY




## SHURFLO RV FRESH WATER PUMP

## INSTALLATION AND OPERATION

Shurflo's patented RV Fresh Water Pumps for drinking water were developed to delivery smooth, consistent flow at all ranges of operation, while drawing low current. The balanced diaphragm design incorporates precision ball bearings for long life. Each motor is equipped with an integral thermal breaker and all units are CE approved. RV fresh water pumps are enclosed to prevent incidental moisture from entering; however, they are not intended for environment where splashed water is present. When installed correctly, RV Fresh Water Pumps provide years of quiet operation.

**General Information**

Shurflo water pumps meet the essential health and safety requirements and are in conformity with the EU EMC directive 89/336/FEC as specified in EN 55014 (1993).

Shurflo realises that in many instances our pump is being installed as a replacement pump within an existing system. The following guidelines should be considered to achieve optimum pump operation.

**Mounting**

The pump can be at the same level or below the water tank. It may be positioned above the water tank if needed, as it is capable or a 6 ft. (1.8m) vertical prime. Horizontal inlet tubing will allow priming to 30 ft. (9m).

The pump should not be located in an area of less than one cubic foot (0.03m) unless adequate ventilation is provided. Excessive heat may trigger the integral thermal breaker and interrupt operation. When the temperature drops, the breaker will automatically reset and start the operation. The pump may be mounted in any position.

The mounting feet are intended to isolate the pump from the mounting surface; over tightening, flattening, or use of oversized screws will reduce the ability to isolate vibration/noise.

**Winterizing**

If water is allowed to freeze in the system, serious damage to the plumbing and the pump may occur. Failures of this type will void the warranty. The best guarantee against damage is to completely drain the water system. However, non-toxic antifreeze for fresh water, available at local RV centres, may be used.

**CAUTION: Do not use Automotive Antifreeze to winterize drinking water systems. Such solutions are highly toxic. Ingestion may cause serious injury or death. To properly drain the system perform the following:**

Drain the water tank. If the tank doesn't have a drain valve open all taps allowing the pump to operate (15min. ON. 15 min. OFF) until the tank is empty.

Open all the taps (including the lowest valve or drain in the plumbing) and allow the pump to purge the water from the plumbing, then turn the pump OFF.

Using a pan to catch the remaining water, remove the plumbing at the pump's inlet/outlet ports. Turn the pump ON, allowing it to operate until the water is expelled. Turn OFF power to the pump once the plumbing is emptied. DO not reconnect pump plumbing. Make a note at tank filler as a reminder: "Plumbing is Disconnected".

All taps must be left open to guard against any damage.

## TROUBLESHOOTING

Vibration induced by road conditions or transporting can cause plumbing or pump hardware to loosen. Check for system components that are loose.
Many symptoms can be resolved by simply tightening the hardware. Check the following items along with other particulars of your system.

**PUMP WILL NOT START/BLOWS CIRCUIT**

- Electrical connections, fuse or breaker, main switch and ground connection.
- Is the motor hot? Thermal breaker may have triggered; it will reset when cool.
- Is voltage present at the switch? Bypass the pressure switch. Does the pump operate?
- Charging System for correct voltage (±10%) and good ground.
- For an open or grounded circuit, or motor; or improved sized wire.
- For seized or locked diaphragm assembly (water frozen?).

**WILL NOT PRIME/SPUTTERS:**

(No discharge/motor runs)

- Is the strainer clogged with debris?
- Is there water in the tank, or has air collected in the hot water heater?
- Is the inlet tubing/plumbing sucking in air at plumbing connections (vacuum leak?)
- Is the inlet/outlet plumbing severely restricted or kinked?
- Proper voltage with the pump operating (±10%)
- For debris in pump inlet/outlet valves or swollen/dry valves
- Pump housing for cracks or loose drive assembly screws

**PUMP WILL NOT SHUT-OFF/RUNS WHEN TAP IS CLOSED:**

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

**NOISY OR ROUGH OPERATION:**

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

**RAPID CYCLING:**

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

**LEAKS FROM PUMP HEAD OR SWITCH:**

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

## LIMITED WARRANTY

Shurflo warrants its RV Duty Fresh Water Pumps to be free of defects in workmanship and materials under normal use, for two years beginning with the purchase date of the unit.

This warranty does not extend to any Shurflo products, which have been misapplied, improperly installed or altered outside the Shurflo factory.

**Accessories & Fittings**

Shurflo's warrants its accessories and fittings to be free of defects in workmanship and materials (under normal use) for one year beginning with the purchase date of the accessory or fitting.

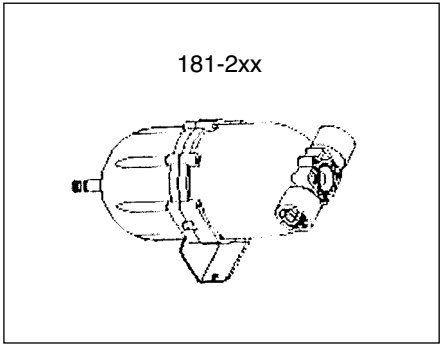
This warranty does not extend to any Shurflo products, which have been misapplied and/or improperly installed.

**All Products**

Shurflo is not responsible nor will it reimburse for labour necessary to remove and reinstall a pump and/or fittings and accessories if found defective.

Shurflo's obligation under this warranty policy is limited to the replacing or repairing (whichever it deems advisable) any such part, which is returned to Shurflo's factory with transportation charges pre-paid and which upon Shurflo's inspection is found defective under the terms of this warranty.

## SHURE FLO ACCUMULATOR




In the majority of installations the Shure Flo pump is mounted with a Shure Flo accumulator. The Shure Flo accumulator tank is a bladder type pressure storage vessel and/or pulsation dampening device designed to hold water under pressure. The accumulator tank provides additional water storage to assist the pump in meeting the total demands of the system. It extends pump life by eliminating pump pulsation on/off. The accumulator also makes small amounts of water available at a moments notice without cycling the pump.

To work with the 30psi pump installed, the accumulator pressure should be set at 18psi, +/- 5psi, and before installation the accumulator is factory set with a pre-charge of 20psi.

During the life of the accumulator the pre-charge pressure should not require frequent adjustment, but checking the pressure annually is advisable. The accumulator is fitted with a Schreider valve on the top of the chamber which allows the pre-charge pressure to be checked and/or adjusted. The pressure can be checked with a tyre pressure gauge, and adjustments can be made if necessary with a bicycle hand pump. Please note that the pre-charge pressure of 20psi must not be exceeded for long term storage or during system non use.

## INBOARD WATER TANKS AND ON-LINE WATER SYSTEMS

Please refer to the water system schematic on page 40 with reference to these instructions. Two model specific systems are in use:

- Pressure switched systems in caravans with no internal water tank as already described.
- Pressure switched systems in caravans with an internal tank, featuring a single pump with valve arrangement to cover all water system requirements.

**INTERNAL TANK OPERATIONS – PRESSURE SWITCHED SYSTEM**

When an internal water tank is fitted options exist to supply water to the taps and shower from either the internal tank or the external supply.

Before using the water system ensure that the drain valves both in the hot and cold circuit and adjacent to the water heater are in the closed positions (See page 40)

**TO USE AN EXTERNAL WATER CARRIER TO SUPPLY THE TAPS:**

- Ensure that the external hose and filter assembly is connected, and suspended in the external water container with water present.
- Close the tank isolation valve on the mid right of the tank installation, (see diagram page 40)
- Turn the selector valve to the left of the tank installation clockwise to connect the external supply to the water pump.
- Switch the pump switch to the 'ON' position on the control panel

If the taps within the caravan are closed, the pump will run until the correct pressure is attained within the plumbing. If the water system is being operated for the first time or from a drained condition, air in the system will need to be expelled. Opening the internal taps in the caravan will allow this to happen, this should be repeated at the hot and cold position of each tap / mixer, until water is flowing freely in all cases.

**TO USE THE INTERNAL WATER TANK TO SUPPLY THE TAPS:**

- Check the water level gauge on the control panel to confirm the water level within the tank.
- Close the tank isolation valve on the mid right of the tank installation, (see diagram page 40).
- Turn the selector valve to the left of the tank installation anti-clockwise to connect the supply from the internal tank to the water pump.
- Switch the pump switch to the 'ON' position on the control panel

If the taps are closed within the caravan the pump will run until the correct pressure is attained within the plumbing system. If any of the taps are open water will flow from those taps as soon as the pump is switched on, unless the system is being run for the first time or from a drained condition.

**TO FILL THE INTERNAL TANK:**

- Ensure that the external hose and filter assembly is connected, and suspended in the external water container with water present.
- Open the tank isolation valve on the mid right of the tank installation, (see diagram page 40)
- Turn the selector valve to the left of the tank installation clockwise to connect the external supply to the water pump.
- Ensure all of the taps within the caravan are in their closed positions.
- Switch the pump switch to the 'ON' position on the control panel

Water will now be drawn from the external container by the internal pump and forced into the internal tank. Water will flow into the tank until either the external container is empty, or the internal tank overflows. Progress can be monitored using the water level gauge on the control panel.

## WHALE AQUASOURCE

The Aquasource allows mains water to be connected to the caravan in place of the inlet hose and filter, as shown on the water system schematics. The Whale Aquasource can only be used with the Whale water inlet. The hose features pressure reduction valves which reduce mains water pressure to a level which will prevent damage to the caravan water system.

If a pressure switched system is installed and the Aquasource is plugged in instead of the hose and filter, the operation of the water system is unchanged. The pump will still run when an internal tap is opened or during a tank filling operation.

When using an Aquasource system, do not sleep or leave the vehicle unattended without turning off the mains tap.

**WARNING: It is not recommended to tow with water in the onboard water tank as this could affect stability.**

**WARNING: Do not under any circumstances connect your caravan to the mains water supply without the pressure reducer fitted. Damage will occur to the caravan's water system.**

**GUIDANCE ON CLEANING PORTABLE WATER TANKS AND THE WATER SYSTEM IN TOURING AND MOTOR CARAVANS**

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

**Separate Water Containers**

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

**For Systems:**

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

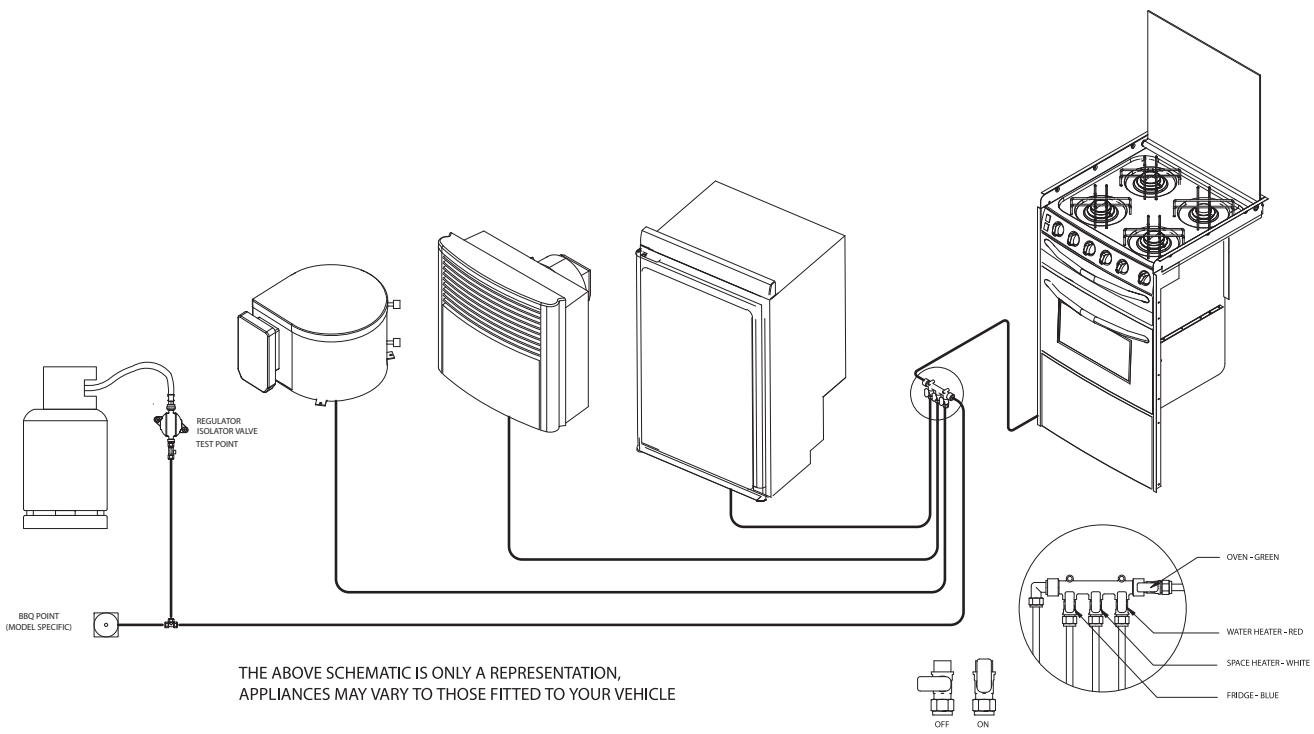
Suitable sterilising chemicals are available from your caravan dealer, accessory shop, chemist or home-brew shops. It is not, however, recommended to use bleach or sodium metabisulphite.

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

**WARRANTY**

Products are guaranteed from the date of purchase against defects in materials and workmanship. If the unit proves faulty, return it to your supplier with proof of purchase and purchase date. Please note that frost damage is not a valid warranty claim.

The manufacturer retains the right to repair or replace the unit. The manufacturer cannot be held responsible for claims arising from incorrect installation, unauthorised modification or misuse of the product. The above does not affect your statutory rights.




**Typical gas schematic drawing**

## GAS

### GENERAL INFORMATION

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

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

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

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

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

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

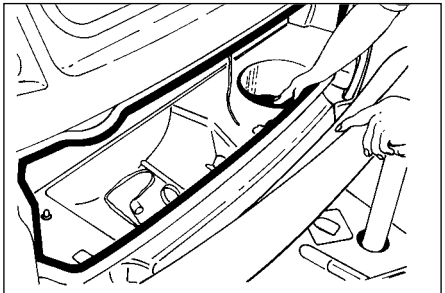


**Fig. A Gas Bottle Compartment**

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

LPG bottles i.e. Propane, Butane and Camping Gaz cylinders all have varying bottle adaptor connections. It is important to check you have the correct hose and adaptor to suit your gas bottles. Push on hoses are no longer permitted under the new regulations, The new high-pressure hoses have threaded connections and must be securely attached to the regulator and to the gas bottle.

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

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

**Fig. B**
**Gas Regulator**

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

**Cylinder compartment**
All cylinder compartments have two universal plastic mouldings fitted to the floor of the compartment that are designed to fit both steel and BP Gas Light cylinders.

## TYPES OF GAS

**Butane**
Butane is supplied in the U.K. in green, blue or aluminium bottles.

All these have a male left hand thread EXCEPT for Camping Gaz which has a special female right hand thread and Calor 7kg and 15kg and aluminium bottles which have a special clip-on connection.

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

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

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

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

Scandinavian countries use the same connector.

Germany and Austria supply propane with a male connection.

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

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

## GAS SAFETY ADVICE

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

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

**Facts about LPG**

LPG is not poisonous.

Bi-products are harmless.

There is danger if all air and oxygen were excluded.

(Ventilation holes must be kept clear at all times).

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

**Awning Spaces LPG Appliance Exhaust**

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

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

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

**PRECAUTIONS**

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

b) Avoid naked lights when connecting or changing a cylinder.

c) Check the flexible hose frequently.

d) The gas is heavier than air and therefore sinks to the lowest point.

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

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

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

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

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

# Services

**Always read individual appliance instructions**

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

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

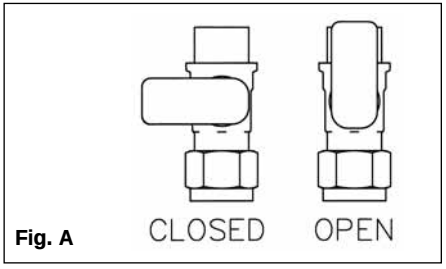


**Fig. A**

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

Gas bottles must be fully located, seated at the base of the bottles and restrained by the strap provided in the dedicated compartment position.

Straps are positioned to suit 6kg and 7 kg bottles.

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

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

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

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

RED - Water Heater
WHITE - Space Heater
BLUE - Fridge
GREEN - Oven
YELLOW - Barbecue (if fitted)

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

**THERMAL INSULATION HEATING**
Your caravan has been designed to achieve a thermal insulation and heating level for specific climatic conditions when tested according to the procedure in EN1645-1. The classifications are as follows:

GRADE 1
A caravan with an average thermal transmittance (u) that does not exceed 1.7w/(m$^2$k).

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

GRADE 3
A caravan with an average thermal transmittance (u) that does not exceed 1.2w/(m$^2$k) and which can achieve an average temperature difference of at least 35k between inside and outside temperatures when the outside temperature is -15°C.

## ELECTRICITY

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

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

**INSTRUCTIONS FOR ELECTRICITY SUPPLY**

**On arrival at caravan site**

1. Before connecting the caravan installation to the mains supply, check that

   (a) both 12N, 12S or 13 pin plug(s) and hitch have been disconnected from the towing vehicle, once disconnected the 12N, 12S or 13 pin plug(s) should be placed in the holder(s) provided to ensure protection against mechanical damage and the elements,

   (b) the mains supply is suitable for your installation and appliances, i.e. whether it is AC or DC and whether it is at the correct voltage and frequency,

   (c) your installation will be properly earthed. Never accept a supply from a socket outlet or plug having only two pins, or from a lighting outlet, and

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

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

2. **MAKE SURE THAT THE SWITCH AT THE SITE SUPPLY POINT IS OFF.**
3. Lift the cover of the electricity inlet provided on the caravan, and insert the connector of the supply flexible cable.
4. Remove any cover from the socket outlet provided at the site supply point, and connect the plug at the other end of the supply flexible cable to this. Switch on the main switch at the site supply point.

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

**IT IS IMPORTANT THAT THE MAIN SWITCH AT THE SITE SUPPLY POINT SHOULD BE SWITCHED OFF, THE SUPPLY FLEXIBLE CABLE DISCONNECTED, AND ANY COVER REPLACED ON THE SOCKET OUTLET AT THE SITE SUPPLY POINT BEFORE DISCONNECTING THE FLEXIBLE CABLE FROM THE CARAVAN. IT IS DANGEROUS TO LEAVE THE SUPPLY SOCKET OR SUPPLY FLEXIBLE CABLE LIVE.**

Because touring caravans are generally left unused for long periods in the open, it is strongly advised that the mains installation is inspected periodically to ensure that it is safe to use. The IEE Wiring Regulations recommend that mains installations in touring caravans are re-inspected every 3 years by a qualified person who should sign and issue a periodic inspection report

**NOTE:** The manufacturer recommends annual inspections.

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

- an approved contractor of the National Inspection Council for Electrical Installation Contracting* or
- a member of the Electrical Contractors' Association
- a member of the Electrical Contractors' Association of Scotland

- a qualified person acting on behalf of the above (in which event it should be stated for whom he is acting).

**The names and addresses of Approved Contractors in any locality (there are over 10,500 in the UK) can be obtained from Electricity Shops, or direct from:*

NICEIC, Vintage House,
37 Albert Embankment, London SE1 7UJ

Telephone: 0171 582 7746

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

ECA, Esca House,
Palace Court, London W2 4HY

Telephone: 0171 229 1266

ECA of Scotland, 23 Heriot Row
Edinburgh EH3 6EW

Telephone: 0131 225 7221

**WARNING: CURRENT CONSUMPTION IN THE CARAVAN MUST NOT EXCEED 16 AMPS OR THE PITCH PERMITTED MAXIMUM IF THIS IS LESS THAN 16 AMPS.**

**IT IS DANGEROUS TO ATTEMPT MODIFICATIONS AND ADDITIONS YOURSELF. LAMPHOLDER—PLUGS (BAYONET-CAP ADAPTORS) SHOULD NOT IN ANY CIRCUMSTANCES BE USED.**

## OVERSEAS CONNECTION

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

Care must be taken when connecting supplies abroad since the supplies can be of REVERSE POLARITY.

The significance of REVERSE POLARITY is that when equipment is switched off it may not be electrically isolated.

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

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

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

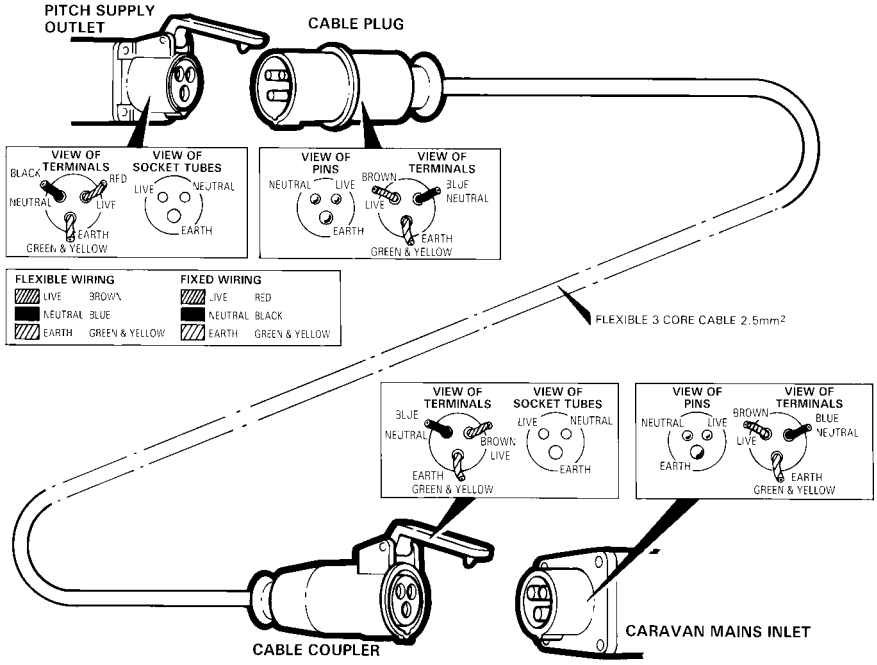
**WARNING: Never allow modifications of electrical or LPG systems and appliances except by qualified persons.**

## 230V MAINS ELECTRICAL EQUIPMENT POWER CONSUMPTION

**Note:** It is possible that the 230v mains electrical equipment may not all operate simultaneously. A typical UK motorhome site mains hook up point provides a maximum output of 10 amps and on some continental sites the available output may be as low as 5 amps. If your loading exceeds the site supply it may trip the site circuit breaker. Please check the available mains supply with your site operator.

Similarly loadings on each circuit breaker within the caravan should be observed. A label positioned close to the MCB's will identify which appliances within the caravan are fed from which MCB. Consulting the table on page 55 in conjunction with this label, will give an indication of which appliances can, and cannot, (site supply allowing), be operated simultaneously.

## WIRING OF CONNECTING CABLE AND CARAVAN MAINS INLET

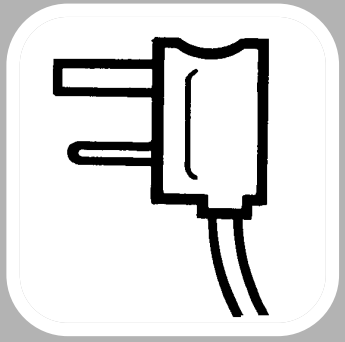



**WARNING:** IT IS ESSENTIAL THAT CONNECTIONS ARE MADE EXACTLY AS SHOWN. IF TERMINAL MARKINGS ARE NOT IN ACCORDANCE WITH THE DIAGRAM THEY MUST BE IGNORED. IF IN DOUBT CONSULT A QUALIFIED ELECTRICIAN.
THE LEGAL LENGTH OF THE MAINS INLET CABLE IS 25 ± 2 METRES. WHEN IN USE IT MUST BE FULLY UNCOILED AND PROTECTED FROM TRAFFIC.

**TYPICAL APPLIANCE CONSUMPTION FIGURES**

| Appliance/ Item | 230 Volt | | 12 Volt | | LP Gas |
|---|---|---|---|---|---|
| | Watts | Amperes | Watts | Amperes | grams/hour |
| Refrigerator | 115 W | 0.5 amp | Only when towing | | 12 - 17.5 g/h |
| Ultraheat Space Heater | 500 W | 2.2 amp | 12 W | 1.0 amp | 30 to 280 g/h |
| | 1000 W | 4.5 amp | 12 W | | |
| | 2000 W | 8.5 amp | 12 W | | |
| Ultrastore Water heater | 850 W | 3.7 amp | Not applicable | | 120 g/h |
| Cooker Hotplate 1 | Not applicable | | Not applicable | | 161 g/h |
| Hotplate 2 | Not applicable | | Not applicable | | 110 g/h |
| Hotplate 3 | Not applicable | | Not applicable | | 73 g/h |
| Hotplate 4 | 800 W | 3.5 amp | Not applicable | | Not applicable |
| Grill | Not applicable | | Not applicable | | 117 g/h |
| Oven | Not applicable | | Not applicable | | 125 g/h |
| Battery Charger | 430 W | 1.9 amp | Not applicable | | Not applicable |
| Lighting 230V (based on 2x 40 W bulbs) | 80 W | 0.3 amp | Not applicable | | Not applicable |
| Lighting 12V (based on 10 W bulb) | Not applicable | | 10 W | 0.8 amp | Not applicable |
| Avtex 15" LCD TV | 345 W | 1.5 amp | 43 W | 3.6 amp | Not applicable |
| Pressure switched pump | Not applicable | | 48 W | 4.0 amp | Not applicable |
| Radio/ CD player | Not applicable | | 12 W | 1.0 amp | Not applicable |
| Omnivent position 1 | Not applicable | | 15 W | 1.2 amp | Not applicable |
| position 2 | Not applicable | | 30 W | 2.5 amp | Not applicable |
| position 3 | Not applicable | | 50 W | 4.0 amp | Not applicable |
| Air Conditioning unit | 1200 W | 5.25 amp | Not applicable | | Not applicable |
| Microwave (factory fit) | 1200 W | 5.3 amp | Not applicable | | Not applicable |

Note: These are approximate figures for guidance only.



# ELECTRICAL EQUIPMENT

## NE171 CONTROL PANEL


### CAR / VAN SELECTOR SWITCH

A car/caravan selector switch is provided on this control panel and should be used in the following way:

### CARAVAN (VAN) POSITION

When in this position 12V DC power is available from the caravan battery to power all 12V circuits. If the charger is switched ON the caravan battery will be charged up by the charger / transformer unit.

### CENTRAL POSITION

When in this position with the charger switch ON, power is provided to all 12V circuits via the charger / transformer only. With the charger off all 12V DC circuits are isolated.

### CAR POSITION

The switch can be placed in this position should the caravan battery become discharged and a 230V supply is not available. First of all the towing vehicle should be electrically connected with the caravan via the 12S connector. Care is needed to avoid discharging the battery in the tow vehicle to an extent that the engine cannot be started.

Please note that when towing and using the 12V element of the fridge, correct positioning of the car/van selector switch may be required – see details in the 'Towing Code' section of this handbook.

### PUMP SWITCH AND INDICATOR

Included on this panel is a pump isolation switch. The isolation switch illuminates the LED above the switch when in the on position. The isolation switch is used to isolate the 12V DC power to the pump in the event of a pump fault, or merely for use as a safeguard against unwanted pump operation.

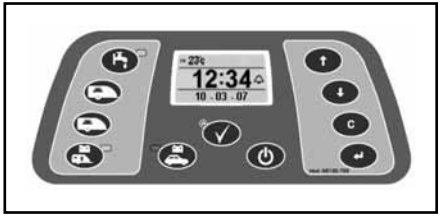
### BATTERY CONDITION METER

The Red display on the control panel shows the voltage of the caravans 12V DC circuits measured at the control panel. This figure will change as the charger is switched ON or OFF, when 12V DC appliances are switched ON or OFF, and as the state of charge of the caravan battery changes.

With the charger switched ON it is possible for the voltage shown to be up to 13.8V. With the charger switched OFF or no 230V supply present, and with the car/selector switch in the VAN position, the reading gives an indication of caravan battery voltage.

- A voltage below 11V, when no 12V DC appliances are operating, would indicate the battery requires charging.
- A voltage above 12V would indicate that the battery is in a good state of charge.
- If a figure between 11V and 12V is shown the battery should be re-charged if desired. Maintaining a leisure battery in a good state of charge will assist in ensuring maximum service life for the battery.

## NE183 CONTROL PANEL
## NE189 CONTROL UNIT
## LOW & HIGH




**CONTROLS:**

Press this key to turn the control panel ON. Depending upon the software version, either a momentary or longer (1 second or more) press may be required to turn the control panel on. In stand-by mode (without active controls) the NE183 control panel with the NE189 control unit consumes a total of approx. 40 mA.

Hold this key down for over 1 second to turn off the control panel, reducing total consumption to just 1 mA.

If the leisure battery voltage drops below 10V for over 2 minutes the control panel turns itself off.

Starting the System will use the first available power source from VAN, CHARGER or CAR.

Key with LED to turn ON/OFF the PUMP. The pump does not work when the control panel is off .

When the pump is working the LED is blinking.

Key for turning LIGHT group A on and off.

Key for turning LIGHT group B on and off.

Key with LED to connect/disconnect the VAN Battery. If the charger is not working and the VAN battery is not connected the system will go off.

If the VAN Battery voltage remains under 10,0V more than two minutes, the System will automatically disconnect the VAN Battery and the System will go OFF.

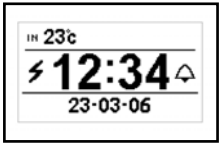
Key with LED to connect/disconnect the CAR Battery. If the charger is not working and the CAR battery is not connected the system will go off.

If the CAR Battery voltage remains under 10,5V more than two minutes, the System will automatically disconnect the CAR Battery and the System will go OFF.

**VIEWING:**

The main screen always shows the internal temperature , the time and date.

If there is a mains supply and the charger is working the display shows the icon ( ⚡ ).

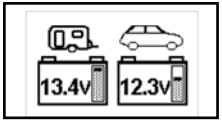



Press this key once

to view the water level in the fresh water tank (0, 1/4, 2/4, 3/4 and 4/4) if connected with Control Unit HIGH.

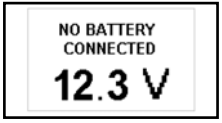

The screen shown remains active for approx. 30 seconds. If connected with Control Unit LOW, this page can be disabled in the PROGRAMMING section.

Press the key twice to view the voltage for the leisure and car batteries.




The screen shown remains active for approx. 30 seconds.

When the Battery Charger is working and no battery is connected a specific page will show the Battery Charger voltage.



The screen shown remains active for approx. 30 seconds.

Display contrast can be adjusted by turning the white pin on the back of the panel.

**PROGRAMMING:**

Hold down this key for over 3 seconds to enter the programming menu.

Use the arrow keys to change page.

Press the enter key ( ↵ ) repeatedly to enter the page and select the value to be changed.

The arrow keys are used to increase or reduce the selected value, whereas the cancel ( C ) key is used to quit the function and save the figure.

The following pages are available:

– Regulation of date and time

– Regulation and enabling of clock. When the clock is enabled, the main screen shows the icon ( 🔔 ). The clock will sound for 30 seconds; press any key to stop it.

– Enabling of tank alarms: fresh water tank empty. When this happens a buzzer is generated and at the same time the display shows the tank viewing window. The tank alarm does not work with the control panel off or the engine / alternator running.

– Enabling of flat Van and Car batteries. Whenever the Van or Car battery drops below 10V (or 10,5) for over 30 seconds a buzzer is generated and at the same time the display shows the viewing window for battery voltage. The battery alarm does not work with the control panel off or the engine / alternator running.

– Enabling of key beeper.

– Programming dimmer level of the LED; after 50 seconds without any operation on the Panel all the LED light will be reduced. At any press the light come On again.

**ADDITIONAL FUNCTION:**

The SYSTEM NE183-NE189 provides some information about typical fault:

OVERLOAD PUMP: When the pump tries to work but there is a problem in the pump circuit.

If the Pump is changed, please use the same type otherwise some false warning will be displayed.

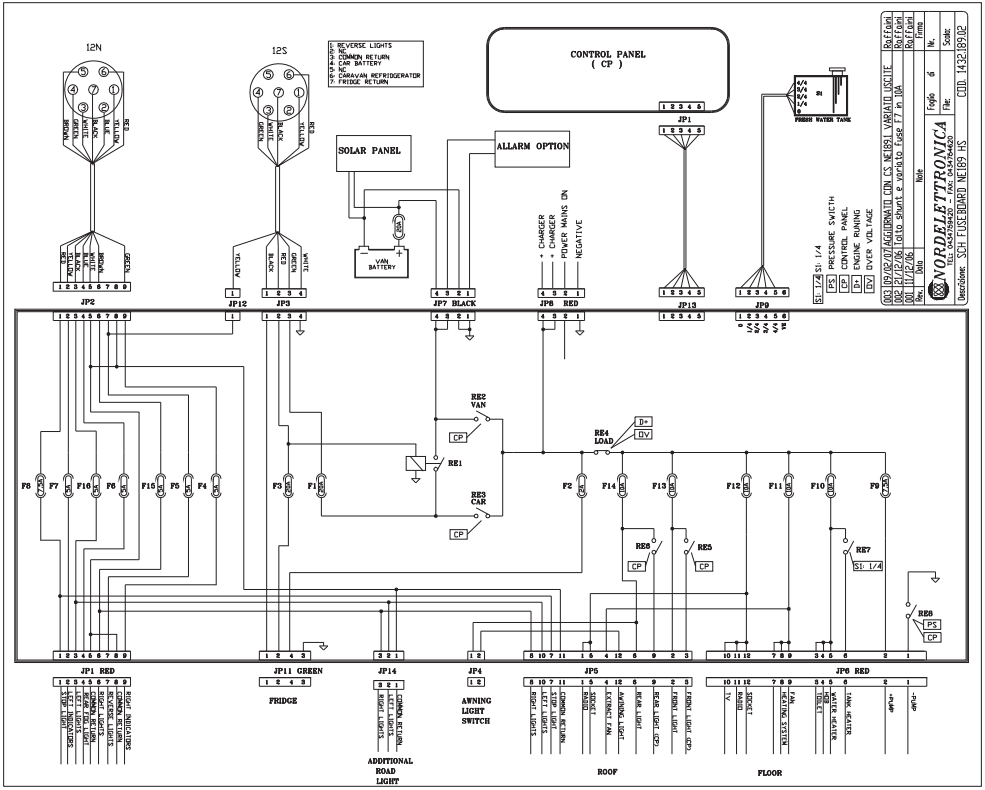
OVERVOLTAGE: If an overvoltage coming from the battery charger is detected, the battery and the loads will be disconnected.

NO CONNECTION: The communication system between the Control Panel and the Consumer Unit is not working.

LOW BATTERY: Starting the System but all the available power source are lower then 9,0 V.

**MEMORY BATTERY:**

On the back of the NE183 control panel there is a buffer battery (LITHIUM 3V CR2032) to maintain the time and various programming functions if 12V energy supply for the PCB fails.


12N
12S
1- REVERSE LIGHTS
2- 12V
3- COMMON RETURN
4- CAR BATTERY
5- NC
6- CARAVAN REFRIDGERATOR
7- FRIDGE RETURN
CONTROL PANEL
( CP )
SOLAR PANEL
ALLARM OPTION
VAN BATTERY
+ CHARGER
- CHARGER
POWER MAINS ON
NEGATIVE
FRESH WATER TANK
PRESSURE SWITCH
CONTROL PANEL
ENGINE RUNING
OVER VOLTAGE
JP1
JP2
JP3
JP4
JP5
JP6 RED
JP7 BLACK
JP8 RED
JP9
JP11 GREEN
JP12
JP13
JP14
RE1
RE2 VAN
RE3 CAR
RE4 LOAD
RE5
RE6
RE7
RE8
FRIDGE
AWNING LIGHT SWITCH
ADDITIONAL ROAD LIGHT
ROOF
FLOOR
NORDELETTRONICA

## NE190 CONTROL PANEL


**COMMAND:**

Key with LED to enable/disable the PUMP. When the pump is working the LED is blinking.

Key with LED to connect/disconnect the VAN Battery. If the charger is not working and the VAN battery is not connected the system will not switch.

If the VAN Battery voltage remains under 10,0V more than two minutes, the System will automatically disconnect the VAN Battery, E4 is blinking for 30 seconds.

Key with LED to connect/disconnect the CAR Battery. If the charger is not working and the CAR battery is not connected the system will not switch.

If the CAR Battery voltage remains under 10,5V more than two minutes, the System will automatically disconnect the CAR Battery, E4 is blinking for 30 seconds.

When the main is connected and the charger is working, the LED is on. When one of the battery is connected too, the Charger is charging the battery connected.

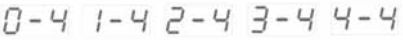
Key to view the voltage of the system.

– only main LED on, the panel will show the charger's output Voltage.

– only CAR/VAN LED, the panel will show the battery voltage.

– MAIN + BATTERY LED, the panel will show the system voltage.

When the NE190 Panel is connected to a System with water level if you push again the TEST, the panel will show the Clear Water Level:




After 30 second without any push button used the panel will switch off the number display and the LED will reduce the brightness.

When push again the indications will come ON.

When the engine is running, all the load (exception of the fridge) will be switched OFF and the Leisure battery will be connected to the engine power generator.

The SYSTEM NE189-NE190 provide some information about typical fault:

Error 1 OVERLOAD PUMP

When the pump tries to work but there is a problem in the pump circuit.
If this message is displayed, all the push button will be disabled for 5 seconds. If the Pump is changed, please use the same type otherwise some false warning will be displayed.

Error 2 OVERVOLTAGE

An overvoltage is detect from the battery charger, the battery and the loads will be disconnected.

Error 3 NO CONNECTION

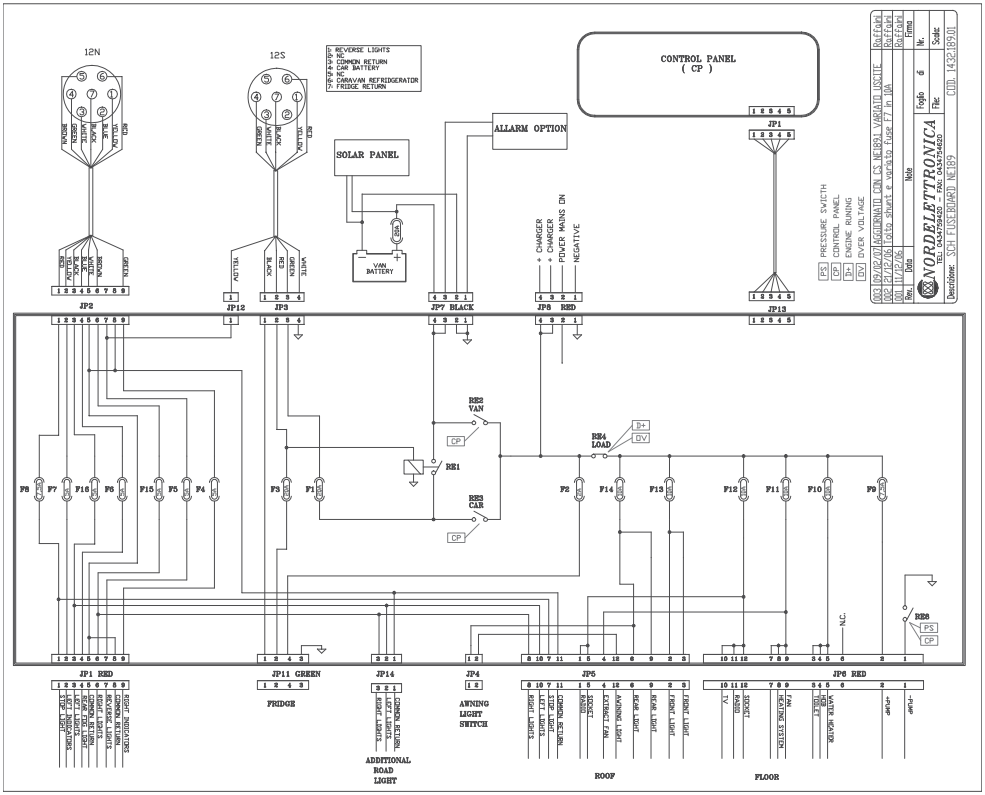
The communication system between the Control Panel and the Fuseboard is not working.

Error 4 LOW BATTERY

Starting the System but all the available power source are less then 9,0 V.

Error 5 TANK LEADS PROBLEM

The connection between the Tank Sensor and the Fuseboard is in the wrong sequence or one lead is broken


12N
12S
REVERSE LIGHTS
COMMON RETURN
CAR BATTERY
N.C.
CARAVAN REFRIGERATOR
FRIDGE RETURN
CONTROL PANEL
( CP )
ALLARM OPTION
SOLAR PANEL
VAN BATTERY
+ CHARGER
+ CHARGER
POWER MAINS ON
NEGATIVE
PRESSURE SWITCH
CONTROL PANEL
ENGINE RUNING
OVER VOLTAGE
NORDELETTRONICA
Descrizione: SCH FUSEBOARD NE189
COD. 14321990
JP1
JP2
JP3
JP6 RED
JP7 BLACK
JP11 GREEN
JP14
JP4
JP5
JP6 RED
RE1
RE2 VAN
RE3 CAR
RE4 LOAD
RE5
FRIDGE
ADDITIONAL ROAD LIGHT
AWNING LIGHT SWITCH
ROOF
FLOOR
N.C.

## POWER SUPPLY UNIT NE143RM

The NE143RM power supply unit controls 230V AC power and provides 12V DC output as follows:

Mains 230V AC - Mains Module with earth leakage protection and over current protection.

The NE143RM power supply units are designed to operate on a mains supply of 207V - 253V AC (for use with low continental voltages). The 40 amp RCD gives protection against earth faults and also acts as the main switch. The mains module then has three MCB's, the ratings of which are appropriate to the appliances and circuits within the caravan.

For details of the circuits linked to each MCB, please refer to the label positioned close to the NE unit. Each MCB carries an indication of its nominal current rating, and a table on page 55 of this handbook gives details of the loadings for each appliance. It may not be possible to operate simultaneously all appliances linked to an MCB, please also consider the total current loading relative to the 230V AC supply available to the caravan.

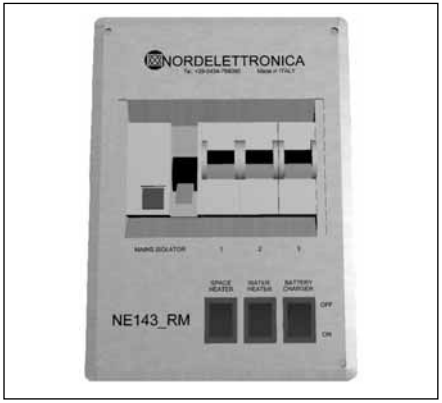
12V DC - The NE143RM power supply unit employs a fully automatic 12V DC charger, which can operate with a wide range of 230V AC input voltages, and provides a stable output voltage even under load. The unit can provide up to 18 amp (@12V) continuously.

The battery charger uses an algorithm which makes it possible to significantly reduce charging time and avoid permanent damage to batteries. It starts charging at maximum current until the battery reaches a voltage of 14.4V, then charging takes place at a constant voltage of 13.8V. In this state the recharge current gradually decreases and the battery can be left permanently connected to the charger without causing it any damage.

The battery charger is fitted with circuitry which will protect it in the event of electrical or thermal overload. Should the current draw exceed the rated output of the unit, then it will begin shutting down. This will probably be noticed as dimming of the 12V lighting. On the removal of the excessive load the charger will automatically recover. To protect against overheating there is an electronic thermal protection circuit, which will operate should the temperature of the unit rise above a safe level. If this happens then the output will shut off until the temperature has dropped back to a safe level.

In addition to the mains module, three switches are present on the front of the NE143RM

**NE143RM**




**SPACE HEATER**

This switch can be used to isolate power to the 230V element on the Truma space heater. This is in addition to the selection of 'OFF', '500W', '1000W' or '2000W' on the space heater's own control module.

**WATER HEATER**

This switch controls 230V power to the Truma Ultrastore water heater. This is the only means of turning the electric element in the water heater on or off.

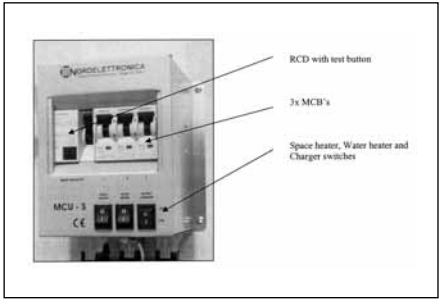
**CHARGER**

This switch controls the charger within the NE143RM. As previously stated the charger

is fully automatic and does not require switching on or off in normal operation. However if 230V input current is limited, turning the charger off may allow use of other 230V appliances.

When this model of NE power supply unit is fitted a separate 12V DC fusing arrangement can be found at the front of the caravan layout, as detailed on page 61.

## CONSUMER UNIT




The consumer unit when fitted acts as the main switch for the caravan 230V system, allowing isolation of all 230V circuits. It forms part of a modular power system along with a 12V distribution unit and separate charger. The unit gives both overload (MCB) and earth leakage protection (RCD) for the electrical supply in your caravan.

For normal operation all RCD and MCB switches on the unit should be in the ON position.

The three switches shown as MCB's (Miniature Circuit Breakers) take the place of conventional fuses but are more convenient.

Having too many appliances switched on at the same time will trip the MCB's. This is a safety measure (for appliance ratings see consumption table, 230V column). Additionally in the event of a fault the MCB will 'trip', i.e. the switch will automatically move to the off position. After eliminating the fault or reducing the load the MCB can be re-set by switching back to the on position (against the spring pressure in an upwards direction).

If an earth fault develops or a person touches a live piece of equipment, the leakage of current to earth should immediately operate the RCD (Residual Current Device) and 'trip' the switch for this module to the OFF position. This switch is only re-settable after elimination of the fault. To re-set, operate the switch as for the MCB's.

Periodically the RCD should be checked by operating the 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 re-set restoring the supply back to normal.

Three smaller switches feature on the lower part of the unit:

**SPACE HEATER**

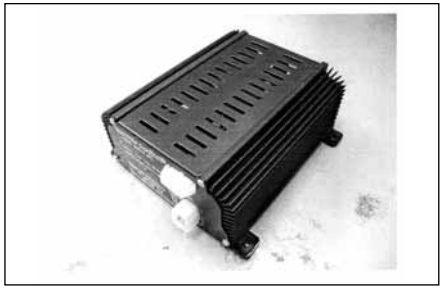
This switch can be used to isolate power to the 230V element on the Truma space heater. This is in addition to the selection of 'OFF', '500W', '1000W' or '2000W' on the space heater's own control module.

**WATER HEATER**

This switch controls 230V power to the Truma Ultrastore water heater. This is the only means of turning the electric element in the water heater on or off.

**CHARGER**

This switch controls the charger within the NE143RM. As previously stated the charger is fully automatic and does not require switching on or off in normal operation. However if 230V input current is limited, turning the charger off may allow use of other 230V appliances.



Please note that if the caravan is fitted with Alde or Truma Combi water/space heater equipment, the switch marked WATER HEATER isolates the supply of 230V to the appliance and the switch marked SPACE HEATER is not used.

## SEPARATE CHARGER

If fitted the NE143 charger/power supply unit is a fully automatic 12V DC charger, which can operate with a wide range of 230V AC input voltages, and provides a stable output voltage even under load. The unit can provide up to 18 amp (@12V) continuously.

The battery charger uses an algorithm which makes it possible to significantly reduce charging time and avoid permanent damage to batteries. It starts charging at maximum current until the battery reaches 14.4v, then charging takes place at a constant voltage of 13.8v. In this state the recharge current gradually decreases and the battery can be left permanently connected to the charger without causing it any damage.

The battery charger is fitted with circuitry which will protect it in the event of electrical or thermal overload. Should the current draw exceed the rated output of the unit, then it will begin shutting down. This will probably be noticed as dimming of the 12V lighting. On the removal of the excessive load the charger will automatically recover. To protect against overheating there is an electronic thermal protection circuit, which will operate should the temperature of the unit rise above a safe level. If this happens then the output will shut of until the temperature has dropped back to a safe level.

## NORDELETTRONICA 12V DC DISTRIBUTION UNIT

When the NE143RM power supply unit is fitted, a separate 12V DC distribution unit can be found in the front bed area of the caravan. This unit is responsible for fusing arrangements for all 12V DC circuits in the caravan, i.e. fuses for internal lighting and appliances, road lighting and also tow vehicle supplies.

Details of the circuits protected can be found in the electrical schematic contained within the service handbook. Labelling on the distribution unit also identifies fuse allocation.

Automotive type blade fuses are mounted on the top face of the unit. Only ever replace a fuse with another fuse of the same rating.

## HABITATION RELAY

To conform to European Safety Standards (EMC), all caravans have been equipped with a habitation relay.

This relay is actuated when the 12N/12S or 13-pin plugs are connected to the tow vehicles sockets and the car ignition is turned on.

The relay automatically isolates all 12V equipment within the caravan, excluding the fridges 12V power supply, from the car.

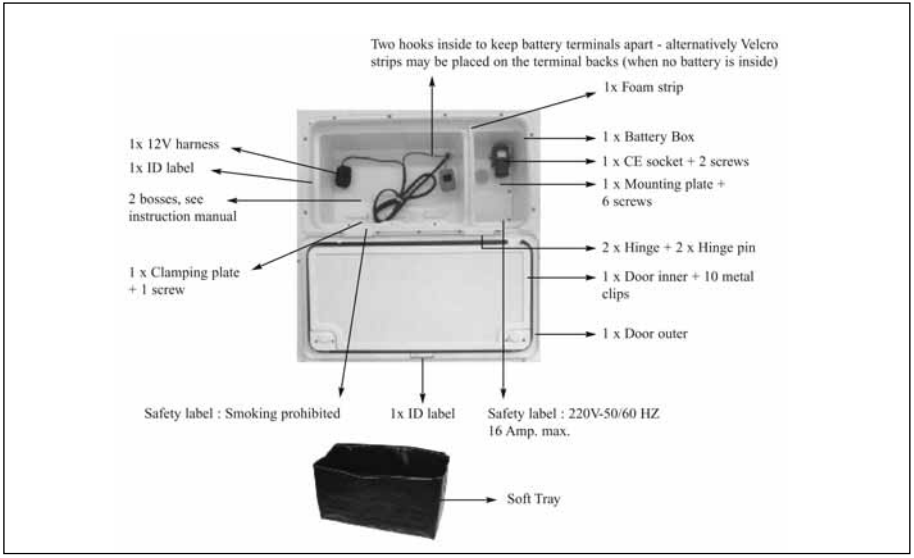
## THETFORD BATTERY BOX

The Thetford Battery Box is intended to accommodate an auxiliary battery in your caravan. The Battery Box has a CE socket to connect to a 230 V power supply. Inside the Battery Box there is the option to fit several sockets and outlets.

### PRECAUTIONS AND SAFETY INSTRUCTIONS

- Use caution when mounting the battery, as batteries contain acid liquids which can cause severe injuries and damage when handled incorrectly. Refer to the instructions on the battery.
- Use protective clothing and glasses when handling a leaking battery, and avoid direct contact to the skin, eyes and respiratory organ.

  Should a battery leakage occur, please act according to the instructions supplied by the manufacturer of the battery. Act with caution as caustic substances are present in the battery.
- No smoking is allowed in the area of the Battery Box.
- Before removing a battery you should always check for spillages by touching the Soft Tray on the outside surface and sensing for any liquid spills. If you think that liquid has been spilt, you should ensure that the Soft Tray and battery are lifted together so that spillages will not occur.



# Electrics

**INSTRUCTION**

**WARNING!**

- Use precaution when mounting the battery, as batteries contain acid liquids which can cause severe injuries and damage when handled incorrectly. Refer to the instructions on the battery.
- No smoking is allowed in the area of the Battery Box!
- Please note that the CE socket has a max of 16 amp.
- The Thetford Battery Box is designed for use with foot mounted batteries. These are recognisable by the rim around the bottom edge of the battery. This rim will locate against the back wall of the Battery Box and the angle metal bracket, which is screwed into place when the battery is fitted. The depth of the battery including rim should be between 173mm and 175mm.
- This product meets the latest version of the EN 1648 part 1 and 2 standard.

  Before placing the battery inside the Battery Box, the adjacent battery should be placed into the Soft Tray and rested on the ground adjacent to the Battery Box. Carefully connect the electrical wires (the red cable attaches to the + pole and the black cable to the - pole of the battery).

**Note!** Incorrect connection of the cables will cause a short circuit with potential hazardous consequences. After mounting the terminals, lift the battery together with the Soft Tray into the middle of the Battery Box compartment. Push the Soft Tray with battery to the back of the Battery Box, into the safeguard bulge. If necessary shift the Soft Tray to the right or left until the battery is in place in the safety area (see photo 1).

The battery is located in the compartment by the manual clamping plate. This has to be screwed to the front of the box (screw is enclosed in package). Please ensure that the Soft Tray is pulled up tightly (to remove creases) before the plate is tightened. The rounded edge of the clamp prevents damage to the Soft Tray. Do not apply extreme force to the screw.

When disassembling, follow this procedure in reversed order. Note! Always check the Soft Tray for acid first! If found, take safety precautions (such as protecting clothing, body and especially the eyes). In case of contact with acid, immediately rinse with plenty of water. Follow regulations concerning these chemicals.

**Tip!** Generally, car workshop and gas station employees are familiar with this matter.

When attaching the 220/230 volts cable on the CE socket, the maximum recommended thickness of the cable is 10 mm. When closing the door, the attached cable is to be fed through the slot at the bottom right of the door.

**Photo 1**

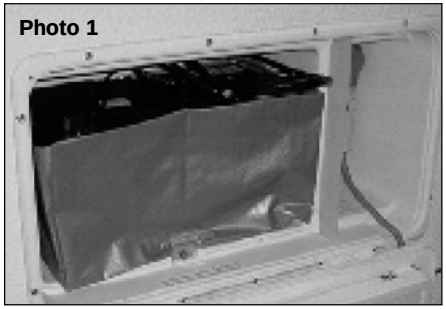
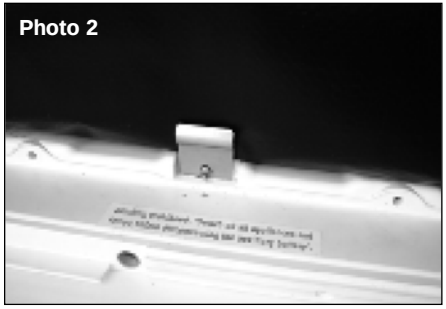


**Photo 2**



**CLEANING AND MAINTENANCE**

- Use protective clothing and glasses when handling a leaking battery, and avoid direct contact to the skin, eyes and respiratory organ.
- Should a battery leakage occur, please act according to the instructions supplied by the manufacturer of the battery. Act with caution as caustic substances are present in the battery.
- Always remove the battery and the power cable before carrying out any maintenance of the product.
- Before removing the clamps switch off all appliances.
- No smoking is allowed in the area of the Battery Box.
- Use a soft cloth or sponge and a non-acid/abrasive detergent when cleaning the Battery Box and Soft Tray.
- To check if any acid is present in the Soft Tray, simply press it softly. A strong smell from the Soft Tray may also indicate spilled acid. The battery can be filled again with acid collected from the Soft Tray. Disposal through local drains is possible and legally permitted, on condition that the acid is mixed with water equalling 50 times the amount of acid. It is often possible to dispose of acid at gas stations.
- Before the camping season or extensive travelling, check the Soft Tray for faults and replace if necessary.
- The cleaning of the Battery Box and Soft Tray should only be done after all power sources have been switched off, in order to prevent a hazardous situations.

**THETFORD WARRANTY**

1. The Thetford Battery Box is warranted to the original purchaser for 3 years from the date of purchase.
2. The warranty covers replacement of parts arising from defects and workmanship and from the inability of the Battery Box to perform its intended function.
3. In case of a defect apply to original dealer or Thetford Service Center with proof of purchase.
4. Defects, which in our judgement occurred from misuse, negligence or accident, are not covered by the warranty. In addition, the warranty does not apply if the product is installed or handled improperly, if the product has been altered in any way, has been repaired by unqualified persons, or if the serial number and/or date has been altered or removed.
   - As the Battery Box is manufactured from polypropylene, it is resistant to temperatures up to 60 degrees Centigrade. Installing the battery box in a position where it will be exposed to higher temperatures will invalidate the warranty and could lead to an adverse effect on the product.
5. Thetford products considered to be defective may be returned prepaid directly to Thetford. Any items received which are judged by Thetford to be covered under warranty will be dealt with accordingly. Defective products not considered to be covered by warranty will incur repair, handling and return carriage costs.
6. No other warranty is given and no personal representative is authorised to make any warranty or assume liability by words or action under any warranty other than that is contained herein.

## BATTERY INSTALLATION

Under normal circumstances it should not be necessary to remove the battery other than for routine inspection of terminals and “topping up”.

**WARNING**: **Explosive gases may be present at the battery. Take care to prevent flames and sparks in the vicinity.**

Your caravan has been fitted with an in-line fuse between the battery terminal and strip connector. It is recommended that the fuse rating fitted in this location does not exceed 20 amps.

**WARNING**: **Switch off all appliances and lamps before disconnecting the battery.**

**Smoking is prohibited around the battery compartment.**

To preserve the life of your leisure battery and charger please observe the following:

i) Do not leave all 12V lights powered at the same time as this will drain your leisure battery more rapidly.

ii) If all 12V lights must be powered together, ensure the battery is 'in-circuit' i.e. selector switch in the 'van' position and that the battery charger is turned on.

iii) For optimum performance use the transformer/charger unit with a leisure battery attached.

## BATTERY

It is recommended that a good quality rechargeable leisure battery is always in circuit when the system is in use.

A deep cycling heavy duty 12V battery should be purchased to provide power for lights and other electrical appliances.
A proprietary brand leisure battery with a minimum of 85 Amp capacity is recommended.

**Note:** 85 Amp batteries and above should be checked dimensionally before purchasing, to ensure fitment within the battery compartment, as brands vary in size.

It should be remembered that batteries suitable for the electrical demands of a caravan differ in design from those for use with a car, and whilst the system may operate with a car battery it is strongly recommended that only a leisure type battery, maintained in good condition is used. The battery should be kept topped up at all times.

**Note:** Some models may have more than one 12V socket fitted, the 6 Amps indicated is available from the 12V socket provided no other 12V socket is used at the same time.

## SOLAR PANEL CONNECTION POINT

A connection point has been included in the caravan electrical harness to take a 12V supply from an aftermarket solar panel (or similar device), to the caravan leisure battery.

The solar panel must provide a fused and regulated output in order to connect to this point. The connection point can be found inside the caravan adjacent to the battery box, in close proximity to the battery box fuse. Through the floor close to the battery box is a cable pass through, allowing a pair of wires from an externally located device to pass from exterior to interior to meet the connection point. This cable pass through will be capped both internally and externally with a cable entry gland.

A kit of parts is available from your caravan supplier which provides the mating half of the connection point. (The White rectangular connector found inside the caravan is a two way JST-LR type connector). For further assistance in identifying the connection, wire colours leading to the connector are detailed in the wiring schematic in your caravan service book.

## GENERATOR GUIDELINES

- Lack of regular servicing can be the cause of most generator problems, gensets under 2kW are mainly dependent on engine speed for output frequency and voltage, poor or no servicing may cause the engine speed governor to run the genset engine too fast. Therefore frequency and output voltage can rise above the specification of the machine data plate i.e. 230V at 50Hz, this may cause damage to electrical/electronic equipment (such as battery chargers).
- A generator should always be run for a few minutes prior to connection with the caravan or motorhome electrics, to allow it to warm up and the output to settle to a steady level.
- The AC output of generators is often derived from an AC alternator, rectified to DC then inverted back to AC. In essence this means the output sinewave may not be very smooth and may not run sophisticated electronics efficiently. Some of the new wave of gensets are more sophisticated in their production of a sinewave output and are more suited to run electronic equipment.
- If in doubt consult your genset dealer or manufacturer for advice.

# FITTED EQUIPMENT

## SAS210 MOBILE ALARM SYSTEM

Using the latest microprocessor technology the SAS210 provides all year round protection for your caravan.

Please read all sections of these user instructions before attempting to operate the SAS210.

If you are unsure of any of the following points, please contact your local dealer or the manufacturer direct (see point 5), on page 75

**1. Operation**

Arm/Disarm

The SAS210 Alarm System is armed and disarmed by pressing the button on the key fob remote controller.

The alarm has four modes of operation:

a) Disarmed

b) Fully armed with internal movement sensor and tilt sensor active

c) Partially set with only the tilt sensor active

d) Partially set with only the movement sensor active.

The alarm indicates arm/disarm status by beeping. One beep = armed, two beeps in quick succession = disarmed.

To part set the alarm (modes c or d) hold down the arm button until the desired mode has been selected:

Hold down and release after 2 long beeps, mode (c) selected.

Hold down and release after 3 long beeps, mode (d) selected.

**Note:** if the arm button is continually held down the system will disarm and then repeat the above sequence.

PIR Movement Sensor

The SAS210 Alarm System comes complete with a 120° x 360° Passive Infra Red movement sensor that detects body movement within the vehicle.

If you are leaving pets within the vehicle the system should be armed in mode (c) to prevent nuisance triggering.

Tilt Sensor

The SAS210 Alarm System has an inbuilt tilt sensor that detects tilting of the vehicle during the hitching process. If the tilt sensor is not set correctly, the alarm will not arm and will indicate a fault by beeping 4 times in rapid succession.

During normal (on the flat) operation there is no need to alter the tilt sensor.

If the vehicle is parked on a steep slope it may be necessary to adjust the tilt sensor. With the alarm disarmed, while viewing the movement sensor lens, move the tilt adjustment lever forward until the green light illuminates. Note the position of the lever.

Now move the lever backwards and again note the position of the lever when the green light illuminates.

Set the lever mid way between the two positions.

Remember to return the lever to the centre (locked) position when returning to 'on the flat' use.

Alarm Siren

When the alarm is triggered the siren will sound for 2 minutes. Following the 2 minute period the alarm will then deactivate for 15 seconds then rearm.

The alarm siren can be turned off at any point by pressing the key fob button. If the movement sensor caused the alarm trigger, the alarm will give a standard 'two beeps in quick succession' disarm indication. If the tilt sensor caused the alarm trigger, the alarm will give 'two beeps in quick succession' followed by a further 'two beeps in quick succession'.

Sleep mode

The SAS210 Alarm System incorporates a sleep mode that extends battery life over a long period of time.

If a charged leisure battery is fitted and is supplying 12V to the alarm system the alarm will operate in standard 'quick response' mode.

If the alarm is operating from the internal alarm battery only, the alarm will operate in 'slow response' battery saving sleep mode. In this mode you will need to press and hold the arm/disarm button for up to 3 seconds to arm or disarm the alarm.

**2. Key Fobs**

The SAS210 Alarm System comes complete with 2 key fob remote controllers. If an additional controller is required these can be ordered from your supplier.

Key Fob Battery Replacement

1. Remove the key fob from your key ring.
2. Prise the casing apart near the key ring fixing slot.
3. While holding the base part of the casing, prise out the old Lithium battery and replace with a new CR2032 battery. Ensure the [+] terminal is located towards the outer case.
4. Relocate the two casing halves and snap together.
5. Refit the key fob onto your key ring.
6. Remember to dispose of old batteries in accordance with local regulations.

**3. Battery**

The SAS210 Alarm System incorporates a 3.3Ah sealed lead acid battery that is charged from the vehicles 12V supply. This battery has been selected to run the alarm without any external supply voltage for up to 9 months depending on ambient temperature/initial charge.

The battery is fully charged when the alarm system is dispatched, but may need further charging if the vehicle is stood for a number of months without a 12V supply to the alarm.

To charge the alarm battery either fit a fully charged leisure battery to the vehicle or connect the vehicle to the mains supply and switch on the 12V charger/power supply.

The internal battery should be replaced approximately every 3 years to ensure correct operation. Replacement batteries can be ordered from your supplier. Always dispose of old batteries in accordance with local regulations.

**4. Specification**

| | |
|---|---|
| Control Box | |
| Supply voltage: | 10.5 to 15V DC |
| Supply current: | 250mA max |
| Operating temperature: | -5 to +30°C |
| Battery capacity: | 3.3Ah at 12V |
| Operating time (armed) with no supply: | 9 months at 20°C |
| Siren output: | 110 dB +/- 10% |
| Movement Sensor | |
| Range: | 120° x 360° x 8M |
| Current consumption: | <1mA typical |
| Key Fob | |
| Range: | >10M typical |
| Battery: | CR2032 Lithium Cell |
| Typical battery life: | 1 year |

**5. Spare Parts/Service**

For spare parts, local supplier contact details or other service information please contact:

Sargent Electrical Services Ltd.
service desk on 01482 678981
during normal office hours.

# Fitted Equipment

The instructions covering fitted equipment to your caravan were correct at the time of going to print. Owners handbooks are updated annually and we take great care to try and ensure their accuracy. However, the Swift Group Limited cannot accept responsibility for any changes that may be made in specification or operating instructions to the equipment described in this section after the time of going to press.

Every care is taken to ensure that the information provided in this handbook is correct and easy to understand.

Separate manufacturers' leaflets on many of the components are also included in the Owner's Pack provided with this caravan and we recommend that you compare the instructions in the handbook with the component manufacturers literature, to ensure the information provided is as accurate as possible.

If you are in any doubt as to how to operate the equipment in your caravan, please contact the component manufacturer's service department on the telephone number shown on their component leaflet. If you remain in any doubt, please contact the Swift Group Supercare customer care service department on 01482 875740.

**Equipment Specification**
For details on type of equipment fitted in your caravan, please refer to the Sales Brochure or Dealer.

**IMPORTANT**
To maximise the use and life of all fitted equipment in your caravan it is essential that any accompanying manufacturers' literature is read fully. All recommended maintenance and preparation procedures should be followed. The information provided in this handbook is only intended as a guide. If in any doubt consult your manufacturer appointed dealer, particularly before attempting to install EXTRA EQUIPMENT.

**NOTICE: In the interest of safety, replacement parts for an appliance shall conform to the appliance manufacturer's specifications and should be fitted by them or their authorised agent.**

## THE TRUMA ULTRASTORE WATER HEATER

### OPERATING INSTRUCTIONS

**Attention:** Before using for the first time, it is essential to flush the entire water supply through with clean warm water. Always mount the cowl cap when the water heater is not being operated! Drain the water heater if there is a risk of frost! **There shall be no claims under guarantee for damage caused by frost!**

When connecting to a central water supply (rural or city connection) or when using more powerful pumps, a pressure reducer must be used which prevents pressures of greater than 2.8 bar occurring in the Ultrastore.

**Filling the Truma Ultrastore with water**

**e = Lever position "Closed"**

**f = Lever position "Drain"**

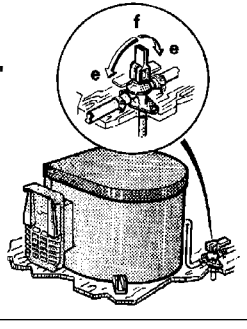



**Fig. 1**

1. Check that the safety/drain valve in the cold-water intake is closed. Lever should be in the horizontal position, position (e).
2. Open the hot tap in the bathroom or kitchen with pre-selecting mixing taps or single lever fittings set to hot.
3. 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.

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

**Note:** If just the cold water system is being used, without water heater, the heater tank is also filled up with water. In order to avoid damage through frost, the water contents must be drained by activating the safety/drain valve, also when the heater has not been used. As an alternative, two shut-off valves, resistant to hot water, can be fitted in front of the cold and hot water connection.

**Draining the water heater**

1. Disconnect power for water pump (main switch or pump switch).
2. Open hot water taps in bathroom and kitchen.
3. Open safety/drain valve: Lever in vertical position, position (f).
4. 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).

**Gas operating instructions**

**Attention:** Never operate the water heater without water in it!

If the wall cowl is positioned close to an opening window (or hatch) - in particular directly under it - it must remain closed when the water heater is in use (see warning plate).

1. Remove cowl cover.


**a = Rotary switch "On" "Gas operation"**

**b = Rotary switch "Off"'**

**c = Rotary knob for temperature selection (illuminated by green lamp "Operation")**

**d = Red indicator lamp "Failure"**

2. Open gas cylinder and open quick-acting valve in the gas supply line.
3. Select required water temperature at rotary knob (c) infinitely variable from approx. 30° to 70°C.
4. Switch on water heater at the rotary switch (a) on the control panel, green indicator lamp "Operation" lights up.
5. If there is air in the gas supply line, it may take up to a minute before the gas is available for combustion. If the appliance switches to "Failure" during this period, switch off the appliance - wait 5 minutes - and switch on again!

**Switching off (gas operation)**

Switch off the water heater at the rotary switch (b).

**Drain** the water heater if there is a risk of frost!

If the water heater is not to be used for a longer period, mount cowl cover (non-observance of this point can lead to the function of the appliance being impaired through water, dirt or insects), close quick-acting valve in the gas supply line and close the gas cylinder.

**There** shall be no claim under guarantee if this point is not observed.

**Always** remove the cowl cover prior to operating the water heater!

**Red indicator lamp "Failure"**

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

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

**In event of faults, always contact the Truma Service on Tel: 01283 511092.**

**Electrical Operating Instructions**

Switch the switch on the control panel to "On". This indicates the electrical water-heating element is operative.

When using the vehicle switches refer to operating instructions of the vehicle manufacturer or see switch labels.

**Note:** The water temperature cannot be selected, automatic temperature limitation at approx. 70°C. For a faster heating up period the appliance can be simultaneously operated with gas and electrical power.

**Note:** The water tank in the Truma-Ultrastore is made of high quality food-proof stainless steel VA.

Use wine vinegar for de-scaling 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 "Certisil- Argento". Other products, particularly those containing chlorine are unsuitable.

In order to avoid the proliferation of micro-organisms, heat the Ultrastore to 70° at regular intervals.

**Do not use the water as drinking water!**

**Important Operating Notes**

1. 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.
2. The guarantee will be invalidated if this point is not observed. Always remove the cowl cover prior to operating the water heater!
3. If there is a defect in the electronics, return the control Printed Circuit Board well padded. If you fail to pack it correctly the guarantee will be invalidated. Only use original Truma Ultrastore control P.C.B's as spare parts.
4. 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.

**General Safety Notes**

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

- Extinguish all naked flames
- Do not smoke
- Switch off the appliance and gas cylinder
- Open the windows
- Do not operate any electrical switches
- Have the entire system checked by an expert

1. Repair jobs are only to be carried out by an expert.
2. 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.
3. The operating pressure for the gas supply is 30mbar (or 28mbar butane/37mbar propane) and must correspond to the operating pressure of the appliance (see name plate).
4. Do not operate the water heater when refuelling the vehicle and when in the garage.
5. 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 is to immediately run the heater at maximum output and to ensure adequate room ventilation.
6. If the burner makes an unusual noise or if the flame lifts off, it is likely that the regulator is faulty and it is essential to have it checked.

**Technical Data**

| | |
|---|---|
| Water contents: | 10 litres |
| Water pressure: | up to max. 2.8 bar |
| Type of gas: | Liquid Gas (propane or butane) |
| Operating Pressure: | 30mbar (or 28mbar butane, 37mbar propane) |
| Rated thermal output: | 1500W |
| Gas consumption: | 120g/h |
| Heating time to approx. 70°C: | |
| Gas operation: | approx. 35 mins |
| Electrical operation: | approx. 70 mins |
| Gas and electrical operation: | approx. 20 mins |
| Power consumption 12V | |
| Ignition: | 0.17A |
| Heating Up: | 0.08A |
| Standby: | 0.04A |
| Power consumption 230V | |
| Heating Up: | (3.7A) 850W |
| Weight (empty): | 6.7Kg |

## THE TRUMA S 3002 P & S 3002 AUTO SPACE HEATER

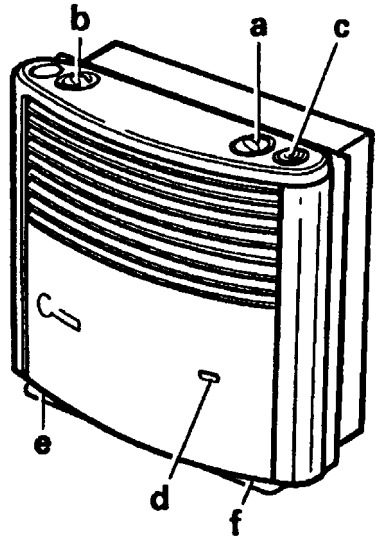
### INSTRUCTIONS FOR HEATERS FITTED WITH AUTOMATIC IGNITOR OR PIEZO IGNITOR

**Switching On**

1. Open the valve on the gas cylinder. Open quick-acting valve in gas supply line.
2. Turn control knob to thermostat setting 1-10 and press it down as far as the stop. At the same time keep operating the Piezo ignitor rapidly until the flame ignites.
3. Keep the control knob depressed for a further 10 seconds to allow the safety pilot to operate.
4. (Piezo only) Watch through the flame window for another 10 seconds to make sure that the flame does not go out through air in the supply pipe (caused by the valve being closed or changing the cylinder).

**Attention: Always wait at least 2 minutes before attempting to re-ignite, otherwise there is a risk of blowbacks (misfiring). This also applies if a working heater goes out has to be re-lit.**

# Fitted Equipment




**a = Control knob**
**b = Integrated control panel for Trumavent fan TEB**
**c = Piezo ignitor or automatic ignitor**
**d = Flame observation window**
**e = Name plate (remove casing)**
**f = Thermostat probe**

**In the case of left-handed installation, the parts are arranged on the other side.**

**Automatic Ignitor**

Prior to first ignition, make sure that the batteries have been inserted; observe correct fit battery cassette (see changing batteries, page 81).

**Thermostat**

Set the required room temperature at the control knob (numbers 1-10). For an average room temperature of approx. 22°C we recommend setting:

3-5 Without the Trumavent Fan (switched on)

4-8 With the Trumavent Fan

**Switching Off**

Set control knob to "0". If turning off for a long period of time, close the quick-acting valve in the gas supply line. Close valve of gas cylinder.

**Important Operating Notes**

1. If the gas supply line is filled with air, it may take up to a minute before the gas becomes available for combustion. During this time depress the control knob and continuously operate the Piezo ignitor until the flame ignites.
2. You will have to find out the exact thermostat setting yourself, depending on how much heat you need.
3. Repairs are only to be carried out by a competent service engineer.

**Attention: A new O-ring must always be installed after dismantling the exhaust duct.**

4. Any alteration to the appliance (including exhaust duct and cowl) or the use of spare parts and accessories, which are important to the function of the heater and which are not original Truma parts, as well as the non-observance of the installation and operating instructions, will lead to the cancelling of the guarantee and exclusion of liability claim.
5. During the initial operation of a brand new appliance, a certain amount of fumes and a slight smell may be noticed for a short while. Remedial action is to immediately run the heater at maximum output and to ensure adequate room ventilation.
6. In winter, before switching on the heater, remove all snow from the cowl.
7. Inspect the exhaust duct and all connections at regular intervals and always whenever there is a blowback (misfire). It is essential that the exhaust duct is installed so that it slopes upwards over its whole length and is securely fixed with several clamps. Never place any object on the exhaust duct, since this

could result in damage. The exhaust duct connection to both the heater and the cowl must be firm and well sealed.

Do not operate heaters with incorrectly fitted or damaged exhaust ducts.

8. Never allow the warm air outlet on the heater to be obstructed in any way. For instance never hang washing on or in front of the heater to dry. Misusing your heater in this way could cause serious damage from overheating. Do not place flammable objects near the heater. Please follow these guidelines in the interest of your own safety.
9. If the burner makes an unusual noise or if the flame lifts off while burning, it is likely that the regulator is faulty and it is essential to have it checked.
10. Cleaning (with switched off appliance): It is recommended that at least once a year, before the heating season starts, you remove any dust that has collected on the heat exchanger base plate.

**Technical Data:**

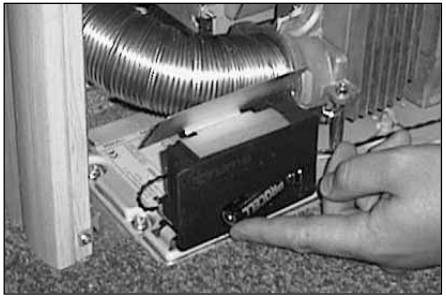
| | |
|---|---|
| Type of gas: | Liquid gas (propane/butane) |
| Operating pressure: | 30mbar (28mbar butane, 37mbar propane) |
| Rated thermal output: | 3400W |
| Gas consumption: | 30-280 g/h |
| Product Indent. | No: CE-0085AP0325 |
| *Automatic Ignitor* | |
| Power consumption: | 50 MA (ignition)<br>0.01 MA (monitoring) |
| Operating voltage: | 3V |

**CHANGING OF BATTERIES**

**Changing the Batteries on the Automatic Ignitor**

Only change the batteries with the heater switched off.

Always insert new batteries at the beginning of the heating season.



Remove front of heater retaining screw, located through centre of black grill. Unclip front of heater, slide up battery cover to reveal battery. Change the batteries. Observe plus/minus.

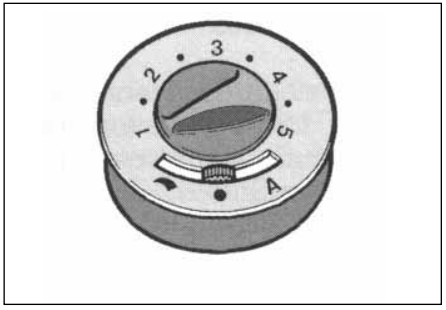
Only use temperature resistant (+70°C), leak-proof Mignon round cells (LR 6, AA, AM 3, Art. no. 30010-23600). Other batteries could lead to malfunctions!

## TEB FAN

**Always observe the operating instructions prior to starting!**

**The vehicle owner is responsible for the correct operation of the appliance.**

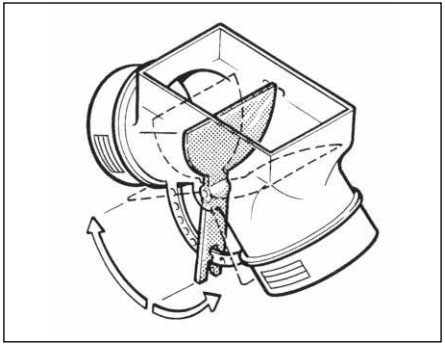
**Repairs are only to be carried out by an expert!**




a = Manual control
(e.g. for ventilation) Adjust desired output at the control knob.

b = Off
(or automatic operation/ heating with heaters Trumatic S 3002 K and S 5002 K)

c = Automatic operation
(Heating) The output steadily adjusts to the respective heat emission of the heater. The maximum output can be limited at the control knob, as required. The regulating between this value and slow running is carried out automatically.



The quantity of air can be individually adjusted at the air flap (f), for warm air distribution.

In centre position 50% of the warm air is distributed to each outlet.

Use the fan duct with 72 mm and if the fan ducts are of different lengths or on sides with a greater heat requirement. This means that the air output can be used to the full on this side. By adjusting the air flap (f) the quantity of air can be increased individually. This means that the air out-put on the other side is reduced.

If the air output drops or the operating noise increases, the fan impeller wheel may be severely soiled.

**Cleaning**

(with switched off appliance!) We recommend removing dust which has collected on the heat exchanger and base plate of the heater and on the impeller wheel of the Trumavent fan, once a year before the heating season starts. Clean the impeller wheel carefully using a brush or tooth brush.

## TRUMA ULTRAHEAT ADDITIONAL ELECTRIC HEATING FOR TRUMATIC S 3002 (P), S 5002 AND S 55 T HEATERS

**Function description**

Truma-Ultraheat is an additional 230V electric heater for the LPG heater models Trumatic S 3002/S 5002.

Heater operation is basically possible with gas only, electricity only or simultaneously with electricity and gas.

When using simultaneously the electrical unit will switch itself off before overheating occurs as a result of the stronger gas burner.

When using electrical only we recommend to set the fan control on position 3 (manual or auto), remembering to set the output level to

2000W (ensure that the fuse protection for the power supply of the camp site is sufficient).

If more than 2kw are required (heating up/cold temperatures) you must refer back using gas operations as the 230V electrical operation is a secondary heater only.

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

**WARNING:-Surfaces become hot in use, guards provided do not give full protection to the young or elderly**

**OPERATING INSTRUCTIONS**

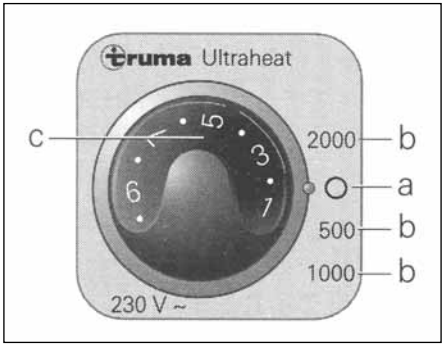
**Before operating the heater for the first time it is essential to observe the operating instructions, enclosed with the heater.**

**Control panel with thermostat**

a = Rotary switch "Off"

b = Rotary switch "On"
power settings:
500 - 1000 - 2000 W

c = Rotary control knob for room temperature (illuminated by green indicator lamp "operation")




**Switching On**

**Attention:** Before switching on, ensure that the fuse protection for the power supply of the campsite is sufficient for the selected power setting (b) (see Technical Data).

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

1. To switch on, turn the rotary switch to the desired output level (b).
2. Set rotary control knob (c) to the desired room temperature.

The thermostat setting on the operating element (1-9) must be determined individually depending on the heating requirement and the type of vehicle. For an average room temperature of about 23°C, we recommend a thermostat setting of about 6 - 8.

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

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

**Switching off**

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

**IMPORTANT OPERATING NOTES**

1. Repairs may only be carried out by an expert.
2. The heater's hot air outlet should under no circumstances be blocked. Never hang clothes or similar in front of or on top of the heater to dry. This could cause serious damage to the heater as a result of overheating. Do not place inflammable materials near the heater! Please observe these instructions for your own safety.
3. The performance of the room thermostat will be affected if temporarily covered or obstructed
4. When operating a brand-new heater for the first time (or after it has been idle for a lengthy period) you may temporarily notice a slight smoke and smell. We advise running the heater at full power and thoroughly ventilating the room.

5. Any modifications to the appliance or the use of spare parts and accessories important for operation which are not original Truma parts, of non-observance of the instructions for installation and use will result in the guarantee becoming invalid and no liability will be assumed.

   Furthermore the approval for operating the appliance will become invalid and in some countries also the approval for operating the vehicle.

**The mains element on the space heater is designed for supplementary heating. It is not recommended to run along side the gas for prolonged periods of time.**

**TECHNICAL DATA**

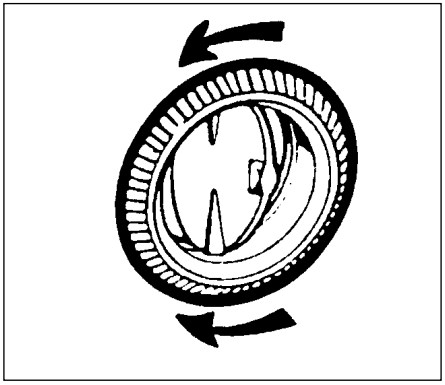
**Power supply:** 230 V ~, 50 Hz

**Power consumption at power setting:**
500 W: 2.2 A
1000 W: 4.5 A
2000 W: 8.5 A

**Weight:** approx 2kg

**BUTTERFLY OUTLETS**

The butterfly plate may be opened or closed to control the quantity of air and may also be twisted around to control direction.



For uniform distribution, outlets nearest the heater should be closed more than those further away.

**Blown air**

The air ducting outlets are generally of the butterfly type and may be opened or closed by adjusting the butterfly valves. Twisting the disc in its housing directs the flow in the direction required.

One outlet on each leg of the air ducting layout must be kept open at all times.

**Switching off**

Push slide switch (a) to the "OFF" position.

**IMPORTANT OPERATING NOTES**

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

**TECHNICAL DATA**

**Power supply:** 230 V ~, 50 Hz

**Power consumption at power setting:**
500 W: 2,2 A 1000W: 4,5 A 2000 W: 8,5 A

**Weight:** approx. 2 kg

## ALDE COMPACT 3010 QUICK START GUIDE

Use the Left < and Right > arrow keys to move across the symbols. Highlight the required symbol so that it flashes. You can then adjust the function.

Use the +/On and -/Off keys to adjust settings and turn functions On and Off.

| | |
|---|---|
| On | With 'On' displayed the boiler is in standby mode and ready to be given commands. |
| Off | With 'Off' displayed the boiler is shutdown. |
| | Select your desired room temperature. |
| | 30 min hot water booster, with this function 'On' the circulation pump for the heating is turned off. |
| | Select 'On' to operate the boiler LPG. |
| | Select 1kW or 2kW to operate the boiler on 230V Electric. |
| | Indicates that the circulation pump is operating for central heating. |
| | Indicates that 230V is supplied to the boiler. |

**PRE-START CHECKS**

- Ensure the system is filled with Glycol before starting the boiler, check the expansion tank level. The fluid should be 10mm above the minimum mark when cold.
- Ensure adequate LPG Propane, 230V and 12V supplies are connected and turned on. The control panel should be active and display the 230V connection symbol.
- Turn the boiler 'On' using the control panel, then scroll across and raise the desired room temperature to +30ºC. The circulation pump symbol should appear. Visually check in the expansion tank that the pump is operating.
- Scroll across and turn on the 2kW electric heater using the panel. Wait for 10 minutes and check that the upper flow pipe on the boiler is getting hot. The bottom return pipe may also be warm.
- Scroll back and turn on the gas burner using the control panel. You might not be able to hear it start, so visually check the flue outside to confirm the boiler is operating. Wait for 10 minutes and check the lower return pipe on the boiler. It should now be hot and the boiler fully operational.

## ALDE COMPACT 3010

**Please read these instructions carefully before using the boiler.**

These instructions are approved for The Alde Compact 3010 boiler fitted in caravans, motor caravans and buildings in accordance with CE no. EMC e5 02 0138, 845 BP-0003.

Installation and repairs may only be carried out by a professional. National regulations must be adhered to.

### BOILER DESIGN

The boiler consists of three eccentrically-fitted cylinders (heat exchanger, water jacket for the heating system and, outermost, water jacket for hot water). The two outer pipes, and their ends and connections, are made of stainless steel, while the heat exchanger is made of aluminium.

The heat exchanger is divided into two semi-circles. The burner is located in the upper half, being the combustion chamber, and the combustion gases are expelled through the lower half. The burner unit is fitted on the end of the heat exchanger. It consists of a combustion fan, burner, solenoid valve and intake/exhaust connections. Two heating cartridges are fitted to the water jacket of the heating system. Maximum output is 2 or 3 kW, depending on model.

## DESCRIPTION OF FUNCTIONS

### USING LPG

When LPG operation is selected on the control panel, the combustion fan starts. When the fan speed is correct, it signals the circuit board that the boiler can be lit. The circuit board sends ignition sparks to the sparkplug at the same time as it sends electricity to the solenoid valve, which opens to allow gas in. The burner ignites, and a sensor transmits a signal back to the circuit board that the boiler is lit, and the ignition spark stops. The burner keeps burning until the boiler thermostat or the room thermostat reaches the set temperature reading.

Should the boiler go out for any reason, the sensor is activated and a new attempt is made to start the boiler (in about 10 seconds).

### USING THE HEATING CARTRIDGE

Electrical operation is selected on the control panel, the 12-volt relays on the circuit board trip, allowing the 230 volt supply to reach the electrical elements.

The heating cartridge is controlled in the same way as the gas boiler.

### WARM WATER

When only warm water is required, for example during the summer, no settings need to be made, the boiler will look after this function automatically.

The pump will only start when the temperature in the vehicle is lower than the set temperature (see item 4, Control Panel). If the vehicle temperature is higher, the pump will not start.

### IMPORTANT INFORMATION

- The boiler must not be started if there is no glycol in the system.
- The LPG boiler and heating cartridge may be operated in parallel.
- The heating system may be heated up without the warm water heater being filled with fresh water.
- Always switch off the main isolator for the boiler when the vehicle is not being used.
- Always drain the warm water heater of fresh water if there is a risk of frost.
- The LPG boiler must not be operated when refuelling the vehicle.
- When washing the vehicle, take care not to get water in the roof vent.

**THE DOMESTIC HOT WATER HEATER**

The boiler is fitted with a built-in warm water heater with a volume of approx. 8.5-litres fresh water. The warm water heater can produce around 12 litres of 40°C water per half-hour (at a cold water temperature of 10°C). If the heating cartridges are used instead of gas for heating the boiler, the capacity is slightly reduced.

Always rinse out the heater before it is used, particularly if it has not been in operation for some time. **NB!** The hot water is not intended for drinking or cooking. When the heater is in continuous use, it should be emptied approx. once a month, to ensure that a new air cushion is formed in the heater.

The air cushion is essential for absorbing pressure surges in the heater. For emptying specially-adapted boilers, as well as any other freshwater systems in the vehicle, please refer to the manufacturer's instructions.

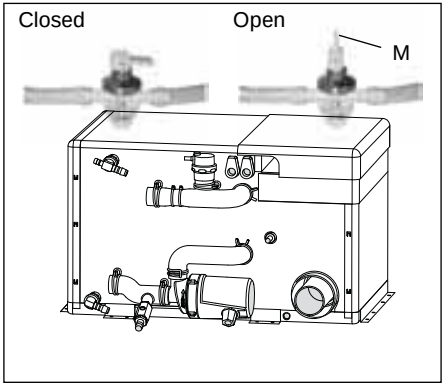
**NB! The warm water heater should always be drained of fresh water when there is a risk of frost and when the caravan is not in use.**

The warranty does not cover frost damage.

**Draining the heater using the combined safety/drain valve:**

1. Switch off the freshwater pump
2. Open all water taps.
3. Then open the safety/drain valve by raising the yellow lever (M) to a vertical position.
4. The heater will now drain directly below the vehicle through the safety/drain valve hose. Check that all the water is emptied out (about 7-10 litres). Leave the valve in the open position until the next time the heater is used.

**NB!** Check that the automatic check valve (N) is open and is allowing air to enter the heater when it is being drained, and that the hose (O) is not blocked.




**THE HEATING CARTRIDGES**

All Compact 3010s are fitted with two 230V heating cartridges with a maximum output of either 2100 or 3150W. Select the heating cartridge output on the control panel.

Always check that the input fuse of the vehicle has the correct amperage in relation to the selected output.

Note these ratings are for the boiler only.

1050W requires a 6 amp fuse.
2100W requires a 10 amp fuse.
3150W requires a 16 amp fuse

**THE CIRCULATION PUMP**

A circulation pump is required to circulate the heated glycol fluid. A 12V circulation pump is fitted in the expansion tank.

An optional 230V circulation pump can be fitted on the boiler. Selection of circulation pump is made with a switch on the control panel. The room thermostat on the control panel controls the circulation pump, i.e. switches it on or off according to the amount of heat required.

**SYSTEM TEMPERATURE**

The boiler is set to a system temperature of 80°C, i.e. the temperature of the glycol fluid as it circulates in the heating system.

**AIR CIRCULATION**

In order to achieve the best possible result from the principle of convected heat, it is

important to allow air to circulate freely under bunks, and behind backrests and wall-mounted cabinets.

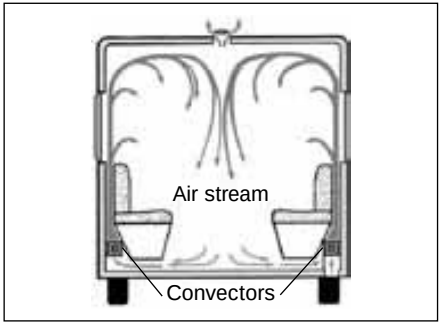
If the vehicle has a fitted carpet, ensure that the carpet does not obstruct the air supply to the radiators.

It is just as important that cushions or blankets do not interrupt the flow of air behind backrests and wall cabinets.

## MAINTAINING THE HEATING SYSTEM

### WINTERCAMPING

While camping during the winter, ensure that the flue is kept clear of snow and ice, since the inlet air to the LPG boiler enters through the flue. Do **not** start the LPG boiler until the flue is completely free of snow. A flue extension (part no. 3000 320) for fitting on the roof is recommended for winter camping.

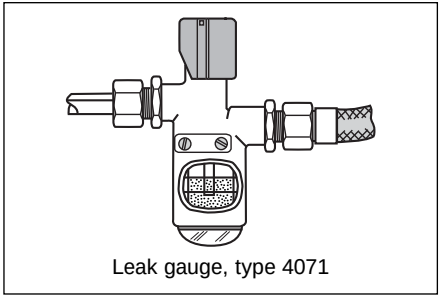



### THE LPG SYSTEM

The LPG system should be checked regularly by a professional, who will ensure that there are no leaks from connections or hoses.

LPG hoses should be changed according to national regulations, maximum of five years. Check the date stamp on the hose. Hose has a propensity to dry out and crack.

To increase safety, we recommend fitting an Alde leak gauge, type 4071, as close as possible to the pressure reduction valve.



Leak gauge, type 4071

### THE HEATING SYSTEM

Regularly check the heating system's fluid level in the expansion tank. The level should be about 1cm above the minimum indicator in a cold tank. The heating system should be filled with a mixture of water and glycol.

For preference, use high quality readymixed glycol (with inhibitor) intended for use in aluminium heating systems.

If using concentrated glycol, the mixture should consist of 60% water and 40% glycol. If the heating system will be exposed to temperatures below -25°C, the glycol content must be increased, but not to more than 50%. Any vessels used for the liquid must be spotlessly clean, and the pipes in the heating system must be free of contamination. This will prevent the growth of bacteria in the system.

The glycol mixture should be changed every second year, since its ability to protect against corrosion, for example, will deteriorate. The glycol content should be checked before topping up with new liquid. This will ensure that the concentration of glycol in the mixture is not too high.

If the fluid level in the expansion tank falls for reasons other than evaporation, please check all joints, drain cocks and bleeder screws to ensure that they are not leaking. If the glycol-water mixture leaks out, rinse with water and wipe up.

Never allow the heating system to stand empty of glycol.

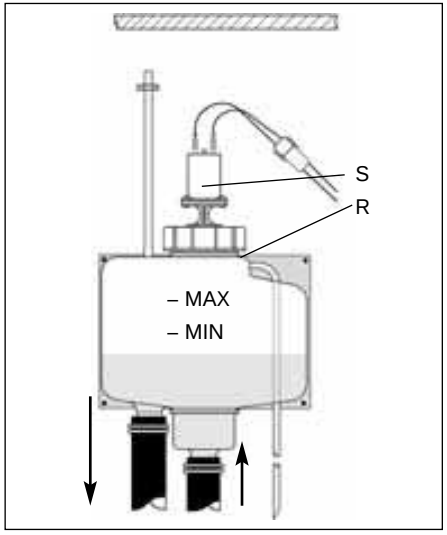
### FILLING THE SYSTEM WITH GLYCOL FLUID

NB! Any vessels used to carry the fluid must be spotlessly clean and the pipes in the system must be free of contamination. This will

prevent the growth of bacteria in the system.

The system is filled through the expansion tank, either manually or using the Alde filling pump which both tops up and bleeds the system. For manual filling, unfasten the circulation pump nut (R) and lift the pump (S) out of the tank. Slowly pour the glycol mixture into the tank. Bleed the system.

Top up with more liquid if the level has fallen after bleeding. Bleed a newlyfilled system regularly during the first days the heating system is in operation.




**BLEEDING THE SYSTEM**

Depending on how the pipes have been fitted, air pockets may form when the system is filled with glycol fluid.

A sign that there is air trapped in the system is that the heat released into the pipes only extends a metre or so from the boiler even though the circulation pump is operating.

In newly-filled systems, small air bubbles can form in the expansion tank, creating a murmuring sound. If the circulation pump is stopped for a few seconds, the bubbles will disappear.

**Bleeding:**

If a bleeder screw is fitted to the outgoing pipe, open this bleeder screw and leave it open until it starts to discharge water.

If the boiler is fitted with an automatic bleeder, there is no need to bleed it manually. Start the LPG boiler. The circulation pump should be switched off.

Open the remaining bleeder screws in the system (please refer to the instruction manual of the vehicle for their locations). Leave the bleeder screws open until they start discharging fluid, and then close them. Start the circulation pump and let it run for a while. Check that the pipes and radiators around the vehicle are heating up.

**If they still fail to heat up, try the following:**

**Single-axle caravan:** Stop the circulation pump. Lower the front of the caravan as far as possible. Leave it in this position for a few minutes to allow the air to travel upwards in the system. Open the bleeder screw at the highest point. Leave it open until it discharges glycol fluid. Raise the front of the caravan as far as possible and repeat the procedure in this position.

Then position the caravan horizontally and start the circulation pump. Check that the pipes and radiators around the vehicle are heating up.

**Motor caravan or twin-axle caravan:**
The easiest way to bleed the heating system is to place the vehicle on a sloping surface or to raise one end of the vehicle using a jack. Bleed the system as described above.

## ABOUT LPG

**THE PROPERTIES OF LPG**

LPG is a petroleum product, formally known as “liquid petroleum gas”. It is mainly made up of propane and butane gas. The advantage of propane is that it remains gaseous at temperatures as low as -40°C, while butane loses effectiveness at +10°C. For this reason, propane is used in colder countries.

The cylinders contain LPG both in liquid and gaseous form. When the cylinders are filled, the pressure turns the gas into liquid. When the cylinder valve is opened, the LPG

becomes a gas again. The risk involved in using LPG is that any leaking gas may ignite and explode. Since LPG is heavier than air, any leaking gas will collect at the lowest point.

LPG contains no toxic substances, but breathing in concentrated gas may have a certain anaesthetising effect, and can also result in shortness of breath and symptoms of suffocation.

These symptoms quickly disappear if the sufferer breathes in ordinary air or oxygen.

Naturally, it is inadvisable to inhale either LPG or exhaust fumes. To make it easier to detect gas leaks, a substance with a distinctly rank smell has been added.

**COMBUSTION**

Complete combustion of LPG only generates carbon dioxide (CO2) and water vapour, just like the air we exhale.

A good supply of air is essential to ensure complete combustion. The flame should burn with a weak blue colour, the centre of the flame should be blue/green. LPG is extremely environmentally compatible and does not generate any soot during complete combustion. It can be stored in cylinders for an unlimited time period, without any deterioration of quality.

**PRESSURE**

The LPG burner usually works at a lower pressure than that in the cylinder. Low pressure (0-50 mbar) and intermediate pressure (50 mbar- 2.0 bar) are created by allowing the gas to pass through a reduction valve. High pressure (over 2.0 bar), is unreduced pressure mainly used in camping equipment. Low pressure and intermediate pressure are always reduced pressure.

## FAULT FINDING

**THE BOILER DOES NOT START**

1. No LPG? Incorrect type for conditions?
2. Is the main tap fully open?
3. If the boiler has not been operated for some time, or if the gas cylinder has been changed, it may take longer than normal to light the boiler.
4. Check that the boiler is connected to the electricity supply (> 11V).
5. Check that the fuse (T) for the boiler is intact.
6. Check whether the electric connections on the boiler are securely in position.

If none of the above helps, contact a service workshop.

**THE HEATING CARTRIDGE IS NOT WORKING**

1. Check that there is an electricity supply (230V ~) to the heating cartridge.
2. Check that the relays fitted to the boiler come on (a slight click can be heard from the relays when the heating cartridge is switched on at the control panel).

If none of the above helps, contact a service workshop.

**WARRANTY**

Alde's warranty is valid for 3 years from the date of purchase of the caravan.

It covers material defects or manufacturing faults on the Alde heating system.

It does not cover frost damage, normal wear and tear parts, Antifreeze,

batteries or other consumables. If you have a problem please contact your dealer

or Alde UK direct.

**NB!** Only genuine Alde parts should be used as replacement parts.

## CONTROL PANEL – FUNCTIONS AND SYMBOLS

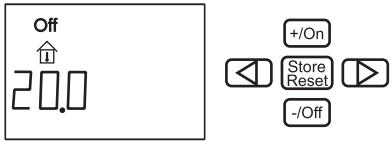
**(Applies to control panels with program version 38 (06-17) or later, see item 17)**

**0. THE STANDBY AND ON-POSITION OF THE CONTROL PANEL**

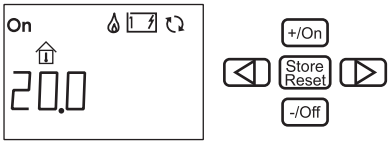
In standby, the functions which are activated in the boiler are shown, and there is no background lighting in the display. The control panel automatically goes to standby from the on position after two minutes if no buttons are pushed or if you step to standby (left of On/Off) with the arrow keys.

Start the on position by pressing any button. The background lighting comes on (blue light) and a function that can be set flashes. Select a function that can be set with the arrow keys. The settings are automatically saved.

1. The control panel is on standby and the heater is switched off.

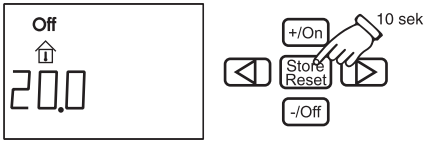



2. The control panel is on standby and the heater is operating.

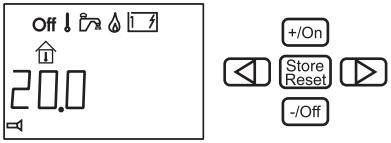



**1. RESETTING THE SYSTEM**

1. Press the Store/Reset button for 10 seconds. The control panel is reset to the factory setting.




2. The main breaker to the control panel is in the “Off” position, Gas is on, Electricity at 1kW and 22°C.



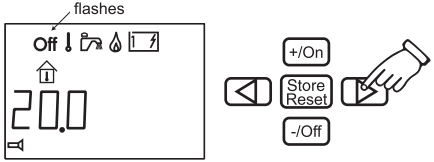

The pump is in automatic position. The lower menu row is not lit up.

**2. START THE HEATER**

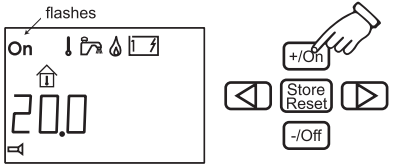
Start the heating in the caravan with the settings last used.

If you break the power to the heater, the settings which were last used will automatically be used when the power comes back on.

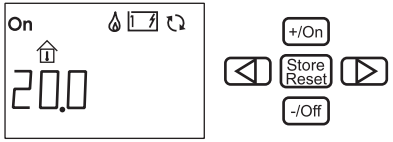
1. Press the button with the arrow until “Off” (main breaker) in the display flashes.




2. Press the +/On button.“On” (main breaker) in the display flashes.

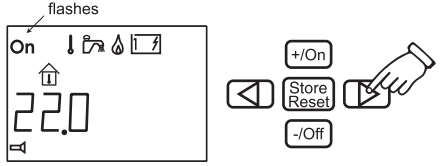



3. The settings are ready.“On” (main breaker) is shown in the display when the panel returns to standby.

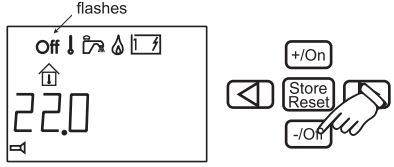


### 3. SWITCH OFF THE HEATER

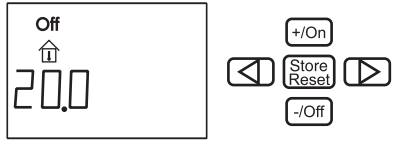
1. Press the button with the arrow until “On” (main breaker) in the display flashes.




2. Press the -/Off button. “Off” (main breaker) in the display flashes.




3. The settings are ready. “Off” (main breaker) is shown in the display when the panel returns to standby.

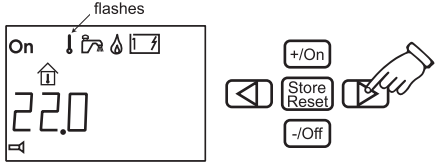



### 4. SET THE TEMPERATURE YOU WANT IN THE VEHICLE

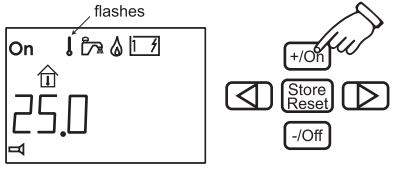
The temperature of the vehicle can be set from +5°C to +30°C at intervals of 0.5°C.

1. Press the button with the arrow until the symbol for selecting temperature flashes.

   The temperature shown is the temperature which is set at present (in this case 22.0°C).




2. Increase the temperature by pressing the +/On button. Lower the temperature by pressing the -/Off button. The diagram shows that we have set the temperature at 25.0°C.



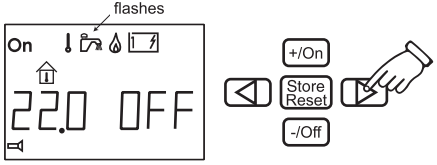

3. The settings are complete and the boiler is working at the set temperature.

### 5. WARM WATER

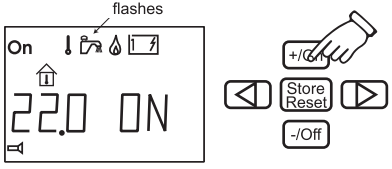
If you need more warm water you can increase the quantity temporarily for 30 minutes by increasing the water temperature from 50°C to 65°C.

When 30 minutes have elapsed, the water temperature returns to 50°C and the symbol goes out. When you have selected more warm water, the circulation pump stops.

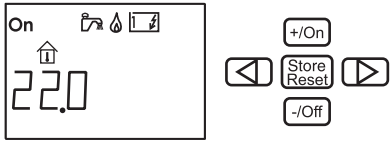
1. Press the button with the arrow until the symbol for selecting warm water flashes. The “OFF” text is shown next to the temperature on the display.




2. Switch the warm water on by pressing the +/ON button. The “ON” text is shown next to the temperature on the display.

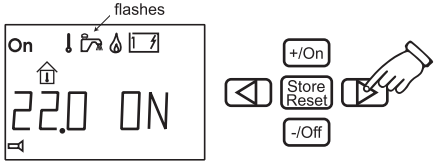


3. The warm water symbol is displayed when the panel returns to standby.

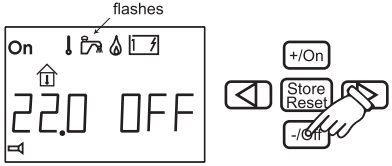



If you want you can switch off more warm water before 30 minutes have elapsed.

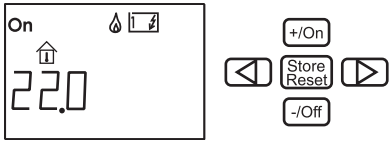
1. Press the button with the arrow until the warm water symbol flashes. The “ON” text is shown next to the temperature on the display.




2. Switch off the warm water by pressing the -/Off button. The “OFF” text is shown next to the temperature on the display.



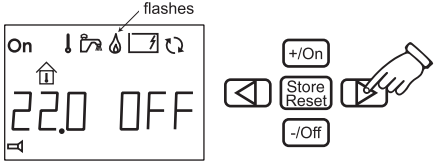

3. The warm water symbol goes out when the panel returns to standby.



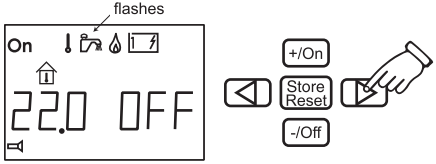

**6. HEATING WITH GAS**

Do as follows to activate heating with gas.

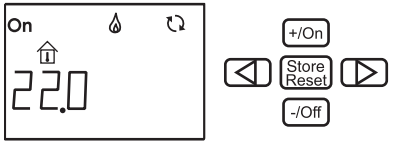
1. Press the button with the arrow until the gas heating symbol flashes. The “OFF” text is shown next to the temperature on the display.




2. Select gas heating by pressing the +/On button. The “ON” text is shown next to the temperature on the display.

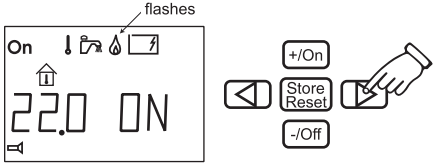



3. The gas heating symbol is displayed when the panel returns to standby.

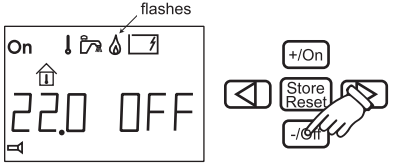



Do as follows to switch off the gas heating.

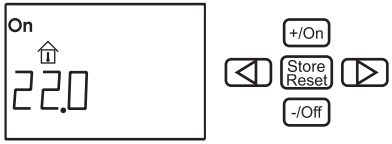
1. Press the button with the arrow until the gas heating symbol flashes. The “ON” text is shown next to the temperature on the display.




2. Switch off the gas heating by pressing the -/Off button. The “OFF” text is shown next to the temperature on the display.



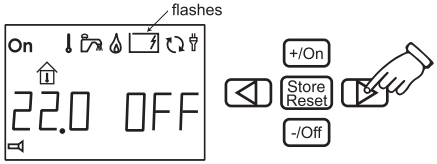
3. The gas heating symbol goes out when the panel returns to standby.



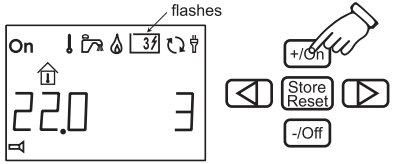

### 7. HEATING WITH ELECTRICITY

To activate heating with electricity. The greater the power the more rapid the heating will be.

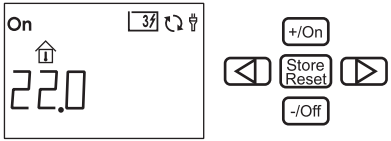
1. Press the button with the arrow until the electrical heating symbol flashes. The “OFF” text is shown next to the temperature on the display.




2. Select power (1kW, 2kW or 3kW) with the +/On or -/Off buttons. The diagram shows that 3kW power has been selected (some boilers are only equipped with 1-2kW).

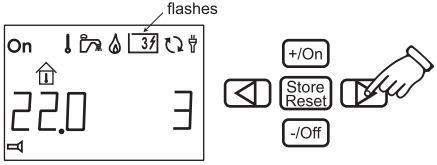



3. The electrical heating symbol is shown when the panel returns to standby.

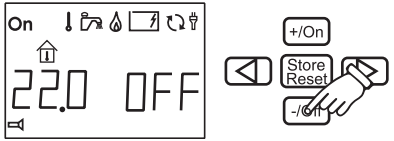



Do as follows to switch off heating with electricity.

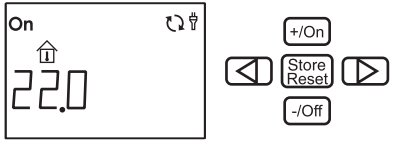
1. Press the button with the arrow until the electrical heating symbol flashes.




2. Switch off the electrical heating by pressing the -/Off button until all power steps have gone out. The “OFF” text is shown next to the temperature on the display.




3. The electrical heating symbol goes out when the panel returns to standby.

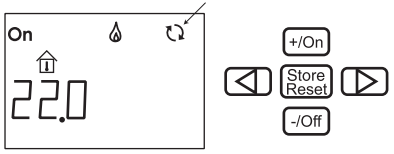



### 8. CIRCULATION PUMP

This symbol is displayed when the circulation pump is operating (12Vpump or 230V-pump).

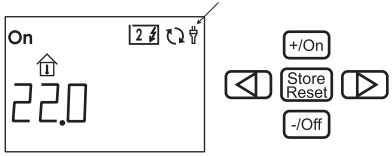
When heating is required in the vehicle, the pump starts automatically.

The boiler selects the 230V pump if one is installed in the system. When the 230V is disconnected from the vehicle the 12V pump is automatically selected. The symbol will light up even if the pump is defective.



### 9. 230V CONNECTION

This symbol lights up when 230V is connected to the vehicle.




### 10.TEMPERATURE

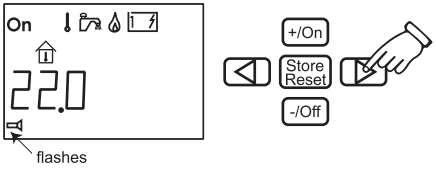
This symbol shows the indoor temperature in the caravan in intervals of 0.5°C.

This symbol shows the temperature outside the caravan in intervals of 1°C. To use this function an outdoor temperature sensor must be installed.

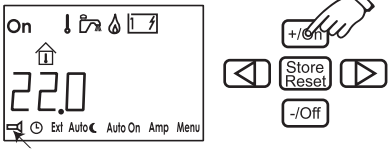
### 11.WORKING WITH THE LOWER MENU ROW

The lower menu row can be used for such things as setting the clock, external start, night temperature, automatic start of the heater. To use the lower menu row you must activate it by doing as follows:

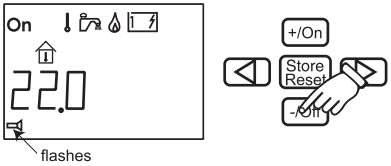
1. Press the button with the arrow until the symbol for the lower menu row flashes.




2. Light up the menu row by pressing the +/On button. The lower row with symbols lights up.



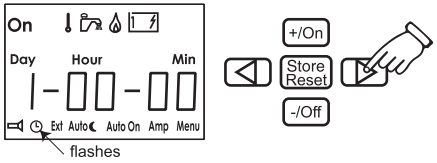

3. To switch off the lower menu row, press the -/Off button when the symbol flashes. Activated functions will be displayed even if the lower menu row is switched off.



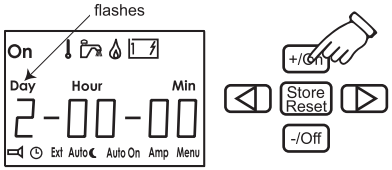

### 12.CLOCK

To set the clock, first light up the lower row of functions (see item 11).

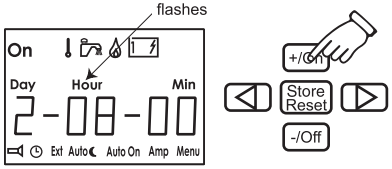
1. Press the button with the arrow until the clock symbol flashes.



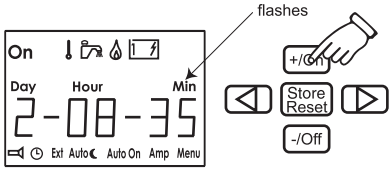

2. Press the +/On button. Day flashes. Use +/On or -/Off to set the weekday.



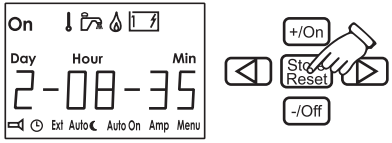

3. Step forward with the arrow key until the time is displayed. Hour flashes. Use +/On or -/Off to set the full hour.



4. Then step forward with the arrow key until the minutes are displayed. Min flashes. Use +/On and -/Off to set the minutes.




5. Press Store and the time you have set is stored.The example shows Tuesday, 08.35.



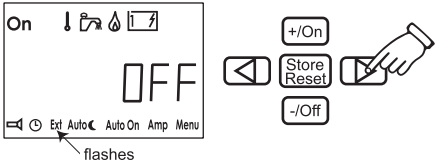

If the power to the panel is broken and the battery backup is not connected, the clock must be set again.

Weekday: 1-7
1=Monday
7= Sunday
Hours: 0-23
Minutes: 0-59

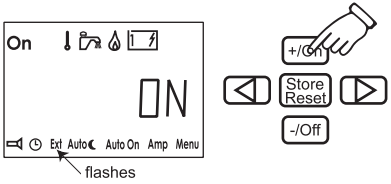
**13.EXTERNAL START Ext**

This function is used if you wish to start the heater in the caravan from outside. To use this function it is necessary to have an installation for external start (see vehicle manual). To activate external start, first light up the lower menu row of functions (see item 11).

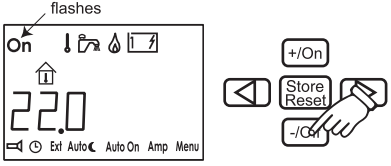
1. Press the button with the arrow until the “Ext” symbol flashes. The “OFF” text is shown next to the temperature in the display.



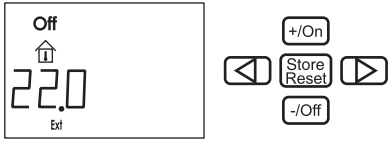

2. Press the +/On button. The “ON” text is shown next to the temperature in the display.




3. Press the button with the arrow until the On symbol (main breaker) flashes. Press -/Off.




4. Off and Ext are shown in the display when the panel returns to standby. External start is activated.




When external start is activated the heater will start with the latest settings and “ON” (main breaker) comes on. If 12V is not connected to the heater, the display will not light up until 12V is connected. The external start function is still activated.

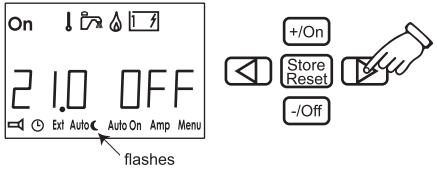
To switch off external start, go to the “Ext” symbol in the on position and press the -/Off button.

**14.AUTOMATIC TEMPERATURE CHANGE Auto**

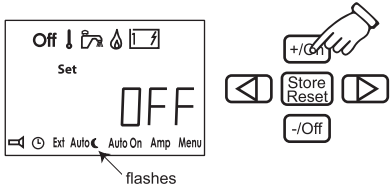
This function is used when you wish to set automatic temperature change, for example, during the night.

In order to activate automatic temperature change, first light up the lower row of functions (see item 11).

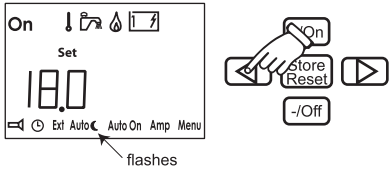
1. Press the button with the arrow until the symbol for automatic temperature change flashes. The temperature and the “OFF” text are shown on the display.



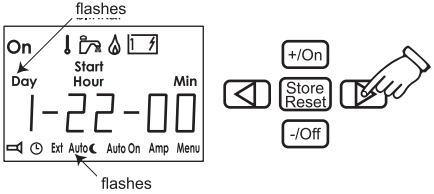

2. Press the +/On button. Set flashes and the OFF text is shown in the display. Press +/On to activate the function. “ON” is shown in the display.



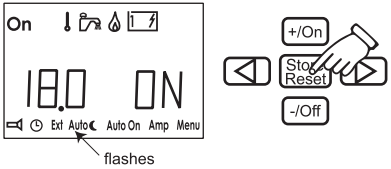

3. Press the left arrow key. The required temperature is displayed. Then adjust the temperature by pressing the +/On or -/Off button.




4. Then press Store and the start time is displayed. Adjust the start time (the same procedure as in 12) and press the “Store” button.




5. Now adjust the stop time and press “Store” again. The text field shows the required temperature and ON.




6. If you want the temperature change to be repeated daily, select day 0. Auto☾ is shown in the display when the panel returns to standby.

**15.STARTING THE HEATER AUTOMATICALLY AutoOn**

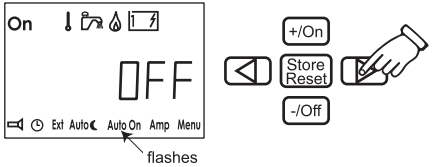
This function is used if you want the heater to start automatically at a later time. The heater works for 24 hours and then stops.

Automatic start is repeated the following week as long as the function is activated.

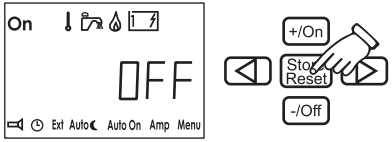
To activate the function you must first light up the lower row of functions (see item 11).

The function controls the panel’s main breaker.

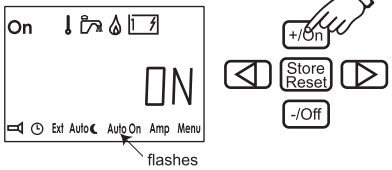
1. Press the button with the arrow until the AutoOn symbol flashes. “OFF” is shown in the display. To activate AutoOn, press the +/ On button or the -/Off button to close the function.




2. The start time will be displayed. Set the time in accordance with item 12 and press “Store” to store the settings. “OFF” is shown in the display.




3. Press the +/On button. On is shown in the display and AutoOn flashes. Set the panel’s main breaker to OFF.



When you get to the vehicle and AutoOn is activated, de-activate AutoOn so that the heater does not stop after 24 hours (the boiler cannot be switched off when AutoOn is activated).

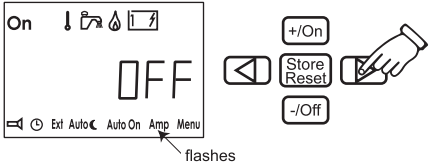
You can then step back with the left-hand button in the settings and press Store in all positions.

**16.LOAD MONITOR Amp**

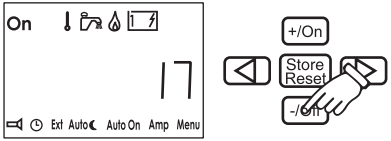
This function is used if you do not want the 230V fuses to become overloaded. If the vehicle's total current consumption exceeds the set value, the boiler's electrical power will be automatically reduced. On account of voltage variations and tolerances, one can select various control levels (for example, for 6A fuse, one can choose either 5,6,7 Amp setting).

If the fuse does not hold, select a lower set value. The function is disconnected in the factory setting. To activate the function, you must first light up the lower row of functions (see item 11).

1. Press the button with the arrow until the Amp symbol flashes. "OFF" is shown in the display.




2. Press the -/Off button to activate and set the function. The following values can be set with +/On or -/Off buttons, 5,6,7,9,10,11,15,16,17.




3. Amp is shown in the display when the panel returns to standby.

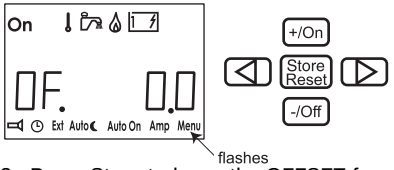
**17.MENU Menu**

In the "Menu" setting one can activate a number of functions. To activate the function you must first light up the lower row of functions (see item 11). To step between the various functions, use the arrow keys.

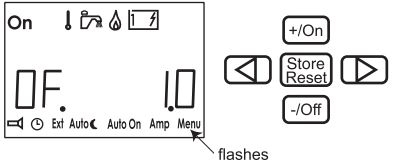
OFFSET (Temperature adjustment)

With this function you can calibrate the temperature on the panel if you notice that the temperature (the stabilised room temperature) does not correspond with the temperature shown on the panel.

1. Press the button with the arrow until the Menu symbol flashes. Press +On.
2. When OF is displayed, adjust the temperature displacement with +/On or -/Off (+/-5°C in intervals of 0.5°C).



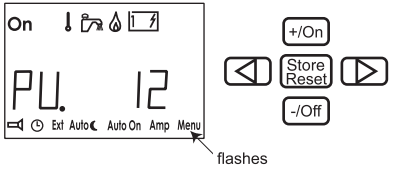

3. Press Store to leave the OFFSET function.



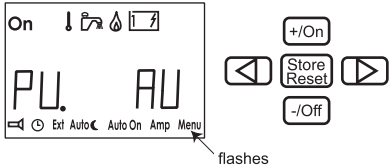

PUMP 12V/PUMP AU.

The12V pump is used in the PU 12 setting even if 230V is connected. In the PU AU position, the 230V pump works, and when 230V is disconnected, the 12V pump starts. The PU AU function is activated in the factory setting.

1. Press the button with the arrow until the Menu symbol flashes. Press +On.
2. When OF is displayed, step with the arrow key until PU AU is displayed. Press +/On and PU 12 is displayed.



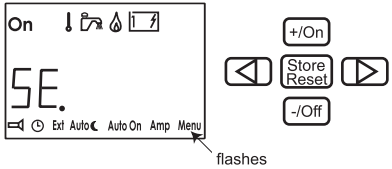
3. Press -/Off and PU AU is displayed. Press Store to leave the pump function.



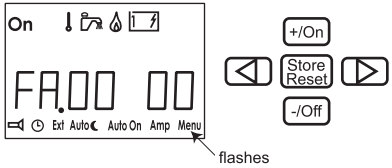

SERVICE

With this function one can see what values* from the heater are displayed. The values are updated once per second.

1. Press the button with the arrow until the Menu symbol flashes. Press +On.
2. When OF is displayed, step with the arrow key until SE is displayed. Press +/On to see the various values (-/Off can also be used).




3. To leave Service, press Store.




* The values shown during service are:

**FA (revolutions):** The speed of the fan divided by 2.

**SH (temp):** Warm water temperature.

**HE (temp):** Operating temperature.

**OH:** If the overheating protection has been tripped On or alternatively Off.

**HS (X):** Software version in the heater.

**PS (X):** Software version on the panel.

**I:** Amp. Guideline value shown in steps of 0.5 A.

**WI:** Window breaker on-off.

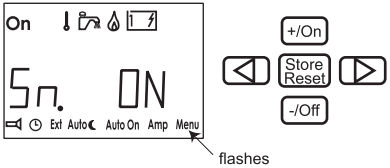
**ES:** External start on-off.

**10-RS:** Heater information, only for ALDE.

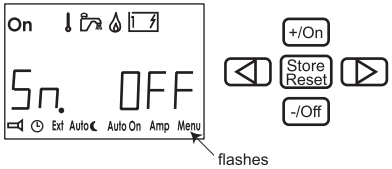
BUTTON SOUND

With this function you can connect or disconnect the button sound to the buttons. The button sound is disconnected in the factory setting.

1. Press the button with the arrow until the Menu symbol flashes. Press +On.
2. When OF is displayed, step with the arrow key until Sn is displayed. Press +/On and the button sound is connected.



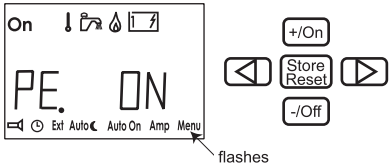

3. Press -/Off to disconnect the button sound. Then press Store to leave the button sound function.



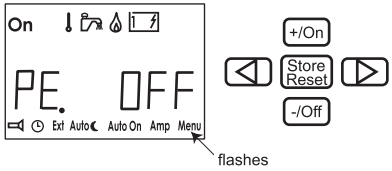

CONSTANT PUMP OPERATION

With this function, selected pump is in constant operation. The function is disconnected in the factory setting. This function limits the hot water supply, particularly when there is little need of heat.

1. Press the button with the arrow until the Menu symbol flashes. Press +On.
2. When OF is displayed, step with the arrow key until PE is displayed. Press +/On and constant pump operation is connected.




3. Press -/Off to disconnect constant pump operation. Then press Store to leave the pump operation function.

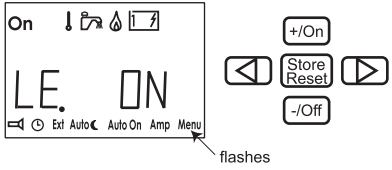



AUTOMATIC TEMP. INCREASE

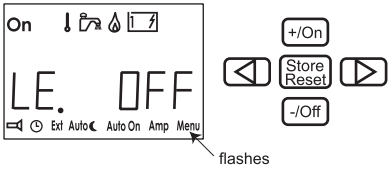
At 02.00 hours (night time) the boiler starts and works in accordance with Warm water (item 5) if the clock is set. The reason for this is to reduce the risk of legionella.

The function is disconnected in the factory setting.

1. Press the button with the arrow until the Menu symbol flashes. Press +On.
2. When OF is displayed, step with the arrow key until LE is displayed. Press +/On and legionella is connected.




3. Press -/Off to disconnect legionella. Then press Store to leave the legionella function.




**18.FAULT MESSAGES**

When a fault occurs in the system the reason is shown in the display.

**LOW BAT:** If the vehicle has a battery voltage of less than 10.5V, the heater stops. The heater is automatically reset when the voltage comes up to 11V.

**FAN:** Faulty fan speed. Automatic resetting after 5 minutes.

**GAS OUT:** Gas finished. Resetting by switching off and restarting the boiler in accordance with item 1.

**OHEAT 1:** Overheating protection tripped. To re-set, disconnect 12V from the boiler and connect again.

**OHEAT 2:** Thermostat tripped. To re-set, disconnect 12V from the boiler and connect again.

**WINDO:** Window open, the boiler stops for gas. Gas operation in the boiler starts when the window is closed. Electrical operation functions. Check the vehicle instructions to see whether this function is installed.

**SERIAL:** There is a connection fault between boiler and panel. Normally, this is a mechanical fault in the connection between the heater and panel. To re-set, break the main current and then start again.

**19.EMERGENCY START**

• Disconnect 12V and the cable to the panel on the heater.

• Connect a cable between 2 and 9 in the contact device (on the heater).

• Connect 12V to the heater.

Now the heater starts with gas and 1kW. (Regulation of room temperature does not function, constant pump operation)

**TECHNICAL DATA**

**Measurements/Weights**

| | | |
|---|---|---|
| Boiler height: | 310mm | |
| Boiler depth: | 340mm | |
| Boiler width: | 510mm | |
| Weight: | 14kg (without fluid) | |
| **Gas** | **Propane** | **Butane** |
| Output 1: | 3.3kW | 3.8kW |
| Consumption | 245g/h | 275g/h |
| Output 2: | 5.5kW | 6.4kW |
| Consumption: | 405g/h | 460g/h |
| Pressure: | $I_{3+}$ 28-30/37 mbar | |
| | $I_{3B/P}$ 30 mbar | |

**Volume/Pressure/Temp**

| | |
|---|---|
| Liquid volume radiator water: | 3.5 litre |
| Liquid volume warm water: | 8.4 litre |
| Max pressure radiator water: | 0.05MPa (0.5 bar) |
| Max pressure warm water: | 0.3MPa (3.0 bar) |
| System temperature: | max 85°C |

**230V ~**

| | |
|---|---|
| Output element: | 1 x 1050W |
| Output element (2 or 3kW): | 1 x 2100W |

**12V DC**

| | |
|---|---|
| Current consumption: | 1 amp (max) |
| Fuse: | 3.15 amp+ / 3.15amp- |

## THETFORD ABSORBER REFRIGERATORS

This user's information is for N112, N145, N175 & N180 models of Thetford absorption refrigerators. It explains how to use your refrigerator correctly and safely. Read the manual carefully before using the refrigerator for the first time to obtain a quick overview of how to operate and use the refrigerator.

Thetford absorption refrigerators are specially designed to store fresh and frozen food and make ice cubes in caravans and campers. The control panel allows you to select the preferred energy source and cooling level. Different energy sources allow you to use your refrigerator under different conditions.

Thetford absorption refrigerators belong to category C11: gas appliances that must be installed so that the combustion area is isolated from the living space.

To find out more about how your absorption refrigerator works, visit the website at www.thetford-europe.com.

### PRECAUTIONS AND SAFETY INSTRUCTIONS

#### Alerts

The following alerts are used in this user's manual:

*Warning!* "Warning" alerts the user to the danger of damage to the product or to the user if the user fails to carry out the described procedures carefully.

Non-observance of the procedures may result in serious injury to the user or damage to the product.

*Caution!* "Caution" alerts the user to the possibility of damage to the product if the user fails to carry out the described procedures carefully.

*Important!* "Important" denotes supplementary information for the user and alerts the user to potential problems.

#### Warnings

- This refrigerator must be installed according to the manufacturer's instructions and in compliance with local and national regulations.
- Read this manual carefully before you start to use your refrigerator.
- Always consult the warnings before you perform any maintenance or gas checks.

Repairs/maintenance

- Never open or damage the cooling system. The cooling system is pressurised and contains substances harmful to health.
- Never attempt to repair gas, extractor or electrical parts yourself. They must be repaired by a qualified service engineer. Contact the Customer Service department of Thetford for a list of qualified parties.
- Always switch off the refrigerator before you perform any kind of maintenance or cleaning.

Use

- Never cover the ventilation grills in the walls of a caravan. Good ventilation is essential for the correct working of the absorber system.
- Water in the ventilation grating can result in damage to the refrigerator. Therefore, we advise that you put the winter cover over the ventilation gratings prior to washing your vehicle.
- Never expose the refrigerator to rain.
- Never operate the refrigerator by gas while driving. If a road accident results in fire, there is a risk of explosion.

What to do if...

- You smell gas:
  - close the valve of the gas bottle;
  - extinguish any naked flames;
  - do not switch on any electrical devices or lighting;

- open the windows and leave the room;
- contact the Customer Service department of Thetford.

• You suspect a leak in the cooling system:

- switch off the refrigerator;
- extinguish any naked flames;
- provide sufficient ventilation;
- contact the Customer Service department of Thetford.

**ABOUT YOUR REFRIGERATOR**

Your refrigerator has a cold space and a freezer compartment. After starting up the refrigerator, allow it to cool for at least eight hours before placing any food in it.

**Cold space**

The cooling fins are located on the inside of your refrigerator. The absorption system uses the cooling fins to withdraw heat from the refrigerator. Therefore, never place plastic or paper over the cooling fins. Air must be able to circulate freely through the refrigerator so that heat can be extracted.

**Important!** Do not cover the cooling fins at the back of the refrigerator with plastic or paper. The refrigerator cools optimally when air is allowed to move freely through the refrigerator.

• To limit frosting on the cooling fins:

- always cover liquid foods before placing them in the refrigerator;
- always let hot food cool before placing it in the refrigerator;
- never keep the refrigerator open longer than necessary.

Fitting racks

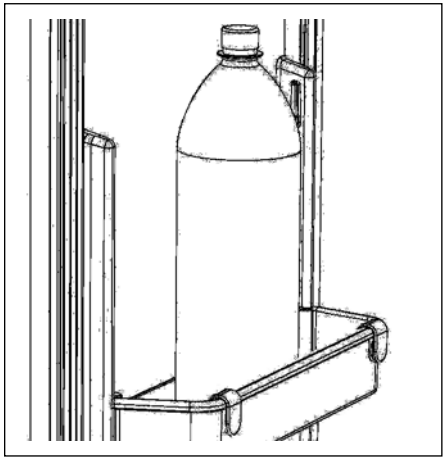
Inside your refrigerator there are two or three storage racks. You can adjust the racks to a convenient height by means of a simple click system:

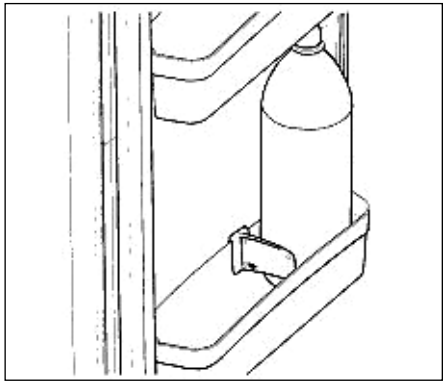
- click the plastic bracket to the right short side of the rack;
- turn the bracket into the horizontal position and insert the rack tipped in a sloping position into the refrigerator;
- place the short side without bracket into one of the grooves on the left wall of the refrigerator;
- place the short side with bracket in the corresponding groove on the right wall of the refrigerator;
- turn the bracket downwards to fix it into the groove.

To move a rack, turn the bracket upwards and remove the rack. Place the rack at the required height in the way described above.

Securing products for driving

The fitting racks in your refrigerator have a system for you to secure products while 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 are two unique Thetford bottle slides (see illustration) The slides prevent bottles from sliding around during driving. Push the slide against the products in the door or place the products between the bottle slide .





**Freezer compartment**

**Important!**

- The freezer compartment is unsuitable as a means of freezing food, the freezer will maintain the temperature of already frozen food
- Use only drinking water to make ice cubes.
- Do not place any other products in the freezer compartment when you are making ice cubes.
- Water freezes fastest with the thermostat at the highest setting.

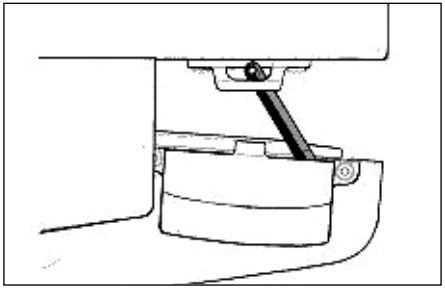
**Tip!**

- Make ice cubes at night when your refrigerator has more spare capacity.

**Door locking mechanism**

The refrigerator door has an automatic locking mechanism. The door locks automatically when you press it shut firmly. 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 pin when the door is closed, you can be sure that the door does not open during your journey.

If you are not going to use the refrigerator for a prolonged period of time, you can use the special storage latch of the door locking mechanism (see illustration) to prevent odours. Rotate the hook through 90 degrees and lock it in place using the strike plate.



**MODEL NUMBERS:**

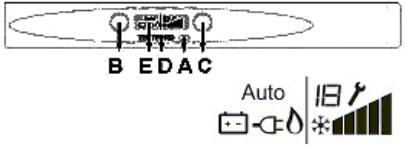
**Electrical ignition (N80E, N90E, N100E, N109E, N110E, N145E, N175 & N180)**

- EES (Electric Energy Selection): the 'Electric' version, where the preferred energy source has to be selected manually [no 'Auto' function possible]

**SWITCHING ON THE REFRIGERATOR (control panel)**

- It is recommended to 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.

**Switching on the refrigerator**




A = Main switch (on/off)
B = Mode selection switch
C = cooling level selection switch
D = Function LED
E = LCD display

1. Open the valve of the gas bottle.
2. Open the taps of the gas supply.

3. Press main switch (A). The function LED will turn blue and all symbols on the LCD display will light up.
4. Use the mode selection switch to select the power supply that you want. The LCD display will show the option you have selected.
5. Set the desired refrigerating cooling level by means of the cooling level selection switch (C). The LCD display will show the cooling level setting you have selected.

A. Use the main switch to switch the refrigerator on and off. The function LED will turn blue. The display LCD shows the most recent settings. After 10 seconds the LCD display's backlight will go out. The function LED remains blue.

B. Press the mode selector switch and the LCD display backlight will show the setting for 10 seconds. Pressing the mode selector switch successive times takes you through the menu in the following sequence: Manual DC (12V), manual gas, manual mains voltage (230V).

C. Use the cooling level selector switch to control the temperature of the refrigerator. When you press the cooling level selector switch, the LCD backlight will light up and show the currently set temperature. Every time you press the cooling level selector switch again, you set the refrigerator one position cooler. On reaching the coldest temperature, the system will start again at the warmest temperature setting. Ten seconds after release of the cooling level selector switch, the system will switch off the LCD backlight.

**Selecting electrical power manually**

**Mains voltage (230V):**

**The LED warns you whenever insufficient voltage is available or if a fault occurs. If this happens, the LED will start flashing once per second and an error code is shown in the LCD display**

When sufficient current is available again, or the fault has been resolved, the LED will emit a steady blue light again.

**Direct current (12V):**

**The LED warns you whenever your vehicle's engine is not running, or if a fault occurs, or if insufficient voltage is available. If this happens, the LED will start flashing once per second and an error code is shown in the LCD display.**

Once the engine is running, or the fault has been resolved, or sufficient voltage is available again, the LED will again emit a steady blue light.

**Powering with gas**

**Warning!** - Flammable material must be kept away from the rear of the refrigerator.

- For selection of gas type, see the information plate inside your refrigerator.
- For the pressure regulator model, see the information plate inside your refrigerator and the table at the back of this booklet.
- The type of gas container and its location must be in compliance with the most recent regulations. Ensure that the unit is installed in a location with good ventilation and make sure that the ventilation openings in the gas container storage location remain open.
- The changing of the gas container must be done outside in the open air and out of reach of any possible sources of ignition.
- It is prohibited to use gas to power the refrigerator while you are driving.
- It is prohibited to use gas to power the refrigerator in the vicinity of petrol stations.

**Selecting gas operation manually**

**If the flame cannot be lit within 30 seconds, the gas supply will stop and gas mode will be switched off. The LED start flashing every second and an error code is shown in the LCD display**.

The gas mode can be reset only if the refrigerator is switched off. If you switch the refrigerator on again and the gas mode is still not working, the LED of the manual gas mode will flash to indicate that gas is

unavailable and an error code is shown in the LCD display.

**Important!** It is prohibited to use gas to power the refrigerator while you are driving. If a road accident results in a fire, there is a danger of explosion. It is prohibited to use gas to power the refrigerator in the vicinity of petrol stations. If it takes longer than 15 minutes to refuel your vehicle, you should switch the refrigerator off using the main switch (A).

**Switching off the refrigerator**

- Push the main switch (A).
- The blue LED will go out.
- The refrigerator is now completely switched off.
- Use the special storage latch on the door locking mechanism to fixate the open door. This prevents unpleasant odours and mould in the refrigerator.

**MAINTENANCE**

Regular maintenance is necessary to ensure the correct functioning of your refrigerator.

**Cleaning**

**Tip!** A good time to clean your refrigerator is straight after you have defrosted it.

- Clean the refrigerator with a soft cloth and mild detergent.
- Dust the refrigerator with a soft, moistened cloth.
- Use a brush or soft cloth to remove once a year any dust from the condenser at the inside of the refrigerator.

**Important!** - Do not use soap or aggressive detergents that are abrasive or soda-based.

- The removable interior components of the refrigerator are not dishwasher proof.

**Defrosting**

Frost will gradually build up on the condenser of the refrigerator. You should defrost the refrigerator as soon as the frost layer is about 3 mm thick. Frost reduces the refrigerating capacity and life of your refrigerator.

- Remove the ice cube tray and all food.
- Switch off the refrigerator.
- Leave the refrigerator door open.
- Place dry towels in the refrigerator to absorb the water.
- Place trays containing hot water in the freezer compartment.
- After defrosting (when the freezer compartment and condenser are frost-free), remove the towels and the water trays and use a cloth to dry off the refrigerator.
- Switch the refrigerator on again in the way described in section 4.1 ("Igniting and starting your refrigerator").

**Important!** - Do not use force or sharp objects to remove frost.

- Do not try to accelerate defrosting by using (for example) a hair dryer.

**Door locking mechanism**

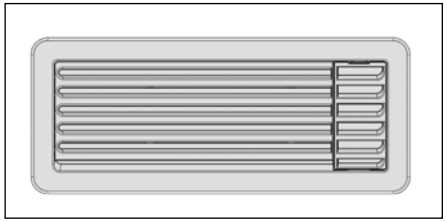
Frost will form in the refrigerator if the door is not closed properly. To determine whether the door closes properly, close the door with a piece of paper between the door and the refrigerator. Pull at the piece of paper. If you feel resistance, the refrigerator door closes properly. If you feel no resistance, the door does not close properly. Perform this test regularly on all four sides of the refrigerator door.

If you find that the door does not close properly, check whether the door locking mechanism keeps the door properly shut.

**Winter operation**

If you use the refrigerator when the outdoor temperature is below 8°C, install the Thetford vent winter/storage cover on the ventilation grills. The cover protects your refrigerator from excessively cold air. The winter cover is a refrigerator accessory obtainable from your caravan dealer.

**Tip!** It is advisable to use the winter/storage cover if you are not going to use the vehicle for a long period of time.



Ventilation grating with winter cover

**IMPORTANT;** DO NOT USE THE WINTER/ STORAGE COVER IN TEMPERATURES GREATER THAN 8°C AS THIS CAN DAMAGE THE COOLING UNIT AT THE REAR OF THE FRIDGE. Remove the covers and re-fit when placing the vehicle back into storage.

**Maintenance of gas equipment**

A **qualified service engineer** must maintain and inspect gas and electrical equipment. It is advisable to have this maintenance work performed by a customer service centre. Contact the Customer Service department of Thetford for a list of qualified parties.

**Important!** European laws covering gas appliances and extractors prescribe observance of the following rules (which are the user's responsibility):

- appliances that run on liquid gas must be inspected before being used for the first time and every year thereafter.
- the gas burner must be cleaned at least once a year or more frequently if necessary.
- If a gas hose is used, it must be checked annually. This hose has a limited life and, thus, must be regularly replaced. Check the hose regularly for cracks, splits and ageing. If in doubt, replace the hose. Pay attention to the maximum life of the hose and replace it in time, as advised by the manufacturer or in conformance with local regulations.
- For replacement, a gas hose approved in accordance with the local regulations must be used. Position the hose so that it can rotate, is not kinked, and will allow
- Due to the limited life of the gas hose, it must be installed so that replacement is possible.

**Maintenance checklist**

This refrigerator will give you many years of trouble-free use if you simply run through the following checklist regularly:

- keep the refrigerator clean (see section 7.1 of the user instruction manual, "Cleaning");
- defrost the refrigerator as often as is necessary (see section 7.2 of the user instruction manual, "Defrosting");
- check the door closing mechanism regularly (see section 7.3 of the user instruction manual, "Door locking mechanism");
- make sure that the ventilation grills are not blocked;
- Regularly clean the ventilation grills.

**Vent screen**

The vent has a vent screen to prevent bugs from entering the combustion area of the refrigerators. These vents need to be cleaned regularly to insure a good airflow. When the refrigerator performs poor because of external circumstances such as extreme ambient temperatures, the vents can be removed to improve the airflow and improve the cooling performance of the refrigerators.

**STORAGE**

If you do not expect to use your refrigerator for a lengthy period, carry out the following actions:

- Remove all food
- Switch off the refrigerator
- Clean the refrigerator as described in Section 7.1 'Cleaning'
- Shut off the gas tap to the refrigerator
- Leave the door of the refrigerator ajar using the special door closure hook (storage position)
- Place the winter protection on the ventilation grill.

**TROUBLESHOOTING**

If your refrigerator does not refrigerate properly or will not start, run through the following checklist. If this fails to solve the problem, please contact the Customer Service Department in your country (see the addresses at the back of this manual).

- Check whether you have followed the instructions in chapters 4, 5 or 6 of the user instruction manual ("Switching on the refrigerator").
- Check whether the refrigerator is on a level surface.
- Check whether the refrigerator can be used with an available energy source.

| **Problem: refrigerator will not work on gas** | |
|---|---|
| Possible cause | Action you can take |
| a) Gas bottle is empty. | a) Replace the gas bottle. |
| b) Valve of the gas bottle or one of the shut-off valves is closed. | b) Open the valve of the gas bottle or shut-off valve(s). |
| **Problem: refrigerator will not work on 12V DC** | |
| Possible cause | Action you can take |
| a) 12V fuse is defective. | a) Fit a new fuse (Camper —> fuse box of camper. Car —> fuse box of car) |
| b) Battery is empty. | b) Test the battery and charge it. |
| **Problem: refrigerator will not refrigerate sufficiently** | |
| Possible cause | Action you can take |
| a) Insufficient ventilation for the refrigerator. | a) Check whether the ventilation gratings are covered. |
| b) Thermostat set too low. | b) Increase the setting of the thermostat |
| c) Too much ice on the condenser. | c) Check whether the refrigerator door shuts properly and defrost the refrigerator. |
| d) Too much hot food stored simultaneously. | d) Let the food cool off first. |
| e) Gas burner is dirty. | e) Have the gas burner cleaned. |
| f) Door does not shut properly. | f) Check the door closing mechanism. |

**Control Panel Diagnostics**

Refrigerators with a LCD control panel have a special diagnostics area which displays an error code if there is a fault.

- **Fault 1:** AC heater current is measured to be 75% below nominal current.

  Action: Contact your dealer or a Thetford Service Centre.

- **Fault 2:** DC heater current is measured to be 75% below nominal current.

  Action: Contact your dealer or a Thetford Service Centre.

- **Fault 3:** AC heater is ON when it should be OFF.

  Action: Contact your dealer or a Thetford Service Centre.

- **Fault 4:** DC heater is ON when it should be OFF.

  Action: Contact your dealer or a Thetford Service Centre.

- **Fault 5:** Senses flame when gas should be OFF.

  Action: Contact your dealer or a Thetford Service Centre.

- **Fault 6:** Senses gas output terminal ON when should be OFF.

  Action: Contact your dealer or a Thetford Service Centre.

- **Fault 7:** Senses gas output terminal OFF when should be ON.

  Action: Contact your dealer or a Thetford Service Centre.

- **Fault 8:** AC mains supply is 20% below nominal.

  Action: Your controls are in manual AC mode, but there is no power available. Check if you plugged in the 230V connection, if so the voltage supply on the 230V connection is to low, contact the power supplier.

- **Fault 9:** Gas lockout because flame fails to ignite after 30 seconds.

  Action: Your controls are in manual gas mode, but the flame fails to ignite. Check if your gas cylinder is empty or if one of the shut-off valves is closed. Select another energy source. Reset the fridge 3 or 4 times in gas-mode until flame ignites. Contact your dealer or a Thetford Service Centre if problem isn't resolved.

- **Fault 10:** No "engine running" signal is present and control is in Manual DC mode.

  Action: Your controls are in manual DC mode and the engine of your vehicle is not running. The refrigerator can only cool on 12V when the engine of your vehicle is running. Start the engine or select a different energy mode.

- **Fault 11:** No energy source is available and control is in AUTO mode.

  Action: Your controls are in AUTO mode, but no energy source is available. Start the engine, connect the 230V supply or open the gas supply and reset the refrigerator by turning it of and on again.

- **Fault 12:** Contact your dealer or a Thetford Service Centre.

- **Fault 13:** Thermistor fails; control automatically switches to Backup mode (BOS).

  Action: Check if the connector above the fin on the inside of the cabinet is correctly plugged in. If so contact your dealer or a Thetford Service Centre.

- **Fault 14:** Display Board and Power board lost communication with each other.

  Action: Contact your dealer or a Thetford Service Centre.

**GUARANTEE, CUSTOMER SERVICE AND LIABILITY**

**Guarantee**

Thetford B.V offers the end users of Thetford refrigerators a three-year guarantee.

In the case of defects within the guarantee period, Thetford will repair or replace the product. In this instance, the costs of replacement, labour costs for the replacement of defective components and/or the costs of the parts themselves will be paid by Thetford.

1. To make a claim under this guarantee, the user must take the product to a Service Centre recognised by Thetford. The claim will be assessed here.
2. If components are replaced during repair under guarantee, these become the property of Thetford.
3. This guarantee does not prejudice current consumer protection law.
4. This guarantee is not valid in the case of products that are for, or are used for, commercial purposes.
5. No claim under the guarantee will be accepted in the following circumstances:
   - the product has been improperly used or the instructions in the manual have not been followed
   - the product has not been installed in accordance with the instructions
   - alterations have been made to the product
   - the product has been repaired by a Service Centre not recognised by Thetford
   - the serial number or product code have been changed
   - the product has been damaged by circumstances outside the normal use of the product

**Liability**

Thetford is not liable for loss and/or damage caused directly or indirectly by use of the refrigerator.

**ENVIRONMENT**

Refrigerators manufactured by Thetford B.V. are PCB-free. Most of the refrigerator is recyclable.

If the refrigerator has reached the end of its service life, contact your local waste processing company to dispose of the refrigerator in an environment-friendly way.

**Energy-saving tips**

- Install the refrigerator and switch it on about 12 hours before you put anything in it.
- Do not expose the refrigerator to direct sunlight.
- At an ambient temperature of approximately 25°C you can let the refrigerator operate at the middle position of the thermostat (both with gas operation and mains voltage).
- Store foods that have been pre-cooled.
- Open the door only briefly when you take things out of the refrigerator.
- Defrost the refrigerator regularly.

## STOVES HOBS, GRILLS AND OVENS

**PLEASE READ THE MANUFACTURERS INSTRUCTIONS BEFORE OPERATING THE APPLIANCE**

**WARNING: When you are cooking it is essential to provide additional ventilation such as opening windows near the grill, cooker and oven.**

**WARNING: When using cooking or heating appliances, surfaces and handles may become hot. Care should be taken and if necessary hand protection used.**

**WARNING: Extra care should be taken when accessing the locker above the hob especially whilst the hob is in use. Always be aware when opening the locker door objects could fall out onto cooking pans causing injury.**

**BURNER IGNITION**

The hotplate lid must be open for the hotplate, grill or oven burners to ignite.

The ignition should not be operated for more than 15 seconds. If, after 15 seconds the burner has not lit, stop operating the ignition, open the compartment door and wait at least 1 minute before attempting to ignite the burner.

In the event of the burner flames being accidentally extinguished, turn off the burner control and do not attempt to re-light the burner for at least 1 minute.

**SPARE PARTS**

When ordering spare parts, please give the following information so the appliance can be correctly identified:

1. The name of the appliance from the facia, and its colour.
2. The model number and the serial number of the appliance (from the data badge).

**BE SAFE - NOT SORRY**

**Warning:** Good ventilation is essential to the continuing safe operation of all gas appliances. Do not allow any ventilation openings to become accidentally or deliberately blocked.

Keep all flammable materials (such as curtains, furnishings, towels and clothing) away from the appliance.

Parts of the appliance may be hot during or immediately after use. Allow sufficient time for the appliance to cool after switching off.

When opening the appliance door, take care to avoid skin contact with any steam which may escape from the cooking.

Do not use aluminium foil to cover the grill pan, or put items wrapped in foil under the grill as this can create a fire hazard.

Do not use the oven with the door inner glass panel removed (glass oven doors only).

If the cooker has a storage compartment below the oven, this should only be used to store oven furniture. Do not store any flammable materials in this compartment.

When cooking with fat or oil, never leave unattended.

Turn pan handles inwards so they are out of reach of children and cannot be caught accidentally.

Glass lids may shatter when heated, turn off all burners before shutting the lid.

Models without ignition button: For safety reasons, we recommend the use of a hand held spark ignitor or gas lighter to ignite the burner, rather than a match or taper, which could allow burning debris to fall behind the appliance.

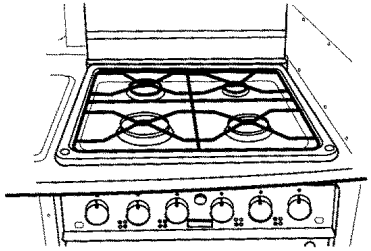
**When you have finished cooking, check that all controls are in the off position.**

**THE HOB**

**Caution:**

- Do not use foil on the hob, as it creates a fire hazard
- Glass lids may shatter when heated, turn off all burners before shutting the lid
- Note: When positioning the pan support, ensure that the fingers are central to the burners (Fig 1 of the user instruction manual).

# Fitted Equipment



**Stoves Hob**

Always use the most appropriate size of burner for the pan you wish to use. Use pans with a flat base of minimum 100mm/4 ins diameter, and maximum 200mm/8 ins diameter, which are stable in use. Avoid old or misshapen pans as these may cause instability.

**Important:** Any spillage of liquid should be cleaned away immediately to reduce the risk of fluid entering the appliance.

**Ignition** - Push in the control knob and turn anticlockwise to the large flame symbol. Keep the knob depressed, and press the ignition button (if fitted), or use a hand held spark ignitor or gas lighter. The knob must be held in for 15-20 seconds before releasing.

**ELECTRIC HOTPLATES**

Before using for the first time, prime the hotplate - switch it on without a pan to harden and burn off the coating. Use a medium-high setting for 3 - 5 minutes. A non-toxic smoke may occur.

To switch on, turn the hotplate control knob to the required setting.

The high speed hotplate ring (if fitted) is identified by its central red spot - this ring has a faster response time.

**THE GRILL**

- Note: The door must be open when the grill is used.
- Caution: When the grill is being used, accessible parts may be hot; young children should be kept away.
- Never cover the grill pan or grid with cooking foil, or allow fat to build up in the grill pan as this creates a fire hazard.
- Keep all flammable material away from the appliance.

**To light the grill**
Push in the control knob and turn anticlockwise to the large flame symbol. Keep the knob depressed, and press the ignition button (if fitted), or use a hand held spark ignitor or gas lighter. The knob must be held in for 15-20 seconds before releasing.

**Detachable grill handle (if supplied)**
Place the handle (shield uppermost) over the edge of the grill pan at the recess and slide along to position centrally between the two locater bumps. To remove the handle, place the grill pan down, and lift the handle slightly as you slide it along the recess.

**Using the grill**
Push in the grill pan until it locates centrally under the grill burner

There are three different grilling positions as the trivet can be inverted to give a high or low position or it may be removed.

1. The high trivet position is suitable for toasting bread.
2. The low trivet position is suitable for grilling all types of meat.
3. With the trivet removed the food is placed directly on the base of the grill pan, eg; when cooking dishes such as whole fish.

**Always** preheat the grill for 3 minutes for best results.

**When you have finished grilling, check the control knob is in the off position.**

**THE OVEN**

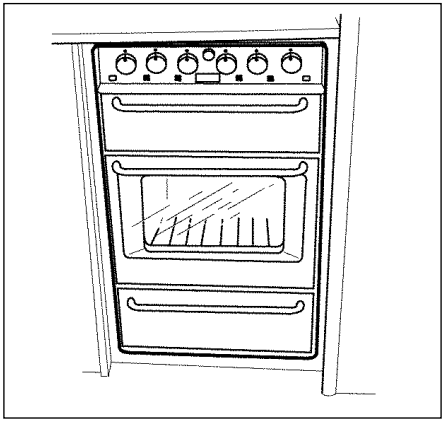
**Caution: When you are cooking, keep children away from the vicinity of the oven.**

- **Important**: A safety device stops the ignition being used when the oven door is closed.
- Do no use foil on the oven shelves as this creates a fire hazard, and can hinder circulation of heat.
- Keep all flammable material away from the appliance.

**To light the oven**

1. Open the oven door and turn the control knob anticlockwise to the required gas mark. Push in and hold in the control knob, and either press the ignition button (if fitted) or use a hand held spark ignitor or gas lighter.
2. Once the burner has lit, close the oven door and hold the knob in for 15-20 seconds.
3. If the flame goes out, the flame sensing device cuts off the gas supply to the burner. To light the oven again, wait for 3 minutes then repeat the above procedure.

**To turn off** - Push in the control knob and turn clockwise.



**Preheating**
The oven must be preheated for 10 minutes when reheating frozen or chilled food, and we recommend preheating for all yeast mixtures, batters, soufflés and whisked sponges.

**Using the oven**
The shelf positions in the oven can be altered. If you prefer darker cooked results, cook on a higher shelf. For paler results use a lower shelf.

The cake tray and roasting tin that are supplied with this appliance are the largest which can be used for good results and even baking. Extra shelves, tins or trays can be ordered from your supplier.

Place food items on the tray and position the tray on the centre of the shelf, leaving one clear shelf position between shelves to allow for circulation of air.

**CLEANING**

**Caution: Any cleaning agent used incorrectly may damage the appliance.**

**Always let the appliance cool before cleaning.**

Some cooking operations generate a considerable amount of grease. This combined with spillage can become a hazard if allowed to accumulate on the appliance through lack of cleaning. In extreme cases this may amount to misuse of the appliance and could invalidate your guarantee.

Do not use caustic pastes, abrasive cleaning powders, coarse wire wool or any hard implements as they will damage the surfaces.

All parts of the appliance can be safely cleaned with a cloth wrung out in hot soapy water.

**Burner caps and heads**

**Important:** Allow burners to cool before cleaning.

**Caution:** Hotplate burners can be damaged by soaking, automatic dishwashers (or dishwater powders/liquids), caustic pastes, hard implements, coarse wire wool and abrasive cleaning pastes.

# Fitted Equipment

For the burners to work safely, the slots in the burner head, where the flames burn, need to be kept clear of deposit. Clean with a nylon brush, rinse and dry thoroughly.

Clean with a mild cream cleaner eg; Cif, or use a moist soapy Brillo pad.

**Note:** Fixed burners (if fitted): Some versions incorporate fixed burners. These burners are secured to the hob with 2 screws. Fixed burners must be cleaned whilst in position. Make sure that the gap between the burner and the hotplate does not become blocked with grease.

**Glass parts (if fitted)**

DOOR PANELS, FACIA PANEL, HOTPLATE LID

Do not use abrasive cleaners or polishes. Use a mild cream cleaner, eg; Cif. Rinse thoroughly and dry with a soft cloth.

The inner door glass panel can be removed for cleaning; open the door wide, hold the bottom and top edges and slide out. When replacing the glass panel, hold it level and straight with the grooves in the door trims before sliding back in.

**Painted, plastic and gold coloured parts**

DOOR FRAME & HANDLES, CONTROL KNOBS

Only use a clean cloth wrung out in hot soapy water.

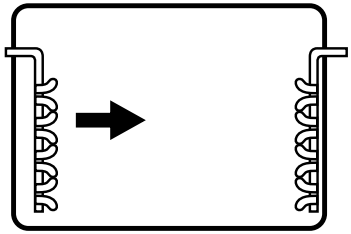


**Fig. 1 Chrome Plated Parts**

**Vitreous enamel parts**

GRILL PAN, HEATGUARD, OVEN/GRILL COMPARTMENT(S), HOB SPILLAGE WELL, PAN SUPPORTS

Use a mild cream cleaner. Look for one that has the Vitreous Enamel Council's recommendation seal, eg; Cif.

**Chrome plated parts (Fig 1)**

GRILL GRID, SHELVES, SHELF RUNNERS

Do no use abrasives or polishes. Use a moist soap pad, eg; Brillo. Shelf runners can be removed for cleaning. Grasp the runners and slide out of the hanging holes as shown in fig 1.

**Stainless steel surfaces (stainless steel models only)**

Only use a clean cloth wrung out in hot soapy water, and dry with a soft cloth. Do not use undiluted bleach or any products containing chlorides as they can permanently damage the steel.

Some foods are corrosive, eg; vinegar, fruit juices and salt, and they can mark or damage stainless steel if they are left on the surface for any length of time. Wipe any spillage immediately.

Sharp objects can mark the surface of stainless steel but will become less noticeable with time.

**Electric hotplates**

**Important: Ensure that elements are switched off and cool before cleaning**

For normal cleaning use a clean damp cloth. For heavy cleaning, use a clean damp cloth or scouring pad with a cream cleaner.

Follow the circular grooved pattern on the hotplate. Rinse off any cleansing agent thoroughly, then switch on to a low-medium setting for few minutes to dry. When cleaning take care to avoid the red dot on the high speed hotplate (if fitted).

## SPINFLO OVEN

**IMPORTANT:** Before using the appliances for the first time, remove all accessories and packing in the grill and oven, including any surface protection film, i.e. plastic coating. Clean all interior surfaces with hot soapy water to remove any residual protective covering of oil and rinse carefully.

**WARNING**

- ACCESSIBLE PARTS MAY BE HOT WHEN THE GRILL IS USED, YOUNG CHILDREN SHOULD BE KEPT AWAY.
- WHEN COOKING ALWAYS ENSURE YOUNG CHILDREN ARE KEPT AWAY.

Ensure the gas cylinder is turned on. In the event of a gas smell, turn off at the cylinder and contact supplier. 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, as small amount of yellow tipping will occur and then slightly increases as the burner heats up.

**IMPORTANT:** The control tap on this appliance operates both the grill and oven burners. To ensure safe operation it is not possible to operate both burners at the same time.

**Using the hob burners**

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. Flame supervision: Each burner is controlled individually and is monitored by a thermocouple probe. 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.
3. To light: Push in the control knob and turn to full rate - see Fig.2. Hold a lighted match or taper to the burner and push the control knob in and hold. It is necessary to hold the knob depressed after the burner has ignited or approximately 10-15 seconds, to allow the thermocouple probe to reach temperature, before releasing the knob. Should the flame go out when the knob is released, the procedure should be repeated holding the knob depressed 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. If the burner has not lit within 15 seconds the control knob should be released and the burner left for at least 1 minute before a further attempt to ignite the burner.
5. For simmering, turn the knob further anti-clockwise to the low rate position.
6. To turn off: Turn the control know 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 using the hotplate burners.

**IMPORTANT:** The two in line hob burners on this appliance will support pans from 10cm to 20cm. The single hob burner will support pans from 10cm to 22cm.

**WARNING**

- GLASS LIDS MAY SHATTER WHEN HEATED. TURN OFF THE HOTPLATE AND ALLOW IT TO COOL BEFORE CLOSING THE GLASS LID.
- REMOVE ALL SPILLAGE FROM THE SURFACE OF THE GLASS LID BEFORE OPENING.

**Using the grill**

**IMPORTANT**

- THE GRILL MUST ONLY BE USED WITH THE DOOR OPEN.
- THE HEAT DEFLECTOR BELOW THE FASCIA SHOULD BE PULLED OUT PRIOR TO LIGHTING THE GRILL. NEVER ADJUST THE HEAT DEFLECTOR POSITION WITHOUT USING HAND PROTECTION I.E. OVEN GLOVES.

# Fitted Equipment

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. To light: Open door, push in the control knob and turn to full rate - see Fig 2.

   Hold alighted 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.
3. 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.
4. 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. An 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.
5. Although the grill does heat up quickly, it is recommended that a few minutes pre-heat be allowed.
6. 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 accidentally being extinguished, turn off the burner control and do not attempt to re-ignite the burner for at least one minute.
7. It is normal for the flames on this burner to develop yellow tips as it heats up, particularly on Butane.
8. A reversible grill pan trivet enables the correct grilling height to be achieved.

Fast toasting - trivet in high position

Grilling sausages - trivet in high position

Grilling steak/bacon - trivet in high position

Grilling chops, etc. - trivet in low position

Slow grilling - trivet removed

9. 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.

**IMPORTANT**

- The pan supplied with the appliance is multi functional, for use either whilst grilling or when using the oven.
- The handle design allows removal or insertion whilst the pan is in use.

**Using the oven**

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. 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 the process holding control knob for slightly longer.
3. For models fitted with spark ignition the procedure is similar except that the burner can be ignited by depressing the ignition button, which is located on the fascia. Ignition must be carried out with the door open, and if the burner has not lit within 15 seconds the control knob should be released and the oven left for at least one minute before a further attempt to ignite the burner.
4. Place the oven shelf in the required position and close the door. Set control knob to approximately gas mark 5 and heat the oven for about 30 minutes to eliminate any residual factory lubricants that might impart unpleasant smells to the meals being cooked. A non-toxic smoke may occur when using for the first time so open any windows and turn on mechanical ventilators to help remove the smoke.

5. Although the oven does heat up quickly, it is recommended that a 10 minute pre-heat should be allowed. The oven should be up to full temperature in about 15-20 minutes.
6. To turn off: Turn the control knob until the line on the control knob is aligned with the dot on the control panel.
7. Shelf: The shelf has been designed to allow good circulation at the rear of the oven and are also fitted with a raised bar to prevent trays or dishes making contact with the back of the oven. To remove a shelf, pull forward until it stops, raise at front and remove.

**Oven temperature control**

The temperature in the oven is controlled by a thermostatic gas tap and is variable over the range 130ºC to 240ºC. 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 several dishes requiring different temperatures may be cooked at the same time. In this way maximum benefit can be obtained from the gas used to heat the oven. Care should be taken not to overload the oven, adequate spacing being used to allow free circulation for heat.

**Cooking guidelines**

See user instructions.

**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.

**DON'T** allow children near the cooker when in use. Turn pan handles away from the front so that they cannot be caught accidentally.

**DON'T** allow fats or oils to build up in the oven tray or base.

**DON'T** use abrasive cleaners or powders that will scratch the surfaces of the appliance.

**DON'T** under any circumstances use the oven as a space heater.

**DON'T** put heavy objects onto open grill and oven doors.

**Leaks**

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

## SHARP R209 MICROWAVE OVEN

Please refer to the appliance manufacturers handbook regarding: - OPERATION, COOKING ADVICE, AFTERCARE and GUARANTEE

**WARNING:** THE DOOR, OUTER CABINET, OVEN CAVITY, TURNTABLE AND DISHES WILL BECOME VERY HOT DURING OPERATION. TO PREVENT BURNS, ALWAYS USE THICK OVEN GLOVES.

**ELECTRICAL CONNECTION**

- Do not allow water to come into contact with the power supply cord or plug.
- Insert the plug properly into the socket.

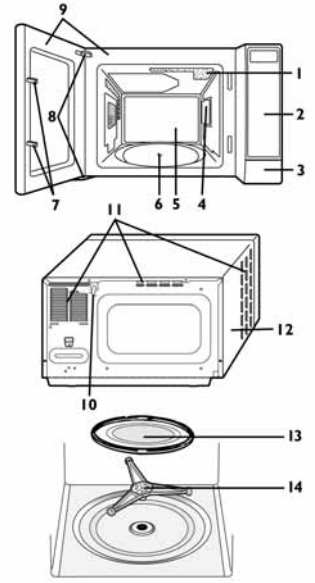
# Fitted Equipment

- Do not connect other appliances to the same socket using an adaptor plug.
- If the power supply cord is damaged, it must be replaced by a Sharp approved service facility or a similarly qualified person to avoid a hazard.
- When removing the plug from the socket always grip the plug, never the cord as this may damage the power supply cord and the connections inside the plug.
- If the plug fitted to your oven is a rewireable type and in the event of the socket outlet in your home not being compatible with the plug supplied, remove the plug properly (do not cut off).
- If the plug fitted to your oven is a non-rewireable type and in the event of the socket outlet in your home not being compatible with the plug supplied, cut-off the mains plug.
- Refit with a suitable type, observing the wiring code given in 'To replace the mains plug' on page 34 of the SHARP user instructions.

**IMPORTANT SAFETY INSTRUCTIONS PLEASE READ CAREFULLY AND KEEP FOR FUTURE REFERENCE**

**OVEN USE:**

- THE OVEN IS FOR DOMESTIC FOOD USE ONLY.
- NEVER OPERATE THE OVEN WHEN EMPTY.
- DO NOT LEAVE OR STORE ANYTHING INSIDE THE OVEN WHEN NOT IN USE.
- NEVER ATTEMPT TO USE THE OVEN WITH THE DOOR OPEN. IT IS IMPORTANT NOT TO FORCE OR TAMPER WITH THE DOOR SAFETY LATCHES.
- NEVER OPERATE THE OVEN WITH ANY OBJECT CAUGHT IN THE DOOR.
- DO NOT INSERT FINGERS OR OBJECTS IN THE HOLES OF THE DOOR LATCHES OR AIR-VENT OPENINGS AS THIS MAY DAMAGE THE OVEN AND CAUSE AN ELECTRIC SHOCK.




1. Oven lamp
2. Control panel
3. Door opening button
4. Waveguide cover (DO NOT REMOVE)
5. Oven cavity
6. Coupling
7. Door latches
8. Door hinges
9. Door seals and sealing surfaces
10. Power cord
11. Ventilation openings
12. Outer cabinet
13. Turntable
14. Roller stay

- IF WATER OR FOOD DROPS INSIDE THE AIR VENT OPENINGS SWITCH OFF THE OVEN IMMEDIATELY, UNPLUG IT AND CALL A SHARP APPROVED SERVICE FACILITY. (SEE PAGE 34 OF THE USER INSTRUCTIONS).
- NEVER MOVE THE OVEN WHILE IT IS OPERATING.
- NEVER PLACE ANY OBJECT SUCH AS A TEA TOWEL, ORNAMENT, RECIPE BOOK ETC IN ANY OF THE AIR GAPS BETWEEN THE MICROWAVE AND THE INSIDE FACE OF THE MICROWAVE CABINET. CLEAR AIR GAPS AT THE TOP, BOTTOM AND BOTH ENDS ARE ESSENTIAL TO THE EFFICIENT OPERATION OF THE MICROWAVE.

| **MICROWAVE OVEN** If factory fitted the specification is: | | |
|---|---|---|
| Make | | SHARP |
| Model | | R209 |
| Power supply | | SINGLE PHASE 230-240V, 50Hz, |
| Microwave | Power Consumption | 1.21kW |
| | Input power | 5.2A |
| | Output Power | 800W (IEC 60705) |
| | Frequency | 2450 MHz |
| Outside dimensions | | 460(W) x 281(H) x 360(D)mm |
| Cavity dimensions | | 322 (W) x 187(H) x 336 (D)mm* |
| Oven capacity | | 20 litre* |
| Cooking uniformity | | Turntable diameter 272mm |
| Weight | | Approx 12kg |

* Internal capacity is calculated by measuring maximum width, depth and height. Actual capacity for holding food is less.

If fitting a Microwave DIY we recommend you purchase the above specification.

**PACEMAKER:** IF YOU HAVE A HEART PACEMAKER, CONSULT YOUR DOCTOR OR THE PACEMAKER MANUFACTURER PRIOR TO OVEN USE.

**ADVISORY NOTE FOR USERS OF A MICROWAVE OVEN**

Microwave Ovens were originally introduced to re-heat pre-cooked pies etc. Over the years people started using them for re-heating ready made meals and now for they are used for cooking small amounts of food.

Most small microwaves, and some large microwaves, cease to cook the food when the microwave starts to overheat. This often occurs when batches of food are cooked consecutively.

**Overheating is caused by a number of factors: -**

- The heat generated within the Microwave.
- The Heat generated by an adjacent Oven, Hob of Fridge/Freezer, Radiator etc.
- The Heat generated in the environment due to the heating system and/or lack of ventilation etc.
- The mounting of the microwave in a housing.

It has been proven in independent tests that even when placed on a worktop in an open household kitchen environment a microwave will switch off, or the Magnetron will reduce

its output, when the microwave starts to overheat.

This fact is exacerbated in a Caravan or Motorhome as space is at a premium. The microwave has to be placed in a cabinet to maximize the space available for all the family activities that take place in the modern Caravan and Motorhome. The housing also secures the microwave whilst travelling.

Frequently the above results in the Microwave being mounted above an Oven/ Hob or a Fridge/Freezer.

When the Sharp Microwave starts to overheat, the magnetron automatically reduces its output but the Microwave still looks the same. The Light will stay on, the turntable will continue to rotate, the cooling fan will still operate and the timer will continue.

The above means that times quoted in recipes should be used for guidance only.

It is essential, when cooking with any microwave, that the food is examined to ensure that it is fully cooked before eating.

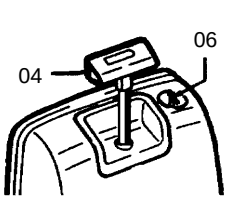
## THETFORD CASSETTE C-200 CW (Manual) and C-200 CWE (Electric)

**FEATURES**

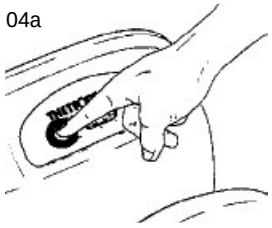
1. Removable seat and cover.
2. Rotatable bowl.
3. Valve blade handle: opens and closes valve blade.
4. Flush-handle activates the flush by lifting and pushing down the handle.

4a **C-200 CWE.** Flush button: activates flush.

5. Power-supply for the waste-level indicator: two batteries, type: Penlite 1,5V AA alkaline.
6. Waste-level indicator: indicates when holding tank requires emptying.
7. Rotating pour out spout: makes emptying holding tank easy and convenient.
8. Upper carrying handle
9. Automatic holding tank vent: vents the holding tank when the tank is inserted in the toilet. This prevents under- or overpressure in the holding tank.
10. Valve blade opener.
11. Sliding cover: closes automatically when holding tank is taken out. Guarantees optimal hygiene.
12. Valve-blade
13. Vent button: vents the holding tank to avoid splashing while emptying.
14. Hand grip
15. Access door
16. Waterfill door

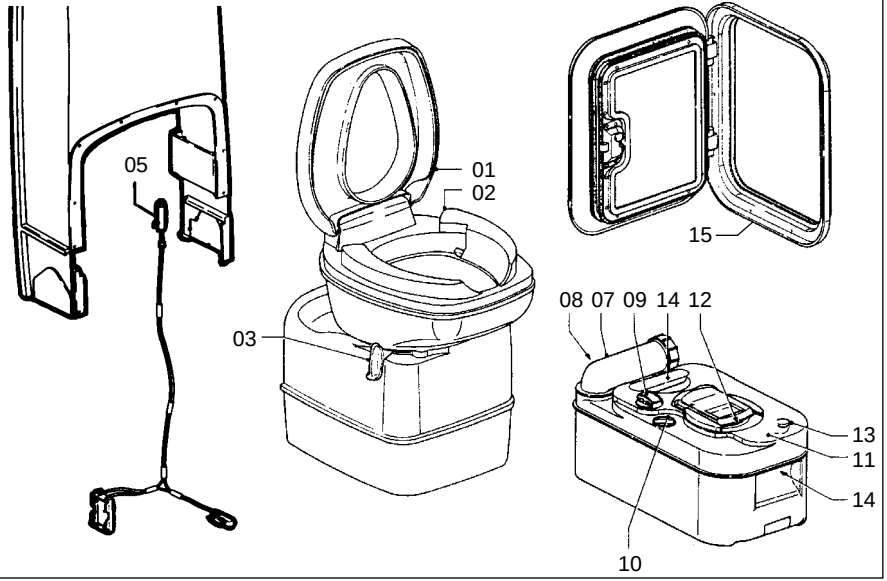



**C-200 CW only**




**C-200 CWE only**


**C-200 CW only**



# Fitted Equipment

**CASSETTE C-200 CW AND C-200 CWE**
The toilet section of the C-200 includes a rotatable bowl, removable seat and cover, a console with a flush handle/flush buttons, a built in flush-watertank and a waste level warning indicator. The valve blade handle is located underneath the bowl.

**PREPARING FOR USE**

1. Open access door pull retaining clip upwards (fig. 1).
2. Remove holding tank by pulling straight out. When holding tank hits the stop, tilt front end downwards slightly and remove (fig. 2).
3. Position tank vertically and swivel pour out spout upwards (fig. 3).
4. Remove the cap of the pour out spout. Add required quantity of toilet fluid through pour-out spout then add approx. 2 litres of water through the spout to cover holding tank bottom. Replace cap and return pour out spout to its original stored position (fig. 4).

   **Note: Warmer weather or longer intervals between emptying the waste tank may require additional toilet fluid. Use only Thetford toilet fluid to achieve the best results.**

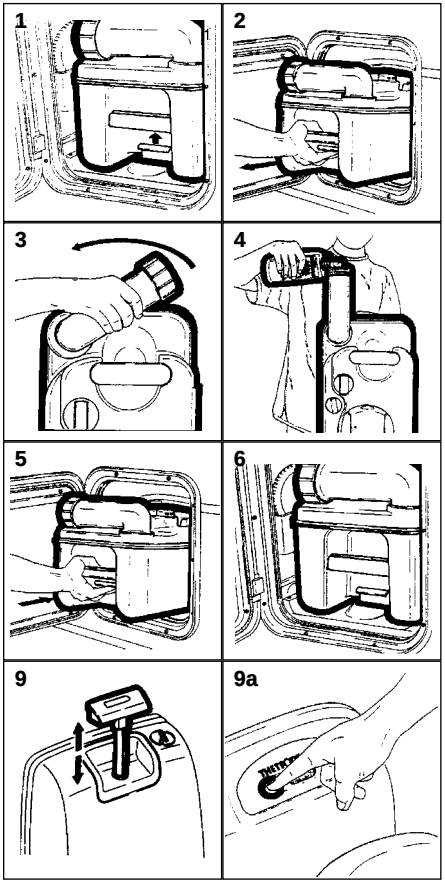
   **Caution: Never add toilet fluid directly into toilet bowl.**

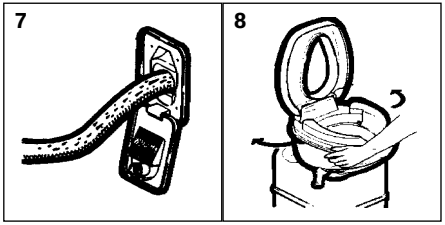
5. Slide the holding tank into position through access door (fig. 5).
6. Make sure the holding tank is secured by the retaining clip. (fig. 6).
7. Open the waterfill door and add 50 ml of Aqua Rinse. Aqua Rinse results in a better flush and improves the hygiene of the toilet. Then fill the watertank with fresh water using a jerrycan or a hose. Tank capacity is 7 litres (fig. 7).

**OPERATION**

8. Turn the bowl in the most comfortable position (fig. 8).
9. **C-200 CW only:** Before using the toilet it is recommended to flush some water into the bowl by lifting and pressing down the flush handle (fig. 9).

9a. **C-200 CWE only:** Before using the toilet it is recommended to flush some water into the bowl by pressing and releasing the flush button (fig. 9a).



10. The toilet may be used with the blade open or closed. Pull valve handle towards you to open (fig. 10).

11. C-200 CW only: After use, open valve blade (if still closed) and flush, lift the flush handle and press it down (fig. 11). After flushing, close the blade by turning the blade handle.

11a. C-200 CWE only: After use, open valve blade (if still closed) and flush, press the flush button (fig. 11a). After flushing, close the blade by turning the blade handle.

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

**EMPTYING THE HOLDING TANK**

The holding tank capacity is approx. 17 litres and the tank should be emptied when the waste-level indicator lights up. The waste-level indicator lights up when the holding tank contains more than 15 litres of waste.

**CAUTION: Do not allow the holding tank to become overfilled. See trouble shooting section for emergency emptying procedure.**

12. Open access door and remove the holding tank. The holding tank can only be removed when the valve blade is closed (fig. 12).

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

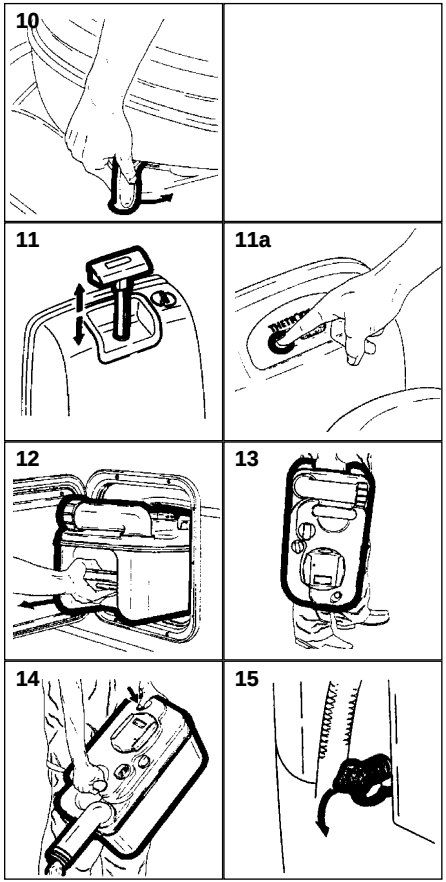
14. Remove the spout cap. Grasp unit by upper carrying handle nearest to pour out spout. Place other hand on upper rear hand grip so that vent button can be depressed with the thumb while emptying. This ensures a smooth outflow of the tank contents. (fig. 14).

    **Note:** Only depress the vent button when pour out spout is pointed downwards.

    Rinse the holding tank with clean water. For preparing for use again, see steps 1 to 7.

**CLEANING AND MAINTENANCE**

The lipseal and the seal of the automatic vent are made of rubber and therefore these parts need regular maintenance (depending on frequency of use, once or twice a month).



**Lipseal:** Remove the sliding cover. Open the valve-blade by turning the blade-opener knob anticlockwise. Clean the seal with water. Dry the seal and grease with silicone spray/oil or vegetable oil.

**Seal of automatic vent:** Turn the automatic vent 60° anticlockwise and remove gently. Clean the seal with water. Dry the seal and grease with silicone spray/oil or vegetable oil.

To clean the holding tank, empty the tank, and rinse with clean water. Use a mild soap to clean toilet bowl, seat and cover, as well as exterior of toilet unit and holding tank.

**NOTE:** Do not use strong household detergents or cleaners that contain chlorine, solvents or acid contents.

**WINTERING/STORAGE**

The Thetford Cassette C-200 CW/CWE is easily winterised for storage.

Empty remaining fresh water into the bowl by activating the flush handle up and down (C-200 CW) or by pressing the flush button (C-200 CWE).

Once pump has been cleared and water flow has stopped completely, release into waste tank. Remove waste tank and empty contents in normal way.

To evacuate any remaining water from the fresh water tank. place a container underneath the drainplug and remove drainplug.

When procedure has been completed replace drainplug and waste holding tank (fig. 15). Clean the seals and grease them after drying (see cleaning and maintenance).

Leave the blade of the holding tank open. Do not replace cap on the pour out spout, to ventilate the holding tank. (Also grease the seal of the pour out spout cap.)

**COLD WEATHER USE**

The toilet can be used in cold weather conditions provided that the toilet is in heated surroundings. If this is not the case, you can use a nontoxic antifreeze (propylene glycol) or an antifreeze such as those used in car radiators. Add the antifreeze to the water in the tank. Add the quantity specified in the instructions, paying due regard to the safety instructions.

**HIGH ALTITUDE AND WARM WEATHER USE**

Pressure may build up in the holding tank if the tank is not inserted while driving at high altitudes or in warm weather conditions. The automatic holding tank vent will vent the tank when there is over- or under-pressure. High temperatures may require additional Thetford toilet fluid.

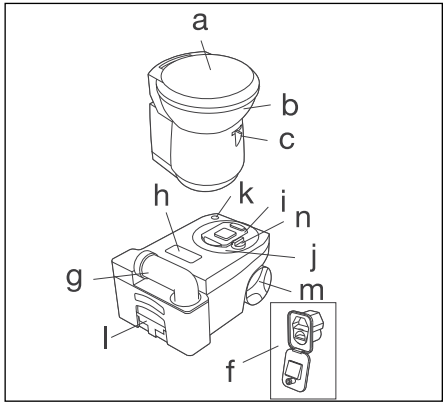
**THETFORD WARRANTY**

1. The Thetford Cassette is warranted for one year from the date of purchase, please fill in and return the warranty card
2. The warranty covers replacement of defective or flawed parts and the inadequate performance of the toilet.
3. In case of a defect apply to an original dealer or Thetford Service Centre with proof of purchase.
4. Defects, which in our judgement occurred from misuse, negligence or accident, are not covered by the warranty. In addition, the warranty does not apply if the product is installed or handled improperly or if other than the prescribed toilet fluids have been used or if the product has been altered in any way or has been repaired by unqualified persons, or if the serial number and/or date has been altered or removed.
5. Should the original buyer wish to return to us parts believed to be defective, the parts should be sent prepaid. If we find the parts defective and covered by warranty, they will be repaired and returned. If warranty does not apply or has expired, a nominal charge will be made. Any transport costs are for the account of the owner.
6. Before returning product or parts they should be properly cleaned, in order to carry out inspection and repair.
7. No other warranty is given and no personal representative is authorised to make any warranty other than that is contained herein.

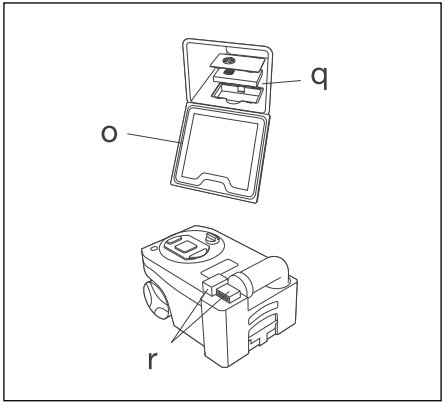
## THETFORD C250 CWE CASSETTE TOILET

The Thetford Cassette Toilet is a high quality product. The toilet forms an integral part of your caravan or motorhome 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 motorhome. The Thetford Cassette Toilet is the solution to the sanitary problem in your caravan or motorhome!




These instructions cover the C-250CWE this has its own flush-water tank.




**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 Opener

o) Access Door to Waste Holding Tank

**OPTIONAL FEATURES**

p) Electric Blade

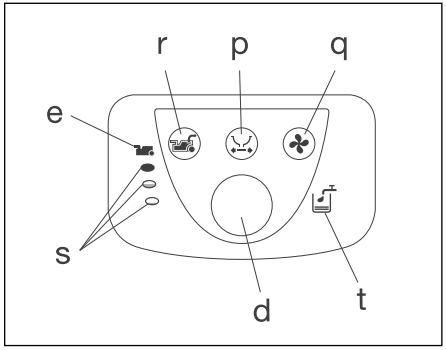
q) Automatic Ventilator

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)

**CONTROL PANEL**



# Fitted Equipment

**PREPARING FOR USE (STANDARD)**

1. Open the access door on the outside of your caravan or motorhome
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. For more information on Thetford toilet fluids, see last page of the Thetford user manual. Screw the cap back onto the emptying spout and turn back to its original position.

**Note.** The Emptying Spout Measuring Cap is supplied in the same packaging as the Thetford user manual.

**WARNING!** 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.

**WARNING!** 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 jerry can or hose. Your toilet is now ready to use.

**PREPARING FOR USE WITH OPTIONAL FEATURES**

8. Automatic Ventilator: Open the access door on the outside of your caravan and remove the Waste Holding Tank (as described above).
9. Remove the filter housing cover and if no filter is present, place a new filter into the filter housing. Peel off the sticker lids on the filter. Place back the cover of the filterhousing.

**USING THE TOILET (STANDARD)**

10. Turn the bowl to the desired position with the lid closed and using both hands.
11. 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.
12. 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.

**IMPORTANT WARNING NOTICE!** 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.

**USING THE TOILET WITH OPTIONAL FEATURES**

13. Electric Blade: Push the electric blade button on the control display to electrically open or close the blade. In the case of failure, you can manually open or close the blade by sliding the small handle under the toilet bowl sideways.

14. Automatic Ventilator: The ventilator automatically starts when the control panel is activated (by pressing the flush button) and will automatically shut off after approximately 5 minutes. The Automatic Ventilator Indicator will flash until automatic shut-off occurs. If you want to stop the ventilator, press the Automatic Ventilator button. If you want to re-start the ventilator, press the button again (the LED will start flashing again).

15. Flush Water Tank Level Indicator (only for toilets with own flush-water tank): When the Flush Water Tank Level Indicator lights up, refill the flush-water tank, as only about 1.5 litres of water is left in the tank, which is sufficient for approximately 2 flushes.

**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.

16. 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.

17. Pull the handle up and wheel the Waste Holding Tank to an authorised waste disposal point.

18. 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.

**WARNING!** DO NOT SERIOUSLY SHAKE THE TANK OR USE HIGH PRESSURE WATER CLEANERS. THIS MAY CAUSE DAMAGE TO THE TANK'S INTERIOR.

**Note.** 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.

**EMPTYING WITH OPTIONAL FEATURES**

19. 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.

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

20. 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.

**IMPORTANT!** 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.

**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.

Note. 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.

**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. See page 46 of the Thetford user manual for more information (=matrix). 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 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.

**Note.** 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.

**CLEANING AND MAINTENANCE FOR OPTIONAL FEATURES**

- Automatic Ventilation: The filter of the Automatic Ventilation needs to be renewed periodically. After approximately 4 full weeks of use, the filter loses its absorption power.
- Pump-Out Waste System: To ensure optimal functionality of the Pump-Out Waste System, periodical maintenance of the tube and pump is recommended. After emptying the Waste Holding Tank completely, fill it with clean water and empty it again. This will clean the pump and the hose. Do this once every 3 weeks when on holiday. This should ensure proper operation of the system.

**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.

**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 authorised 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.

21. 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.

Thetford warranty refer to the Thetford user handbook.

## CARAVANS WITH EXTERNAL BARBEQUE POINT

Models equipped with an external barbeque point can be used to power any gas appliance suitable for the gas used in the caravan, at the working pressure shown on the label in the barbeque outlet box. Please note when using the outlet that the fitted regulator will allow a maximum of 1.5kg per hour of gas to be taken from the gas bottle. Therefore the consumption of gas from both the appliances within the caravan and the appliance connected to the barbeque point cannot exceed a total of 1.5kg per hour at any one time. If you are in any doubt please consult your dealer for advice. To use point proceed as follows:

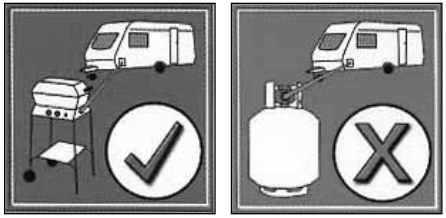
1. Fit male nozzle from despatch kit to your barbeque or appliance ensuring a gas tight joint. The work should be carried out by a competent person; if in any doubt consult your dealer.
2. Open box lid by pulling tab on bottom edge and lifting. Remove red cover cap.
3. Insert male nozzle on appliance into female coupling, push firmly until click is felt.
4. Open gas locker on caravan, ensure gas bottle tap is open and supply is connected to regulator. Turn isolation tap behind barbeque point to open (so that the tap handle is in line with the flow direction of the gas.
5. Returning to barbeque point, turn red knob until it is in line with the flow direction of the gas.
6. Light and operate appliance to its instructions.
7. When operation of external gas appliance has finished, turn red knob in barbeque box so that it is at right angles to the flow of gas to isolate the appliance.
8. Release the appliance hose and nozzle by pushing back the collar of the coupling.
9. Replace red cover and close lid of barbeque point.

Please note that you cannot open the gas supply until the nozzle has been inserted.

In the interest of safety all external hose lengths should be kept to a minimum and attachments secured correctly.

**WARNING**: **Care should be taken when using the external barbeque point. Never barbeque next to an awning or tent.**

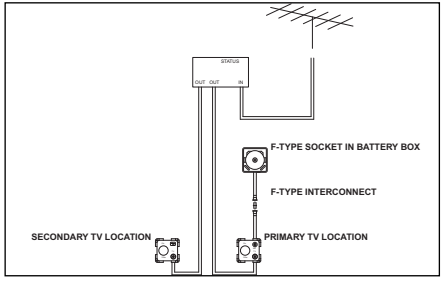
**WARNING: The caravan barbeque point should only be used as an outlet point for gas, never connect a gas bottle direct to the outlet.**



## CARAVANS WITH TV INLET IN BATTERY BOX

Models equipped with TV points in the battery box have the facility to take an external signal and supply that signal to TV points within the caravan. Depending upon model there are two ways of achieving this:

### CARAVANS WITH SCREW ON / F-TYPE CONNECTION IN BATTERY BOX




Caravans equipped in this way feature a direct link from the connection point in the battery box, to an auxiliary connection point at the primary TV position within the caravan. The primary TV position is that which also features an AV outlet plate (see later text).

The direct link can be used to:

1) Supply an external signal (caravan site TV feed) to the primary TV position

- Connect the socket in the battery box, with a suitable lead, to the appropriate socket on the caravan site supply post. As the connector in the battery box is a screw on 'F-type' connector, an adaptor to convert this to a 'push-on' co-ax connector, which may be required, has been supplied with your caravan.
- Locate the primary TV position within the caravan. At the 12V, TV and SAT socket, connect your TV to the output from the socket marked SAT with a suitable lead.

2) Connect an external satellite dish to a decoder within the caravan. (The direct link uses F-type interconnects throughout to allow the decoder and dish to communicate correctly)

- Connect the dish to the socket in the battery box with a suitable lead. The F-type to co-ax adaptor should not be used.
- Connect the dish input connection on the decoder to the 'SAT' socket on the 12V, TV and SAT socket located in the primary TV location.

3) Supply a signal from within the caravan to the exterior of the caravan

- Connect the output from your VCR or other device to the SAT connection on the 12V, TV and SAT socket at the primary TV position.
- Connect your receiving device (TV or similar) to the socket in the battery box with a suitable lead.

As can be seen from the simplified schematic, when multiple TV locations are present in a van, all of these receive signals from the TV aerial connection box. Using adaptors and link cables which are readily available, it may be possible to re-direct a signal from the 'SAT' connection at the primary TV location, up to the aerial connection box to be then distributed to other TV positions within the caravan. Please remember that as the number of connections increases the quality of the signal reduces.

## SUPPLIER FITTED / SUPPLIED ENTERTAINMENT EQUIPMENT

Audio-visual equipment may have been fitted by your dealer, or supplied with the caravan, depending on the specification of the caravan. Although not specific, below are details of the types of equipment which would be fitted as appropriate to the specification of the caravan:

### CD/MP3/TUNER WITH AUXILIARY INPUT

Where provision has been made in the furniture to install a head unit similar in appearance to that fitted in the dashboard of a car. The unit operates as a CD player and FM/AM radio. In addition MP3 files stored on a CD can be read and played by the unit. An auxiliary input on the front of the unit allows a separate MP3 player to be connected from that player's headphone socket. (A separate lead may be required).

Speakers mounted in the front locker of the caravan are connected to this head unit for a stereo sound output. A retractable AM/FM aerial on the side of the caravan, or concealed in furniture with the head unit, enables reception of radio stations.

### LCD TV/DVD/CD/MP3/DVB UNIT

When a combination 15" LCD TV is supplied with the caravan, the features within the TV replace those otherwise catered for by an automotive head unit. As a result locker mounted speakers, and a dedicated position for a head unit, are not fitted. An AM/FM aerial is also omitted as DVB radio channels can be obtained on the TV unit via the roof mounted TV aerial.

DVB radio channels include many national radio stations, but may not include local radio stations normally received on AM or FM wavebands.

Please see the instructions supplied with the TV for details of scanning for DVB TV and radio stations – The number of channels available will vary according to area, depending on the signal strength available at the location.

## STATUS 530 DIRECTIONAL TV AND FM RADIO ANTENNA
**(model dependant )**

Firstly determine the approximate location of the nearest transmitter and whether the signals are horizontally or vertically polarized. For assistance ask your site operator or check 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 polarized 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 polarized signals with the TELESCOPICS EXTENDED

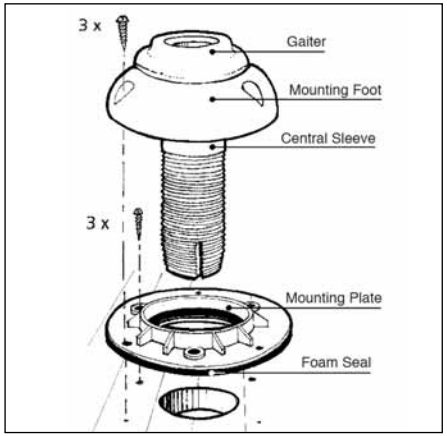
3. Switch ON the Power Pack and the RED LED will illuminate.
4. Check the gain control switch is set to normal – NML.
5. Tune your television to the strongest signal. You may need to adjust the direction of the mast to achieve the best quality picture.
6. Secure by tightening the Mast Locking Collar and Wall Bracket

**REMOVING THE ANTENNA**

A permanently fitted Status can be easily removed leaving only the Mounting Foot and rubber gaiter.

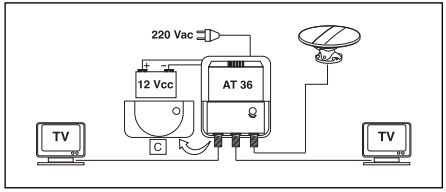
1. Unplug the antenna from the Power Pack.
2. Loosen the Mast Locking Collar and Wall Bracket and lift off whilst feeding out the cable.
3. Push the Blanking Cap supplied into place.

**IMPORTANT** – The Blanking Cap is a temporary seal and is not for long term use.




## WING OMNI-DIRECTIONAL TV ANTENNA **(model dependant )**

This is a plug and play antenna, only suitable for use with televisions. The pinnacle on the roof cannot be removed.



## BEDDING

Sleeping bags and continental quilts can be compressed into small spaces and can be ready to use in minutes.

**LOWER SINGLE BEDS ASSEMBLY**
(Figs. A & B)

1. Unroll bed slat bundle and place between the recess in both seats.
2. Arrange seat cushions as appropriate.

**DOUBLE BED ASSEMBLY**
(Fig. C)

1. Grip front of slatted bed and walk backwards until bed is fully extended.
2. Arrange seat cushions as appropriate.

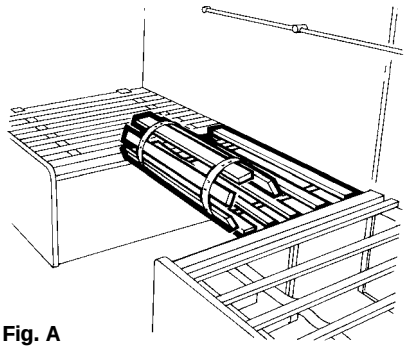


**Fig. A**

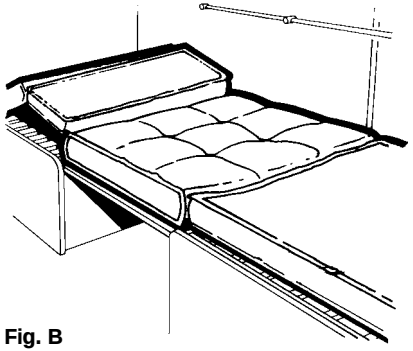


**Fig. B**

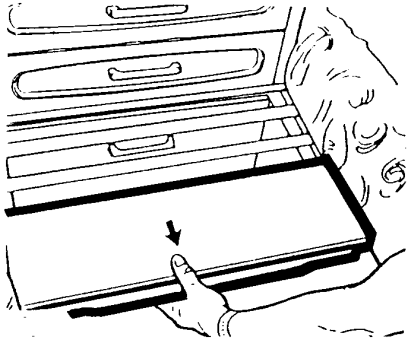
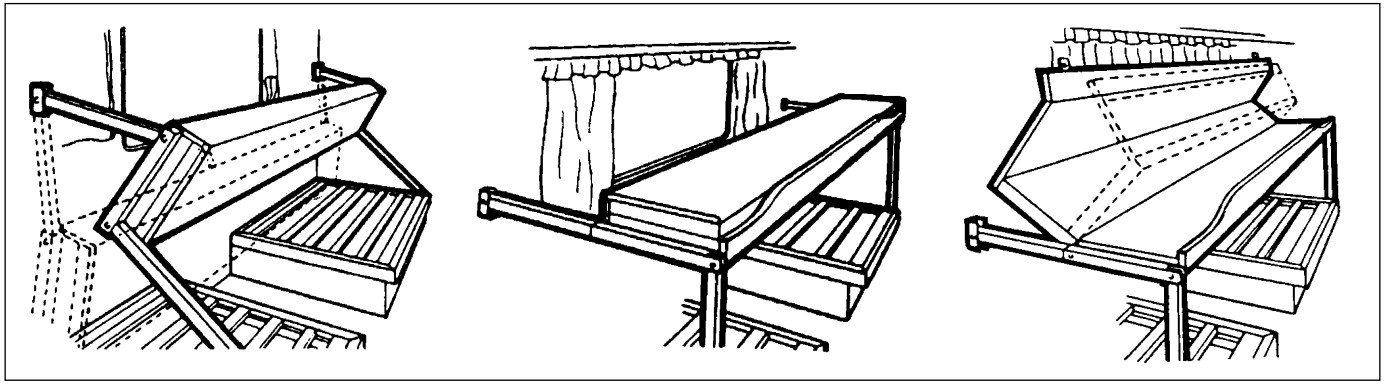


**Fig. C**



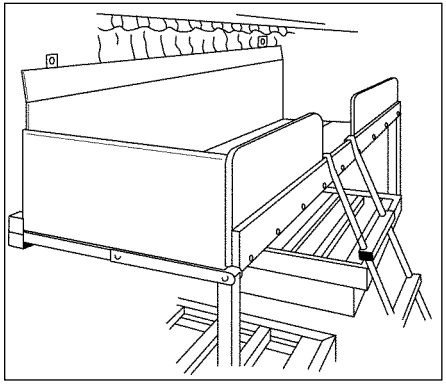
**PULLMAN BUNKS**

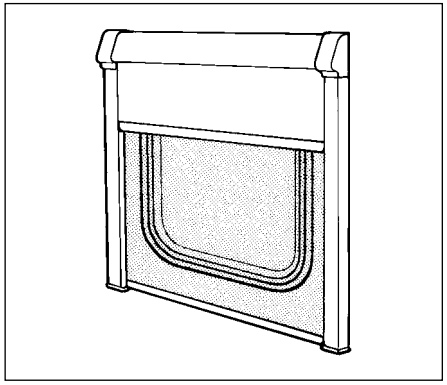
1. Release catches, one at a time.
2. Release press studs on the bed board.
3. Grasp the bunk as shown and pull carefully in direction of arrows.
4. The bunk is designed to automatically move into the correct position.
5. Where a bed board is fitted, unfold and make sure it is secured by press studs when lifted into position. (The bed board is required to protect both the occupant and the window from damage during use of the bunk.)
6. Locate safety boards.
7. Arrange seat cushions as appropriate.

BUNKS ARE DESIGNED TO CARRY A CHILD TO A MAXIMUM OF 70KG (11 STONE)

**WARNING: Use upper bunks for sleeping only, with the provided protection against fall out in position**

**WARNING: Care shall be taken against the risk of fall out when the upper bunks are in used by children especially under 6 years of age, these bunks are not suitable for use by infants without supervision.**





## KOMFORTROLLO BLINDS (SEITZ)

**Blinds and Flyscreens**
Flyscreen and blinds operate in the same manner. The flyscreen can only be 'fully up' or 'fully' down, but the blind also has an intermediate position.

To operate, pull down by holding the fingergrip(s), gently ease towards the window to locate the catches. To retract, pull down easing away from the window to release the catches and guide to the required position.

- ONLY OPERATE BY HOLDING THE FINGERGRIP(S) - pulling on one side will cause uneven running and snagging.
- DO NOT ALLOW THE BLIND OR FLYSCREEN TO RE-COIL WITHOUT CONTROL.
- It is not recommended that blinds and/or flyscreens are left in the down position for long periods or when travelling, as this can result in fatigue of the spring.
- Clean the cassette, side track and fabrics with mild detergent and water.
- Lubrication of mechanism or spring is not required or recommended. However, if components should require cleaning, use only WD40 or similar with fluff-free cloth. Other lubricants may result in damage to fabrics and plastics.

**Tension Adjustment**
Remove plastic cover (if fitted) to locate tension lugs. The tension lugs have a slot and are located in the cassette on a 'bayonet' principle. Insert screwdriver into slot (ensure a good fit), turn lug clockwise to allow the spring tension to push the lugs just free of the cassette. Keep fingers away from screwdriver tip to avoid accidental injury. Spring can now have more or less tension applied as required.

If in doubt of tension to be applied, release all tension and re-start. In which case, with blind fully wound on the roller, apply 12 revolutions of lug (factory setting).

Refitting is a reversal of removal procedure.

For more detailed information, see manufacturer's instructions.

**Cassette Blind and Flyscreen**
Always hold the end rod in the middle. When closing blinds, slide the end rod of the flyscreen blind on to the end rod of the sun blind and engage. To open the blind push the end rods towards the darkening blind to the edge and disengage the end rods. Now move the end rod of the flyscreen back by hand - do not let it recoil.

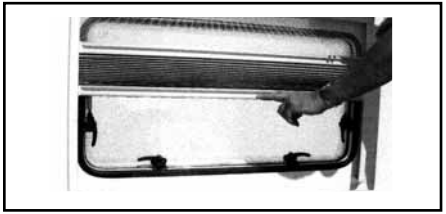
## OPERATING INSTRUCTIONS FOR SOFTROLLO BLINDS

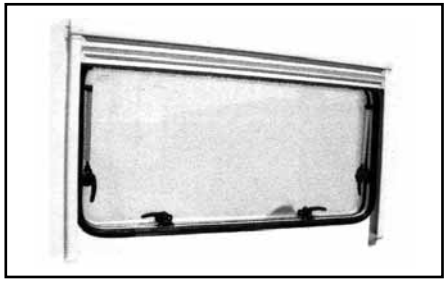
**Closing:** Grab the end bar in the middle and push the blind and flynet together or singly (blind - lower end bar) downwards until the required position is reached.

**Opening:** Push the end bar of the flynet and / or of the blind upwards.

**Care instructions:** Clean the blind only with a damp sponge. Clean on a regular basis to avoid dirt particle build up as this can damage the blind material.Use only water or with mild sudsor a vacuum cleaner.

In order to avoid material fatigue, do not leave the flynet closed for a long time.





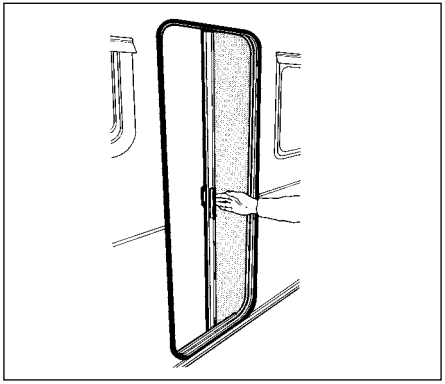
## DOORSCREEN

When drawing or releasing the doorscreen, care should be taken not to let it spring back freely, this may result in damage to the screen or its fittings.

Always pull the doorscreen close to the centre. It is not advisable to pull close to the top or bottom as this will cause snagging and uneven running.

**Caution**
**When opening or releasing the doorscreen, care must be taken to avoid trapping fingers.**

**Do not allow the doorscreen to slam open.**



The door flynet operates independently of the door by sliding across the door threshold.

## ROOF LIGHTS

When opening the roof lights, care must be taken to release the locking mechanism as the unit is raised.

Roof lights must be fully closed when towing.

Roof lights provide 12,500mm² of fixed ventilation each.

## WINDOWS

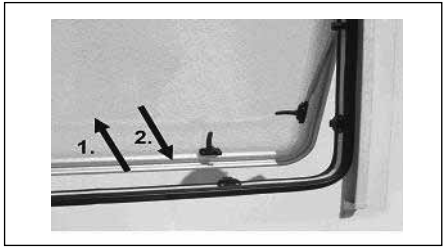
To open press the knobs in the middle of the catches and turn through 90°. Swivel the pane open as required.

To close the window, open the window as far as possible and slowly close again, turn the catches through 90° to close.

All opening windows have two catch positions. The first position is for ventilation the second seals the window from ventilation and rain.

## OPERATING INSTRUCTIONS FOR SEITZ C5-WINDOWS

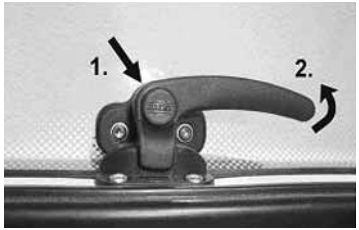
In order for the top-hung windows to be opened, all catches have to be open. To do so press the button in the middle of the catch (1) and turn the handle 90° while still pressing the button (2). Leave the catches open, otherwise the seal might get damaged when the window is closed and the catches would have to be opened again.




Push the pane outwards until the stays lock in position, with an audible click, with the pane at the required angle (1). Make sure that both stays are locked in place.

In order to close the window, push the pane to the maximum opening angle and let it descend slowly (2). Pull the window all the way down until it rests on the rubber seal and simultaneously turn the catches 90°.

It is possible to leave the window open in a ventilating position by fixing the lower edge of the pane with the catches to the groove in the plastic piece on the inner frame. Turn the catches 90°, push the pane ca.10 mm outwards and lock the catch in the groove.




**Care instructions**

Wash the pane only with mild suds and plenty of water, or with the Seitz Acrylic Cleaner. Use talcum powder for the rubber seals.

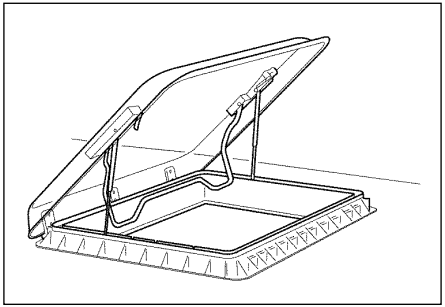
## HEKI-2 ROOF LIGHT (SEITZ)

The lift/tilt roof light can be set in 3 positions by means of pneumatic springs.

Position 1 lifts the pane 12mm without allowing rain to enter the caravan.

Position 2 sets the pane to a 150mm opening and locks with a bar.

Position 3 opens the pane through 55°.



A fully adjustable flyscreen and black-out screen are built into the inner frame. The flyscreen can be drawn independently and the black-out screen is variable for partial or full black-out.

Forced ventilation functions via a brush lined duct instead of a ventilated pane.

A cover hood can be fitted for winter protection.

Heki-2 roof lights provide 13,200mm$^2$ of fixed ventilation

## MINI HEKI ROOFLIGHT

To open depress button and push bar upwards. The rooflight has two open ventilation positions and a fully open position.

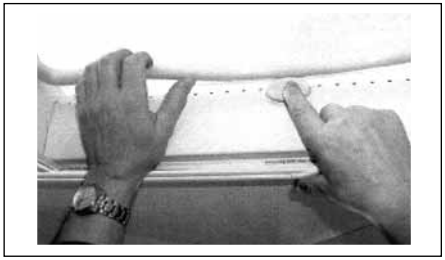
The blind and flynet operate independently of each other and are engaged by connecting to each other and sliding.

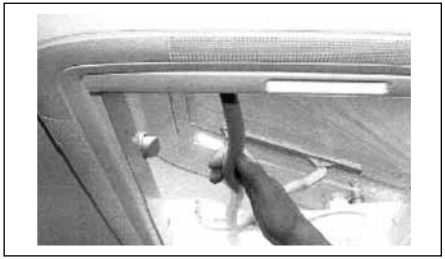
**Heki care instructions:** Clean the blind only with a damp sponge. Clean on a regular basis to avoid dust/ dirt particle build up as this can damage the blind material. Use only water or with mild suds or a vacuum cleaner.

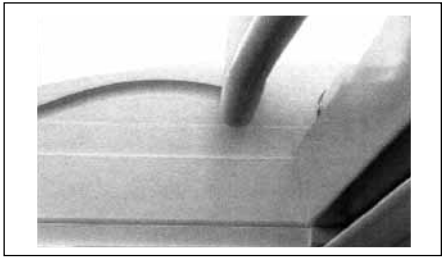
In order to avoid material fatigue, do not leave the flynet closed for a long time.

## MIDI-HEKI ROOF LIGHT WITH OPERATING BAR

**Opening the dome**

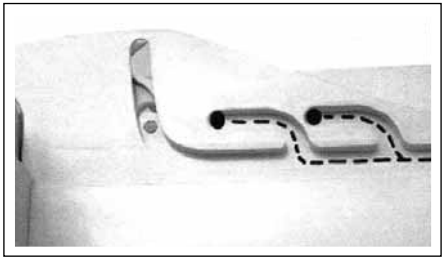






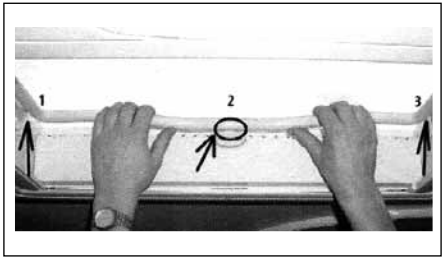
**Intermediate position of the dome**

By pushing the bar into the marked rest position,two extra opening angles, apart from the one in which the dome is fully opened, can be chosen.

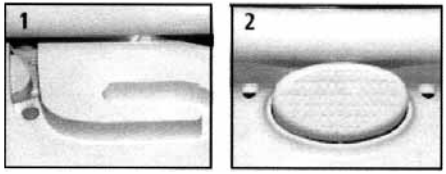


**Closing the dome**
(Drive and rest position)

Push the bar with both hands on the right and left side in such a way that the hook bolt (1) locks the dome on the left and the right side and the bar lies on the push button (2).

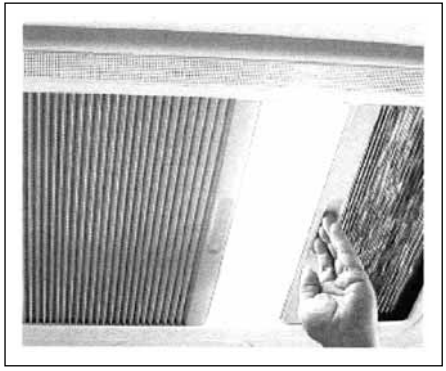



**Check if the dome is locked.**

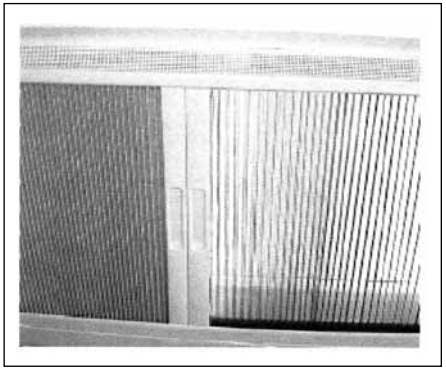



**Opening/closing the blind and fly net**

Pull the end rod from the recessed part and push it in a position you desire.



(Both systems are adjustable in any position and can be used independently from each other.)



**Safety precautions**

- Repairs should be carried out by trained personnel only.
- Inform a dealer in case of defects and malfunctions.
- Before starting off, check the roof light for damage in the dome (tension cracks) and the opening mechanism which could arise owing to, for example, branches and other natural causes.
- Do not step on the dome.
- Do not leave the vehicle without closing the roof light (danger of burglary, water penetration and wind).
- Do not open in strong wind, rain or snowfall.
- Before opening, remove snow, ice, dirt etc. from the dome.
- Malfunctions are to be repaired by an approved dealer at once.
- Do not use caustic detergents ( danger of tension cracks in the dome).
- Before setting off close the dome and check the locking mechanism.
- Avoid high speed (maximum speed recommended is 130km/h).
- Do not close the blind more than 2/3 during the day (danger of heat accumulation)
- Before starting off open the blind
- The function of the ventilation (optional) is only ensured if the gap between vehicle roof and dome is free of snow and dirt.
- The protection foil on the dome is not weatherproof and has to be removed after installation.

**Care instructions**

- Clean the dome with Seitz acrylic cleaner.
- Opaque spots and light scratches on the dome can be removed with the Seitz Acrylic Polish and the Seitz Special Polishing Cloth.
- Use talcum powder regularly (4 times yearly) to care for the rubber seals.
- Clean the blinds only with water and mild soaps suds or a vacuum cleaner.

**The guarantee becomes null and void if the care and safety instructions are not followed.**

**MAINTENANCE**

**Care**

Never use aggressive or corrosive cleaners

The acrylic cover and the frame is to be cleaned only with damp cloth and with mild cleaner that does not contain solvents or abrasives.

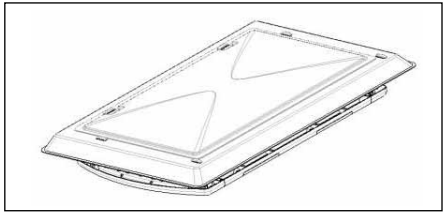
Take care that water does not get into the motor and into its electrical wiring.
The ventilation grids of the inner frame can be removed for cleaning purposes.

All rubber seals should be dusted with talcum powder at least once per year.

The fly net and pleated sunscreen may be cleaned by using a soft brush or a damp cloth.

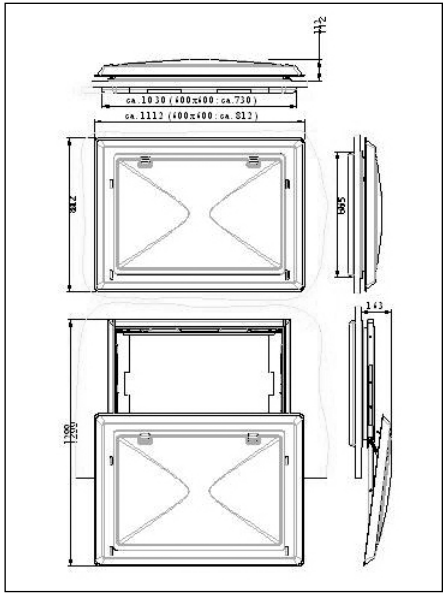
**Tensioning SEITZ cassette blinds**

The spring in the SEITZ side and rear window fly screens are pre-tensioned. However, it may be necessary in the future to adjust the tension. The tensioning screw



is positioned on the right hand top corner of the cassette. Firstly remove the plug then adjust by rotating the screw clockwise. Then replace plug.

Front end SEITZ window blinds/fly screens are also pre-tensioned, it may also be necessary in the future to adjust the tension of these. remove the left hand top corner cap. Adjust the lower screw for the blind and the higher screw for the fly screen. Care should be taken not to over tighten the springs.



The blinds should rewind without stopping or moving in a sluggish manner.

**Cleaning**

Clean the cassette, side tracks and fabrics with warm water and a mild detergent. Avoid the use of cleaners with solvents or abrasives.

**Documents**

User Guide and crank should be stored within the vehicle.

**Spares**

Spare parts can be bought from your dealer.

**THE OMNIVENT (12V) ROOFLIGHT**

The Omnivent is a double glazed rooflight constructed from a synthetic ultra-violet screened material. Its side operating mechanism allows a completely free central opening with built-in fixed ventilation when closed.

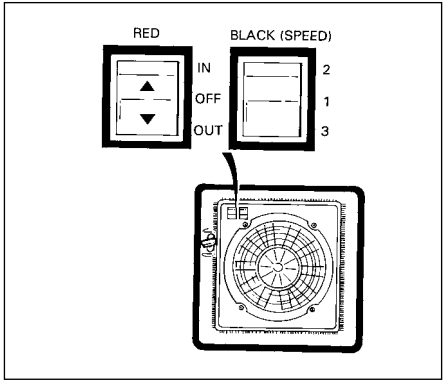
**Red Switch = Mode of Operation**

Induction (IN)
Expel (OUT)


**Black Switch = Speed Control**

1, 2 and 3

Omnivents give no fixed ventilation when set on induction.



## B2200 AIR CONDITIONER

### 1. HOW TO USE THE AIR CONDITIONER

The air conditioner performance can be improved by taking some simple measures

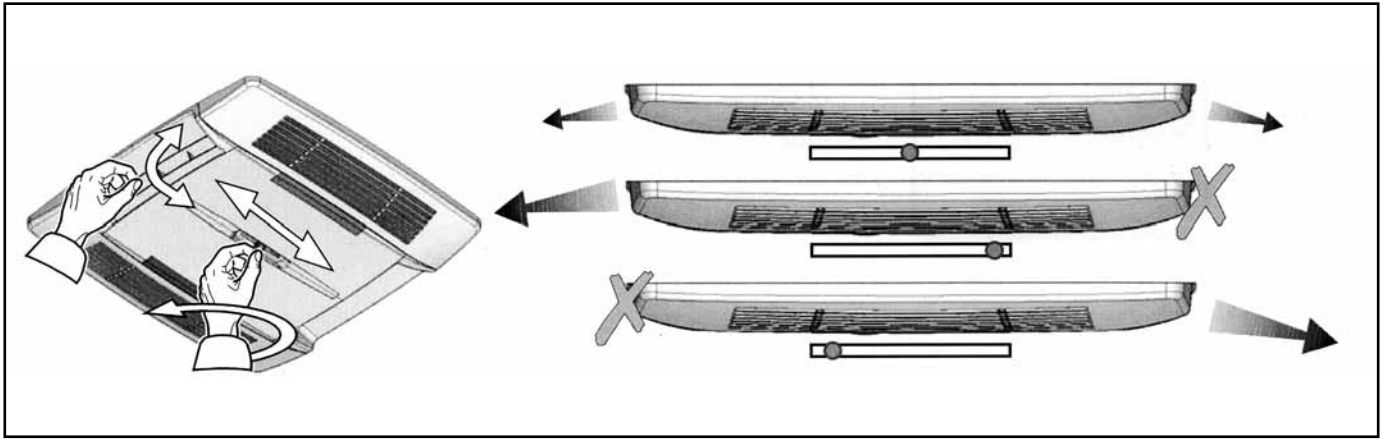
- Improve the thermal insulation of the vehicle by closing any opening and by covering any glassed surfaces with reflecting curtains.
- Avoid opening doors and windows unnecessarily.
- Select the most suitable temperature and speed.
- Properly direct the air flaps

To prevent troubles and minimise risks for people, take the following precautions:

- Always wait some minutes (at least 3) before attempting to turn the air conditioner on, after turning it off, to prevent damage to the compressor.
- Do not obstruct the air inlets and outlets with cloths, paper or other objects.
- Do not introduce your hands or other objects into the openings.
- Do not spray the air conditioner with water.
- Keep flammable substances away from the air conditioner.

**Adjusting the air direction**

Position the air diffusing flaps to direct the air to the desired position. In order to balance the airflow it's necessary to rotate the centre knob anti-clockwise, to choose the wished position and then rotate clockwise.

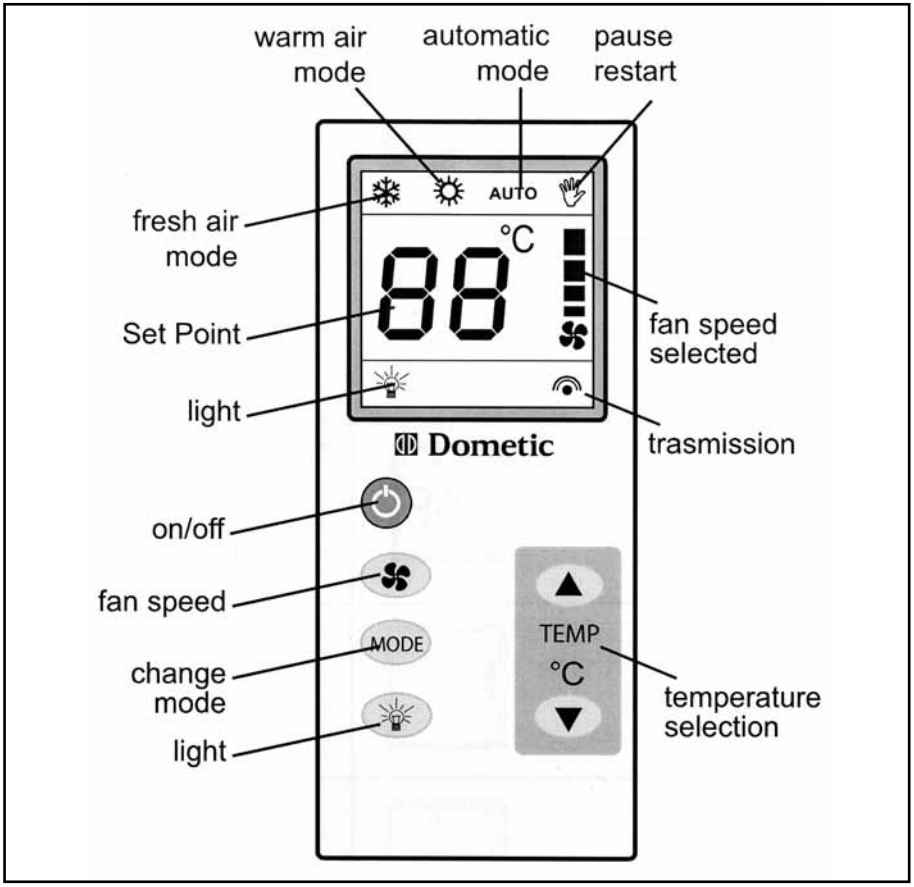


**2. DESCRIPTION OF THE CONTROLS**

Selection of the operating mode

When turned on, the system always waits 2 minutes before starting the compressor and sets to AUTOMATIC MODE. To select one of the manual modes, proceed as follows:

- Press the "MODE & SET" key to scroll through the possible settings (manual fresh air, manual warm air, ventilation, automatic), select the required mode while holding the key pressed down for two seconds until the selected mode is confirmed by the system.



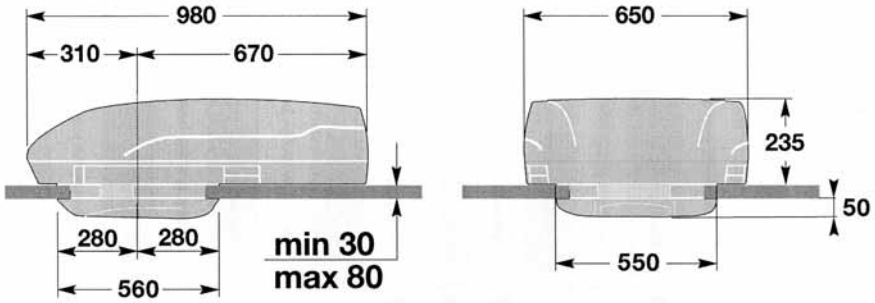
### 3. DESCRIPTION OF THE CONTROLS

| Mode | Description | Display visualization |
|---|---|---|
| AUTOMATIC<br>**AUTO** | The ▲▼ keys enables the user to change the PRE-SET TEMPERATURE.<br>In this mode, the machine automatically controls the compressor, the heater and the ventilation speed by comparing the SET TEMPERATURE with the internaltemperature. |  |
| MANUAL FRESH AIR | The ▲▼ keys enables the user to change the PRE-SET TEMPERATURE.<br>The keys allows changing the VENTILATION SPEED.<br>In this mode, the machine automatically controls the compressor and compares the SET TEMPERATURE with the internal temperature. |  |
| MANUAL WARM HAIR | The ▲▼ keys enables the user to change the PRE-SET TEMPERATURE.<br>The keys allows changing the VENTILATION SPEED.<br>In this mode, the machine automatically controls the compressor and compares the SET TEMPERATURE with the internal temperature |  |
| VENTILATION | The keys allows changing the VENTILATION SPEED.<br><br>The system only operates the fan inside the vehicle.<br>In this mode, compressor and heater do not run. |  |
| LIGHT | Pressing the light key the light on the airconditioner diffuser is switched on .The light works also when the remote control is off, in this case on the display will appear only the light symbol. |  |

**Alarm Visualisations**

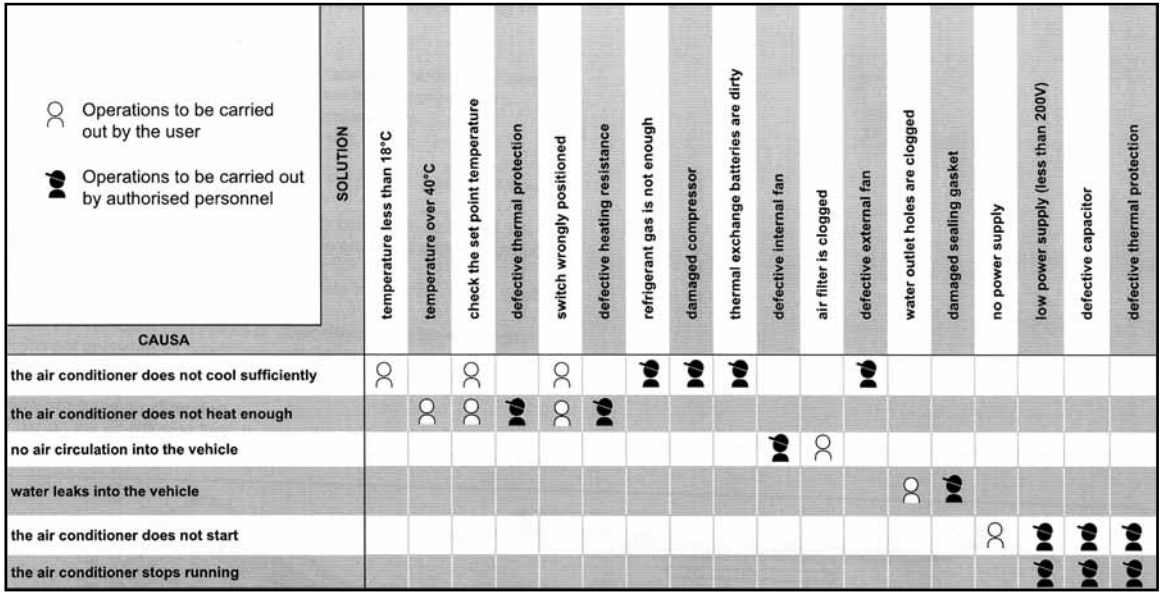
• When the display shows the ON symbol and the timer symbol flashes, the system is waiting 2 minutes from the last compressor stop elapse.

**4. TECHNICAL DATA**




| *Description* | *Measure-ment unit* | *Model* B2200 |
|---|---|---|
| Refrigerant gas (type-quantity) | g | R407C-460 |
| Refrigerating yield | Watt/h | 2050 |
| Cooling consumption | W | 910 |
| Heating capacity | W | 1200 |
| Electrical rating | V-Hz | 230-50 |
| Protection degree | IP | X4 |
| Conditioned air volume | $m^3/h$ | 380 |
| Max internal volume of the vehicle (with insulated walls) | $m^3$ | 25 |
| Weight | kg | 34 |

## 5. TROUBLES, CAUSES, SOLUTIONS




## 6. EXTRAORDINARY MAINTENANCE

For the best performance of your air conditioner, have you dealer/workshop clean it thoroughly before use:

1. Thermal exchange batteries
2. Water outlet holes are properly cleaned

## 7. RECYCLING

Regarding disposal and recycling, follow the national or local regulations. To this end, address to the authorised environment bodies.

## CARE OF LAMINATE TOPS, TABLES, FURNITURE AND DOORS

DO NOT use abrasives, chemically treated cloths or aggressive detergents as these may cause damage

DO NOT place hot objects on laminated surfaces i.e. tops, tables. Any temperatures 70°C and over will cause permanent damage.

Clean worktop surfaces, furniture and door fascias with a soft, slightly damp cloth, dry off with a soft cloth.

## ASH FRAMED DOORS

In order to provide customers with the latest designs of door furniture it is possible, due to the use of natural wood, that warping may occur. This should not detract from the correct functioning of items fitted in the caravan.

**Information**

During the normal travelling vehicle vibration and flexing may cause some of the furniture doors to become out of alignment.

For your convenience many hinges are adjustable.

## TABLES

Slide top of drawers out and fold back to form convenient table. (Fig. A)

The pedestal table can be swung round for easy access to the seating and then re-positioned afterwards. (Fig. B)

Tables stored in the table storage compartment must be securely clipped into place whilst in transit.

**CAUTION: When erecting the free standing table, be careful to avoid trapping fingers.**

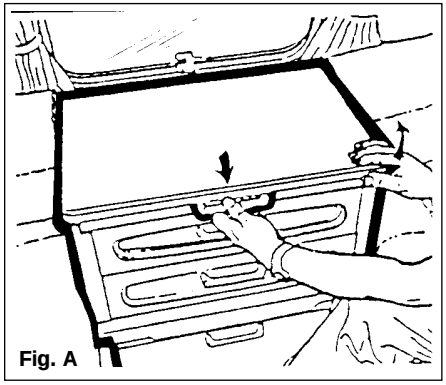


Fig. A

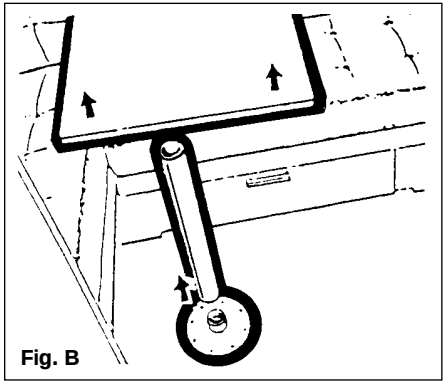
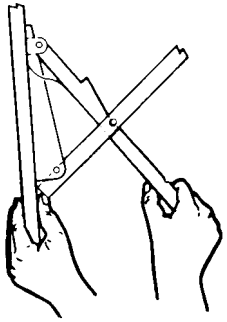


Fig. B



NOT TO SCALE

## SHOWER

When using the shower, always ensure that the shower screen is fully closed thus avoiding water spray on unprotected areas.

**Table Storage**

To avoid damage care must be taken when removing tables from their stored position.

Where two tables are stored together in a low level storage area care should be taken to remove the table positioned opposite the hinged edge first.

## 12V READING LAMP

**WARNING** 12v reading/ spotlamps generate high temperatures when in use, the body, lens/ bulb may become very hot. **NEVER** make directional adjustment in the direction of flammable materials i.e. curtains, nets or blinds.

## FIXING OF AWNINGS

In order to avoid puncturing the outer skin of the caravan wall, it is recommended that awning poles are fixed to your caravan using load spreading eyelet pads or rubber sucker pads.

Attaching awning brackets and associated fixings to your caravan by using mechanical methods which pierce the outer skin of the caravan wall can allow water ingress which will invalidate the product warranty.

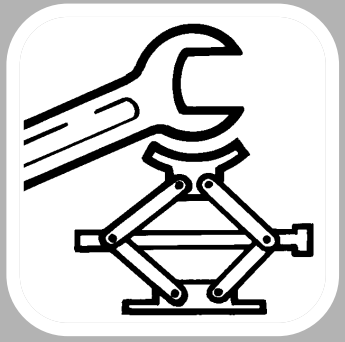
**Important:**
Care must be taken when using an awning as poles and suckers can cause damage to exterior side panels.

Awnings should be taken down in strong winds to protect the side panels from cosmetic damage and dents from the awning poles.

**Note:**
Awnings should be kept ventilated when discharging products of combustion exhaust into them.

**Awning Sizes**
Due to the various awning types and sizes the awning sizes provided in the Service and Warranty Handbook are for guidance only.

Specific awning sizes must be confirmed with the dealer or awning manufacturer prior to purchase.



# MAINTENANCE



## MODIFICATIONS - DIY WORK

Owners need to be aware that carrying out DIY modifications to your caravan may in certain instances, invalidate the warranty cover and could also affect the safety and structure of the caravan.

**WD40 IS NOT RECOMMENDED FOR EXTERNAL OR INTERNAL USE**

**WD40 attacks paintwork and sealants.**

**If a lubricant is required for Interior hinges, Sliding door tracks, Bottle box hinges, Exterior door hinges, Plastic tracking etc. We recommend "Ambersil 40+" this is readily available from most DIY/ Automotive retailers including Hanford's**

Before carrying out any DIY work within the warranty period (3/5) years please check with your nearest Swift Group dealer or contact Supercare customer services on 01482 875740 for advice.

## CARAVAN EXTERIOR

**Aluminium Panels**
The stove enamelled paintwork is very durable and easy to clean owing to the high gloss properties.

**Plastic Panels (GRP/ABS)**
These are used for front and rear panels and, in some cases for the roof.

**Cleaning**
For both aluminium panels and plastic panels.

1. Wash the caravan regularly with mild detergent. Rinse with cold water and leather off.
2. For better protection a similar coloured good quality car wax may be applied.

For sealed areas a mild soap is the best way to clean without affecting the sealant.

Acid or alkaline based cleaners or solvents should not be used.

**WARNING: Under no circumstances use any abrasive cleaning agents or solvents on the exterior panels.**

**Care should be taken as the silicon in some polishes can attack the rubber used on the exterior for seals and gaskets.**

**Mouldings**
All mouldings are of anodised aluminium and will retain their lustre for a long period if no abrasive materials are used to clean them.

**Acrylic Windows**
Wash windows carefully, as you would with the paintwork of your car, do not scrub windows prior to removing surface dirt and film with a hose pipe - trapped dirt could cause scratching.

Wash with a solution of warm soapy water, windows can then be dried off with a leather.

Small scratches can be removed, consult your dealer.

Catches and stays do not require any special attention or lubrication.

**CONDENSATION**

**What is condensation**

Condensation is the change of water from its gaseous form (water vapour) into liquid water. Condensation generally occurs in the atmosphere when warm air rises, cools and looses its capacity to hold water vapour. As a result, excess water vapour condenses to form droplets.

**Why condensation occurs**

Condensation occurs when warm moist air meets a cold surface. The risk of condensation therefore depends upon how moist the air is and how cold the surfaces of the vehicle are. Both of these depend to some extent on how the vehicle is used. In a Caravan or Motorhome with a cold outside wall, if the temperature of the wall falls below the dew point temperature, it is quite normal for condensation to occur predominantly on the external walls.

**When condensation occurs**

Condensation occurs usually in winter, because the Caravan or Motorhome is cold and because skylights, windows and doors are opened less and therefore the moist air cannot escape.

**How condensation occurs**

Condensation occurs often for short periods in bathroom and kitchen areas because of the steamy atmosphere, and quite frequently for long periods in unheated areas; it also occurs in cupboards or corners of rooms where ventilation and movement of air is restricted.

**What is important**

Two things are particularly important:

- To provide ventilation so that moist air can escape.
- To use the heating reasonably

**How can you prevent condensation**

Provide ventilation so that moist air can escape.

a) Good ventilation of kitchens when washing, cooking or drying damp clothes is essential. Use the electric element of the space heater will help, when washing, cooking, or drying damp clothes, and particularly when the windows show signs of misting up.

b) If there is no mains electric supply and therefore you cannot use the electrical element of the space heater, open the skylights or windows slightly, but keep the door closed as much as possible.

c) After showering, keep the bathroom window or skylights open, and shut the bathroom door long enough to dry off the room.

d) In all other areas provide some ventilation. Fixed ventilation is provided in accordance with BS EN 721: 1998 this is through skylights and ‘heki roof lights’ in the roofs and from ventilators through the floor under cookers, doors and in bed boxes it is important not to block these.

Too much ventilation in cold weather is uncomfortable and wastes heat. All that is needed is a very slightly opened window or skylights. Opening a skylight or ‘heki; rooflights partially or windows opened to about 1cm opening will usually be sufficient.

**Provide reasonable heating**

a) Do not use of portable paraffin or flueless gas heaters at all.

b) If drying damp clothes or towels, open a window enough to ventilate the area and turn on the electric element of the space heater but do not hang items over the heater.

c) Try to make sure that all areas are at least partially heated. Condensation most often occurs in unheated areas.

d) To prevent condensation, the heat has to keep room surfaces reasonably warm. It can take a long time for a cold caravan or Motorhome to warm up, so it is better to have a small amount of heat for a long period than a lot of heat for a short time.

e) Caravans and Motorhomes are left unoccupied and unheated and can get very cold. Whenever possible, it is best to put the heating on at a low level before setting off on a journey in the winter to pre heat the vehicle.

f) In houses, the rooms above a heated room benefit to some extent from heat rising through the floor. In Caravans and Motorhomes this does not happen.

Caravans and Motorhomes use only carefully selected insulation materials but unlike most rooms at homes they have all outside walls, so they lose heat through all walls as well as the roof and floor.

Even in a well insulated Caravan or Motorhome with reasonable ventilation it is likely during cold weather if the temperature is less than 10°C that condensation will occur. Ideally the temperature should be kept about 20°C although this is not always possible.

**Mould growth**

Any sign of mould growth is an indication of the presence of moisture and if caused by condensation gives warning that heating or ventilation, may require improving.

# Maintenance

**New vehicles**

New Caravans and Motorhomes often take a long time before they are fully ‘dried out’ because of moisture in the materials used in the manufacture. While this is happening they need extra heat and ventilation. At least during the first winter trips and may require more heat than they will need in subsequent winters journeys. Allowance should be made for this.

**WARNING: Do not wash your caravan with a high pressure washer as these can permanently damage the seals of your caravan.**

**Changing Exterior Bulbs**

ALWAYS REPLACE LIKE FOR LIKE

For individual replacement bulb specification, refer to your Service Handbook.

Generally road lighting bulbs can be easily replaced by unscrewing and removing the lens from the exterior of the caravan, however once the high level brake lamp is removed from its housing there are further screws to undo at the back of the lamp to gain access to the bulb housing.

## CARAVAN INTERIOR

Follow these guidelines to ensure your investment is receiving the very best attention.

**Side Walls, Roof Lining**
A simple wipe over with a damp cloth and a very mild detergent is all that is needed.

**Soft Furnishings**
Should be vacuumed occasionally to remove grit and sand and help to keep its smart appearance and ensure long life. The upholstery can be cleaned with a mild, reputable upholstery cleaner. It is recommended that the curtains and pelmets are specialist cleaned only. The foam used in cushions is manufactured to meet fire regulations. It requires time to return to its normal position after prolonged use.

**Work Surfaces**
You should not stand very hot items on any of the work surfaces, especially models with polycarbonate moulded sinks and drainers.

**Cupboard Catches**
It is advisable to lightly oil all cupboard catches, sliding bolts and hinges from time to time.

**Kitchen Equipment**
All the thermoplastic parts in these areas have easy clean surfaces. To ensure long life and to prevent damage you must not use any cleaning materials at all and ensure water temperatures do not exceed 70ºC (putting cold water in first is suggested). After every use it is essential that you rinse with clean water only and wipe with a soft damp cloth. Failure to follow these simple instructions may result in premature failure or cracking which will not be covered by any guarantees (including extended warranties).

**Bathroom/Shower**
These products should be cleaned immediately after use. Apply a warm, mild soapy water solution with a soft cloth and rinse with clean water immediately. Abrasive materials must never be used. For stubborn stains "Thetford Bathroom Cleaner" is recommended as the use of other cleaners may harm these products, cause premature failure and will invalidate the warranty. "Thetford Bathroom Cleaner is available from most caravan dealer shops.

**Furniture**
A simple wipe over with a damp cloth should be all that is required. Polishing with a proprietary brand of wax polish enhances and maintains furniture in showroom condition.

It must be remembered that because the frames of the doors are made of ash, which is a natural product, they can be affected by temperature and humidity and may bow under certain conditions. As conditions change they should revert to their original positions.

**Kitchen Drainer and Cutting Board**
You should not stand hot items on to the removeable plastic kitchen drainer. To wash use only warm soapy water, do not use chemicals and bleach.

The round wooden kitchen cutting board can be lightly brushed with vegetable oil to enhance it.

**Changing interior bulbs**
remove the lens or lampshade to access the bulb.

ALWAYS REPLACE LIKE FOR LIKE

For individual replacement bulb specification, refer to your Service Handbook.

**Locker Header Fluorescent Tube Replacement**

- Ensure power supply to light is switched off.
- Open locker, light is mounted above. Locate fixing screws (orientated towards ceiling) and remove.
- In the case of a side locker, a small furniture component onto which the light fitting is secured can now be removed.
- In the case of an upper welsh dresser ( or similar), a larger component carrying all the lights from above that piece of furniture may detach.
- Once the appropriate light fitting has been accessed, the tube should be twisted along its length to release the tube and allow it to be lifted from the fitting.
- Please see the bulb replacement chart for details of the type of tube fitted. In addition, different 'colour temperatures' of bulb are available. For a consistent appearance replace tubes with those of equivalent colour temperature: This will be stated on the fitted tube in the format '4200K' or similar.

## WINTERISATION/STORAGE

This is probably an opportune moment to arrange for the caravan to have its annual service at your appointed dealer.

The following applies wherever your caravan is stored particularly during the winter months.

Do not park near trees or larch type fences, due to possible wind damage.

Keep any grass around the floor of the caravan short, to maintain air flow and stop any possible damp getting into the caravan.

It is advised that the caravan is ventilated regularly throughout the winterisation /storage period, opening windows, doors and rooflights when possible.

**General**
All moving parts should be checked for free operation.

Clean all cooking appliances and refrigerator.

Lubrication should be carried out at the points illustrated in the general notes on chassis maintenance (page 155).

Charge up the on-board battery every 2 months.

Check alarm battery condition every 2 months and charge if necessary.

Leave the refrigerator door open.

Leave furniture doors and lockers open to allow air to circulate fully.

**Condensation**
Condensation will occur when humidity levels rise. Correct heating and ventilation will help reduce this. When cooking or in wet inclement weather increased ventilation through windows and rooflight will be required.

**Soft Furnishings**
Clean and dust the upholstery and if possible remove before placing the caravan into winter storage. Alternatively, stand the cushions on their edges to allow circulation of air. This will reduce the possibility of dampness from condensation.

Keep curtains or blinds closed, to minimise fading of furniture.

If the blinds and/or flyscreens remain down for a prolonged period of time, re-tensioning of the springs will be necessary before re-use.

**Wheels and Tyres**
Do not store in one position with partially deflated tyres. The tyre walls will suffer and do present a real danger of blow outs, especially when travelling at faster speeds than are allowed in the UK.

The wheels should be turned every couple of weeks or even better, the wheels removed and the caravan placed on “winter wheels” or axle stands.

If you are removing the wheels, follow the jacking procedure for changing a wheel.

Check your tyres regularly for signs of age and deterioration, particularly wear, cracking and blistering. If in doubt consult a reputable tyre fitter.

**Water System**

Remove chopping board from bowl.

All single lever mixer taps, including the shower mixer, should have the lever moved to the central position and lifted to the open position for hot and cold.

Locate the system drain valves if fitted, mounted above the floor. Rotate the handle clockwise on each to the open position.

Drain water heater. Open yellow handle on inline valve adjacent to water heater. Valve is open when handle is vertical.

Drain water tank. Open tank isolation valve. Valve is open when handle is inline with body of valve.

Run pump for a short time to assist purging water from pipework.

Remove shower head. Let the shower hose drain into the shower tray and then return to holder.

The pump manufacturer recommends that after draining the caravan, the plumbing connection at the outlet from the pump should be disconnected (This can be done by unscrewing the fitting which connects the plumbing to the accumulator). With a suitable container present to collect any remaining water, the pump should then run for a short time. This ensures that the majority of water is removed from the pump head which will minimise the risk of frost damage to the pump.

Before recomissioning the system reverse all above actions. (See Taps in Services section)

The Thetford Cassette porta potti is easily winterised for storage. Empty the fresh water tank using the drain tube/fresh water tank level indicator (level indicator on electronic models only). Pull the lever indicator/drain tube down from top plug position and outward through door opening to drain water from the tank.

Empty the water fill funnel by pulling the bottle away from tank. Remove the small water cap on the filler bottom, allowing water to drain from the water funnel. (Not C-200 toilet).

Do not tighten caps, this helps in keeping unit dry.

The pour out spout and vent plug can be removed. Seals should be greased if necessary with acid-free vaseline.

**Recomissioning the Water System**
Fill the fresh water tank on the Thetford Cassette porta potti using a hose or jerrycan until the water in the funnel reaches the neck. Tank capacity is 15 litres. Aqua Rinse may be added to improve cleaning of bowl and flushing of unit.

Replace cap. Swing back the water fill funnel until it touches the water tank.

Add Aqua Kem (100 ml) into the Cassette (or 120 ml if using Aqua Kem Bio) through the pour out spout. Add small amount of water through

the pour out spout and replace the cap.

It is advisable after storage to flush the water system initially with a sterilising agent (such as Milton), and then with water repeating until the system is well flushed through.

Connect the pump.

Fill the system with water until water flows freely from the hot taps. About 2 gallons of water will be required. Close the hot taps.

**Appliances**
Before starting caravanning after storage check all gas appliances and electrical points.

**Note:** Preferably not less than once a year, the electrical installation should be inspected and tested by a qualified electrician.

After storage it is advisable to air the caravan and clean throughout, especially cooking appliances and the refrigerator.

Replace the bedding and wheels if they were removed for storage.

**Important**
Always follow the manufacturers recommended procedures after use of fitted equipment in the caravan and before storing for any length of time.

## ALKO RUNNING GEAR

### CARE & MAINTENANCE INSTRUCTIONS FOR YOUR AL-KO CHASSIS AND COMPONENTS

**General Information**
The AL-KO lightweight chassis has been perfected by many years of research and development, supported by an exhaustive test programme.

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 chassis 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 allows replacement of individual parts should the need arise.

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 and should, if properly maintained, last the lifetime of the vehicle.**

When new, the chassis is of a bright and shiny appearance. As the galvanising cures during the initial 2/3 month period, this will gradually change to a medium/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/ components are washed off, using a pressure washer on an annual basis (especially 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.

**Drilling or Welding of Parts or Accessories**

The chassis is designed and built to precise tolerances and **must not** be drilled or welded (except in accordance with certain AL-KO Accessory Operating Instructions). **Failure to comply will invalidate all warranties.**

**Independent Suspension**

The AL-KO 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 section).

**Loadings on Coupling Heads, Overrun Assemblies and Axles**

The permitted 'nose' weights of the coupling head/stabiliser, overrun assembly and drawbars, **must never exceed** the lowest value stamped on the assemblies.

The **maximum axle loading** is that stamped on the plate (Fig. 1 example axle plate) located in the centre of the axle, facing rearwards.

**DO NOT ATTEMPT TO REMOVE AS THIS WILL VOID THE PLATE.**

The third line down marked "Capacity" is the **maximum permitted axle loading and must not be exceeded.**

The caravan manufacturer may have stated a lower maximum loading weight on the plate fitted adjacent to the entrance door,

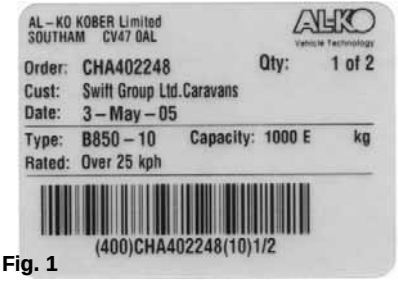


**Fig. 1**

**this then becomes the maximum permitted load and must not be exceeded.** We recommend you record the Axle details for future reference.

It may be possible if required for the caravans MTPLM to be upgraded.

Your caravan dealer will require the following details from the axle plate.

(Example of information ref Fig 1)

- Order - **CHA402248**
- Qty – **1 of 2**
- Date - **3 May 05**
- Type - **B850-10**
- Capacity - **1000E**

**Loading**

Loads to be carried in the caravan should be placed directly over, or as close as possible to the axles, otherwise the handling will be impaired. Maximum gross weight, as advised by the caravan manufacturer, must not be exceeded without approval from AL-KO.

Maximum loading is defined as the difference between ex-works weight and the permitted total weight.

**Load Too Far Forward (Fig 2)**
Steering and braking ability reduced. Increased loading on the rear axle and chassis of the tow vehicle.

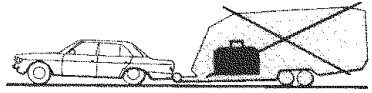


**Fig. 2**

**Load Too Far Back (Fig. 3)**
High skid risk together with poor braking effect.


**Fig. 3**

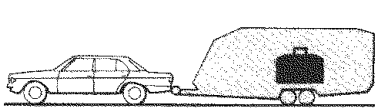


Fig. 4

**Load Over Axle (Fig 4)**
Optimum road holding together with maximum braking effect. Exceptionally heavy loads should packed directly over the axle.

**Attention should be paid to the legal regulations regarding the permitted pressure exerted by the towbar on the towed unit.**

**AXLE TYPES**

**Safety Precautions**

No welding is permitted on AL-KO Axles

It is important that the wheel and hub/ brake drum are compatible. This mean that the PCD, wheelbolts and inset must all be compatible with both the hub/brake drum and the wheel rim.

Particular attention must be paid to the recommended torque figures for the wheelbolts (see pg 18).

The axle type details shown on axle type plates must not be obscured or made illegible by application of any additional surface finish.

**Operating Instructions**

**Service Brake**

When the towing vehicle is braking or travelling down hill, the overrun device shaft is pushed in (dependent on the magnitude of the thrust on the shaft) and presses on the overrun lever. This acts on the bowden cables and expander mechanism, which in turn expands the brake shoes applying the wheel brakes.

**Hand Brake**

With the gas strut version, pull the handbrake lever until upright. With the spring cylinder version, pull the handbrake lever right up to the last tooth. The caravan is then braked.

**IMPORTANT NOTE**

Please note that with the handbrake fully applied, the caravan/trailer is able to move backwards by 25 cms until the spring cylinder/gas spring takes effect.

**Maintenance and Cleaning**

Maintenance of Euro-Plus/Euro-Compact and Euro-Delta.

The above semi-trailing axles come fitted with maintenance free wheel bearings (greased and sealed for life) and no adjustment is necessary.

**NOTE:** The hub bearing is not protected against water ingress. Check wheel brake linings for wear every 10,000 kilometers or

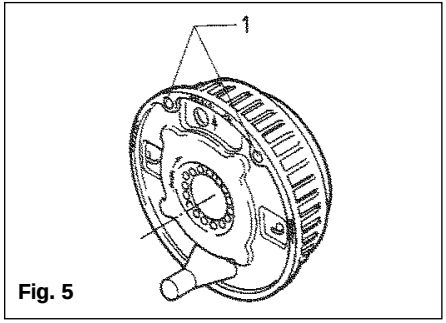



Fig. 5

every 12 months via the inspection hole (Fig. 5/Item 1). Adjust if necessary. Where continuous travel in hilly regions or high mileage is experienced, earlier inspection and adjustment may be necessary.

**NOTE:** The flanged hub-nut, located under the dust cap, used to keep the brake drum in situ, is a ONE-SHOT NUT (ie. must only be used once). If removed it must be replaced with a NEW flanged nut - torqued to 290 ± 10 Nm (214+/1 7.5 lbs/ft). A small amount of special mineral grease, available from AL-KO must be applied to stub axle thread prior to fitting the new flanged nut. After fitting excess grease must be removed with white sprit.

The rear hexagon cap head bolt located under the black plastic cap **MUST NOT BE DISTURBED** under any circumstance. Interference with this nut will result in immediate tyre wear and damage to the

braking system and **WILL INVALIDATE ALL WARRANTIES**. Should the rear nut accidentally be disturbed then the complete axle must be returned to AL-KO for resetting of the toe-in and camber.

No attempt should be made to remove the bearing. In the event of damage to the bearing or drum, only the drum complete with bearing and circlip will be available as a spare. No grease is used in the hub other than the mineral grease on the stub axle. No grease should be placed in the DUST cap. This is not a grease cap as used in all previous hubs

**"Standard Axle" Maintenance (taper roller bearings)**

**After 1500 km or 6 months**

Have the axial play of the hub bearing checked and adjusted if necessary.

**After 10,000 km or 12 months**

Check quantity and quality of grease, renew if necessary.

Check the wear of the wheel brake linings every 10,000 Km or every 12 months through inspection hole (Fig. 5) and adjust if necessary. Where continuous travel in hilly regions or high mileage is experienced, earlier inspection and adjustment may be necessary.

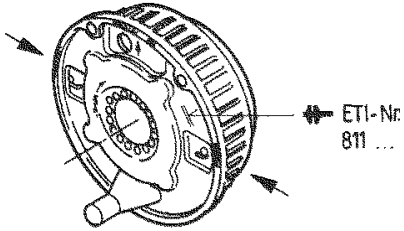



**Fig. 6**

**SPARE PARTS**

Spare parts are safety critical parts! For this reason when fitting spare parts in our products we recommend the use of original AL-KO parts or those parts that we have explicitly approved. The reliability, safety and suitability of parts designed especially for our products, has been determined using a special test procedure. In spite of constantly monitoring the market we are unable to assess or vouch for other products.

If repair work or servicing is required, AL-KO have a large network of AL-KO service stations throughout Europe.

To establish the correct spare parts required for your axle you should always quote the axle type (axle identification plate Fig. 1, page 156) and Spare Part Identification no. (ETI No.), which will be stamped onto the wheel brake or on the identification plate (Fig. 6). Please establish these numbers before contacting AL-KO or a Service Agent.

The AL-KO rubber suspension axle has been designed and developed to suit all types of road conditions and is maintenance free.

Three rubber elements are contained within an hexagonal axle tube. These provide suspension and have inherent damping characteristics.

Figs. 7, 8 & 9 show the deformation of the rubber elements at the extremes of suspension movement.

The axle is designed to ride with the suspension drop arm at, or slightly below, the horizontal position.

For Trouble Shooting & Fault Finding please see Table 1 on page 174.

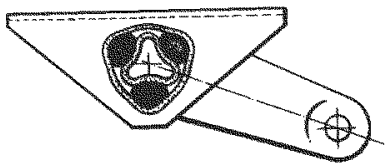


**Fig. 7 Rebound or Free Position**

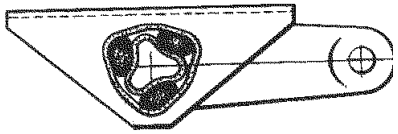


**Fig. 8 Normal or Laden Position**

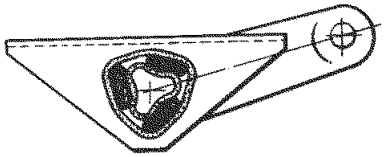


**Fig. 9 Maximum Bump**

**AL-KO BRAKING SYSTEM ADJUSTMENT**

1. Ensure the towing shaft with coupling head is pulled FULLY FORWARD. (Fig. 10).
2. 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. 10).
3. Jack up one side of the caravan, using the AL-KO Side Lift Jack System. (see Jack Operating Instructions).
4. Remove the inner plastic bung from the backplate to expose the “starwheel” adjuster access. (Figs. 10 & 11).
5. 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. 11).
6. Slacken off the starwheel adjuster until the road wheel turns freely in the FORWARD direction. (Fig. 11).
7. 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.12). (On tandem axles a double abutment (bracket) is fitted to the front axle ONLY).
8. Repeat for other wheel or wheels.
9. 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 (bracket) on the front axle.
10. Ensure the balance bar (compensator) is being pulled evenly (Figs.10 & 12). Excessive movement to this bar (double on tandem axles) would indicate possible incorrect adjustment (if appropriate, repeat step No. 7 - Fig. 12).
11. 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.
12. 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

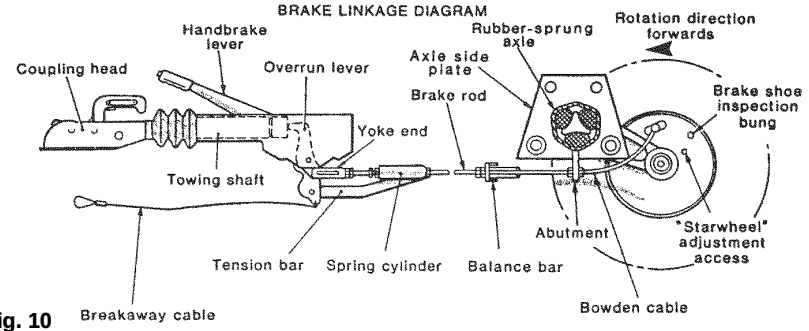



**Fig. 10**

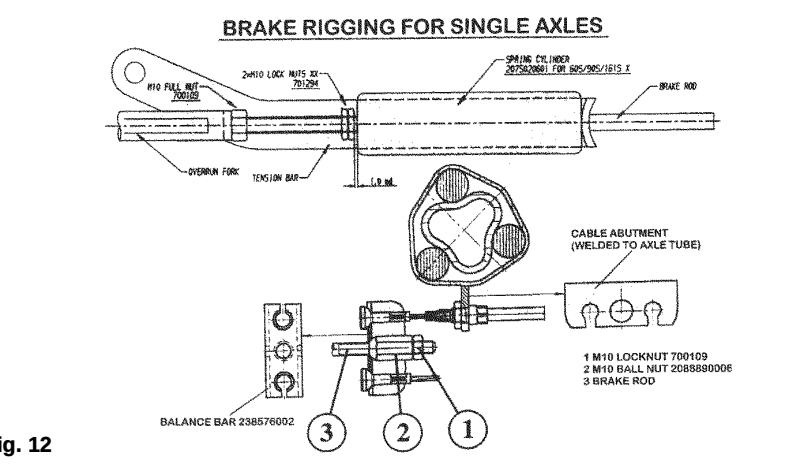



**Fig. 12**

### Brake Linkages

It is recommended that all brake linkage threads are lightly greased for protection.

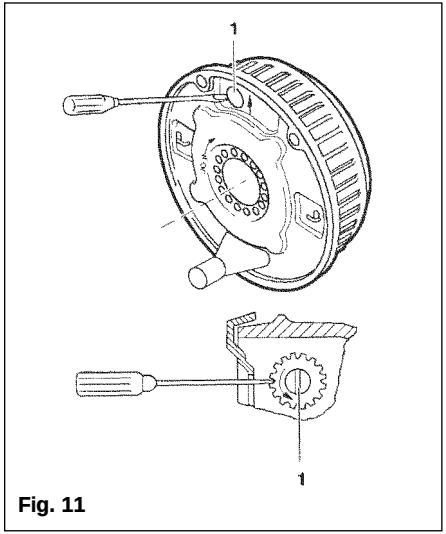



**Fig. 11**

towing shaft. Note! Over adjustment to the long ball nut (Fig. 12/Item 2) could induce movement of the inner brake cable, reducing the effective clearance of the brake shoes. If the overrun 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 brake rod as above (Figs. 10 & 12).

13. Adjust the two locking nuts, forward of the spring cylinder (Fig. 10), (on some chassis a single Nyloc nut is used) to give 1 mm 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. (Fig. 12). (If the overrun assembly is fitted with a gas strut handbrake then no spring cylinder is fitted - therefore ignore this paragraph).
14. 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.
15. OVER ADJUSTMENT of either the wheel brakes or linkages, will result in difficult reversing causing the wheels to “lock-up”.
16. 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. See page 170 for all handbrake operations.
17. Finally, if the road wheels have been removed, re-tighten using a calibrated Torque Wrench to 88 Nm (65 lbs/ft) - on all M12 wheel bolts -in sequence, i.e. North, South, East, West **NOT** clock or anti-clockwise (refers to steel rims only). Remember to over-tighten is just as dangerous as to under-tighten, as this can distort the wheel rims. Avoid the use of power wrenches.

    IMPORTANT - The torque settings should be rechecked after 50 Km. Wheel bolts should **NEVER** be lubricated.

**Coupling Heads/Combined Stabiliser Devices**

**Your Caravan will be fitted with either a standard coupling head or a combined stabiliser/coupling unit. If your caravan is fitted with an AKS 1300 Stabiliser, please request Part No. 1385106 for full operating instructions. If fitted with AKS 2700, request Part No. 1385107.**

**Safety Precautions**

Always ensure that the coupling head is properly connected to the tow vehicle’s towball every time you couple up. If this procedure is not carried out correctly, the caravan/ trailer may become detached from the towing vehicle!

Maximum possible articulation of the coupling head must not exceed ±25 o vertically and ±20 o horizontally - see Fig 13.

If exceeded, components will be overloaded and the operation of the assembly adversely affected!

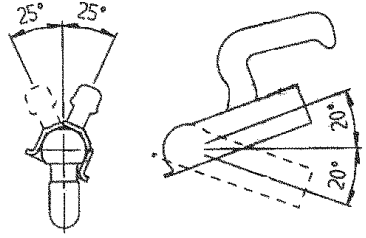



**Fig. 13**

**Operation**

**For Coupling types AK160, AK300 & AK350.**

**Coupling Up**

Open coupling handle. To do this pull the coupling handle up (Fig. 14) in the direction of the arrow.

The coupling mechanism has a fixed open position, ie. as long as the coupling head is not placed on the ball the coupling will remain open.

Put the open coupling onto the towball. The coupling handle automatically and audibly clicks into position. In the interests of safety, press the handle down by hand (Fig. 14).

The coupling head is correctly connected when the green cylinder part of the safety indicator is visible (when viewed from the side - Fig. 14/Item 2).

The coupling mechanism is correctly engaged when the coupling handle can no longer be pressed down any further (by hand).

**Caution**

If the coupling head is not correctly hitched onto the towball, then the caravan/trailer can become disconnected from the towing vehicle.

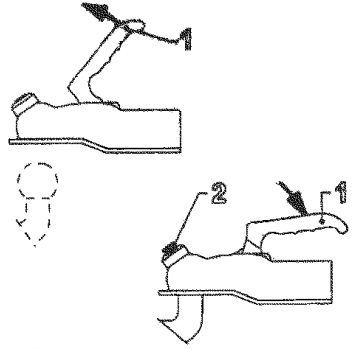



**Fig. 14**

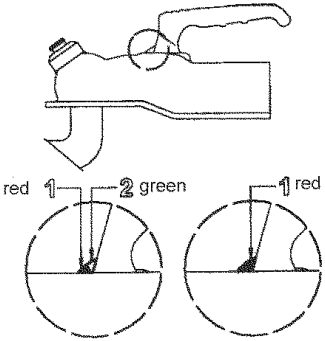



**Fig. 15**

**Uncoupling**

Open the coupling handle and lift the coupling head from the towball. When there are higher nose loads, coupling and uncoupling can be made easier by using the jockey wheel.

**Wear Indicator**

A wear indicator on the coupling head (Fig. 15) shows whether the wear limit of the towing vehicle's towball or the trailer coupling has been reached or not.

For this purpose, hitch up the trailer to the towball and drive the unit for approx. 500 m. This will set the coupling head adjustment. Following this, check the wear indicator as follows.

If the green indicator is visible on the coupling (with the coupling engaged Fig. 15), the coupling head is in good condition or the wear on the towball is within permissible limits.

When the green indicator on the coupling handle is completely covered over and only the red portion is visible (Fig. 15), this could be caused by the following:

- The towball has reached the lowest wear limit of 49.61 mm dia.
- Both coupling head and towball are showing signs of wear.

- Towball is in good condition with 50mm dia, but the coupling head is showing an excessive level of wear.

**Caution**

Under these circumstances, the coupling head can become detached from the towball and the caravan/ trailer can breakaway from the tow vehicle. The coupling head and towball must therefore be checked IMMEDIATELY before future use. Any faulty parts must be changed IMMEDIATELY.

All maintenance work should be carried out by AL-KO Approved Workshops.

**Operation**

**For coupling types AK7, AK 10/2 or AK252. (This type of coupling is normally fitted to trailers or older model caravans).**

**Coupling Up**

Push the safety lever (Fig. 16/Item 1) up with the index finger and lift the handle up and forwards. Put the opened coupling onto the towball with the handle pulled up and in addition press down by hand. The coupling will close by applying a light pressure. Press the handle down by hand until the catch snaps out (Fig. 16).

The coupling head is correctly engaged when the green cylinder part of the safety indicator is visible (Fig. 16/Item 2).

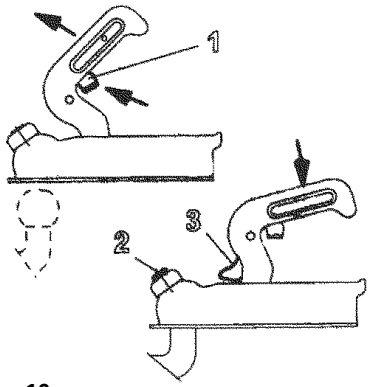



**Fig. 16**

**Caution**

It is most important to check that the coupling head is properly engaged on the towball each time.

**Uncoupling**

Lift coupling handle fully and remove the coupling head from the towball. Where there are higher nose loads, coupling and uncoupling can be made easier by using the jockey wheel.

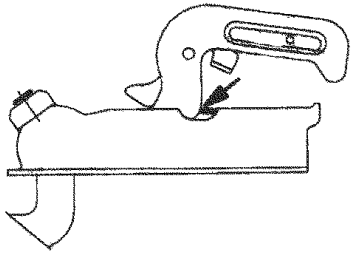


**Fig. 17**

**Wear Indicator**:

If the handle reaches the back of the cutaway portion of the housing, when the coupling head is engaged (Fig. 17) there will be play between the towball and coupling head. Automatic re-adjustment is no longer possible and the assembly will need inspecting.

**Caution**:

Under these circumstances, the coupling head can become detached from the towball and the caravan/ trailer can breakaway from the tow vehicle. The coupling head and towball must therefore be checked IMMEDIATELY before future use. Any faulty parts must be changed IMMEDIATELY.

All maintenance work should be carried out by AL-KO Approved Workshops.

**Servicing & Cleaning**

**Lubrication Points (Fig. 18)**

**Clean Towball**

Lightly grease, or oil ball socket, joints and bearing points as appropriate. General purpose grease to DIN 6=51825 KTA 3K.

For Troubleshooting and Fault Finding please see Table 2 on Page 175.

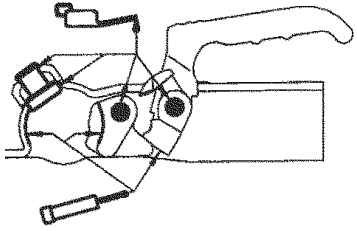


**Fig. 18**

## Operating Instructions for AKS 3004

**REGULATIONS**

1. The AKS 3004 must be used in conjunction with 50 mm dia. towballs which conform to EC Directive 94/20 (DIN 74058 or local equivalent).
2. Suitable for attachment to drawbars or approved overrun braking equipment for single (and tandem axle) caravan/trailers, with a minimum weight of 200 Kg and a maximum permissible weight of 2000 Kg.
3. EC design approval has been given to the AL-KO AKS 3004 coupling under permit No. e1*94/20*0930*00.

**RESTRICTIONS OF USE**

1. The trailer coupling may only be connected to towing vehicles where the clearances for the stabiliser can be observed, in accordance with EC Directive 94/20 (DIN 74058). If these clearances are infringed by special attachments, then the use must be checked separately.

   **Clearances for Stabiliser Handle (Fig. 19)**

   The area above the towball of the vehicle must be free from vehicle components or attachments (A) (eg spare wheels, platforms etc.)

   The clearance for the stabiliser handle must be at least 330 mm (B) + the stroke movement (D) (85mm-100mm), which equates to 440 mm when used in conjunction with an AL-KO overrun.

   Max. 50 mm (C) clearance between the centre of the towball and top of the overrun assembly or fairing, to ensure both coupling handle and stabiliser handle do not foul on operation.

   Maintain the same clearances for other manufacturers' overrun assemblies.

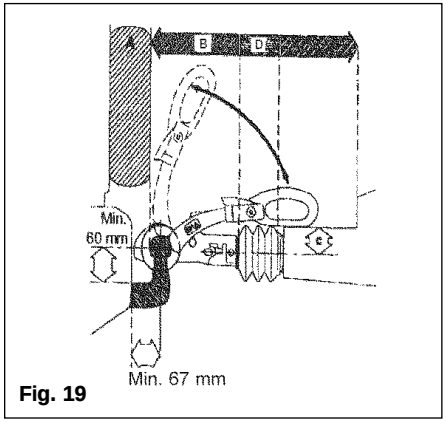



**Fig. 19**

2. Not suitable for use with overrun devices which can revolve above 25 (Fig. 20).
3. Swan Neck towbars (fixed or detachable) are suitable for use with the AKS 3004 providing they comply to EC Directive 94/20 and have the required minimum 60 mm clearance, measured from the centre of the towball (Fig. 20).

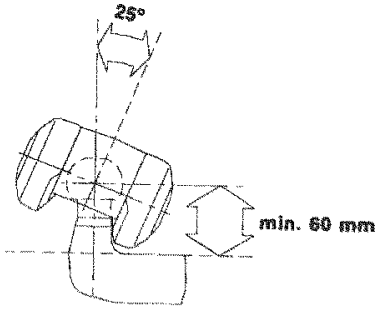



Fig. 20

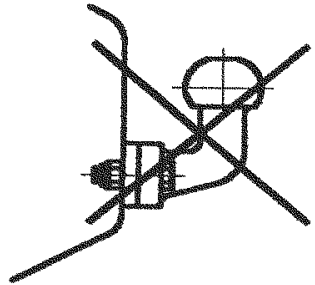


Fig. 21

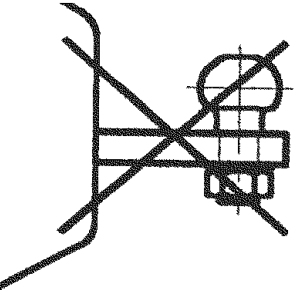


Fig. 22

**SAFETY WARNINGS**

1. In accordance with EC Directive 94/20, couplings of type A 50-1 cannot be used (see Fig. 21), your warranty will be invalid if this type of towball is used.
2. For UK use, please use the extended neck towball (type A50-X).
3. A bolted-in type ball coupling (Fig. 22) is only permissible if the thread is locked or welded.
4. The AKS 3004 cannot be used with a laterally attached reversing lever, on the left side, when facing direction of traffic.
5. The towball must be free from grease, paint and other residue, otherwise the stabilising effect will be greatly reduced.
6. If friction pads become contaminated with grease, they should be replaced.
7. The AKS 3004 should only be operated by one person, when opening or closing the handle, to reduce injury risks.

**AKS 3004 Delivery Specifications**

Coupling handle (Fig. 23/Item 1),
Stabiliser Lever (Fig. 23/Item 2)

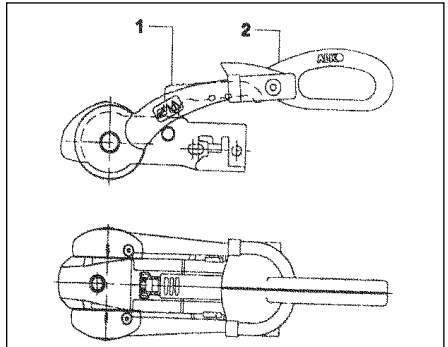



Fig. 23

**Preparation for coupling/uncoupling**

The Stabiliser lever (Fig. 24/Item 2) must be in the uppermost position (open).

**Coupling**

Pull the coupling handle (Fig. 25/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.

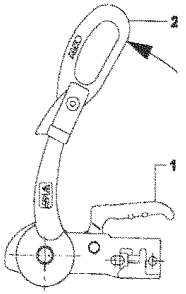



Fig. 24

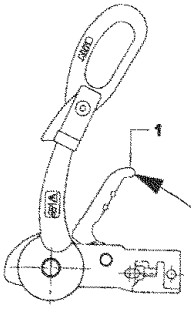



Fig. 25

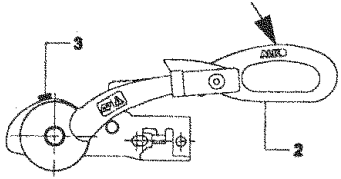



Fig. 26

**Warning:** The coupling is correctly engaged when the green edge of the safety indicator button is visible (Fig. 26/Item 3).

**Stabiliser Unit**

To operate the Stabiliser (once coupled to the towball), simply press the stabiliser lever down as far as it will go (Fig. 26/Item 2).

**Uncoupling**

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.

**Please Note:** The friction pads (Fig. 27/1,2,3) 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.

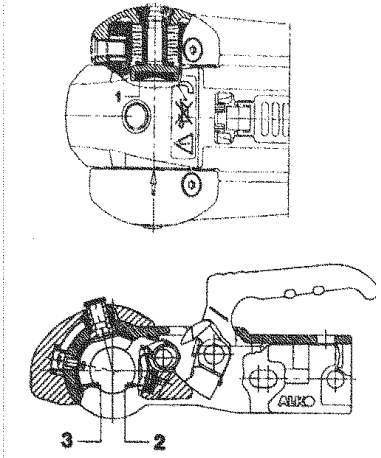



Fig. 27

**Checking the efficiency of the left/right friction pads**

1. Couple up AKS 3004.
2. Open Stabiliser lever (Fig. 28/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. 28/Item 4) is before or on the marked area (Fig. 28/Item 2) the friction pads are still as new (See A)

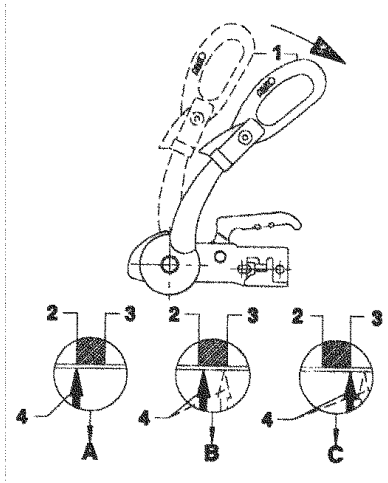



**Fig. 28**

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).

   Please Note: It is not necessary to adjust the friction pads

**Manoeuvring**

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. 29).
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. 29).

**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.

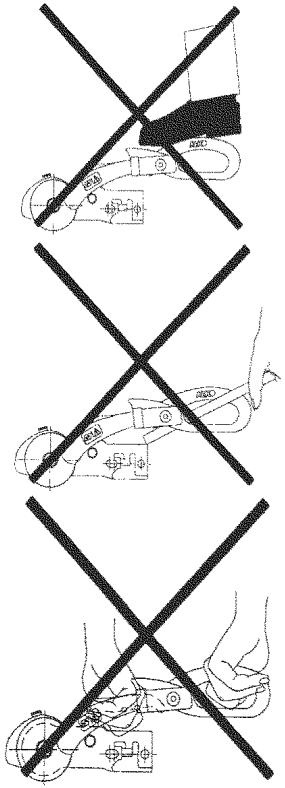


**Fig. 29**

# Maintenance

**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. 30).

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.

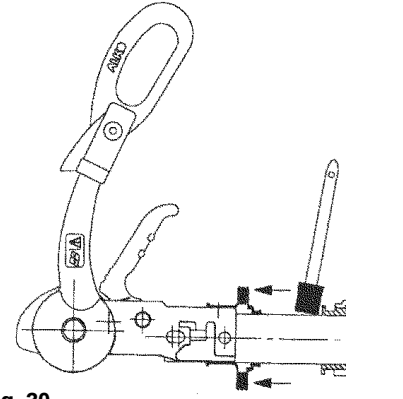


**Fig. 30**

**Servicing and Cleaning**

**Friction Pad Replacement (please replace one at a time)**

1. Uncouple AKS 3004.
2. Remove protective caps (Fig. 31/Item 1) with the aid of a small screwdriver.
3. Press worn out pad inwards and remove (use punch and hammer) (Fig. 31/2)
4. Insert new friction pad from below (after first re-inserting shim washers if they were present) and press in as far as it will go (Fig. 31/Item 4 & Fig. 32).

**Checking the efficiency of the front/rear friction pads**

1. Couple the AKS 3004 to the towball but do not activate the stabiliser.
2. If a green indicator is visible (on the handle), then the AKS 3004 is in a new condition or the pads and towball are within the permissible limits (Fig. 33/Item 2).
3. If only a red indicator is visible (Fig. 34/Item 3), then this may have the following causes:

   a) AKS 3004 is okay but the towball has reached the lowest limit of 49.61mm

   b) AKS 3004 shows signs of wear

   c) Towball is in a new condition (50mm) but the front/rear friction pads show a high degree of wear.

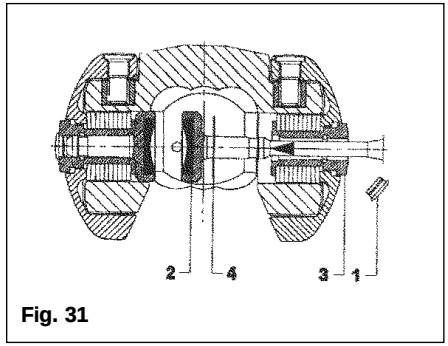



**Fig. 31**

Establish the diameter of the towball so that conclusions may be drawn as to the wear of the friction pads (ball diameter must not be less than 49.61mm)

**Fig. 32**

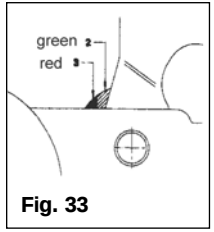



**Fig. 33**

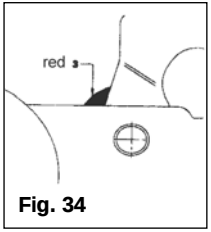



**Fig. 34**

**Friction Pad Replacement (Front/Rear only)**

1. Uncouple the AKS 3004
2. Remove the rubber soft dock (pull up and off) Fig. 35/Item 1 & Fig 36.
3. Press the safety indicator outwards and secure with SW14 hex. spanner (not included), (Fig. 35/Item 2).
4. Remove cheese-head screws (Fig. 35/ item 3 & Fig 36), using special torx tool.
5. Press friction lining recess (Fig. 35/Item 4) inwards and pull down and out.
6. Open coupling handle (Fig. 35/Item 8).
7. Remove countersunk head cap screw using special torx tool (Fig. 35/Item 5 & Fig. 37).
8. Press friction pad inwards with a screwdriver and remove from ball cup.
9. Fitment of new linings takes place in reverse. Tighten screws 3 & 5 to 5 Nm.
10) Replace rubber soft dock, insert top section first then bottom.

**Important Maintenance and Cleaning Advice:**

1. The towball should be cleaned regularly to remove grease or other residue, the use of Thinners, White Spirit or Brake Cleaner is recommended - otherwise the stabilising effect will be severely reduced.

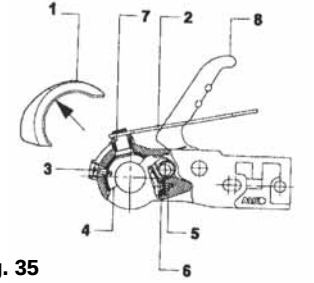


Fig. 35


Fig. 36


Fig. 37

2. If friction pads are contaminated, they should not be cleaned but replaced.
3. The surface of the towball must be free of grooves, rust or seizing marks.
4. Towballs coated (with paint or similar) must have this surface completely removed (use 100 or 120 grain emery paper). If this is not done, increased towball wear will occur and may cause damage to the AKS 3004 components.
5. In Winter, carefully spray only the visual indicator with de-icer.

**Lubrication**

Should lubrication of the stabiliser parts become necessary, then the following must be observed.

a) Clean all parts thoroughly.

b) Areas may only be covered with a thin film of grease (Fig. 38).

c) Use multipurpose grease DIN 51825 KTA 3K.

**Warning:** When lubricating, ensure none gets into the friction pad or towball holding area.

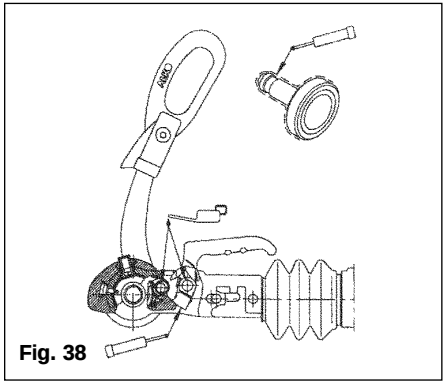


Fig. 38

**AL-KO SECURE IMOBILISER**

Refer to the User Instructions Kit supplied.

**Overrun Devices**

In the importance of Safety, please familiarise yourself with the operation of this overrun device **BEFORE** using your caravan/trailer.

**Safety Precautions**

When parking your tow vehicle and caravan/trailer on site, you must apply the caravan handbrake. If the unit is parked but disconnected from the tow vehicle, it is strongly recommended that each wheel is chocked using AL-KO or suitable wheel chocks.

If a 'detachable' type drawbar is fitted (as with catering trailers). the drawbar must not be removed from the trailer with the hand-brake applied.

**Caution: Please note when parking the caravan/ trailer, the wheelbrake auto-reverse mechanism will allow the caravan/trailer to travel backwards for approximately 25 cm (please allow sufficient clearance when parking).**

**Operation**

AL-KO overrun devices are a mechanical type, using a hydraulic damper.

**Coupling Up**

Manoeuvre towing vehicle or trailer to coupling point.

**Overrun devices fitted with 50 mm coupling head**

Fully open coupling head handle and secure hitch onto the towball. See page 20 (coupling up).

Thread the breakaway cable through the breakaway cable guide provided (Fig. 40) and connect it to attachment point provided on towing bracket (Fig. 39). Please refer to 'Braked Trailers Use of Breakaway Cables' for further detail.

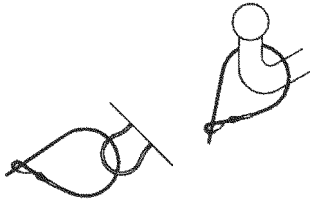


**Fig. 39**

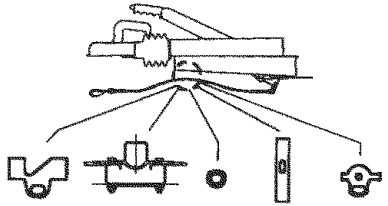


**Fig. 40**

**Caution:** The breakaway cable operates the handbrake (emergency brake), in the event of the caravan/trailer becoming detached from the towing vehicle during towing. For this emergency brake to work correctly, it is absolutely essential that the following points are observed:

1. The breakaway cable MUST run through the breakaway cable guide.
2. The breakaway cable MUST NOT be wrapped around the jockey wheel, as this disables the emergency brake (Fig. 41).
3. The cable MUST run as straight as possible and not be restricted.
4. Ensure the cable is long enough to allow for cornering and will not become taut or snag during use, as this could result in the handbrake operating whilst towing.

   Please refer to 'Braked Trailers Use of Breakaway Cables' Information sheet, supplied with your caravan/trailer.

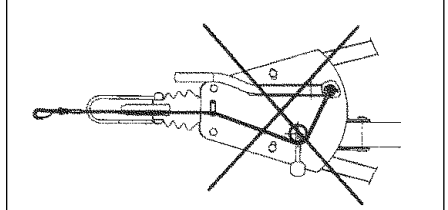


**Fig. 41**

**Overrun device fitted with Eye End**

Lock the eye end into the eye end jaw assembly and see operating instructions for vehicles fitted with eye end jaw assembly.

**Overrun Device Fitted with 50 mm Coupling Head**

Connect trailer electric plug controlling lights and indicators etc. into towing vehicle socket.

Wind the jockey wheel up fully and clamp securely in position, ensuring that it does not foul the brake rod or breakaway cable.

Ensure handbrake is fully off by pushing it fully down (Figs. 42-46).

Remove wheel chocks if fitted and stow safely.

**Caution:** Failure to comply with this could result in the brakes overheating.

**Coupling Up (Euro-Overrun Devices)**

Fully retract Jockey Wheel inner tube so that it locks against Jockey Wheel outer tube.

Slacken Jockey Wheel Clamp handle and raise complete assembly through cutout in body to its highest position (ensure it doesn't come into contact with the brake rod assembly), fully tighten Jockey Wheel Clamp handle to ensure the Jockey Wheel is firmly held in position (Fig. 45).

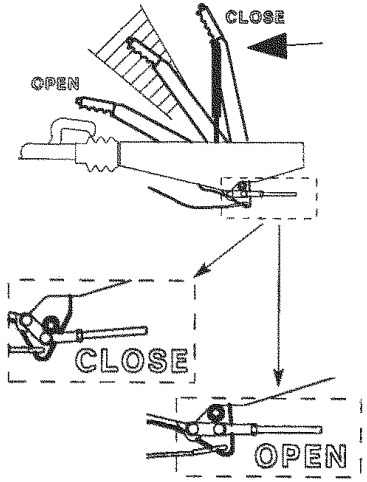


Fig. 42

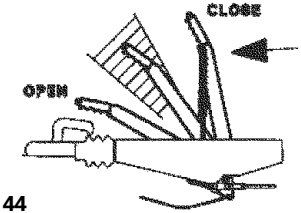


Fig. 44

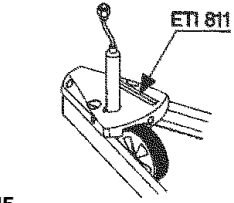


Fig. 45

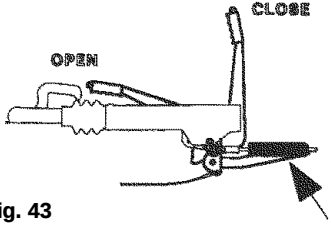


Fig. 43

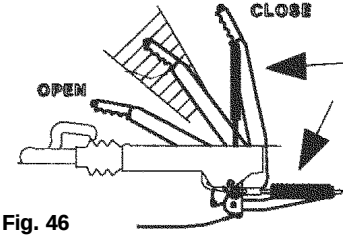


Fig. 46

**Uncoupling (All Types)**

Secure caravan/trailer by chocking both wheels. Apply handbrake fully. There are 4 different handbrake systems (See Figs 42-46). With all four systems please observe the following:

**Handbrake Lever With Gas Strut (Fig. 42)**

Ensure handbrake is fully applied (as highlighted). This will ensure that the gas strut will automatically re-apply the wheel brakes if the trailer starts to roll backwards.

**To Release**

Press the handbrake push button fully home and firmly press the handbrake lever back into the off position (handbrake horizontal).

**Caution: If the handbrake is not fully applied as detailed above, there is danger that the trailer could roll backwards!**

**Caution: The brake rod must not be under tension/bowed when the handbrake is disengaged, otherwise the breakaway mechanism will not function.**

**Handbrake Lever With Spring Cylinder (Fig. 43)**

Apply handbrake fully ensuring that handbrake is in the vertical position. This will ensure that the spring cylinder energy store is fully loaded and will automatically re-apply the wheel brakes if the trailer starts to roll backwards.

**Caution: If the handbrake is not fully applied as detailed above, there is danger that the trailer could roll backwards!**

**Automatic Handbrake Lever (Fig. 44)**

Ensure handbrake is fully applied (as highlighted). This will ensure that the gas strut or spring cylinder will automatically re-apply the wheel brakes if the trailer starts to roll backwards.

**Caution: If the handbrake is not fully applied as detailed above, there is danger that that the trailer could roll backwards!**

**To Release**

Firmly push the handbrake lever back into the off position (Handbrake horizontal).

**Handbrake Lever With Spring Cylinder and Gas Strut (Fig. 46), normally fitted to commercial units:**

Ensure handbrake is fully applied (as described). This will ensure that the gas strut or spring cylinder will automatically re-apply the wheel brakes if trailer starts to roll backwards.

**Caution: If the handbrake is not fully applied as detailed above, there is danger that the trailer could roll backwards!**

**To Release**

Press the handbrake push button fully home and firmly press the handbrake lever back into the off position (handbrake horizontal).

**Servicing**

Every 10,000 - 15,000 Km or every 12 months: Lubricate/grease all sliding and moving parts of the overrun device as show in Fig. 47.

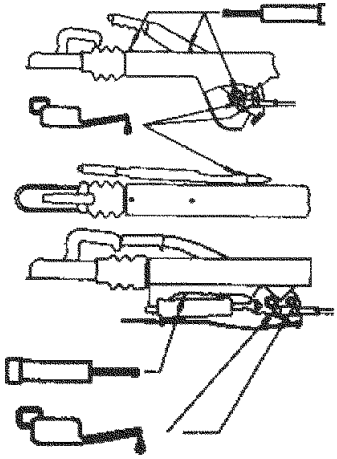


**Fig. 47**

Recommended lubricant. General purpose grease to DIN 51825 KTA 3KA.

**Servicing and care of hot dip galvanised parts**

The formation of white rust is only a surface coating and has no adverse effect on the anti-corrosion properties of galvanising. In order to minimise the potential for the formation of white rust the following precautions should be taken:

- Ensure there is adequate air circulation when storing hot dip-galvanised parts.
- After winter journeys it is recommended that surfaces are washed with clean water.

**Spare Parts**

Spare parts are safety critical parts! For this reason when fitting spare parts in our products we recommend the use of original AL-KO parts or those parts that we have explicitly approved. The reliability, safety and suitability of parts designed especially for our products, has been determined using a special test procedure. In spite of constantly monitoring the market we are unable to assess or vouch for other products.

If repair work or servicing is required, AL-KO have a large network of AL-KO service stations throughout Europe. To establish the correct spare parts required you should always quote the model and type of overrun device in question along with the ETI No. which is stamped into the overrun device housing. The ETI number for the Euro Overrun can be found on the handbrake lever (See Fig. 45).

For Troubleshooting and Fault Finding, please see Table 3 on Page 175.

**Trouble Shooting & Fault Finding**

Table 1 Axles

| Fault | Cause | Remedy |
|---|---|---|
| Poor Braking | Linings worn or damaged.<br>Brake Linings not bedded in.<br>Brake set up incorrect. | Replace Brake Linings.<br>Will pass after braking a few times.<br>Reset Brakes as page 159 & ensure system is lubricated. |
| Difficulty in Reversing | Braking system set too tightly.<br>Auto-Reverse lever too stiff. | Reset Brakes as page 159.<br>Lubricate and free off Reverse Lever. |
| Brakes Overheating | Incorrect setting.<br>Braking system not fully released.<br>Overrun lever stuck.<br>Damage or Corrosion to braking system | Reset Brakes as page 159.<br>Check Handbrake has been released & the system is running freely.<br>Lubricate and free off Reverse Lever.<br>Check system as page 159 and repair or renew parts as necessary. |
| Handbrake Force Low | Incorrect setting of the brakes.<br>Linings not bedded in. | Reset brakes as page 159 and lubricate as necessary.<br>Will pass after braking a few times. |
| Uncomfortable ride or Uneven Braking | Loose braking adjustment.<br>Damper defective.<br>Axle shock absorbers defective. | Reset brakes as page 159.<br>Check and replace damper if necessary.<br>Replace shock absorber. |
| | | |

Table 2 Coupling Heads

| Fault | Cause | Remedy |
|---|---|---|
| Coupling does not engage onto ball | Ball diameter too large.<br>Ball could be damaged or deformed.<br>Coupling head dirty or defective. | Change ball to correct size.<br>Fit new ball.<br>Clean & Lubricate coupling and replace if necessary. |
| Difficulty in Uncoupling | Ball damaged or deformed.<br>Coupling damaged or deformed.<br>Coupling head under pressure from damper. | Fit new ball.<br>Replace if necessary.<br>Pull forward a few inches to to relieve pressure |
| Too much play in the coupling | Coupling damaged or deformed<br>Ball too small | Replace if necessary.<br>Fit new ball. |

Table 3 Overrun Devices

| Fault | Cause | Remedy |
|---|---|---|
| Poor Braking | Overrun shaft tight.<br>Overrun shaft corroded.<br>Body housing damaged. | Lubricate overrun shaft and replace any damaged parts. |
| Brakes Overheating During Towing | Handbrake not fully released.<br>Braking system incorrectly set.<br>Incorrect attachment of breakaway cable. | Release handbrake.<br>Reset brakes as page 159.<br>Ensure correct attachment as listed on page 170 or refer to Braked Trailers Use of Breakaway Cables sheet. |
| Handbrake Force Low | Defective gas strut.<br>Incorrect setting of spring cylinder. | Replace gas strut.<br>Reset spring cylinder as page 159. |
| Brakes Apply During Deceleration or Downhill Travel. | Overrun damper is defective. | Replace the overrun damper. |

# Maintenance

**ACCESSORIES**

**Corner Steadies**
Corner Steadies are as stated, for the purpose of steadying the caravan corners. They are NOT JACKS AND SHOULD NEVER BE USED AS SUCH. The screw and pivot pins should be lubricated periodically to ensure their satisfactory operation. (See also Jack Operation).

**Shock Absorbers**
All AL-KO chassis have pre-punched holes to accommodate Shock Absorbers, in front of the axle. On the Euro-Axle System, axle swing arms have a removable rectangular plastic cap exposing a slot to accommodate retro-fit brackets for the Octagon Shock Absorbers. (See Accessory Price List). Delta Axles have Shock Absorbers fitted as standard which MUST NOT BE REMOVED.

**Stabilisers**
AL-KO overruns can be fitted with a range of AL-KO Stabiliser devices (if not already fitted as standard), dependent on the maximum gross weight of the caravan. AL-KO stabilisers operate on a friction type basis, whereby friction pads grip onto a **dry, grease free towball**. It is important to note that the AKS range of stabilisers are suitable for use with swan neck, fixed or detachable type towbars or the special AL-KO Extended Neck Bolt-On Towball. We do not approve the use of any other bolt-on type towball, other than the AL-KO Towball. Failure to use the correct towball may result in product failure and will invalid your warranty.

The AKS range is available in three different models: The AKS 1300 is suitable for caravans up to a maximum gross weight of 1360 Kg, the AKS 2700 up to 2700 Kg and the new AKS 3004 up to 2000 Kg. Each Stabiliser can also be retro-fitted with an AL-KO Security Device and Safety ball, to ensure maximum theft Deterrent (please see our accessory price list for further details). All 'Red' coloured AL-KO Security Devices have full TUV and Sold Secure Approvals and are available from most good caravan dealers or direct from AL-KO Mail Order on 0800 074 4334.

AKS 1300 & Security Device

AKS 2700 & Security Device

AKS 3004 & Security Device

**Road Wheels**

In most instances the road wheels and tyres are supplied by the Caravan Manufacturer. The condition of wheels and tyres should be checked regularly, particularly for distortion of flanges and the wheel dish. Wheels that are damaged or distorted, or have wheel bolt seatings cracked or deformed **must not be repaired or used in service - these must be replaced.**

**Important:** Standard AL-KO caravan chassis use M12 wheel bolts. These **must always only** be tightened to the correct torque setting:

- Steel wheels 88 Nm (65 lbs/ft)
- Alloy wheels 115 Nm (85 lbs/ft)

in sequence, (i.e. North, South, East, West); **NEVER** clock or anti-clockwise. 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.

**Important:** The torque settings should be re-checked after 50 Km.

If other wheel bolts are used please ensure the torque settings are as follows:

M10 - 49 Nm (36 ft. lb)

M14 - 135 Nm (99.5 ft. lb)

M16 - 210 Nm (155 ft. lb)

**Special Note -Aluminium Wheels**
For aluminium wheels use M12 x 1.5 pitch 26mm

thread length 10.9 Grade 60° conical fixing.

The standard M12 x 1.5 60° Conical Wheel bolts are NOT SUITABLE for aluminium wheel rims. Special wheel bolts should be used.

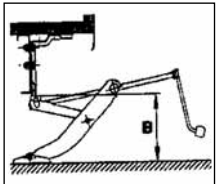
**Jacks**

The **Corner Steadies Should never be used to jack up the caravan.** When jacking becomes necessary use the **AL-KO Side Lift Jack or 2-Tonne Jack system.**

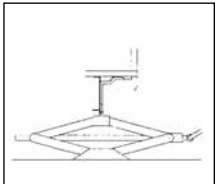
**NOTE: It is essential that the car and caravan are hitched together before commencing jacking.** All AL-KO chassis from 1992 onwards have 2 holes punched in the chassis members, each side (rear of the axle); to accept the brackets for the Jack(s). (See Accessory Price List).

Corner Steadies may be used for stability ONLY, when the caravan is in the jacked position.

The caravan should **never be lifted by jacking up under the chassis member.**



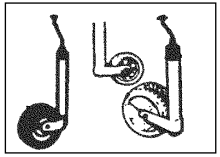

Side Lift Jack



2-Tonne Jack

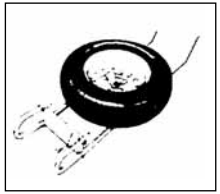
If working under the caravan in an elevated position, axle stands **must be** used for safety. Wheel chocks for the opposite wheel(s) are also advisable.

**Jockey Wheel**



Lubricate screw thread and wheel spindle periodically.

**Spare Wheel Carriers**



Each caravan has a set of punched holes in the chassis member to facilitate the fitting of a spare wheel carrier. The assembly is of a strong, lightweight construction and zinc plated for all-weather protection.

There are 3 variants to suit most AL-KO chassis (record your tyre size on this booklet for future reference).

The carriers can be fitted for left or right hand operation and are easy to fit.

The telescopic frame tubes should be lubricated periodically.

RECORD YOUR SPARE WHEEL CARRIER INFORMATION HERE:

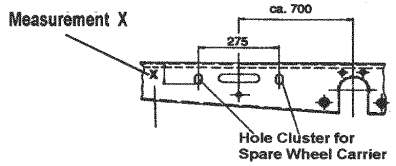
Caravan Make (eg Abbey).....

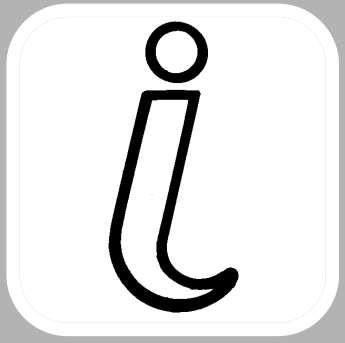
Caravan Model (eg Spectrum 520).....

Year of Manufacture .....

Tyre Size (eg 175R 14 99).....

Dimension 'X' in mm .....
(taken from following diagram)





# GENERAL DATA

# Fault Finding

## WATER

| Problem | Possible Cause | Remedy |
|---|---|---|
| Water not flowing from any tap when operated but pump runs | Freshwater tank empty<br>Pump wired in reverse<br>Pump not primed<br>Pipe inlet or outlet pipe disconnected<br>Pump pipes restricted by kinking<br>Blockage in pump inlet or outlet pipe<br>Blocked in-line filter of pump filter<br>Air leak in suction line to pump | Check<br>Check wiring, refer to pump manufacturers instructions<br>Refer to pump manufacturers instructions<br>Check connections<br>Check pipes run<br>Check, starting inside freshwater tank<br>Dismantle and clean<br>Check for bubbles & secure with clip |
| Pump does not run | Pump or tap incorrectly wired<br>Pump fuse blown<br>Battery disconnected<br>Pump seized or overheated<br>Pressure pump sensing switch may have failed<br>Contacts may be faulty<br>Wiring connections may be faulty<br>On switched tap version, microswitch could be faulty | Refer to pump/tap manufacturers instructions<br>Check wiring connection and then replace with fuse of correct rating<br>Check connections<br>Refer to pump manufacturers servicing instructions<br>Refer to pump manufacturers servicing instructions<br>Check contacts in plug and socket are clean and making contact<br>Check wiring connections<br>Disconnect wires from microswitch and join together. If the pump operates, microswitch should be replaced |
| Water flows from cold tap but not from hot | Feed pipe to water heater incorrectly connected to the heater outlet<br>Blockage in hot pipeline<br>Heater inlet or outlet pipes kinked preventing flow<br><br>Hot tap not connected<br>Hot tap failed or blocked<br>Heater non-return valve jammed | Refer to installation instructions<br><br>Disconnect pipes and inspect<br>Check and re-route if necessary. Ensure that hose is Carver recommended type<br>Refer to installation manual<br>Disconnect and inspect<br>Seek service attention |

## WATER (continued)

| Problem | Possible Cause | Remedy |
|---|---|---|
| Water flows from hot tap but has reduced flow from cold | Cold water pipe kinked preventing flow<br>Blockage in cold pipe line<br>Cold tap not connected<br>Cold tap failed or blocked<br>If a water filter is fitted, the cartridge is exhausted | Check and re-route if necessary<br>Disconnect pipes after 1st Y connector and check up to tap<br>Refer to installation instructions<br>Disconnect and inspect<br>Replace cartridge |
| Reduced flow from both hot and cold taps | Battery condition low causing pump to run slowly<br>If new taps have been fitted they may be restricting flow<br>Pump needs servicing<br>Partially blocked pump filter or in-line filter, if fitted<br>Pump outlet pipe kinked restricting flow<br>Water leak | Check battery state of charge, refer to electrical supply note<br>Disconnect and check that they have at least 1/4" (6.3mm) bore<br>Refer to pump servicing instructions<br>Dismantle and clean if necessary<br>Check and re-route if necessary<br>Check all water connections |
| Reduced flow from either tap | Y' connector(s) fitted incorrectly<br>Pipe kinking restricting flow<br>Bore size difference in taps | Refer to installation instructions<br>Check and re-route if necessary<br>Use taps of equal bore size |
| Warm water flows out of cold tap | Hot water back-feeding into cold line, usually if mixer tap or single outlet hot and cold taps being used | Fit non-return valve in cold supply, near tap |
| If pump motor runs steadily and will not stop | Battery voltage may be too low (below 10.5 volts) | Check that there is water in the container<br>Adjust switch and/or re-charge battery<br>Check all connections in pipework |

# Fault Finding

## GAS

| Problem | Possible Cause | Remedy |
|---|---|---|
| Hob does not light | No gas | Check level of gas in bottle<br>Check gas bottle valve is on<br>Check gas taps are on |
| | Air in pipe | Purge system<br>Refer to hob manufacturers instructions |
| Oven does not light | No gas | Check level of gas in bottle<br>Check gas bottle valve is on<br>Check gas taps are on |
| | Air in pipe | Purge system<br>Refer to oven manufacturers instructions |
| Space heater or central heating | No gas | Check level of gas in bottle<br>Check gas bottle valve is on<br>Check gas taps are on<br>Check exhaust outlet is clear |
| | Over gassed<br>Air in pipe | Turn off appliance, wait 2 minutes and try again<br>Purge system<br>Refer to space heater or central heating boiler manufacturers instructions |
| Fridge does not light | No gas | Check level of gas in bottle<br>Check gas bottle valve is on<br>Check gas taps are on |
| | Air in pipe | Purge system<br>Refer to fridge manufacturers instructions |
| Water heater does not light | No gas | Check level of gas in bottle<br>Check gas bottle valve is on<br>Check gas taps are on |
| | Air in pipe | Purge system<br>Refer to water heater manufacturers instructions |

## CASSETTE TOILET

| Problem | Remedy |
|---|---|
| Bowl does not drain when toilet is flushed.<br>Cassette is overfilled | DO NOT REMOVE CASSETTE. While inside the caravan turn flush knob anti-clockwise to open valve blade and leave it in the open position.<br>Open access door on side of caravan. Rotate pour-out spout outward. Place appropriate size container under spout cap. Remove cap carefully. Allow bowl contents to drain into container. This will lower the water level in the bowl.<br>Replace cap and return pour-out spout to stored position. DO NOT REMOVE CASSETTE.<br>Go inside the caravan and turn the flush knob clockwise to close valve blade. Now, the cassette may be removed following the normal removal and emptying procedure. |
| Odours | Use proper amount of holding tank deodourant specified on bottle. |
| Toilet tissue does not fit into compartment. | Since some tissues are supplied on larger rolls, it may be necessary to use some tissue before storing into compartment. |
| Soiled bowl after flushing | Partially fill bowl to cover soiled portion of bowl. Next flush will dissolve waste. **Tip:** Leave valve blade open during use. |
| No power to add water to toilet bowl | Check cassette safety sensor switch and fuse-holder for proper engagement and operation.<br>**Note:** Cassette has to be removed to reach switch and fuse.<br>Insert cassette and try adding water to toilet bowl.<br>Toilet can be flushed manually. Add water. Add water to bowl from a separate container. Turn flush knob anti-clockwise to open valve blade. Turn clockwise to close valve blade. |
| Cassette cannot be removed | Check for obstacles under retaining clip. Depress retaining clip several times to check operation. Remove cassette.<br>Flush knob and valve blade in partial open position. Close valve blade by moving knob clockwise.<br>**CAUTION: If valve blade is open during cassette removal, severe damage to system can occur. Never force insertion or removal of the cassette tank.** |
| Valve blade mechanism sticks or is hard to open | Spray light film of silicone on blade. |
| Major unit malfunction | Contact your original Caravan Dealer. |

## OWNERS CLUB

The Owners Club is a completely independent organisation run for the benefit of the caravan owners. They have numerous rallies during the year in various parts of the country and every third year there is a 'Works Rally' where owners have the opportunity to visit the factory. Apart from the friendliness and companionship the Club generates it is also actively engaged in charity work for those less fortunate than ourselves. The address of the Secretary of the Owners Club can be obtained from Supercare (SML Ltd), Tel: 01482 875740 or from the Swift Group website.

## SPARES AND AFTER SALES SUPERCARE

There are numerous items available from your dealer ranging from door catches through to spare wheels and touch-up paints. Please note that all after sales enquiries must be directed through your supplying dealer. The after sales service at the factory is geared to support our dealer network as is the service provided by appliance manufacturers.

In the interest of safety, replacement parts for an appliance shall conform to the appliance manufacturers specifications and should be fitted by them or their authorised agents.

**Note:** Please remember to quote chassis number when ordering any items from your dealer.

**Customer Care**
Tel: 01482 875740
Fax: 01482 840082

**NOTE:**
The times for contacting Customer Care by telephone are:

9am to 4pm Monday to Thursday.
9am to 12.45pm Friday.

**Swift Group Website**
www.swiftleisure.co.uk

**Swift Group E-Mail Enquiry**
enquiry@swiftleisure.co.uk

## REPAIR FACILITIES

Should you be unfortunate enough to suffer a major accident with your caravan it is comforting to know that we have a completely separate repair shop facility where their fully trained experts will under take all types of major damage repair work.

Repairs of a minor nature should be referred first to your local dealer.

The enjoyment of caravanning can be greatly enhanced by membership of one or more of the various caravanning, motoring and holiday clubs. Here are some useful addresses:

**CARAVAN CLUBS**

**The Caravan Club,**
East Grinstead House,
East Grinstead
West Sussex, RH19 IUA
Tel: 01342 326944
www.caravanclub.co.uk

**The Camping and Caravanning Club,**
Greenfields House,
Westwood Way,
Coventry,
West Midlands.
Tel: 0845 130 7631
www.campingandcaravanningclub.co.uk

**MOTORING ASSOCIATIONS**

**Automobile Association (AA)**
Fanum House,
Basingstoke,
Hants. RG1 2EA
Tel: 0990 448866
www.theaa.co.uk
e-mail: customer.services@theaa.com

**RAC Motoring Services**
RAC House,
M1 Cross,
Brent Terrace,
London, NW2 1BX
Tel: 0990 722722
www.rac.co.uk

**Green Flag National Breakdown**
PO Box 300,
1, Cote Lane,
Leeds, LS99 2LZ
Tel: 0345 670345

**TRADE ASSOCIATION**

**National Caravan Council**
Catherine House,
Victoria Road,
Aldershot,
Hampshire, GU11 1SS
Tel: 01252 318251
www.martex.co.uk/ncc
e-mail: mail@martex.co.uk

**CRIS**

**HPI Equifax**
Dolphin House,
New Street,
Salisbury,
Wiltshire SP1 2TB
Tel: 01722 411430/422422

Swift Group Limited
Dunswell Road, Cottingham,
East Yorkshire HU16 4JX
Tel: (01482) 875740
e-mail: enquiry@swiftleisure.co.uk
web site: www.swiftleisure.co.uk

# Index

## NOTIFICATION OF CHANGE OF OWNERSHIP

If you sell your caravan, please notify the change of ownership by completing this page, detaching it and sending it to: Swift Group Ltd., Dunswell Road, Cottingham, East Yorkshire, HU16 4JX.

| | | |
|---|---|---|
| DETAILS OF CARAVAN: | Model: | _____ |
| | Chassis No: | _____ |
| CURRENT OWNER: | Name: | _____ |
| | Address: | _____ |
| | | _____ |
| | | _____ |
| NEW OWNER: | Name: | _____ |
| | Address: | _____ |
| | | _____ |
| | | _____ |

Please note that the benefit of any unexpired warranty cannot be transferred to the new owner until the change of ownership details above have been received.