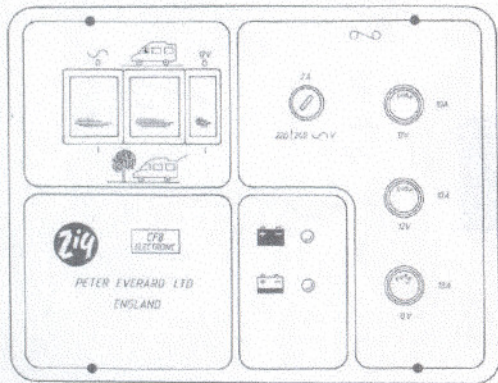


# THE ZIG C.F.8 MOTORHOME, CARAVAN & BOAT BATTERY CHARGING & DISTRIBUTION SYSTEM

## INSTRUCTIONS FOR USE AND FITTING



### IMPORTANT FEATURES

Automatic electronic charging control.

Suitable for touring, motorised caravans and boats.

Mains battery charging, up to 12 amps depending on battery state.

Charging from vehicle or boat generator.

Mains voltage to 12 volt conversion - up to 4.5 amps continuous current.

Switched selection of source, car/boat or auxiliary battery.

Double pole illuminated mains switch.

Safety - The C.F.8 incorporates no less than 6 protection devices to eliminate overheating and overcurrent problems.

Complies with I.E.C. and SMMT regulations



ZIG ELECTRONICS LTD.  
CASHES GREEN ROAD,  
STROUD, ENGLAND.

## INSTRUCTION FOR USE

Please read these instructions carefully before operating the electrical equipment in your caravan. \* An asterisk denotes reference to Figure 1.

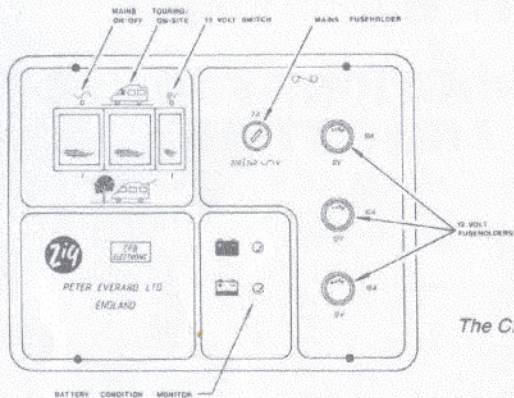


Figure 1  
The C.F.8 Control Panel

### 1. The Caravan/Boat Battery

If the manufacturer, or your dealer, has not fitted a battery, we recommend that one is fitted in order to get the best out of your **ZIG** electrical system. Most manufacturers allocate a space for the battery and supply the necessary cable for connection. In this case, simply locate a new battery in the space provided and connect the wires to the battery; red to positive, black to negative. The 25 amp line fuse (supplied) should be connected in the positive lead. Note that if blue and white wires are used blue is positive, white is negative. It is important that a proper connection is made to the battery using terminals and screws. Crocodile clips must never be used, they deteriorate quickly and are a fire risk. A smear of petroleum jelly should be applied to the battery terminals. See No. 4 in "Important Notes", regarding batteries.

If the manufacturer has not allocated a space for the battery, refer to "Fitting the battery" in "INSTRUCTIONS FOR FITTING".

### 2. Using your 12 volt equipment

Turn on the "12 volt switch" and set the "TOURING/ON-SITE" switch to "ON-SITE" (down position). The battery condition indicator will light either red or green, depending on the state of battery, and the 12 volt equipment in the caravan will be operative. This switch need only be turned off when the caravan is not in use. Note that the 'fridge' is independently wired and is not controlled by this switch. If it is desired to use current from a car, set the "TOURING/ON-SITE" switch to "TOURING". (The car must of course be connected).

### 3. **Charging from the Mains**

Ensure that a mains supply is available to your caravan through the external mains input socket and set the "MAINS ON-OFF\*" to "ON". The "TOURING/ON-SITE\*" switch should be set to the "ON-SITE\*" position. Automatic electronic charging regulation is fitted to the C.F.8, this means that it will supply only the current the battery needs when the caravan is in use.

*N.B. Do not leave the charger switched on for long periods, when the caravan is not in use.*

### 4. **Charging from the Vehicle**

When the vehicle is attached to the car and the "TOURING/ON-SITE" switch\* is set to the "TOURING" position (up position), charging of the auxiliary battery will take place when the vehicle engine is running. The amount of charge depends on a number of factors - the state of charge of both batteries, the cable in use and the distance between the two batteries. Note that in motorised caravans, charging from the vehicle requires only the setting of the "TOURING/ON-SITE" switch\* to "TOURING" and running the engine.

### 5. **Selection of 12 volt source**

It is possible to choose the source of 12 volt current for the van from either the engine or auxiliary battery. This facility will be found very useful when on sites without mains electricity, as it will allow the engine battery to run the van equipment when on site, leaving the auxiliary battery charged. To use the car, simply connect the 7 pin plug and socket (either direct or through an extension lead) and set the "TOURING/ON-SITE" switch\* "TOURING" - when the car is removed, re-set this switch to "ON SITE". It is important to remember that if the car is not driven for long periods and the switch is left in the "TOURING" position, **THE CAR BATTERY WILL BE FLATTENED.**

*N.B. Mains charging cannot be effected with the switch in the "TOURING" position. Extra care should be taken with cars fitted with dynamos, as these do not provide as much output as alternators.*

### 6. **The Battery Condition Monitor\***

The purpose of this device is to warn that the caravan battery is becoming discharged. The red light will glow when the battery voltage is below 11 volts, above this voltage the green light will glow. No harm will come to the system or the battery if the accessories are used when the red light is on, and it will be found that possibly another few days reserve of current is available after the red light first appears. A true reading will only be given when all the 12 volt equipment is switched off and when neither charging system is in operation. The red light may come on when an appliance is switched on, this is normal - current surges cause momentary voltage drop. It is important to remember that the battery monitor is not a charging indicator. The fact that the green light is on does not mean that the battery is fully charged. Even with a flat battery the green light will glow if either charging system is operating, due to the high terminal voltage present at the battery.

*N.B. When using current from the engine battery and the charging switch is in the "TOURING" position, the red light may glow. This is due to voltage drop between car and caravan.*

## 7. The Fuses\*

There are 4 fuses fitted to the C.F.8.

The mains fuse is fitted in the smaller of 4 fuseholders on the front panel and is rated at 2 amp (5 amp for 110V units): it is a standard 20mm x 5mm glass quick blow fuse. This fuse holder can only be removed with a screwdriver (this is to comply with electrical safety regulations).

The three 10 amp fuses mounted on the right of the panel protect the various accessories connected to the ZIG system and are standard 1¼" glass quick blow fuses. Access to the fuses is by turning the fuse cap in the direction of the arrow on the front.

All the fuses are available world wide from electrical and radio dealers. Under no circumstances should a fuse of a different type or value be fitted.

### WARNING

In the event of a fuse blowing there exists a fault in the circuit protected by that fuse, and the cause should be ascertained before replacing the fuse. It is important to remember that a fuse is fitted for the protection of the circuit and is a safeguard against fire and injury. Never remove the front panel with mains, battery or car connected. There are no user serviceable parts inside.

## 8. Using the C.F.8 as a Converter

When a mains supply is connected to the caravan, the unit can be effectively used as a mains to 12 volt converter, to power the 12 volt equipment in the caravan. It does this by replenishing the power drawn from the battery and will automatically adjust this power to the amount being drawn from the battery. Note that the unit will work without a battery installed in the caravan, but we do not recommend this type of use, a battery provides the necessary smoothing required by the increasing number of electronic items being fitted to modern caravans - items such as strip lights, radio, T.V., water heaters, etc.

### IMPORTANT NOTES

1. Due to the powerful output available, the unit will get quite hot during mains charging. An automatic thermal cutout is fitted, which will switch the unit off, if for any reason it reaches too high a temperature. It is important, therefore, not to obstruct the front or rear of the case with clothing or similar items; this will cause the thermal cutout to operate more frequently and will reduce the efficiency. Note that the thermal cutout is completely automatic, it will re-set when conditions return to normal.
2. **Refrigerators**  
These should never be connected to the C.F.8  
(see *INSTRUCTION FOR FITTING*).  
In a properly wired system, the 'fridge is connected directly to the vehicle battery by an independent cable, its operation, therefore, is not affected by the C.F.8 controls. Fitment of a ZIG RM12 relay will ensure that the 'fridge is only drawing power when the engine is running.
3. The main "ON-OFF" switch lights up to show that mains is available, but it has no effect on any other mains equipment which may be fitted. It serves only to switch on and off the battery charger incorporated in the unit. Never connect any other mains equipment to the C.F.8.

#### 4. **Batteries**

Choice of battery will be dictated by the space available, the cost and the amount of use. For most installations, a battery of between 60 and 70 ampere/hours will suffice. Car batteries are designed to supply the very high current required to start an engine, this sort of use is never called for in a caravan and it is therefore not necessary to buy expensive multi-plate types for caravan use. One of the latest maintenance-free batteries designed for the purpose will give the best service. On average a fully charged battery will last approximately one week with careful use, 3/4 weeks with help from the car, as explained in the section "Selection of the 12 volt source". Under no circumstances use a battery which has been scrapped for car use due to faulty cells etc., always purchase a new battery which should give years of service.

5. **WARNING** if the battery is discharged, the load switched onto the distribution load should not exceed the rated output of the battery charger.
6. Maintenance is not required other than to keep the front panel clean with a dry cloth. It is, however, important to make a check from time to time on the condition of wiring in the caravan, in particular, the seven pin plugs and sockets and the mains input connection.

#### **Mains Electricity**

The Zig Charging and Distribution unit is designed to run on 220 to 240 volt A.C. mains electricity. **NEVER CONNECT TO A D.C. SUPPLY.**

In remote parts of Europe and the whole of the U.S.A., the supply is 110 volt A.C. The unit will not charge from the mains with this supply, although no harm will be done if it is connected to 110 volt. The 12 volt equipment will, of course, work normally, including charging from the car. Note that where the supply is low i.e. 220 volts, efficiency in mains charging will be reduced.

The C.F.8 has been specially designed to operate safely on mains electricity in a caravan or boat. It is protected by a double pole mains switch, double wound mains transformer and fuses. It will remain safe even if the polarity of the mains is reversed. **THIS DOES NOT APPLY TO OTHER MAINS EQUIPMENT IN THE CARAVAN.** If you wish to fit extra mains appliances in the caravan, you should consult a qualified electrician and the use of an Earth Leakage Circuit Breaker is strongly recommended for your own safety. Remember mains voltage can be fatal.

## Using the C.F.8 in boats

The unit is particularly suitable for use in motor cruisers, motor sailers and smaller boats, particularly when they are moored for long periods in marinas where mains electricity is available and it is undesirable to run the engines for long periods. The instructions for caravans apply in all cases except where references are made to connecting the car and 7 pin sockets, etc. It is particularly important in marine use that all switches are placed in the OFF position before the battery is disconnected, this eliminates the risk of sparks.

## INSTRUCTIONS FOR FITTING

Please read these instructions carefully before commencing work.

Choose a suitable position for the unit, considering the following points:-

Air should be allowed to circulate freely over the back of the unit, ventilation to the compartment, in the form of two 25mm holes top and bottom must be provided.

Access to the mains inlet socket will be required, so the position of the C.F.8 and this socket should be chosen at the same time.

Access to the caravan battery and the wiring to the accessories will also be required.

A suitable position will usually be found in the side of a wardrobe, cupboard, etc., provided access to the rear of the box is allowed for wiring.

Cut a rectangular hole 178mm (7 $\frac{3}{8}$ " ) x 125mm (4 $\frac{1}{8}$ " ), the C.F.8 will overlap this hole thereby covering any jagged edges. The minimum size of the compartment for the C.F.8 must be 205W x 150H x 125D this will give the minimum clearance all round which must be allowed, i.e. 25mm.

Fit the unit into the hole, using battens at the rear of the screw holes, if the panel is very thin. Glueing the battens will assist removal of the unit, if necessary.

Secure with screws provided.

## Wiring

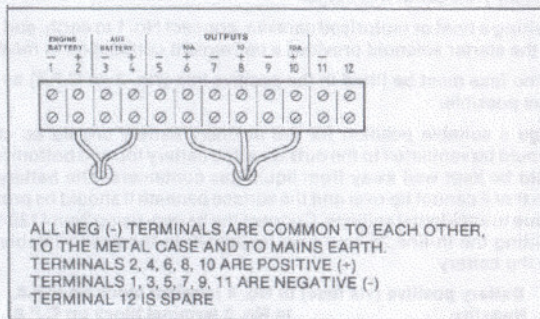


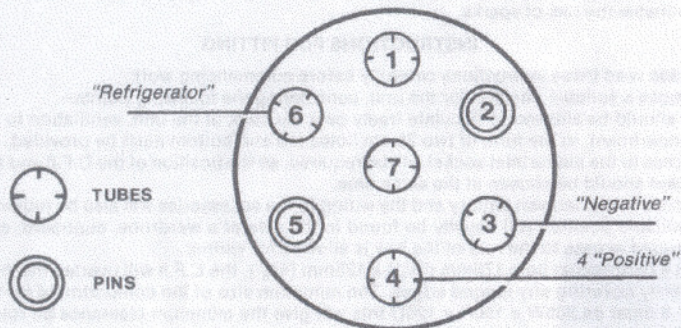
Figure 2  
Terminal Connections to the C.F.8

Suitable cable can be bought from most car accessory shops. Great care should be taken in wiring the unit, its performance will depend on how this is done - **UNDER NO CIRCUMSTANCES USE CABLE SMALLER THAN RECOMMENDED.**

Using cable of at least 2mm<sup>2</sup> (28/03) refer to *Figures 2 and 3*, and connect terminals 1 and 2 (Vehicle Battery) to the 12S cable (Supplementary 7 core, usually grey) as follows:-

**No. 1 on C.F.8 to No. 3 on 12S (Negative)**

**No. 2 on C.F.8 to No. 4 on 12S (Positive)**



*Figure 3 The 12S Plug (Rear View)*

Do not connect your car at this stage.

If you are wiring a boat or motorised caravan, connect No. 1 to earth, and No. 2 to the alternator, the starter solenoid provides a convenient connection in most cases.

A 25 amp line fuse must be fitted in the positive line (No. 2 on C.F.8) as near to the alternator as possible.

At this stage a suitable position for the auxiliary battery should be chosen. The position should be ventilated to the outside at the battery top and bottom levels and in boats should be kept well away from liquid gas containers. The battery should be mounted so that it cannot tip over and the surface beneath it should be protected from corrosion due to accidental spillage. Connect the battery using 2mm<sup>2</sup> (28/03) cable to the C.F.8 fitting the in-line 25 amp fuse (supplied) in the positive cable as near as possible to the battery.

**Battery positive (via fuse) to No. 4 terminal block on C.F.8.  
Negative to No. 3 terminal block on C.F.8.**

**Never** use crocodile clips to connect the battery, these deteriorate quickly and are a fire risk.

Always use proper terminals and screws and smear the connections with petroleum jelly.

Before making any further connections, temporarily remove the in-line fuse from its holder. For motorised and boats, remove the other in-line fuse, as well.

The various accessories can now be connected to the C.F.8 sharing the load between the three 10 amp outlets as equally as possible. The outlets are wired to No's 6, 8 and 10 (all positive) and the corresponding negative connections are No's 5, 7 and 9. As all the negative connections are joined to each other, it does not matter which are used for each fuse outlet.

Refer to *Figure 4*.

**Water pump to No's 5 and 6.  
Fan, cooker hood, etc. to No's 7 and 8.  
Lighting to No's 9 and 10.**

**UNDER NO CIRCUMSTANCES MUST A REFRIGERATOR BE  
CONNECTED TO THE UNIT.**

Due to the high current drawn by refrigerators, they should be wired to the engine battery in such a way that they only operate whilst the engine is running. A Zig RM12 relay will ensure that the main battery will not be flattened by use without the engine running.

The wiring for the 'fridge' should be an entirely separate fused system, do not attempt to connect to terminals 2 on the C.F.8, this will prevent adequate battery charging.

When all the 12 volt connections are complete, the mains connections can be made. The mains input plug and socket should be of the polarised type, i.e. connection can only be made one way round. Suitable sockets can be obtained from caravan accessory shops and chandlers. They should be to B.S.4343. Fit the socket in a suitable position and connect the white mains cable as follows:-

<b>BROWN</b>	<b>to</b>	<b>LIVE</b>	<b>INPUT</b>
<b>BLUE</b>	<b>to</b>	<b>NEUTRAL</b>	<b>200/250 VOLTS A.C.</b>
<b>GREEN/YELLOW</b>	<b>to</b>	<b>EARTH</b>	<b>50/60 Hz.</b>

Do not connect the mains supply at this stage.

Check all the wiring carefully, looking particularly for stray strands which may short to earth. Protect the mains cable from damage by securing with cable clips.

Replace the auxillary battery 25 amp fuse and referring to "INSTRUCTIONS FOR USE" check that all the 12 volt accessories function correctly.

For motorised caravans and boats, replace the other 25 amp line fuse and check that current is available with the "TOURING/ON-SITE" switch in the "TOURING" position.

In the case of touring caravans, it is important to ensure that your car is properly wired before connecting to the van. If your car has previously been wired for touring, check carefully that it has been done in accordance with the following instructions. Alternatively proceed to wire the vehicle as follows:-

**Wiring the Vehicle**

You are strongly recommended to fit the new 12S supplementary plug and socket to your car, for a number of reasons, the 12N original socket is now fully utilised for road lighting if fog lights are used, also the cable used with the 12S system is of a larger diameter and better suited to the large current demands of modern caravans. Connections are made as in *Figure 3*.



The cable used must have a minimum dimension of 2mm<sup>2</sup> (28/03). The connection to terminal 4 on the 12S must be taken right back to the vehicle battery and a 25 amp line fuse **MUST** be fitted in this line as near to the battery as possible. If you are fitting a cable for a refrigerator, this goes to terminal 6 on the 12S, noting that a separate cable must be run back to the battery again with a 25 amp line fuse. Do not attempt to join terminal 6 to terminal 4, this will severely limit the charging current available and could result in the 'fridge' flattening the caravan battery.

A much better method is to wire the 'fridge' through a relay so that it will operate only when the ignition is on. A suitable relay is the ZIG R.M. 12 which comes complete with fitting instructions and is simple to fit.

When the car wiring is complete, the van can be connected and the ZIG system checked out as described in the "INSTRUCTIONS FOR USE".

### Connecting the Mains

The mains supply should be obtained from a domestic supply of 200 to 240 volts from a fused connection point. If a 13 amp household plug is used, this should be fitted with a 3 amp fuse. The cable used to connect the mains should be 3 core sheathed flexible mains cable not less than 0.75mm<sup>2</sup> (6 amp) and should be regularly inspected for damage. When the mains is connected, switch on the MAINS ON/OFF control on the C.F.8 and check that this lights up. Set the "TOURING/ON-SITE" switch\* to on site, and temporarily disconnect the batteries (by removing the fuses) check that the 12 volt equipment is working correctly. Reconnect the two batteries. Installation is now complete.

### Split Chargers

With modern batteries, split chargers are not necessary, as batteries are now much more tolerant to equalisation. The relay type of split charger causes the major problem that current is only available from the vehicle battery when the ignition switch is on, thereby preventing use of the vehicle battery to assist the life of the caravan battery. The diode type of split charger causes voltage drop, this limits the charging current making it necessary to remove the battery for charging if mains is not available. If your car is already fitted with a split charger, we recommend that you remove - or bypass it. If you disconnect a split charging relay, ensure that a 25 amp line fuse is fitted next to the car battery, as described in "Wiring the Car".

### Positive Earth Cars

The ZIG C.F.8 is designed to be used with negative earth system only but can be adapted in various ways to opposite polarity. If this problem arises, ZIG ELECTRONICS LTD. will be pleased to supply further information on request.

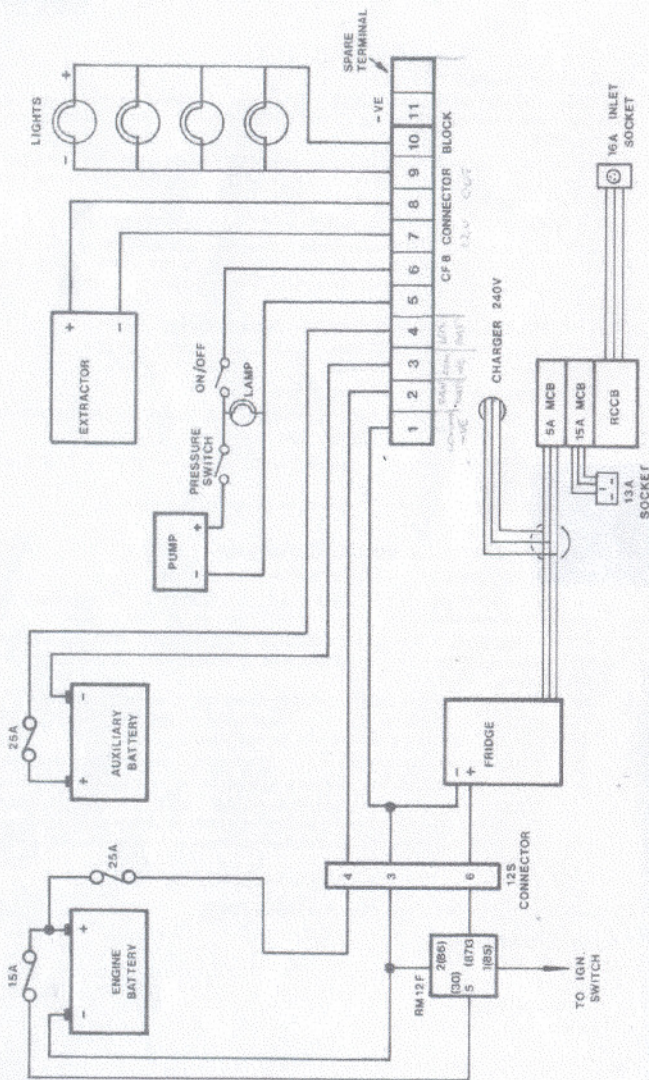


Figure 4 Suggested Wiring Diagram for the C.F.B.

The 12S connector may be deleted if wiring a motorhome or boat.

## FAULT FINDING CHART

SYMPTOM	REMEDY
12 volt appliances work but battery not charging from mains.	Check centre switch is in ON-SITE position. Check mains 2A fuse and Mains supply to caravan. If thermal cut-out has operated, allow time for this to re-set.
12 volt appliances work from auxiliary battery only. Battery not charging from engine.	Check car wiring, especially 7 pin plug & socket. Check car line fuse. N.B. if a split charger has been fitted to the car, power will only be available when the engine is running.
None of 12 volt appliances work.	Check battery line fuse. Check 12V switch is ON.
12 volt appliances work only when mains connected.	Check battery line fuse or battery connections.
Small T.V. picture and dim lights.	Battery nearly flat. Charge battery.
Battery monitor red light flickers when water pump operated.	Normal, due to voltage drop caused by motor surge.
Unit gets hot for long periods and thermal trip can be heard operating.	Faulty battery or excess current being drawn by appliances. Turn off some equipment until battery charged. If this persists, check battery for faulty cell.
Persistent blowing of one of 10 amp fuses.	Check the appliances supplied by this fuse. To isolate these, switch on all equipment, remove fuse and note which equipment stops working.
Battery line fuse blows when battery connections made.	Battery connected wrong way round.
Radio interference when mains charging.	Check battery line fuse, interference may occur if battery is very low, but will cease when it is fully charged.

## GUARANTEE

Thankyou for purchasing a ZIG product.

Peter Everard Ltd., and its subsidiary Zig Electronics Ltd., Guarantee this product against failure due to faulty workmanship and/or material for a period of 12 months from the date of original purchase.

This Guarantee will be extended when the product is fitted to a caravan or motor-caravan by an original equipment manufacturer, the term will then be 12 months from the date that the caravan first became the subject of a retail sale.

It shall be at the company's discretion to determine the method of rectifying the fault.

This Guarantee is not transferable and any claims made under the Guarantee MUST be made to the supplier from whom the product was purchased; (or to the dealer who supplied the caravan originally). It is important that proof of the date of purchase is supplied by the customer.

In the event of a claim under this Guarantee please do one of the following things:

1. Return the product or the caravan to the original supplier together with proof of the date of purchase.
2. Contact the dealer for information about repairs in situ.

Please check the section on "Fault Finding" before making any claim under the Guarantee.

### IMPORTANT

This guarantee will be invalidated if any attempt has been made to open, modify or repair by unauthorised personnel.

Fuses and fuseholders are not covered for failure or damage by whatever cause.

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What to do if a problem occurs outside the Guarantee period:

1. Ask your local caravan dealer if he can service the unit for you.
  2. Contact a qualified electrician (or if the problem is confined to the 12 volt circuits), a qualified auto-electrician.
  3. If 1 and 2 above are not practical or unsuccessful, you may return the product to the manufacturers: Peter Everard Ltd., at Cashes Green, Stroud, Glos. GL5 4RA subject to the following:
    - (a) The product is packaged in accordance with Post Office requirements, i.e. a minimum of 2" (50mm) of packing material around the parcel. Peter Everard Ltd., will not be responsible for any damage in transit.
    - (b) A letter describing full details of the fault, including how and when it occurred.
    - (c) A cheque for £18.90 (incl. vat) made payable to Peter Everard Ltd. This is to defray charges for checking and return postage. If any repairs required exceed this figure you will be advised in writing before repairs commence. Should you decide not to proceed the above amount will be returned to you less the cost to return postage.
- .....

This Guarantee does not in any way affect your statutory rights.

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CASHES GREEN,  
STROUD,  
GLOUCESTERSHIRE.  
GL5 4RA.**

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