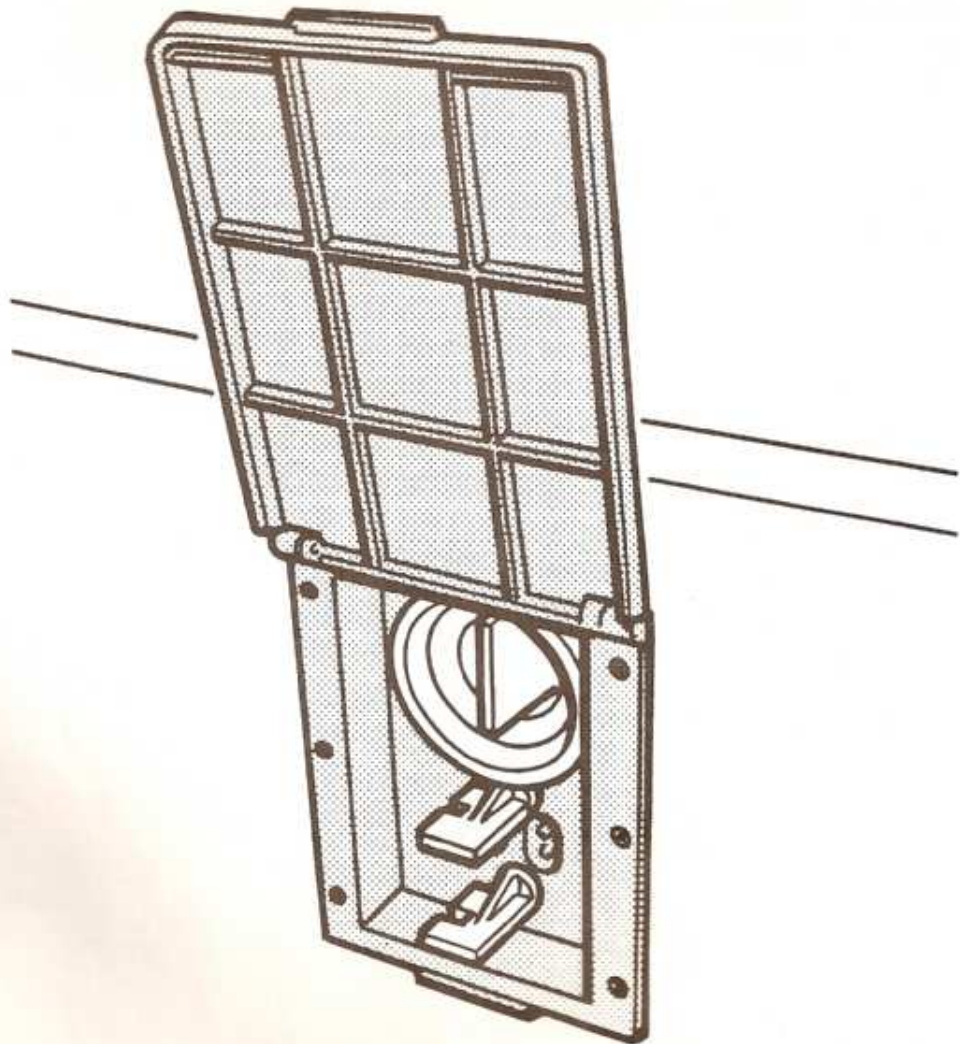


CARVER

CRYSTAL FILTER



INSTALLATION AND USERS INSTRUCTIONS
LEAVE THESE INSTRUCTIONS WITH THE USER

INSTALLATION INSTRUCTIONS

1:0 TOOLS AND ACCESSORIES

The following tools and accessories may be required:

Jigsaw or Padsaw
Drill with 4mm & 10mm Dia. drill bits
Posidrive Screwdriver
Small electrical screwdriver
Masking tape
Panel pins 20mm long
Silicone Sealant
Timber (approx. 600mm long by the thickness of the caravan wall. This will be needed to line the hole).

2:0 SELECTING THE POSITION

- 2:1 Choose a flat vertical wall without interference of trim etc. if possible.
- 2:2 With the shortest possible route to the plumbing system without crossing doorways.

The pipe work should be concealed in cupboards or under bed-lockers etc., but should NOT be run under the floor of the caravan.

- 2:3 The accessibility of existing electrical and water connections should be taken into consideration.
- 2:4 Structural sections within the wall of the caravan should be avoided for safety reasons.

3:0 CUTTING THE HOLE

After selecting the area for fitting the Crystal Filter proceed as follows:-

3:1 INSIDE THE CARAVAN

Temporarily fit the template shown in fig 1 to the inside wall with the bottom of the template touching the floor. Mark position 'O' through the template onto the wall. Remove the template and drill through the inner and outer walls using a 4mm drill bit, ensure that the drill is kept square to the walls.



Fig.1

3:2 OUTSIDE THE CARAVAN

The pilot hole drilled through the two walls allows the template to be positioned correctly on the outer wall. It is advisable to cover an area approx. 250mm x 150mm around the pilot hole with masking tape to protect the paintwork during the cutting operation.

Align the 'O' position of the template with the pilot hole and ensure that the template is square to any locally fitted trim etc..

Drill the four 10mm dia. holes at A, B, C and D through both the outer and inner walls, ensuring that the drill is square to the wall. Using a jigsaw or padsaw cut the walls to the lines shown on the template (see fig 2).

Remove the cut section together with the template and all the masking tape. Carefully dress the edge of both the inner and outer walls to remove any sharp edges. Check that the Crystal Filter will fit into the hole.

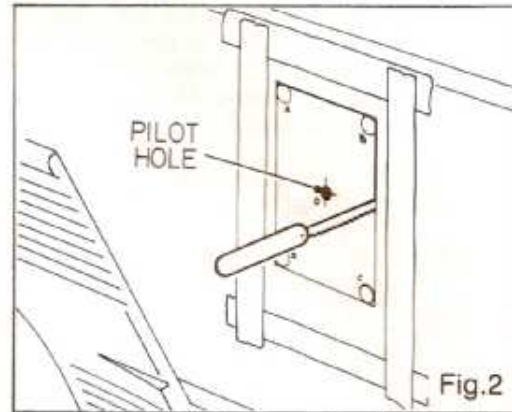


Fig.2

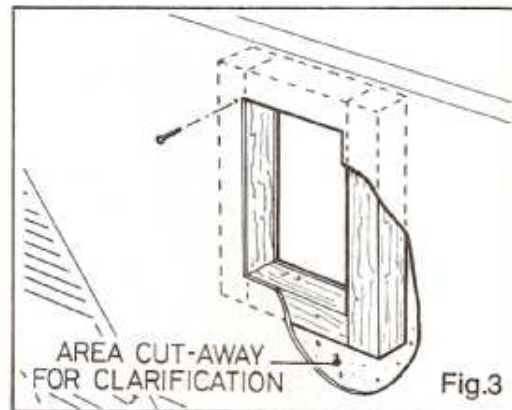


Fig.3

4:0 LINING THE HOLE

It is suggested that the hole should be lined with timber as this makes the installation of the Crystal Filter secure.

Before fitting the timber lining the insulation around the hole should be removed to the depth of the timber lining. The finished hole should be 152mm high x 98mm wide.

Using the silicone sealant seal the lining to the inner and outer walls then secure the timber lining in place with the panel pins (see fig 3). Then remove any excess sealant from around the hole. It is important to check that all the edges are sealed to prevent water entering the walls.

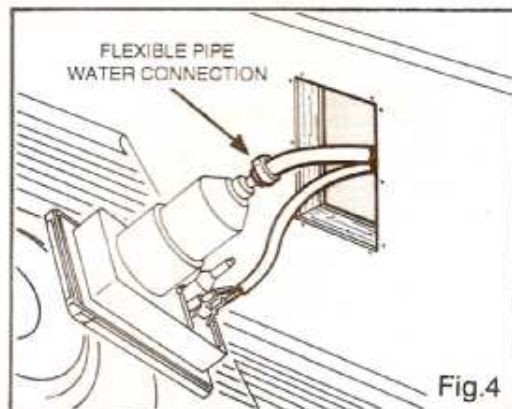


Fig.4

5:0 FIXING THE CRYSTAL FILTER

It is easier to bring the water hose and electric cable through the cut hole and make any connection before fitting the Crystal Filter to the caravan wall (see fig 4 or 4b for Rigid Pipe).

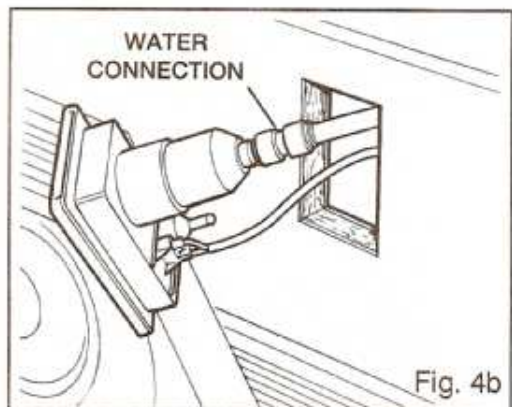


Fig. 4b

5:1 ELECTRICAL CONNECTIONS

The cable should be twin core colour coded brown/blue or red/black with CSA (Cross Sectional Area) of the wire being 0.75mm^2 , suitable for 12 volts DC and fused at 10 amps.

NOTE: The internal wiring of the caravan will be green '+' and white '-'.

Ensure that the polarity is correct i.e. brown or red wire to '+' and blue or black to '-'. The polarity is marked on the rear of the Crystal Filter.

Connect the cable via the switched taps or pressure switch to the caravan 12 volt supply.

NOTE: If the polarity is reversed the pump will still operate but with a reduced performance.

The pump may be operated via switched taps or a pressure switch, a non-return valve is fitted as part of the Crystal Filter.
NOTE: Flexible pipe clips must not be over tightened as it may prevent the non-return valve from operating.

NOTE: If a pressure switch is to be used, then an electrical isolation switch must be used in conjunction with it. The isolation switch should be positioned so that it is convenient for the user to operate.

5:2 WATER CONNECTIONS

The Crystal Filter is designed for connection to 12mm diameter bore hose, and must be secured with a suitable hose clip.

NOTE: Food quality hose must be used to avoid the risk of unpleasant tastes in the water.

At the rear of the Crystal Filter unit there are two water connections, one of which is blanked off. It is recommended that only water that will be used for drinking or cooking should be filtered and that unfiltered water be supplied to the water heater e.g. the Carver Cascade.

Three types of system may be used:-

5:2:1 Drinking and cooking water filtered, hot water system unfiltered. Connect the hose from the cold water taps to the rear of the filter cartridge, then cut off the end of the blanked off tube as shown in fig. 5 & 5b and connect the hose from the hot water system.

5:2:2 All water filtered, no modification to the unit is required (see fig. 6 & 6a).

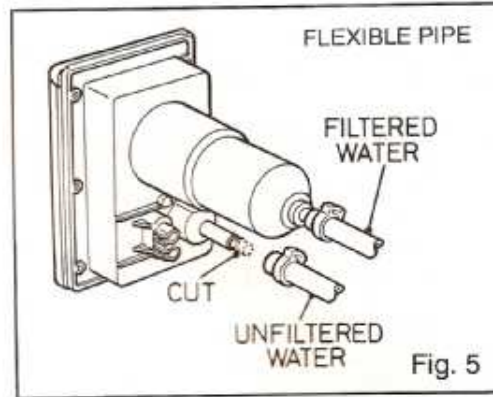


Fig. 5

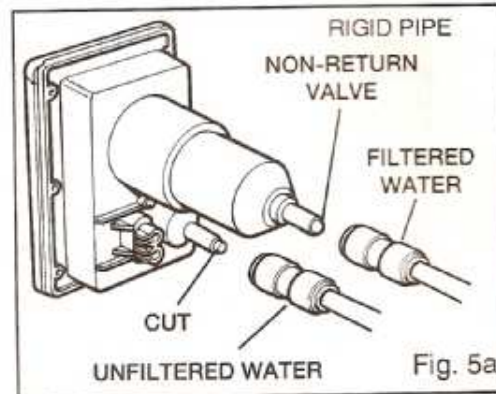


Fig. 5a

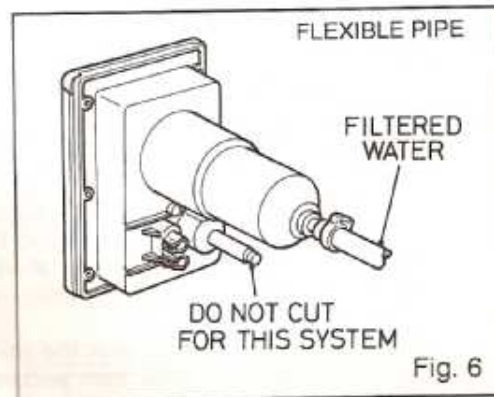


Fig. 6

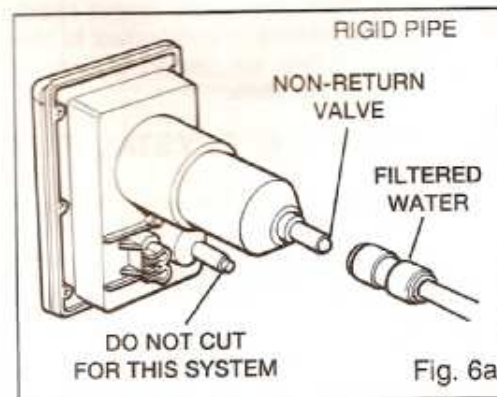


Fig. 6a

- 5:2:3 Winter use system. When the crystal filter is to be used in conjunction with a Carver Compact (see section 8:0)

6:0 FIXING TO THE CARAVAN WALL

- 6:1 After ensuring that both the electric and water connections are satisfactory offer the Crystal Filter into its position. Using the six flange holes as a guide, drill through the outer wall only with a 4mm dia drill bit.
- 6.2 Apply the silicone sealant to the back flange of the Crystal Filter and using the six countersunk head screws secure the Crystal Filter into position (see fig 8). Finally remove any excess sealant from the coachwork.

ENSURE THAT THE REST OF THE SYSTEM IS CONNECTED AND THAT ALL THE JOINTS ARE SECURE.

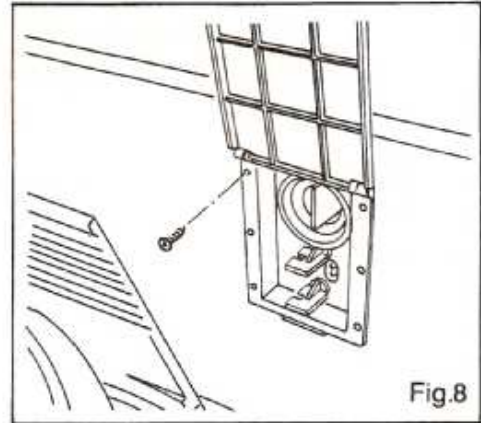


Fig.8

7:0 CHECKING THE INSTALLATION

- 7:1 Clean the water socket and plug of the pump assembly (as both components will be dry and new it is suggested that a smear of vegetable oil on both surfaces will aid fitting). Push the two components together (see fig 9) and lock the connector plug into position by turning the top security clip anti-clockwise and the bottom security clip clockwise.
- 7:2 Place the pump into the water container and ensure that it is totally submerged. Check that the electric supply is connected and working satisfactory. Operate the system, and check that the water is flowing from all taps and that the system is free from leaks

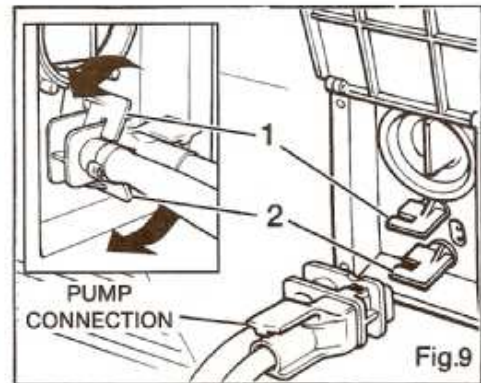


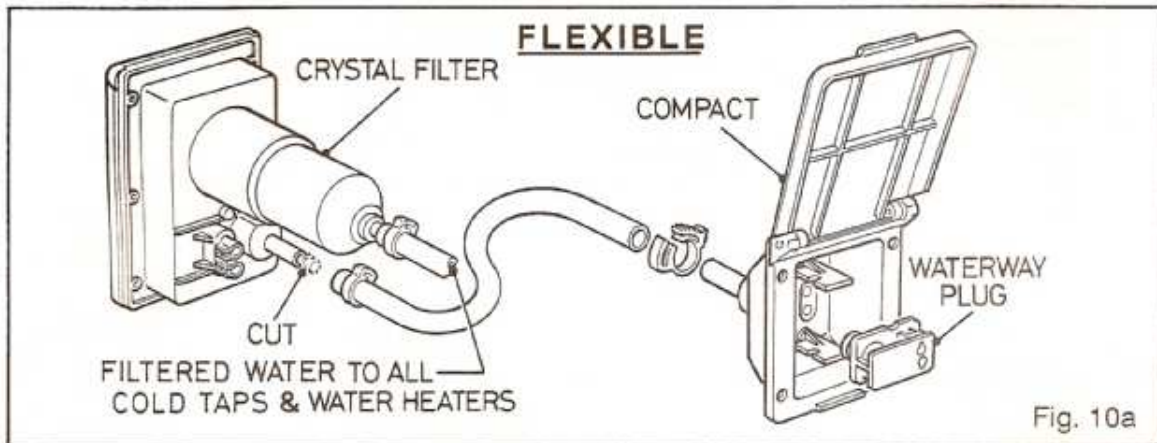
Fig.9

8:0 HOW TO PREPARE YOUR WATER SYSTEM FOR WINTER USE

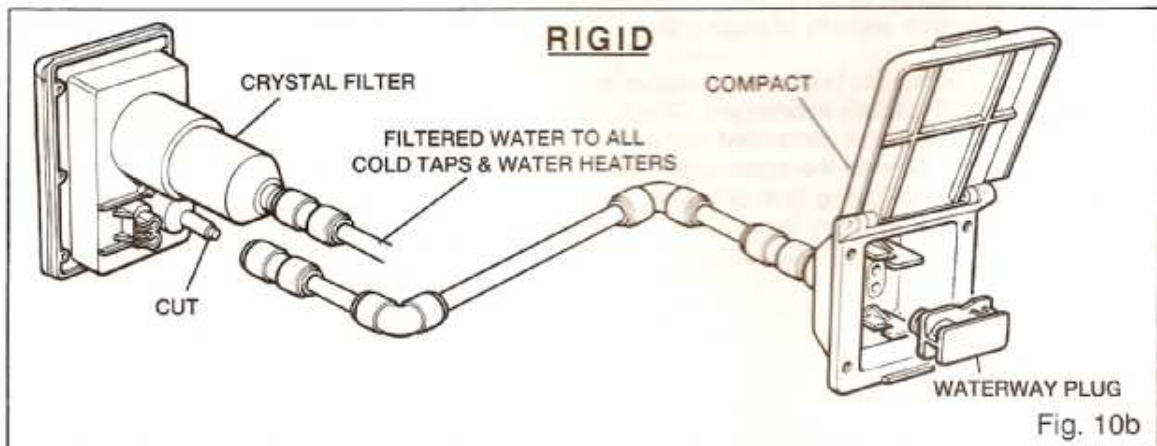
During winter caravanning it is desirable to keep the water container within the caravan to prevent freezing. This can be achieved by fitting a Carver Compact unit inside the caravan in a location where it is convenient to store a container, e.g the washroom or under the sink etc.

Fit a Carver Compact in the required position.

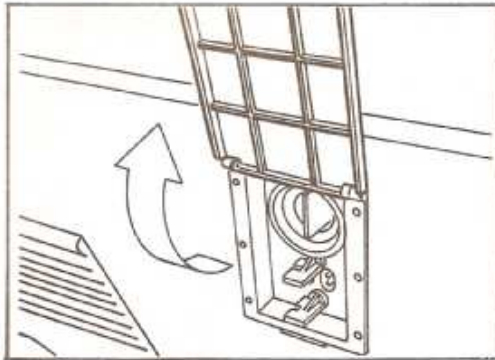
Cut the end off blanked off tube at the rear of the Crystal Filter and connect the water hoses as suggested in fig 10.



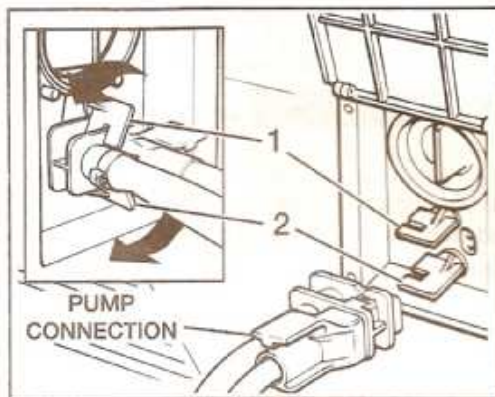
The waterway plug must be fitted to blank off the unused Compact or Crystal Filter system.



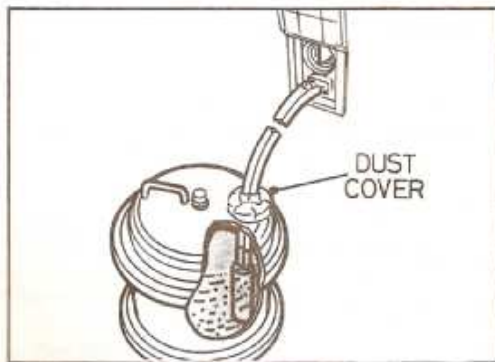
USER INSTRUCTIONS



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



Plug the pump assembly into the socket. Turn the top security clip anti-clockwise and the bottom security clip clockwise to lock the plug into place.



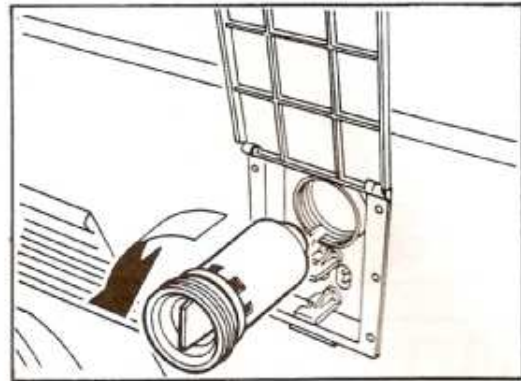
Place the pump into the water container, ensuring that it is fully submerged before operating the system. A Dust cover is available to stop contaminants falling into the water container.

To remove the pump assembly from the Crystal Filter, release the security clips and pull the hose adaptor by using the finger grips provided.

DO NOT REMOVE BY PULLING THE HOSE OR ELECTRIC CABLE.

ROUTINE MAINTENANCE

1. Ensure that the 'O' ring seal on the hose adaptor and socket are free from dirt.
2. To aid fitting of the plug assembly smear the 'O' ring with vegetable oil.
3. To help protect the electrical connections smear both the male and female terminals with petroleum jelly.
- 4 (a) To change the filter cartridge. Turn the cartridge anti-clockwise to remove.
(b) Ensure that the new cartridge is fully tightened in the holder. If the cartridge is difficult to fit smear the 'O' ring with vegetable oil.



NOTES

- a **Never allow the pump to run DRY.** Always ensure that the pump is submerged in the water or the life of the pump will be reduced.
- b Before winter storage the water system must be completely drained and the filter cartridge removed. The filter hole may be sealed with an old filter end cap or left open but do ensure that the lid is firmly closed.
- c **Clean the water system at the start and end of the season with sterilising fluid (see notes under sterilising).**
- d If the pump fails to deliver water the most likely cause will be air in the system. **Switch off the pump and shake the pump assembly in the water. Then switch on again.**

and/or

The filter cartridge is not fully tightened. Ensure that the filter cartridge is screwed fully into its holder.

STERILISING

- a When cleaning the water system at the start of the and end of the season it is advisable to use a sterilising fluid e.g. Chempro SDP or similar. It is recommended that for this operation an old filter end cap is fitted as the fluid reduces the effectiveness of a new filter.
- b Flush the system thoroughly to remove the effective fluid traces.
- c After sterilising the system at the start of the season it is recommended that a new filter cartridge should fitted

FILTER CARTRIDGE

- a. After fitting a new filter cartridge it is recommended that the system is flushed through for approximately 30 seconds to remove any harmless particles of carbon.
- b. It is suggested that the filter cartridge should be replaced after approximately 30 days of caravanning. After such time the carbon filter will become less effective.
- c. Always ensure that the filter cartridge is fully tightened in the holder. If fitting of the new filter cartridge is difficult smear the 'O' ring with vegetable oil.