



## **PC30 & PC45 FCP CONSTANT RUNNING PUMP**

Marine Autopilot Hydraulic Pump  
Installation and Service Instructions

Serial Number



The information in this manual was, to the best of our knowledge, correct when it went to press and Hydraulic Projects Ltd cannot be liable for any inaccuracies or omissions. There may also be differences between the specifications in the manual and the product as a result of ongoing development for which we accept no liability.

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## IMPORTANT SAFETY INFORMATION



**This pump is NOT suitable for installation in vessels with petrol engines or in petrol tank spaces.**

Failure to install and maintain this equipment in accordance with the instructions contained in this Manual could result in damage or injury.

This equipment must be installed and maintained by a person who is qualified to do so. This equipment is only for use with marine Auto pilots within the limitations stated in the following pages.

Auto pilot steering systems are navigational aids and the user must still maintain a permanent watch.

This equipment meets the latest EMC (Electromagnetic Compatibility) standards required for use in the recreational marine environment. In order to ensure conformance and to prevent interference with electronic systems the unit must be properly bonded to earth and the supply cables screened.

### DO NOT FLASH TEST



Beware of hot motor and solenoid components and the risk of entrapment from moving parts.

## **DESCRIPTION**

The "PC" constant running type gear pumps are driven by 12 or 24 Volt DC permanent magnet fan cooled motors. Flow reversal is achieved by switching a double acting solenoid valve. Incorporated in the design are pilot operated check valves that prevent the pump being back driven by the manual steering system.

Other features include compatibility with balanced or unbalanced cylinders and they can also be used with pressurised reservoir systems (max 3.5 bar).

A relief valve, variable speed control and an integral reservoir with filter are fitted as standard.

Maximum flow output at no load is indicated on the rating plate. Check the voltage shown is correct for the output of your auto pilot.

## **LOCATION**

These pumps are designed for 'under deck' installations only.

Excessive temperature, vibration and fumes in the atmosphere can drastically reduce motor brush life.

Mounting the unit on a flimsy surface can transmit and amplify undesirable noise.

As in common with other electrical equipment, contact with water and excessive humidity must be avoided.

Keep the cable and pipe work runs as short as practically possible.

Units must be mounted either horizontally, foot down or vertically, tank down - refer page 8.



This unit must not be positioned in a confined area where there are inflammable gases.

## INSTALLATION

The 'A' and 'B' ports are G1/4 (BSP) parallel threaded, the 'R' port is G3/8 (BSP) parallel threaded.

Use only bonded rubber/metal washers to seal the fittings. Do not use tapered adapters, sealing compound or P.T.F.E tape.

Ports marked 'A' and 'B' are the service line connections to the ram, the pipe work and connections must be suitable for a 100 bar working pressure minimum rating.

The port marked 'R' is the reservoir or balance line. If used as a balance line it must be connected, through a continuous rise to the helm pump bottom connection.



Do not plug this port – damage and steering failure could result.

If used with pressurised reservoir type systems the pipe must be suitable for at least 7 bar.

Ensure that no dirt enters the system during the installation, be certain that all pipes and fittings are cleaned before connecting up.

## HYDRAULIC FLUID

Good quality ISO VG10 to ISO VG42 hydraulic mineral oil is recommended, check the compatibility with the helm pump and ram manufacturers specifications and if it is suitable for use with nitrile rubber hydraulic seals. Refer page 8.

## ELECTRICAL



The EMC filter and contactor supplied must be connected as per the wiring details on page 11. Mount the EMC filter on a dry bulkhead or area not likely to be exposed to water ingress. Ensure that the correct polarity is observed.



Current limitation must be fitted - refer page 8.

## COMMISSIONING



**CAUTION!** Be aware of the danger of moving linkages and the risk of entrapment during this procedure.

Bleed the system according to the helm pump manufacturers instructions. To aid clearing air from the electric pump please note the orientation of the hydraulic/electrical connections -See installation data.

The pump must not be run without oil.

Set the speed control to achieve the desired hard-over time (nominally 12 seconds). Screw in to reduce speed.

The relief valve is set at 58 Bar and should not be adjusted unless the steering gear is designed to operate at a lower pressure.

## TROUBLE SHOOTING

### 1) Motor does not run

- : check electrical connections.
- : check auto pilot output.
- : check motor brushes.
- : check fuse / trip rating (Ref. page 10)

### 2) Motor runs, but no ram movement.

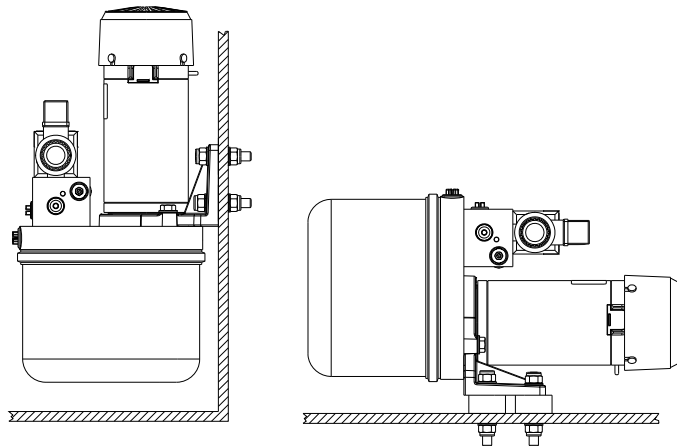
- : check that the solenoid is operating.
- : check motor rotation direction.
- : check for air in system.
- : check for incorrect hydraulic connections.
- : check there is sufficient fluid in the system.
- : check that the flow control is open.
- : check that the relief is set correctly.
- : check the drive coupling between pump and motor.
- : check if the pump has been dismantled and incorrectly assembled.

### 3) Excessive noise

- : check for air in system.
- : check the motor for damage.

## TECHNICAL DATA

Max Pressure:	70 Bar
Amb. Temp:	-20 to +55 deg C
Reservoir Port 'R':	G3/8 (BSP) Parallel
Cylinder Ports 'A' & 'B':	G1/4 (BSP) Parallel
Current Limitation:	Must be fitted with current overload. Minimum fuse/trip rating : 24V pumps = 40A 12V pumps = 50A
Installation:	Under deck, horizontal or vertical (tank down). Do not fit isolation mounts if installing vertically.



Pipework:	Suitable for 70 Bar working pressure (100 max)
Reservoir:	4.0 L Capacity 3.5 BAR Max.
Rec. Oils:	From -20 to +10 deg C use ISO VG10. From +10 to +55 deg C use ISO VG40.
Filtration:	Replacable internal element. Return line 15 micron
Relief Valve:	Pre-set 58 Bar
Speed Control:	Adjustable Pressure compensated. Screw in (clockwise) to reduce speed.
Weight:	12kg



Voltage                      12VDC    340W  
                                   24VDC    440W

Motor Rating:              25% Duty Cycle: 30 A  
 (PC45 FCP 24)            50% Duty Cycle: 25 A  
                                   100% Duty Cycle: 20 A

Solenoid Coils:            12V 2.5A                      Relay:    12V 1.0A  
                                   24V 1.3A                                     24V 0.5A

EMC Protection:            BS EN 60945:2002 (DC) - external filter.

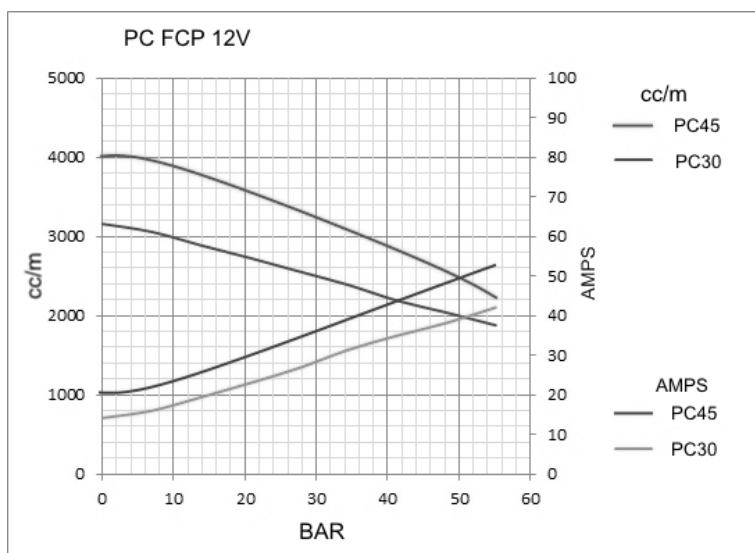
Ignition protection:        BS EN 28846:1993

Ingress Protection         IP54

Performance:

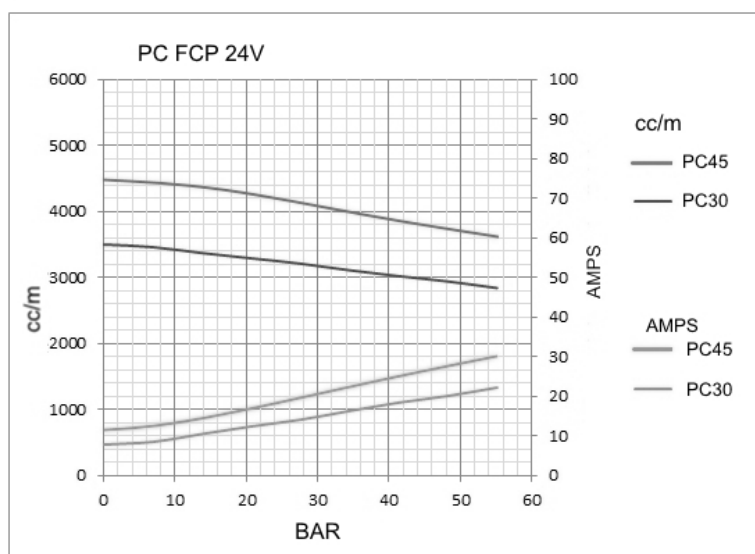
PC30 FCP 12  
 3.0 L/min 12V

PC45 FCP 12  
 4.0 L/min 12V

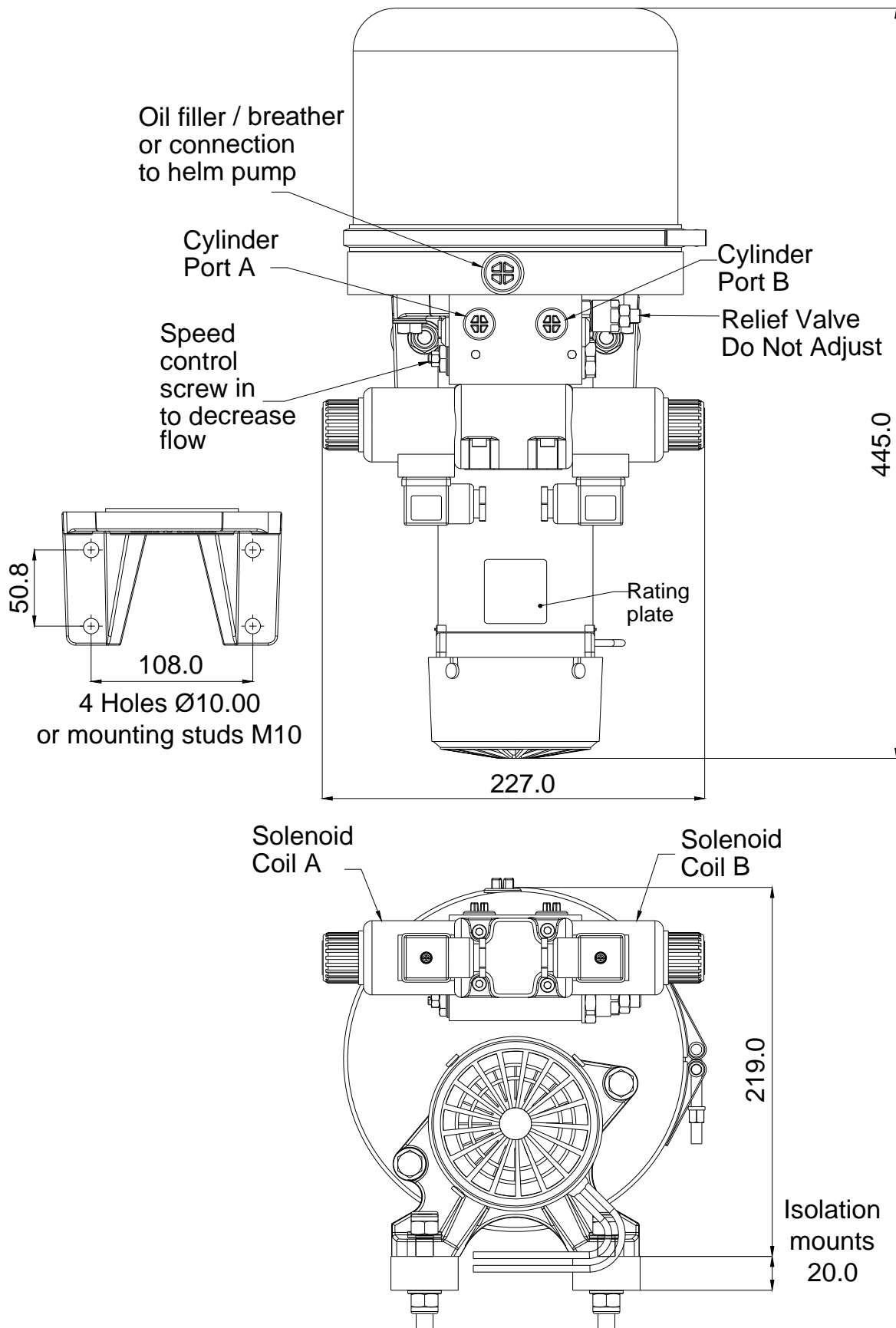


PC30 FCP 24  
 3.5 L/min 24V

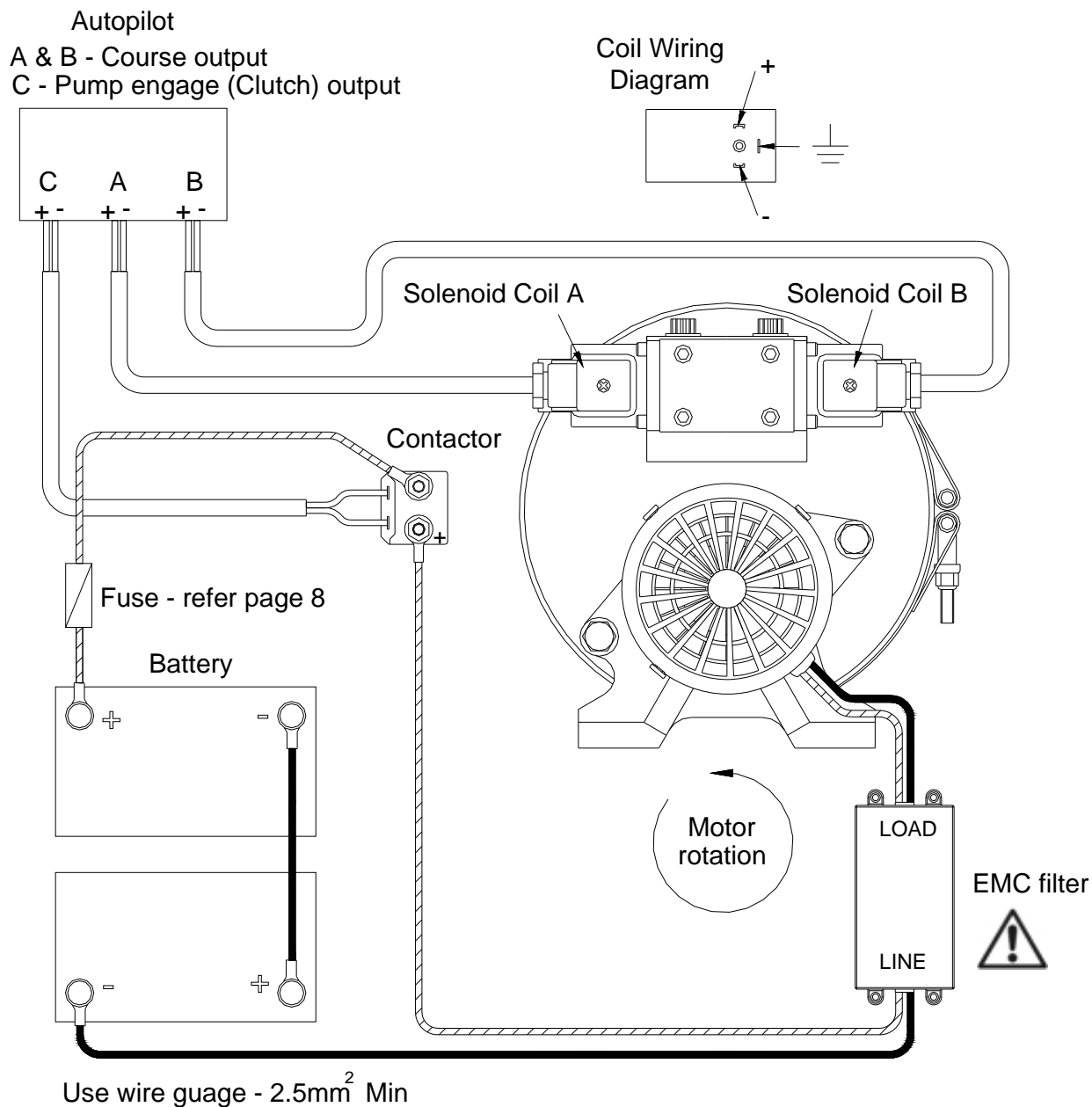
PC45 FCP 24  
 4.5 L/min 24V



## INSTALLATION DETAILS



## WIRING DETAILS



Attach leads to contactor as shown

 RED motor lead

 BLACK motor lead



Observe correct polarity

## **SERVICE**

With a minimum of moving parts and top quality precision engineering the pump will give many years of trouble free service. Should service replacement seals be required, a kit is available from your nearest dealer under the following part code: R2240-sk

## **FILTER**

The pump is equipped with an internal return-line filter which must be changed after the first 50 hours and then annually. Spare filters can be ordered under the part code: R2690.

To access the filter first drain the tank then undo and remove the clamp ring. Carefully withdraw the tank taking great care not to distort the tank or damage the O ring seal or tank lip. The filter is secured with a single nylock nut. Once the filter is replaced tighten the nylock nut until the filter is secure then fit the new O ring and re-fit the tank. A smear of general purpose grease will aid assembly.

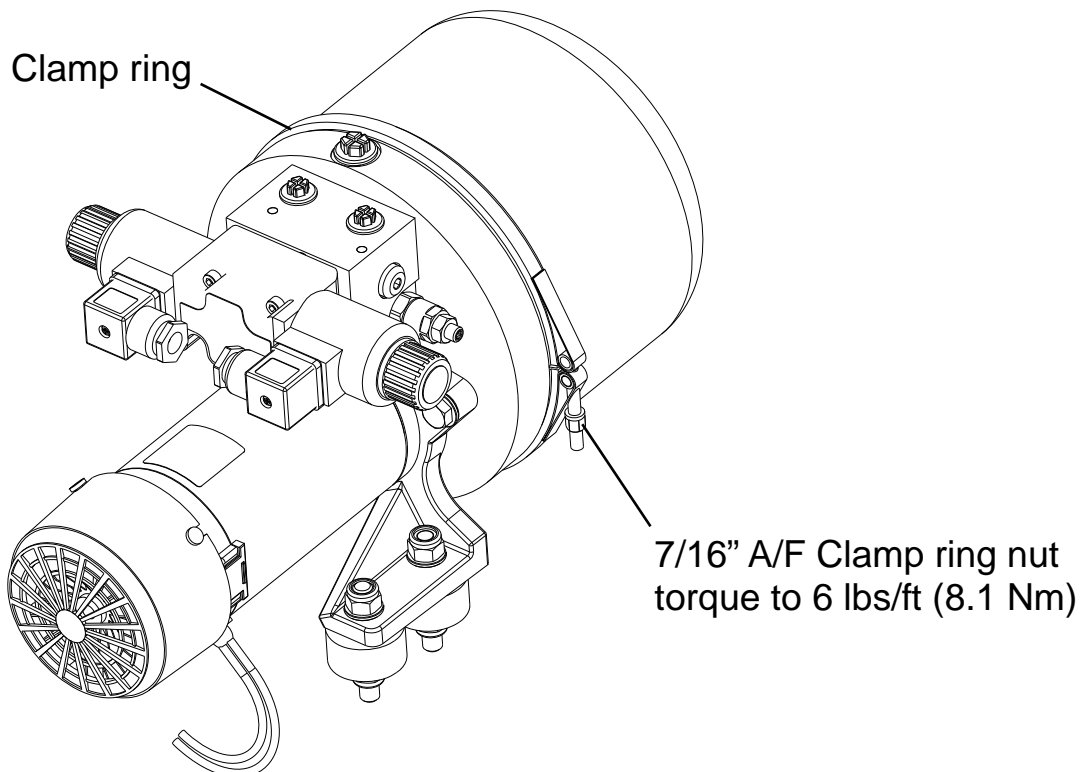
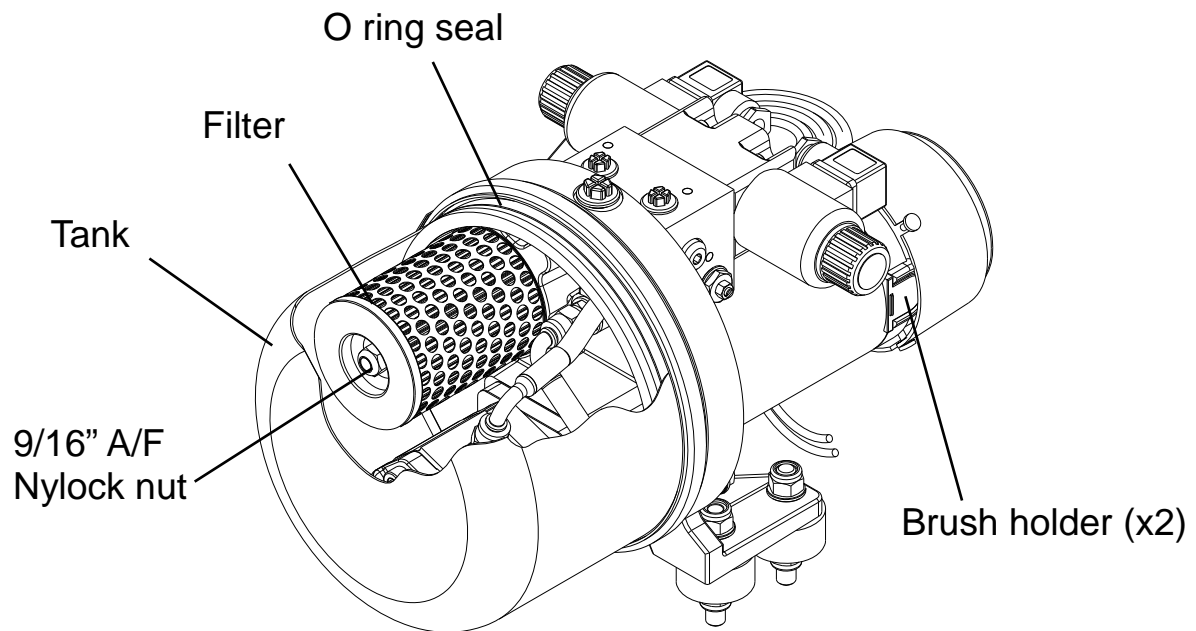
## **BRUSHES**

Inspect the motor brushes every 500 hours, or annually, for wear.

The minimum brush length is 8mm.

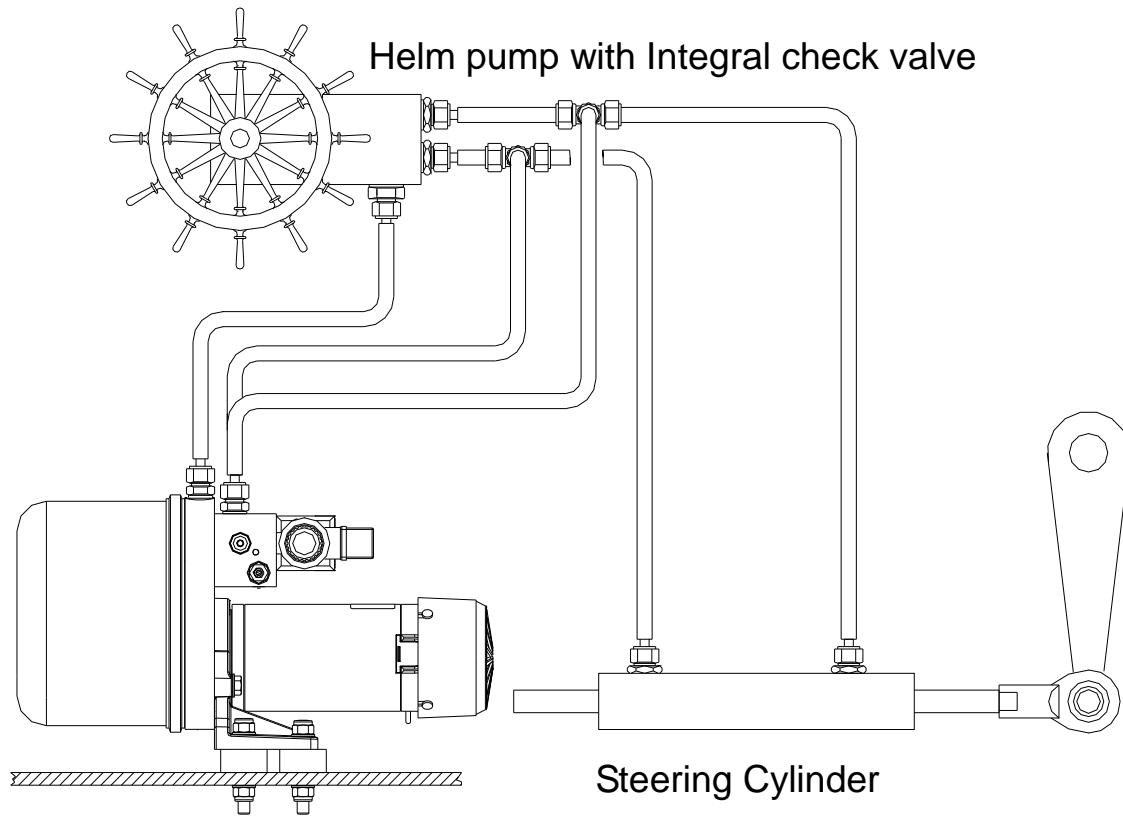
If either of the brushes is less than this they must be changed as a pair. State the serial number of your unit when ordering. Be sure to clean out all loose carbon before fitting new brushes. If fluid has entered the motor, degrease the brush gear and commutator before running the unit, otherwise arcing will reduce brush life.

Part code: 15409/2

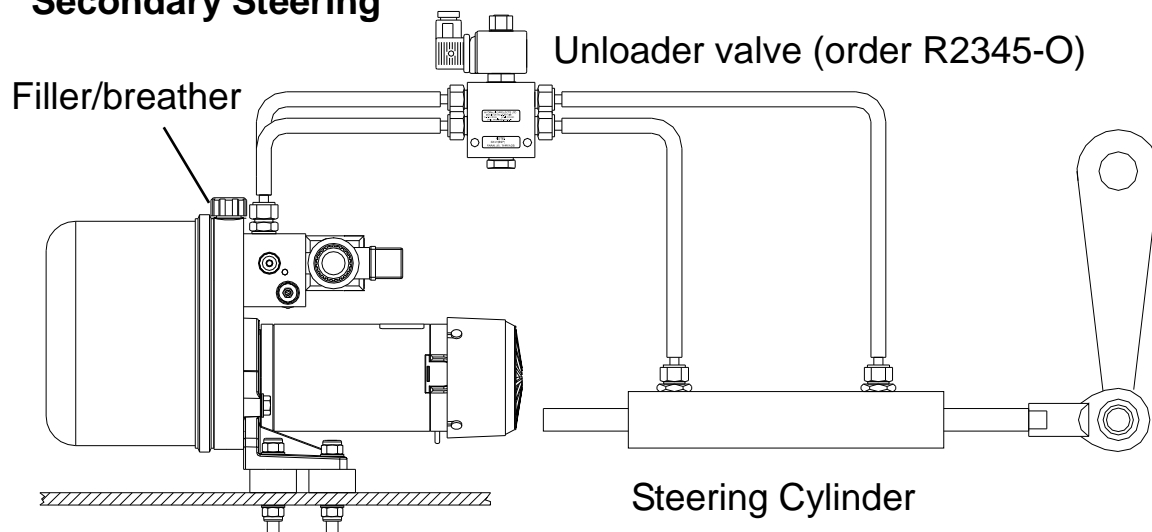


## TYPICAL ARRANGEMENTS

### Primary Steering



### Secondary Steering



## GENERAL INFORMATION

Keep this manual in safe place.

Quote the model and serial numbers in all correspondence.

Model Number: \_\_\_\_\_

Serial Number:: \_\_\_\_\_

Date of Purchase: \_\_\_\_\_

Dealer:: \_\_\_\_\_

\_\_\_\_\_

## CONTACT DETAILS

### Hydraulic Projects Limited

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Devon

EX7 0NH

United Kingdom

Telephone +44 (0)1626 863634

Fax +44(0)1626 866283

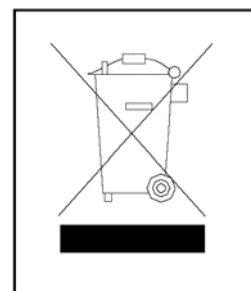
Email [sales@hypro.co.uk](mailto:sales@hypro.co.uk)

Web [www.hypro.co.uk](http://www.hypro.co.uk)

## END OF LIFE DISPOSAL

Please dispose of End of Life items responsibly.

In the event that you are unable to use your nearest local authority civic amenity sites to recycle, units can be returned to us at the address above.





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