



Octopus Pump Installation Guide

PUMPOCT06-12

PUMPOCT10-12

PUMPOCT16-12





OCTOPUS

SELECTION & INSTALLATION GUIDE



OC14268 REV: NEW – 18/05/2016

INSTALLATION GUIDE – OCTOPUS GEAR PUMPS

A. PUMP FAMILY OVERVIEW

Octopus High Efficiency Gear Pumps are available in a range of sizes from 0.6 litres per minute to 1.6 litres per minute. They are also available in 12vdc and 24vdc.

- GEAR PUMP



B. PUMP MODELS COVERED:

1. Octopus Hydraulic Gear Pump:

- 0.6 Litre per minute – 12v – OCTAFG0612.
- 1.0 Litre per minute – 12v – OCTAFG1012.
- 1.6 Litre per minute – 12v – OCTAFG1612.
- 0.6 Litre per minute – 24v – OCTAFG0624.
- 1.0 Litre per minute – 24v – OCTAFG1024.
- 1.6 Litre per minute – 24v – OCTAFG1624.

C. PUMP SELECTION - SIZING:

1. When sizing a pump for an autopilot application.
 - The pump works with both balanced and unbalanced cylinders.
 - Match the pump voltage to the power supply voltage from the autopilot course computer.
 - Size the pump considering the autopilot manufacturer's recommended rudder HO-HO speed for the type of vessel and the steering cylinder volume.
 - Rudder HO-HO speed usually falls within 10-15 seconds.

D. PUMP PREPARATION AND MOUNTING:

D1. PREPARATION:

The Octopus Gear Pump housing has 3 x ¼ NPT female ports.
For a list of all available hose and fitting options see Table 1.

Octopus Reversing Pump Port Layouts & Fitting Options

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Gear Pump Porting.

- 3 x ¼ NPT Female Ports – on front face.
- Flexibility to run lines into pump from front, rear or top must be gained by using fittings of best style to suite the desired run. In any combination (example 2 x 90 degree elbows & 1 x straight),
- LH Sample shown has 3 x 90 degree elbows (without captured sleeve & Nut).
- RH Sample shown has 2 x 90 degree elbows + 1 x straight (without captured sleeve and nut).
- Another option using “T” fittings would be to run lines from the helm pump to one leg of the “T” and a second line from the second leg of the “T” the steering cylinder.

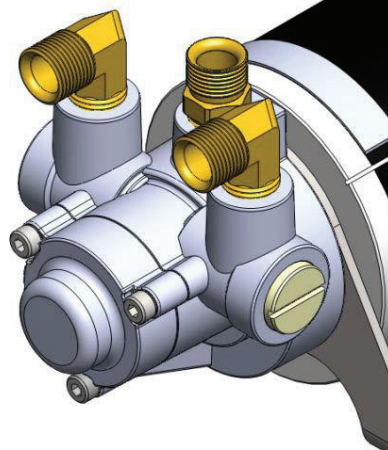
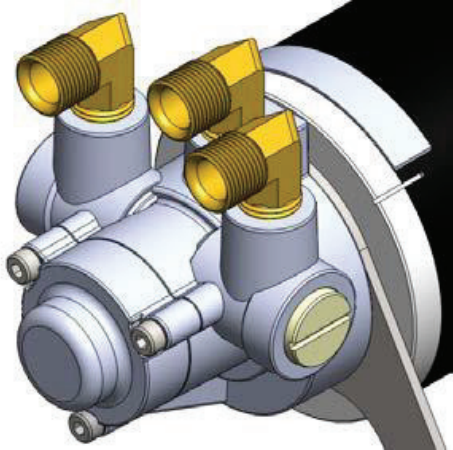


Table 1:

Additional hose and fitting options:

OC17SUK42- 30”, 750MM Hose and fitting kit, including NPT and ORB style Helm “T” fitting kits

OC17SUK47- 4 Piece Orb style Helm “T” fitting kit to fit Seastar helms 2014 or newer

OC17SUK46- 4 Piece NPT style Helm “T” fitting kit to fit most helms 2014 or older

D2. MOUNTING:

The Octopus pump must be located at a level lower than the helm pump; it can be mounted in any orientation. Care should be taken to ensure that the reservoir hose runs in an upwards path towards the Helm pump reservoir connection with no loops or dips. This direct upwards path will ensure that no air pockets can get trapped. The steering lines should also run as directly as possible.

E. HYDRAULIC CONNECTIONS:

1. In any hydraulic system it is important to use flexible hoses between the pump and the copper tubing to protect the tubing against fatigue and also to isolate the more rigid tubing/structure from any noise that the pump may generate.
2. The 2 steering ports must be connected to the tubes connecting the hand steering helm pump to the steering cylinder.

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3. The reservoir port must be connected to the existing reservoir on the steering system. This is either a separate pressurized reservoir or the steering helm itself. There is usually a port on the bottom of the helm pump. If there are 2 helm stations; use the most convenient.

CAUTION:

1. Ensure that the existing hydraulic system has non-return (lock out) valves (check with the steering system manufacturer); if it does not, then suitable valves must be fitted. Most modern steering systems do include non-return valves.
2. A suitable liquid pipe thread sealer may be used sparingly. Do not use plastic or PTFE tape, this can very easily separate and allow fragments into the system.

F. ELECTRICAL CONNECTIONS:

Follow the autopilot manufacturer's instructions when connecting up the Octopus pump. Correct sizing of cable is important. You have purchased the most efficient autopilot pump available today and it is not to your advantage to compromise its performance by using undersize cable. Ensure all electrical connections are properly made.

G. TYPICAL HYDRAULIC RETRO-FIT INSTALLATION PROCEDURE:

(Diagrams on next page)

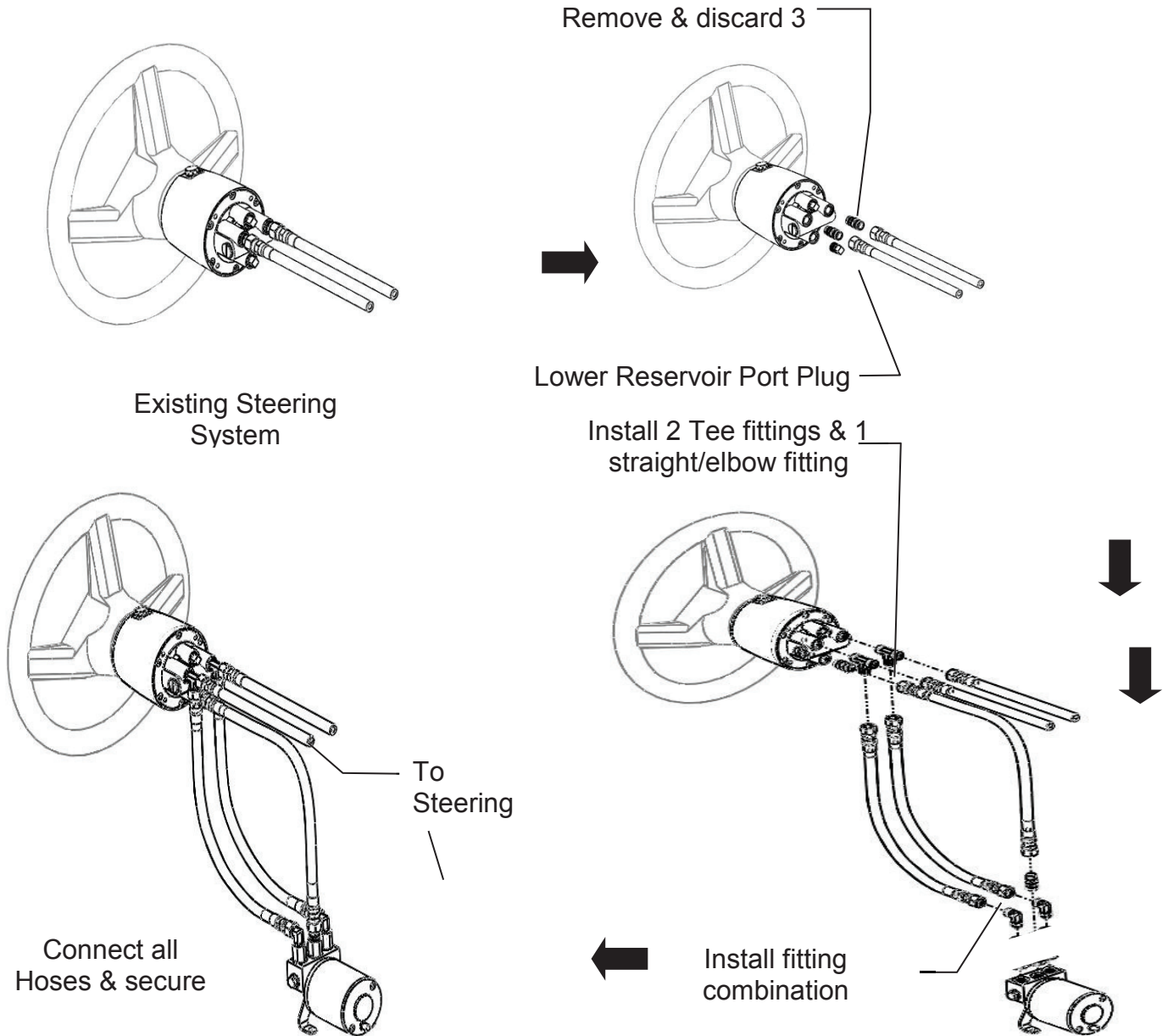
The following example is based upon;

- A vessel with a 2 line hydraulic steering system.
 - An existing manual steering helm with 1/4NPT ports.
 - Utilizing an Octopus Hydraulic Hose and Fitting Kit – OC17SUK42
- i. Working on the back side of the helm pump, identify and tag one of the existing steering hoses and its port to assist in re-assembly.
 - ii. Disconnect 2 existing steering hoses.
 - iii. Remove and discard 2 fittings from the steering ports.
 - iv. Remove and discard the reservoir blanking plug from the lower port.
 - v. Install 2 tee fittings into steering ports
 - vi. Install either a straight or 90° angle fitting into the lower helm reservoir port - (choice depends on the routing of the hose assembly – straight shown in diagrams).
 - vii. Re-connect 2 existing steering hoses to the most suitable connection of the tee fittings. (ensure that steering hoses are connected to the correct side using tags applied in step i.).
 - viii. Choice of connection depends on the routing of the existing steering hoses – in-line shown in diagrams.
 - ix. Connect 2 high pressure steering hoses supplied with kit to the remaining connection of tee fittings.
 - x. Connect 1 x low pressure transparent hose supplied with kit to reservoir port fitting.

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- xii. Install supplied fittings into Octopus pump as required to suit hose routing.
- xiii. Connect the 2 high pressure steering hoses and 1 low pressure transparent hose to Octopus pump.
- xiv. Secure Octopus pump to vessel structure.
- xv. There will be fittings that are not used – they can be discarded.
- xvi. To increase the length of the standard hoses; additional hoses can be spliced.
- xvii. Custom length hoses are available from the factory.



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H. BLEEDING THE SYSTEM:

Bleeding the hydraulic system after installing the Octopus pump is a most important step; if there is any air left in the system; the steering will feel unresponsive, especially at hard over. This can also affect the performance of the Octopus pump, causing noise and degrading response times.

The electrical components (course computer and control head) must be installed and the Octopus pump connected in order to utilize the pump during the bleeding procedure

The system reservoir must be full of hydraulic fluid before starting this procedure and this level must be maintained during the procedure. See the steering system manufacturer's guide for the exact procedure for your steering system. (Note: this can vary depending upon the type of steering cylinder that is fitted).

Stage 1 – Purge the Octopus Pump to Helm Pump lines:

Using the autopilot control head:

Run the Octopus pump in one direction for 10-15 seconds.

Run the Octopus pump in the opposite direction for 10-15 seconds.

Repeat 2-3 times

Stage 2 – Purge the Helm Pump through to the steering cylinder.

The type of steering cylinder will dictate the specific procedure for this operation. See the steering system manufacturer's purging guide.

Stage 3 – Oil Level and System Check:

At this time the steering system must be checked for proper connections of all hoses and fittings and for air removal. To do so: turn the steering wheel and pressurize very hard to port. Apply enough force to the wheel to exceed the pressure relief valve setting. You will not harm the system. While pressure is maintained on the steering wheel; check all port fittings and line connections for leaks. If no leaks are obvious your steering system is ready for use. If leaks are found they must be corrected. Repeat this procedure for the starboard lines. Watch the oil level in the helm pump when the steering reached both hard over positions. If there is no obvious drop in the oil level; the air has been removed. If there is an obvious drop in oil level; you are compressing air and further purging is required. Repeat the Stage 2 Purge.

I. SERVICE:

The Octopus Gear Pump requires no routine service. Installed correctly it will give many thousands of hours of trouble free operation.

J. TROUBLESHOOTING:

If the unit fails to operate after installation is complete, check for the following common causes.

1. Motor does not run:

- No voltage applied to motor.
 - Check voltage at motor with voltmeter.
- Autopilot not switched on correct setting.
 - Check autopilot manual.

2. Motor runs but pump does not move the rudder:

- System not filled with oil.
 - Fill and purge system.
- Hydraulic connection incorrect.
 - Check that 2 steering ports connect to cylinder steering tubes.
- Reservoir line not connected.
 - Must connect to reservoir.