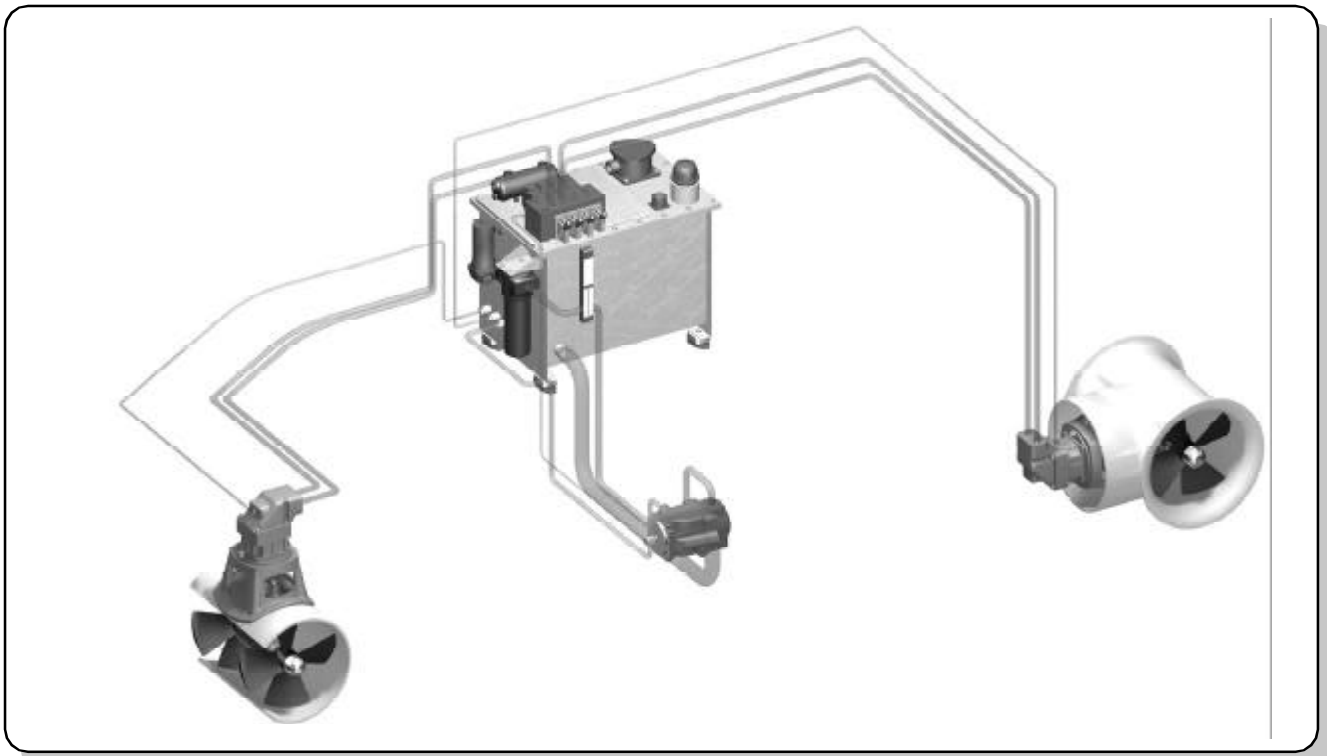
® SIDE-POWER

Hydraulic system

Keep this manual onboard !

Installation and start-up



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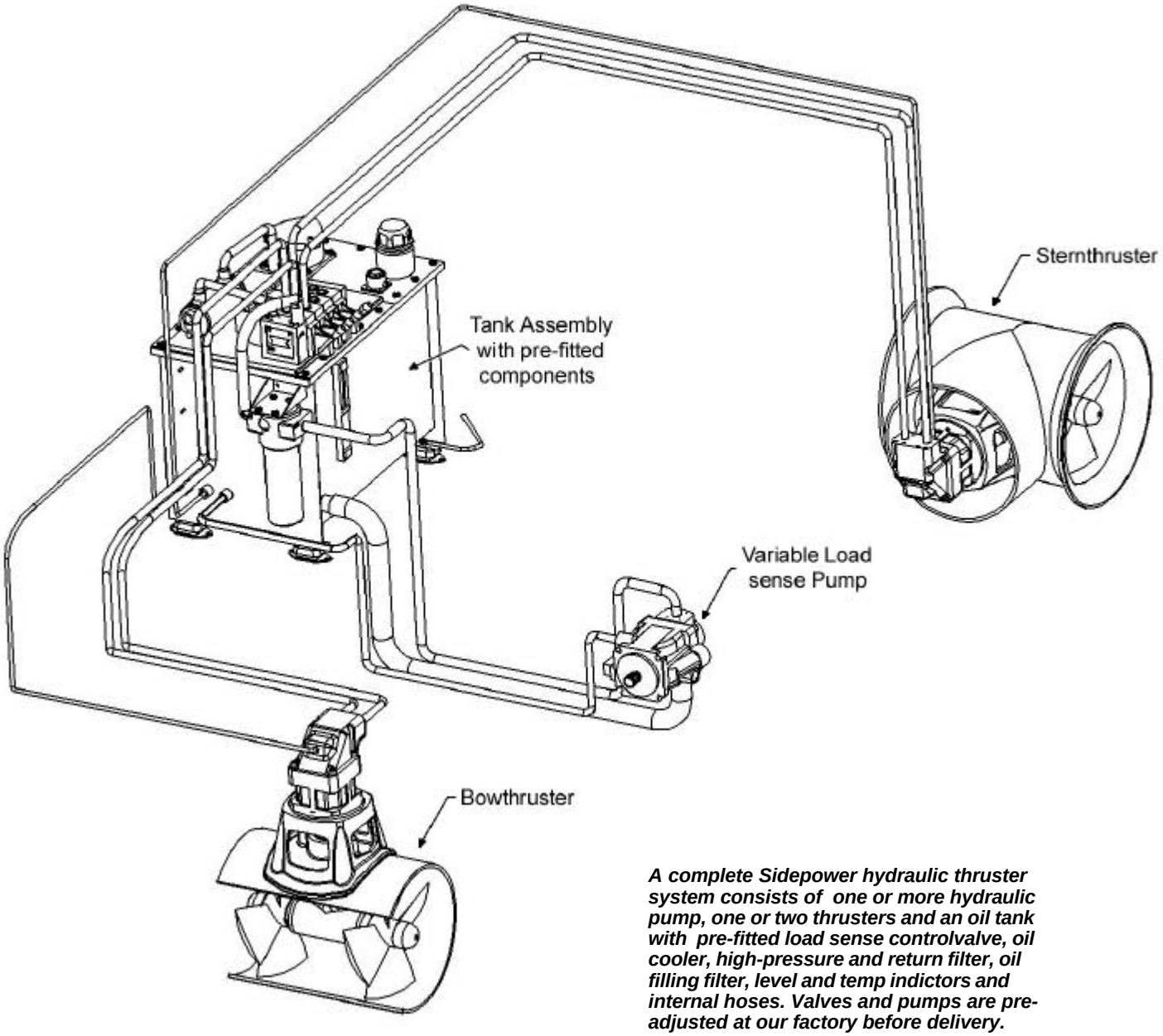
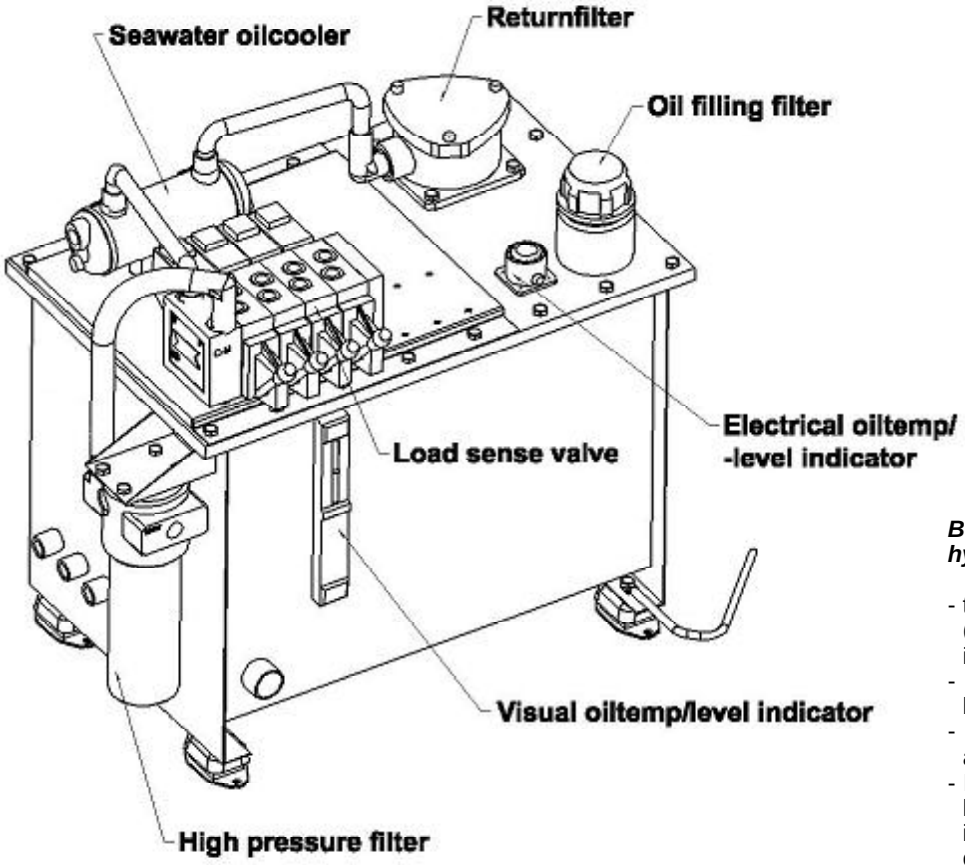


A complete Sidepower hydraulic thruster system consists of one or more hydraulic pump, one or two thrusters and an oil tank with pre-fitted load sense controlvalve, oil cooler, high-pressure and return filter, oil filling filter, level and temp indictors and internal hoses. Valves and pumps are pre-adjusted at our factory before delivery.

Sidepower hydraulic tank and components



Before you install the Sidepower hydraulic thrusters system:

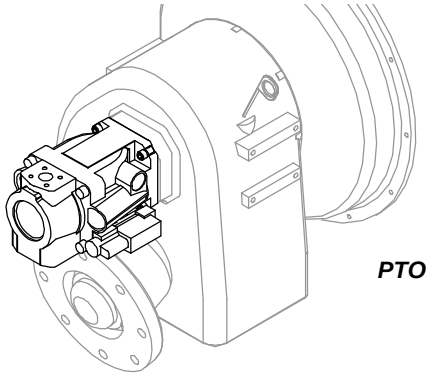
- the thrusters should already be installed (please see the mechanical thruster installation manual)
- hydraulic components can be damaged by dust and dirt
- all hydraulic components must be assembled in a clean environment
- keep these away from the boat until you have finished the «dirty» part of the installation (grinding, drilling etc.) and cleaned up

How to connect the hydraulic pump to the power source

Because of experience with hydraulic thrusters we know there are only two real methods of connecting a hydraulic pump to the motor or generator:

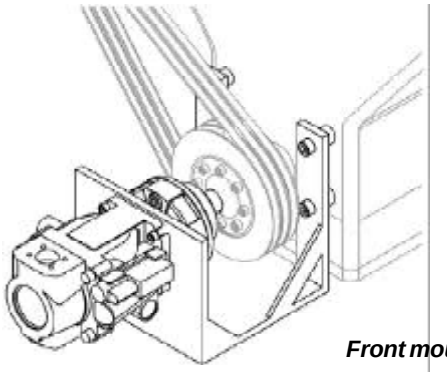
- Power Take Off (PTO) at the gearbox or the motor
- Front mounted with use of a bracket and a flexible coupling

PTO mounted pump
The pump can with a great advantage be assembled to a generator. The advantage with this type of installation is that the pump will be driven by a higher and more stabile speed than installed to the main engine.
You can thereby usa a smaller pump in such an installation.



PTO mounted pump

Front mounted pump
In a lot of hydraulic installations there are no PTO's available. Then you have to use another method of pump to power source connection.
A very reliable way to connect the pump to the motor is to use a bracket and a flexible coupling. The reason for using a flexible coupling is to avoid problems with misalignments between the pump shaft and the motor shaft, because it will always be a tolerance when you make a bracket for the hydraulic pump.
It is important that the hydraulic pump is fixed to the bracket, and the bracket itself is locked to the motor. The pump has to move with the motor.



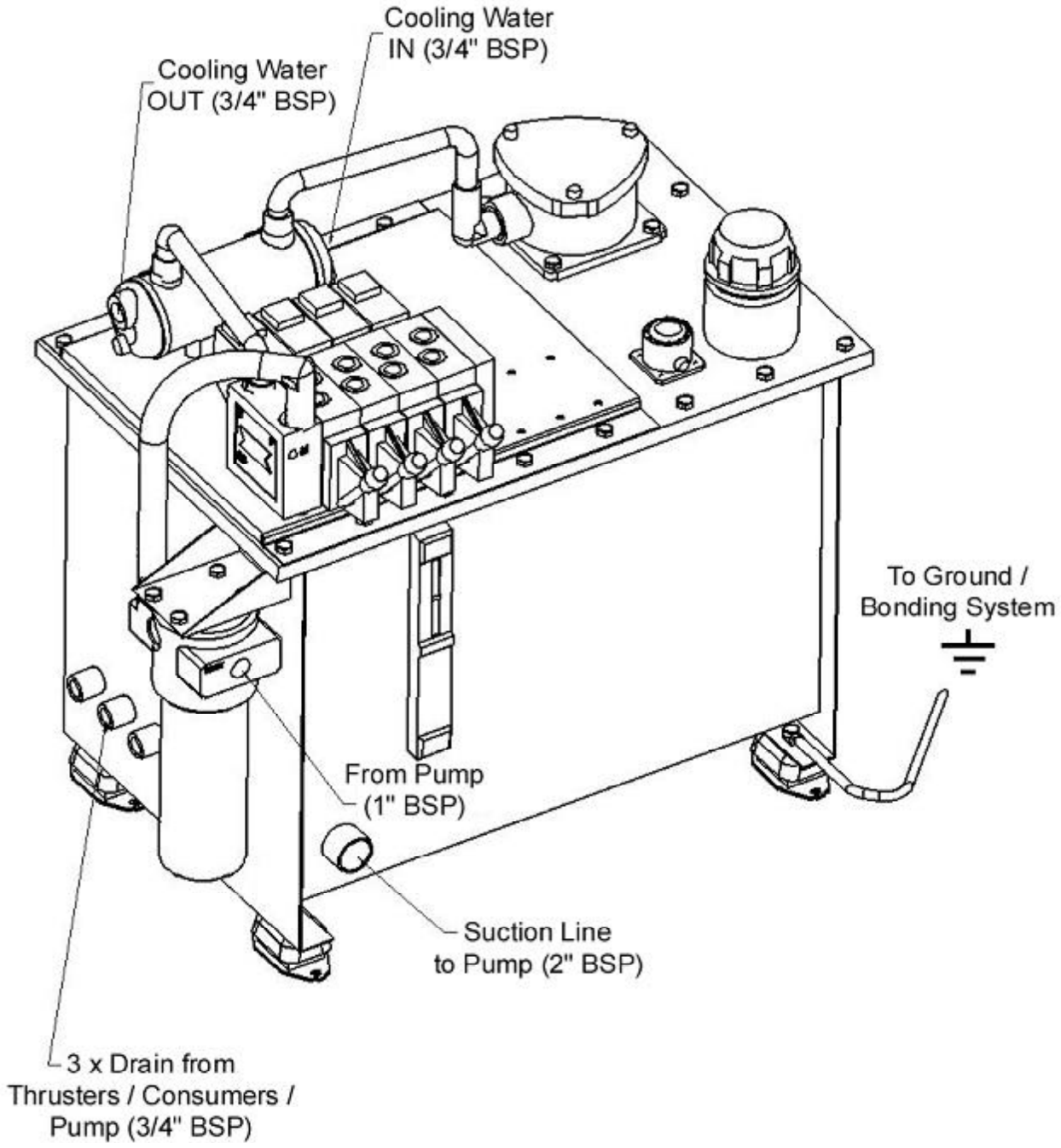
Front mounted pump

Warning !
Check that the power source direction is in accordance with pump direction !
NB ! Please see pump nameplate L=CCW and R=CW

- Place the tank in a position where you have access to the front- and left side for connections and inspection. Ensure that there is room enough above the tank to lift out and replace the return filter.
- The system requires overpressure in the pumps suction line. Place the tank high enough to get the oil level above the hydraulic pump.
- Fasten the tank assembly properly.
- Ground the tank to the boats bonding system.
- Ensure that the tank and the other components are absolutely clean before you start mounting fittings and hoses.

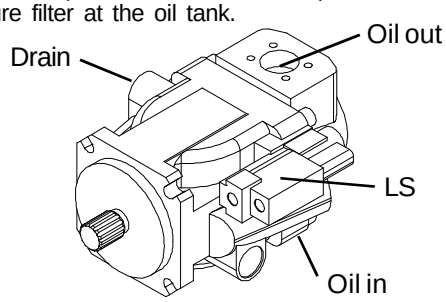
Hose connections

Each thruster system is calculated and set up individually by Sidepower. Please see the enclosed systemdrawings for the actual installation to get the right hoses and fittings.
We advive that you let professionals make the hoses and fittings.
Make sure to clean the hoses internally before assembly.



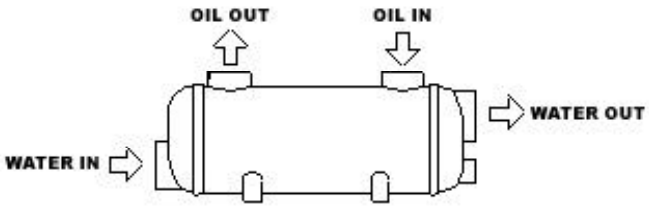
Pump connections

- Fit the LS-hose from the «LS»-port at the valve to the «X»-port on the pump.
- The drain hose should be connected to the highest position of port «L1» and «L2» at the pump (please see pump drawings). Use one of the three drain (3/4" BPS-connections) at the tank.
- Suction hose can be mounted with nipples and hose clamps at pump inlet (2" SAE 3000 PSI).
- Pressure hose has to be mounted at pump outlet (1" SAE 3000 PSI) and at the free 1" BSP port at the high-pressure filter at the oil tank.



Cooling water to oil cooler

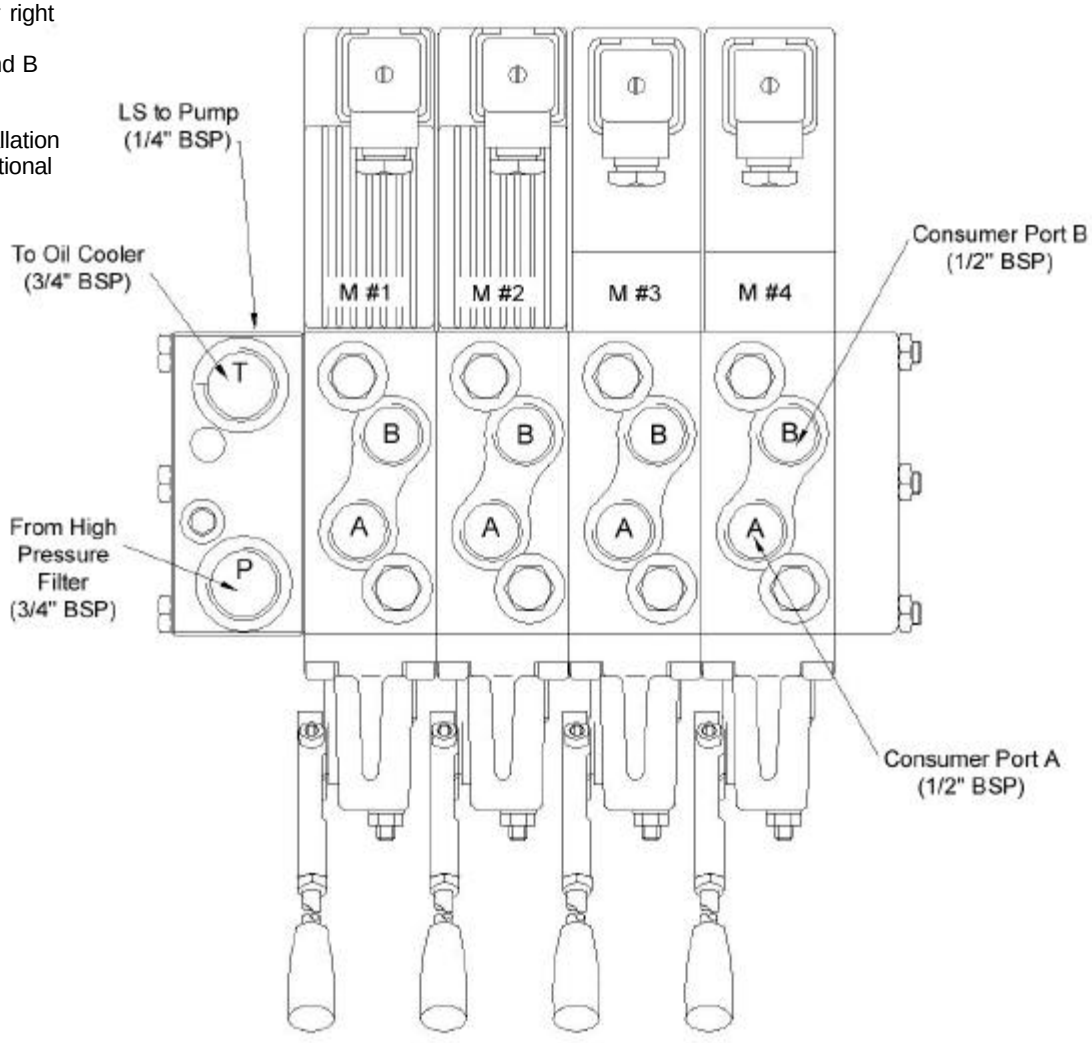
Because of the cooling effect, the direction of the oil flow in a cooler has to be opposite to the waterflow direction.
To get enough cooling the cooler must be supplied with 7-15 l/min. seawater at max 30°C.



Valve connections and connections for additional consumers

Sidepower hydraulic thruster systems can be delivered with various numbers of modules and set-up. Please see enclosed system drawings and valve documentation for Flow/Pressure settings at the actual valve module.
Be sure to connect your consumers to the right modules (right set-up for right consumer).
Attach each consumer to the A and B consumer ports.

Please see the consumers installation manual for on how to install additional consumers.
Connect drain from consumers to drain port at tank.



Electrical wiring

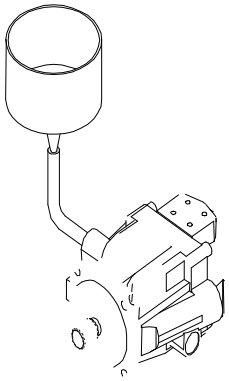
Before you start wiring, it's important to remove the positive battery terminal.
Please see the enclosed electrical drawings for more detailed information.

System fill-up

Fill the oil tank with correct hydraulic oil through the oil filling filter. Use mineral based hydraulic oil with anti-wear additives, viscosity ISO VG 32.00 (by ISO 3448)

The oillevel in the tank should be approx. at the middle of the visual level indicator.
Because vessels heels and the fact that we have an air filter at the oil tank top, avoide higher oillevel than the visual level indicator can show.

Pump(s) have to be filled through their upper drain port.
Pump damages caused by running pumps without oil is not covered by warranty.



Starting up the hydraulic system

Before starting the pumps (main engines):
- Make sure that the vessel is secured so that it will not move in an undesired way when the thruster(s) start pushing.
- Check that the rotation direction of the pump is correct for the rotation direction of the PTO or the motor. Damaged pumps due to faulty drive direction is not covered by warranty.
- Check that the pump drain hose is present.
- Check that all fittings are tightened and not leaking.
- Check that all valves are in centre (no load) position.
- Make sure that the suction hose from the tank to the pump are filled up with oil.
- Remove all electrical connections to the valve.

Starting up the pumps / system

- NOTE ! Make sure to wear protective goggles/glasses in case a hose or fitting is faulty as it could blow when pressurized and high pressure oil will dammage your eyes.
- Start the pumps power source at as low a speed/rpm as possible.
- Run the pumps for approx. 30 sec. Only before stoping the pump(s) power source. Control and refill the oil level at the hydraulic oil tank.
- Check the hose / pipe fittings again for leakages
- Start the pumps power source again, and run the thruster manually with the lever at the valve. Control at the same time the hydraulic pump pressure at the pressure gauge. Start with only 20 to 30% effect (possible to control also on thrusters with single speed control if done with manual levers).
- Control and refill the oil level in the tank and check connections and hoses to the thruster.

Starting up the system

- Run all other hydraulic components in the system using the manaul lever for its valve section at 20 to 30% power, the same way as with the thruster. Check oil level and refill tank, as well as all hoses and connections for each component before doing another.
- The noise level will be reduced during the time you do this low effect running because you pump the air out of the system and bleed the oil in the tank.
- If the noise level do not decrease after approx. 5-7 minutes running it is possible that there is an air leakage in the pumps suction hose / hose connection. Check and repair if necessary.
- Make sure the tank is at the right level.
- Run all components, one at the time, at full power and check the pressure according to the enclosed documentation for each module at the valve.

Starting up the system

- We recommend to run the system for about one hour while continously monitoring the oil temperature and dirt indicating gauges on the filters to ensure that the system is 100% correct before starting to use and rely on it's function.
- It is very important for the lifetime and efficiency of the hydraulic components to avoid an oil temperature at more than 60^0C.

Servicing the hydraulic system

- A hydraulic thruster system requires more service and maintenance than a DC electric thruser system.

- Check filter gauges and oil level periodically, typically at the same time as checking your main engines oil level.
  PS ! A large hydraulic consumer must run at full speed for the dirt indication gauges to work.
- Minimum once a year, the hoses and hose fittings must be checked for wear and leakages. Make sure that all fittings are tight and secure. This must be done more often on a commercial vessel with lots of usage of the hydraulic system. We also advice to drain a little bit out of the drain plug of the tank once a year to let any possible sedimentation and water out.

Warranty statement

1. The equipment manufactured by Sleipner Motor AS (The "Warrantor") is warranted to be free from defects in workmanship and materials under normal use and service.
2. This Warranty is in effect for of two years from the date of purchase by the user. Proof of purchase must be included, to establish that it is inside the warranty period.
3. This Warranty is transferrable and covers the product for the specified time period.
4. In case any part of the equipment proves to be defective, other than those parts excluded in paragraph 5 below, the owner should do the following:
(a) prepare a detailed written statement of the nature and circumstances of the defect, to the best of the Owner's knowledge, including the date of purchase, the place of purchase, the name and address of the installer, and the Purchaser's name, adress and telephone number;
(b) the Owner should return the defective part or unit along with the statement referenced in the preceding paragraph to the warrantor, Sleipner Motor AS or an authorized Service Centre, postage/shipping prepaid and at the expense of the Purchaser;
(c) if upon the Warrantor's or Authorized Service Centre's examination, the defect is determined to result from defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense;
(d) no refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. Prior to refund of the purchase price, Purchaser must submit a statement in writing from a professional boating equipment supplier that the installation instructions of the Installation and Operation Manual have been complied with and that the defect remains;
(e) warranty service shall be performed only by the Warrantor, or an authorized Service Centre, and any attempt to remedy the defect by anyone else shall render this warranty void.
5. There shall be no warranty for defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically designed as waterproof.
6. No other express warranty is hereby given and there are no warranties which extend beyond those described in section 4 above. This Warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, and any other obligations on the part of the Warrantor or its employees and representatives.
7. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any person or persons, or damage to property, loss of income or profit, or any other consequential or resulting damage or cost which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure or malfunction of the equipment, or part thereof.
8. The Warrantor assumes no liability for incidental or consequential damages of any kind including damages arising from collision with other vessels or objects.
9. This warranty gives you specific legal rights, and you may also have other rights which vary from country to country.

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