

*Before you do it your way,
please try it our way*



**SEASTAR
SOLUTIONS®**

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INSTALLATION INSTRUCTIONS

SUPPLEMENTAL

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**SEASTAR™
SEASTAR™
PRO**

Hydraulic Steering



SEASTAR
SOLUTIONS®

⚠ WARNING

Cleaning fluids containing ammonia, acids or any other corrosive ingredients **MUST NOT** be used for cleaning any part of this Hydraulic Steering System. Failure to comply will cause serious damage to the steering system, resulting in possible loss of steering, causing property damage, personal injury and/or death.

⚠ CAUTION

If a 20° mounting wedge is used, cut out dash as per mounting wedge template and mount helm directly to the 20° wedge.

⚠ WARNING

DO NOT use ANY SeaStar PRO helm pump with "unbalanced" steering cylinder as a steering lock up **WILL** result.

SAFETY INFORMATION

⚠ WARNING

The safety information provided below is intended to inform you of the dangers that may be present before, during and after use. It is critical that you read and understand **ALL** the points noted.

PRIOR TO EVERY USE

1. Check Fluid level in highest helm pump (see page 2 for proper fluid level setting).
2. Verify immediate steering response when turning steering wheel(s). Ensure engine(s), rudder(s) and/or outdrive(s) turn when all steering wheels are turned.
3. Visually inspect all steering hoses and fittings for wear, kinking and/or leaks.
4. Check for binding, loose, worn or leaking steering components.

DO NOT OPERATE BOAT IF ANY COMPONENT IS NOT IN PROPER WORKING CONDITION.

DURING USE

1. WEAR A COAST GUARD-APPROVED PERSONAL FLOTATION DEVICE (PFD).
2. ATTACH ENGINE SHUT-OFF CORD (LANYARD) TO YOUR PFD.
3. Never allow anyone not familiar with the operation of the steering system operate the boat at any time.
4. Know and adhere to the operator restrictions for your area including:
 - Federal Laws/Regulations,
 - State Laws/Regulations and
 - Municipal Laws/Regulations.

DO NOT OPERATE BOAT IF ANY COMPONENT IS NOT IN PROPER WORKING CONDITION.

AFTER USE

1. Rinse off steering system thoroughly using "fresh, clean water only".
 - Cleaning fluids containing ammonia, acids or any other corrosive ingredients **MUST NOT** be used for cleaning any part of the hydraulic steering system.

MAINTENANCE

1. Maintain steering system at a minimum of twice per year.
 - For more details see maintenance, section of your owner's manual.

Keep our waters clean for all current and future users. Dispose of ALL fluids in accordance with your local regulations.

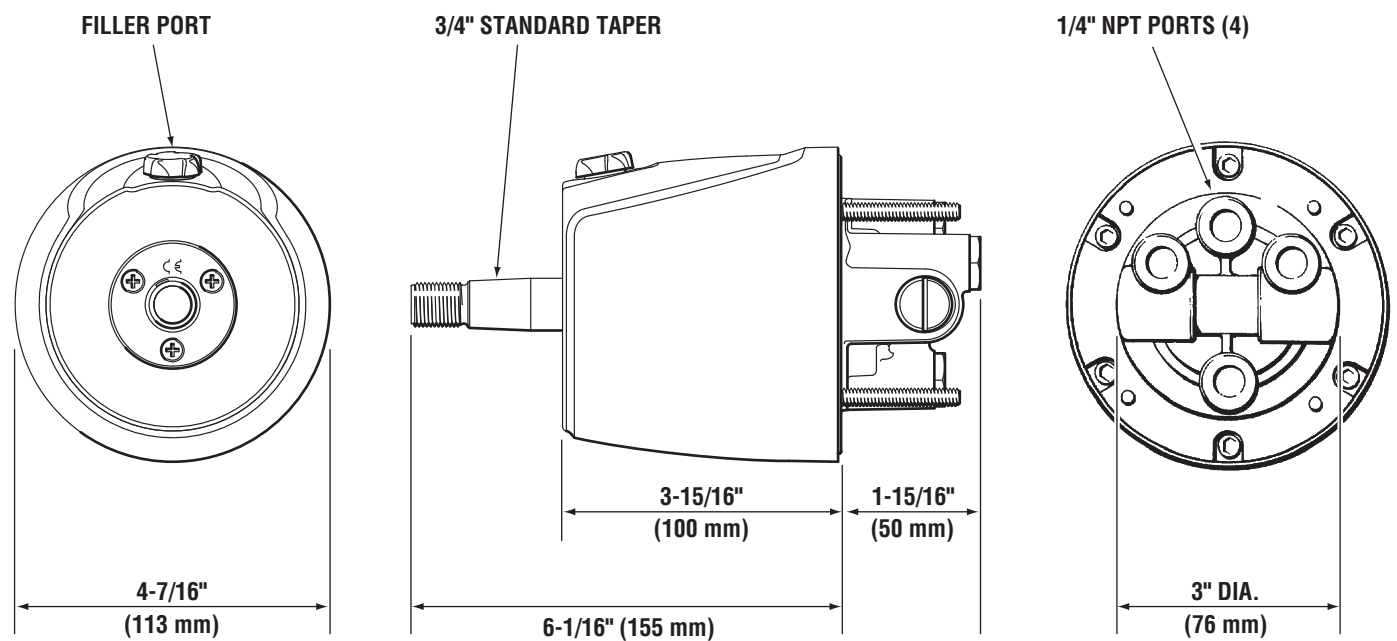
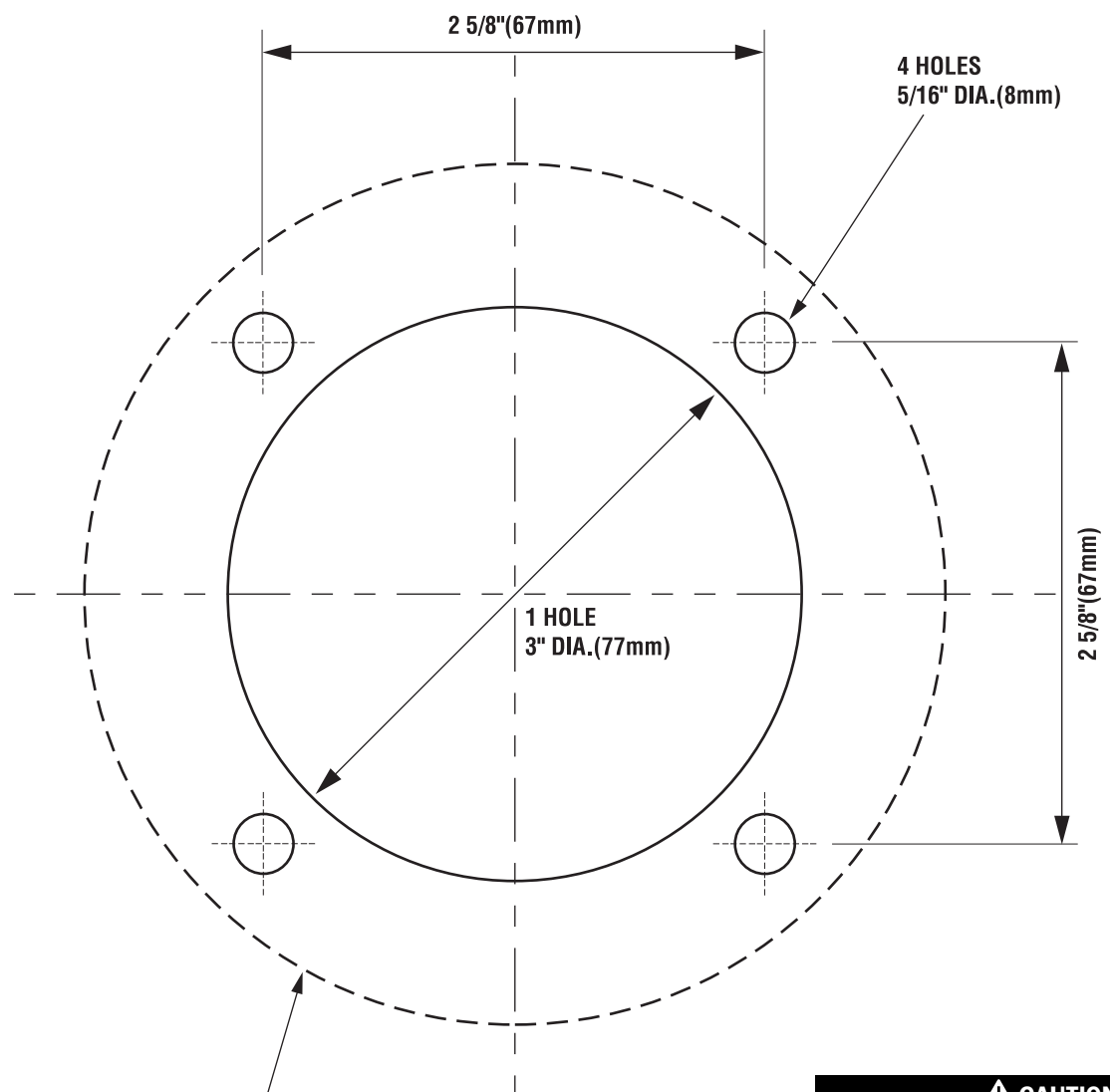


Figure 1.

DASHBOARD MOUNTING TEMPLATE

Mounting template for Standard Front Mount applications only.



**HELM FLANGE OUTLINE (for reference only)
4 1/2" (115mm) DIA. MAXIMUM COVERAGE**

⚠ CAUTION

If photocopied check **ALL** measurements using a measuring device to ensure accuracy.

NOTICE

Important information on reverse side, **DO NOT** cut out.

Figure 2.

MOUNTING THE HELM

Ensuring that the steering wheel will not interfere with any other functional equipment and you have adequate space "behind" the dash for fittings and steering line connections, determine your desired mounting position.

NOTICE

The helm may be mounted with the helm shaft horizontal, vertical or any angle between.

At ALL times the fluid cap MUST be in the uppermost position.

- Tape mounting template to dash and use a center punch for locating required holes.
- Drill the 3" diameter hole and the four 5/16" diameter mounting holes, positioned as shown.
- To ease installation, install your helm hose fittings into the helm pump prior to mount. See NPT fitting installations.
- Ensuring the fill port is in the uppermost position, install helm pump onto dash.
- Install the four washers and four nuts onto the mounting studs of the helm pump. Torque nuts to 15 ft-lb.
- Lightly grease taper of the helm pump shaft and mount steering wheel to helm. Tighten wheel shat nut to 150 in-lb.
- Install hoses as directed in your steering cylinder installation manual.
- Fill and Purge steering system as outlined in your steering cylinder installation manual.

NPT Fitting Installations ONLY:

- Apply a liquid, Teflon based pipe sealant onto the threads going into the helm pump.
- Tighten fitting HAND-TIGHT.
- Using a wrench, tighten an additional 1.5 turns.
- Continue to tighten until desired orientation is met.

CAUTION

DO NOT attempt to install NPT pipe fittings into a cylinder and/or helm pump fitted with an ORB hose fitting port. Doing so will lead to irreparable damage to the cylinder and/or helm port. ONLY use ORB hose fittings provided by SeaStar Solutions.

DO NOT use Steel Fittings with SeaStar Helm Pumps use Brass fittings ONLY.

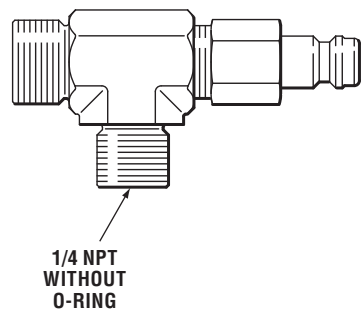


Figure 3.

WARNING

Never use brake fluid. Any non-approved fluid may cause irreparable damage, loss of steering, and cancellation of warranty.

In cases of extreme emergency any non-toxic, non-flammable fluid may provide temporary steering.

NOTICE

Filling the helm full of oil can be done faster if oil is poured into the helm prior to connecting filler tube and oil bottle to the helm.

HYDRAULIC FLUID

Recommended oils for your steering system are:

- SeaStar Hydraulic Fluid, part# HA5430
- Texaco HO15
- Shell Aero Fluid #41
- Esso Univis N15
- Chevron Aviation Fluid A
- Mobil Aero HFA
- Fluids meeting MIL-PRF-5606H specifications.
- Automatic transmission fluid Dexron II may be used in an emergency.

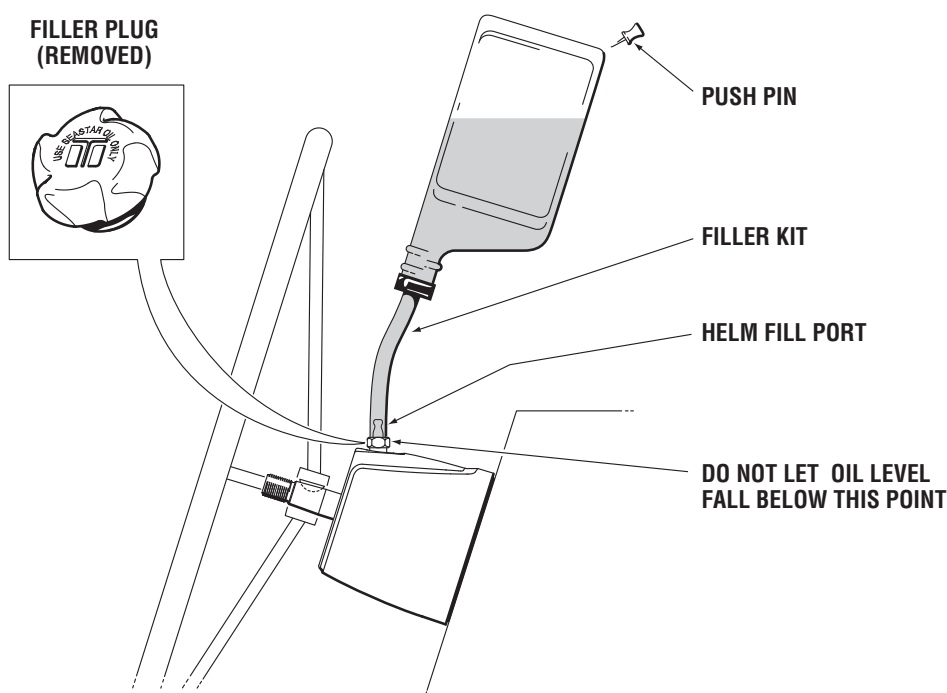


Figure 5.

HYNAUTIC HOSE

IF USING 3/8" ID OR 5/16" ID HYNAUTIC HOSE WITH THIS SEASTAR HELM PUMP PLEASE BE AWARE OF THE FOLLOWING:

The fittings enclosed with this SeaStar Helm Pump are for use with a 5/16" ID SeaStar Hose or 3/8" OD Nylon Tubing ONLY.

If using 5/16" ID or 3/8" ID Hynautic hose, a separate Hynautic fitting kit is required (purchased separately).

Examples of a typical Hynautic installations are shown in figures 6 and 7. Installations may vary, please confirm what parts are required for your application before proceeding.

WARNING

DO NOT use ANY Hynautic hose or tubing with SeaStar Pro Helms.

Installation of new fittings:

Remove plugs from helm pump. Apply a PST based Teflon pipe sealant.

DO NOT USE TEFLON TAPE.

Torque new fittings to 140in-lb (16.18N-m).

Attach Hynautic hoses.

WARNING

DO NOT attempt to connect 45° flare hydraulic hose fittings with the fittings supplied with the SeaStar Helm Pump. Failure to comply with the above may result in loss of steering causing property damage and/or personal injury.

HYNAUTIC FITTING KIT#	QTY.	PART#	DESCRIPTION	REFER TO FIGURE
HF-05	2	690051	Elbow: For use with the "P" and "S" ports and either the 3/8" or 5/16" ID Hynautic Hose.	6 & 7
	1	690011	Straight Fitting: For use with 3/8" ID or 5/16" ID Hynautic Hose Return Line.	7
	1	691061	Straight Fitting: For use with 3/8" OD Tubing Return Line.	7
	1	285621	Straight Fitting: For use with 1/4" Copper Tube Return Line.	7

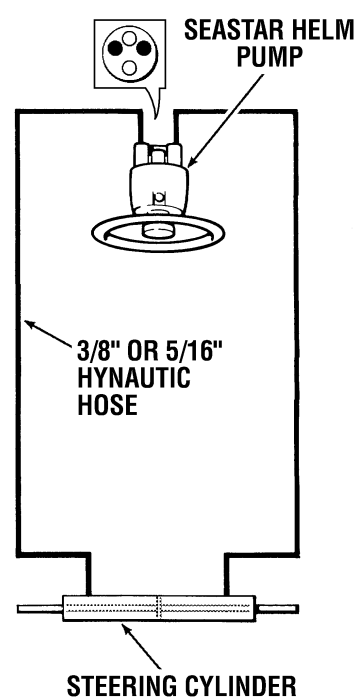


Figure 6.

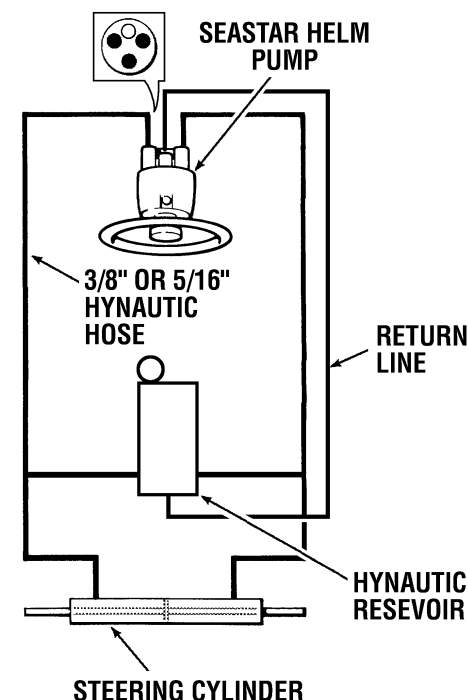


Figure 7.

OIL LEVEL & SYSTEM CHECK

STEP 1 – Oil Level Setting

WARNING

The oil level MUST be checked and maintained BEFORE EACH use to ensure safe steering operation. Failure to adhere to this warning may lead to loss of steering control resulting in persons being ejected from vessel or collision with an obstacle, leading to property damage, personal injury and/or death.

CAUTION

Side mount and Splashwell mount cylinders are unbalanced. To set the oil level in the helm pump the cylinder rod MUST be fully "retracted (cylinder shaft all the way in the cylinder body). Failure to adhere to this caution WILL result in oil spillage at the helm filler port and/or stiff steering operation.

- For helms mounted with the wheel shaft completely horizontal MUST be filled to the bottom of filler hole AT ALL TIMES. DO NOT allow oil level to drop more than 1/4" below filler threads.
- For helms mounted on a 20 degree angle, or, with wheel shaft in the vertical position, oil level should be within 1/2" of filler hole.

STEP 2 – System Check

WARNING

The system check MUST be completed after installation. Doing so will ensure the safe operation of your steering system and will any fault/leak will show at this time. Failure to adhere to this warning/check may result in the loss of steering control leading to ejection from the vessel, or, collision with an obstacle resulting in property damage, personal injury and/or death.

- Turn steering wheel hard over to hard over to confirm unrestricted movement of the steering system and hoses. Repeat this procedure in ALL trim/tilt positions of the engine(s). If interference occurs, or, hoses are being stretched this MUST be removed prior to operating your boat.
- Confirm that engine(s) are deflecting to the proper direction when steering wheel is turned.
- If no interference is noticed, or, any interference is corrected, go to next step.
- Take steering wheel hard over to starboard (any helm can be used on a multi-station boat). Once the wheel reaches its stop point (cylinder is fully stroked out), continue to force the wheel one (1) full turn past stop. Leave wheel in this position while you check all PORT side connections, fittings, seals and hoses for leaks.

NOTICE

This step will NOT harm the system and any noise made during this step should not be considered a fault in the steering system.

- If leaks are noticed they MUST be repaired prior to operating boat. After repair repeat bleeding procedures as outlined in this manual
- Repeat to the Port direction and inspect ALL starboard side connections, fittings, seals and hoses for leaks.

NOTICE

This step will NOT harm the system and any noise made during this step should not be considered a fault in the steering system.

- If leaks are noticed they MUST be repaired prior to operating boat. After repair repeat bleeding procedures as outlined in this manual.

WARNING

Failure to complete the above noted step or, failure to correct a problem may result in loss of steering control leading to ejection from the vessel or collision with an obstacle resulting in property damage, personal injury and/or death.