

# MANUAL FILLING AND PURGING THE SYSTEM

## Read First

These instructions show how to fill and purge a SeaStar Steering System with the P/A unit installed. The same steps apply to ALL cylinders with the exception of which bleed fitting to open and close and the direction the cylinder rod moves. These variations are shown in inset diagrams at each step. For multiple steering stations, start with the lowest station while going through Steps 1 – 7, repeat at each higher station until complete.

## ⚠ CAUTION

**DO NOT turn ON P/A unit until manual portion is completed.**

**This procedure requires two people. One person may not be able to remove all the air from the system, which will result in spongy, unresponsive steering.**

During the entire filling procedure, fluid **MUST** be visible in the filler tube. **DO NOT** allow fluid level to disappear into the helm pump, as this may introduce air into the system and increase your filling time.

## Hydraulic Fluid Requirements

2 bottles (2 quarts or liters) for single station and single cylinder systems. One additional bottle for each cylinder, helm, and or autopilot added to the system.

## NOTICE

*Fluid can be re-used if filtered through a fine mesh screen such as that used for gasoline. If unable to filter fluid, an additional bottle of fluid is required.*

## NOTICE

*“Bleeder” refers to cylinder or P/A unit fitted with bleed fittings. Bleed fittings can be opened by unscrewing bleed nipple nut two turns.*

## NOTICE

*Protect your boating environment by ensuring that all used fluid is disposed of properly.*

## Single Station One Cylinder

## NOTICE

*BEFORE bleeding the main steering system (helm, hoses and cylinders), the RETURN line will need to be purged.*

## Step 1

### Removing Air From Return Line

- Install the fill tube and fluid fill bottle into the helm pump.

## NOTICE

*Filling the helm full of fluid prior to connecting the filler tube and fluid bottle will decrease purge time.*

- Open the manual bleed valve (see Figure 10) and reservoir bleed fitting (see Figure 10) on the power assist unit. The manual bleed valve should be opened two full turns.

# SEASTAR POWER ASSIST

## FILLING AND PURGING

- Fill helm with fluid, then, turn steering wheel to the starboard side until a steady stream of “air-free” fluid comes out of the reservoir bleed fitting on the Power Assist Unit.
- Close reservoir bleed fitting.
- Continue to turn the wheel to starboard another 15 turns after closing the reservoir bleed fitting and prior to closing the manual bleed valve.
- Close manual bleed valve and continue with Steps 2 – 5.

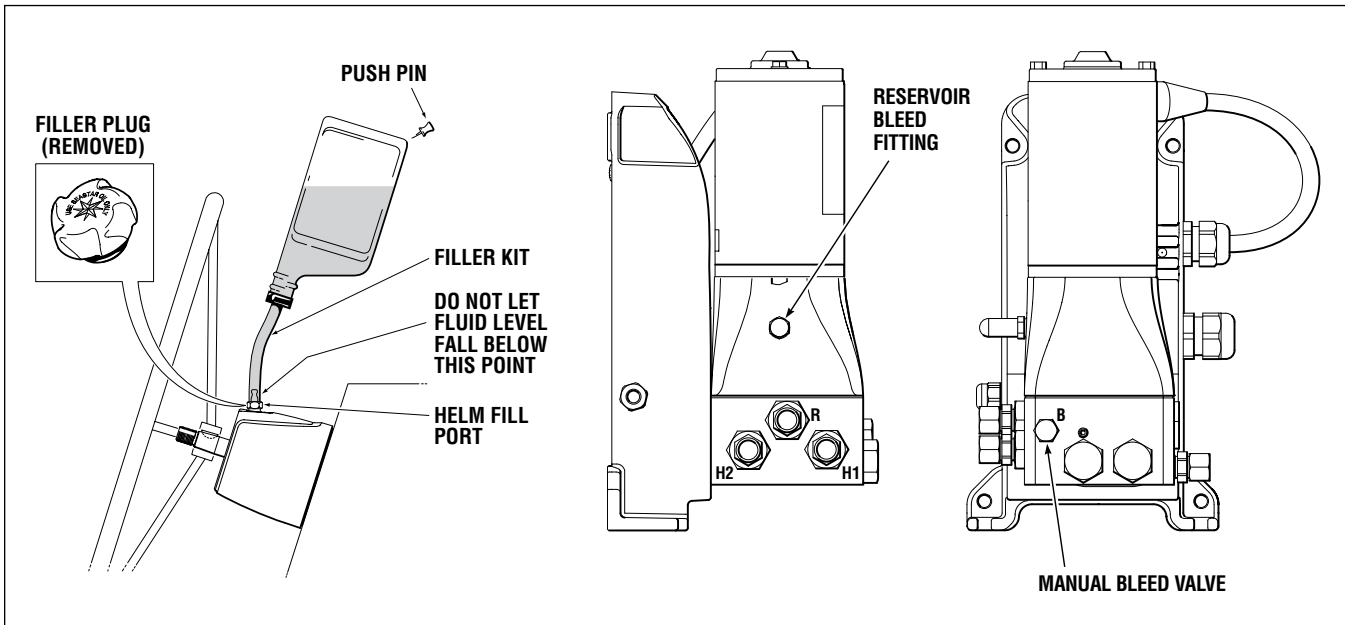
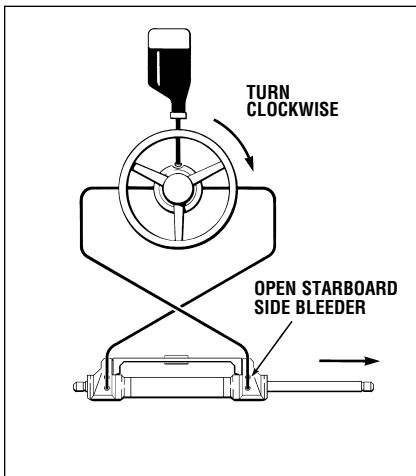


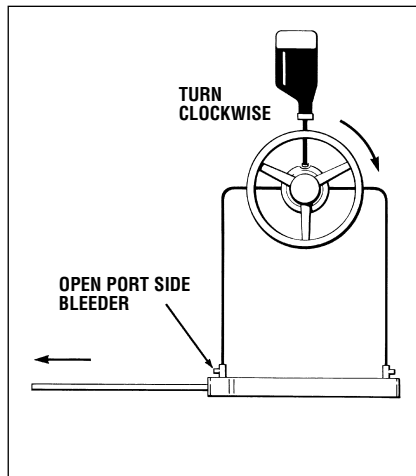
Figure 10.

### Step 2

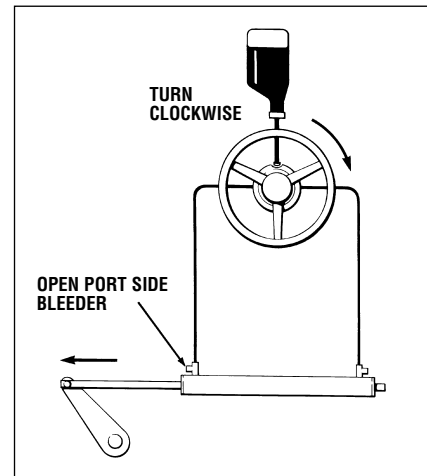
- Turn the steering wheel clockwise until the cylinder rod is fully extended on the proper side of the cylinder as shown below.
- Open bleed fitting as per your installation.



Outboard Front Mount & HC5332 Cylinder.



Side Mount / Splashwell Mount Cylinder.



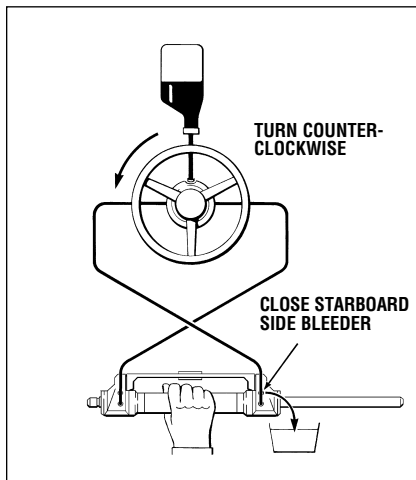
All Balanced Cylinder. Inboard & Sterndrive Cylinders.

**Step 3**

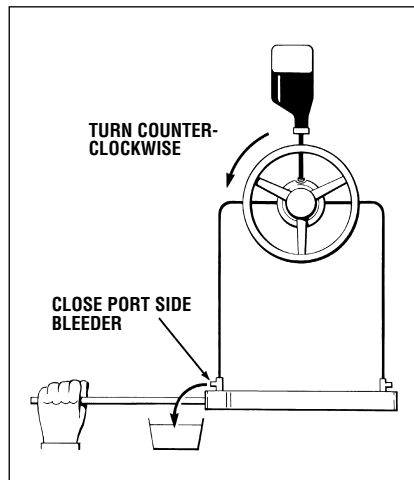
- Holding the cylinder body (Front Mount cylinder) or rod (Side Mount cylinder) to prevent the body/rod from moving, turn the steering wheel counter-clockwise until a steady stream of air free fluid comes out of the bleeder. (Drain approx. 1/2 bottle of fluid or as required).

**Do not use anything other than your hands to restrain the cylinder body/rod.**

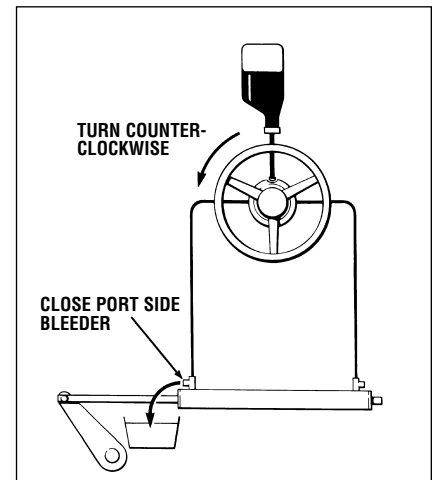
- While continuing to turn the wheel close the bleed fitting for your application and let go of the cylinder body/rod.



*Outboard Front Mount & HC5332 Cylinder.*



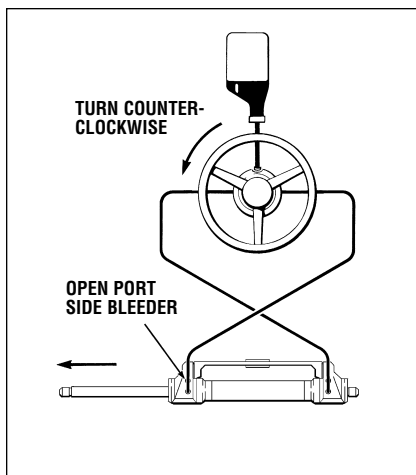
*Side Mount / Splashwell Mount Cylinder.*



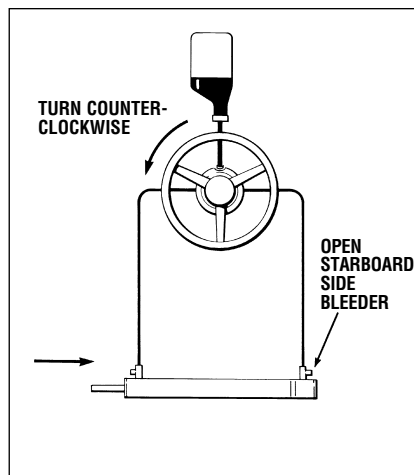
*All Balanced Cylinder. Inboard & Sterndrive Cylinders.*

**Step 4**

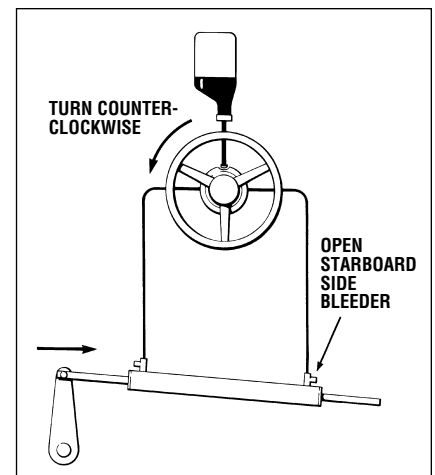
- Continue turning the steering wheel counter-clockwise until the cylinder to the rod is fully extended proper side of the cylinder as shown below. (Steering wheel will come to a stop).
- Open bleed fitting as per your installation.



*Outboard Front Mount & HC5332 Cylinder.*



*Side Mount / Splashwell Mount Cylinder.*



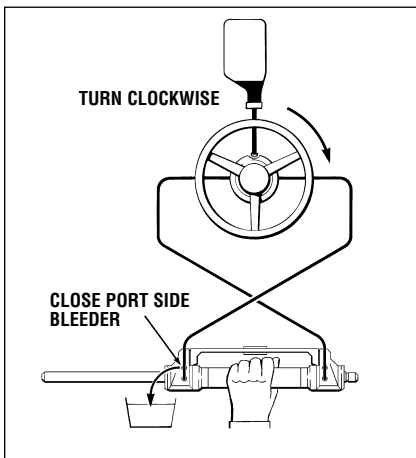
*All Balanced Cylinder. Inboard & Sterndrive Cylinders.*

**Step 5**

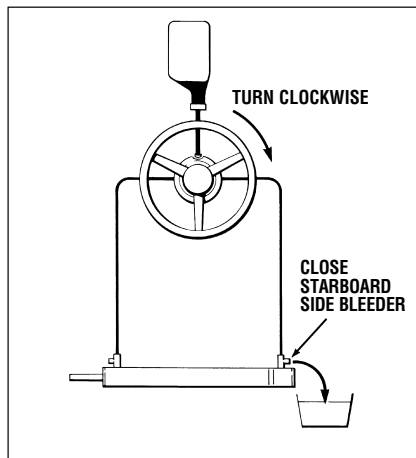
- Holding the cylinder body (Front Mount cylinder) or rod (Side Mount cylinder) to prevent the body/rod from moving, turn the steering wheel clockwise until a steady stream of air free fluid comes out of the bleeder.
- While continuing to turn the wheel close the bleed fitting for your application and let go of the cylinder body/rod.

**⚠ CAUTION**

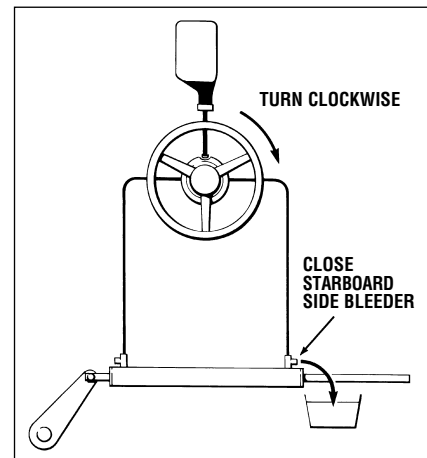
**Prior to operating system, perform Fluid Level and System Check, refer to page 22.**



*Outboard Front Mount & HC5332 Cylinder.*



*Side Mount / Splashwell Mount Cylinder.*



*All Balanced Cylinder. Inboard & Sterndrive Cylinders.*

**Step 6**

- Complete electrical connections as outlined in your Installation Owner's Manual.
- Repeat Steps 2 – 5 of purging instructions with the P/A unit "ON"

**NOTICE**

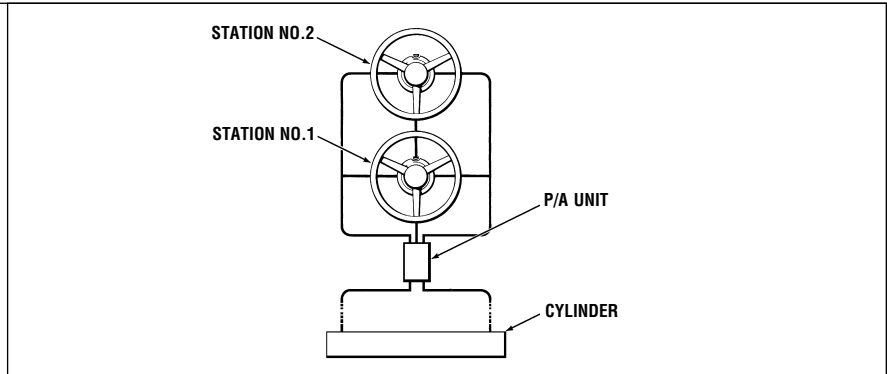
*Be sure to remove ALL air from the autopilot reservoir line.*

*If the system has an autopilot installed, ensure that the autopilot pump is run for at least 10 seconds in both directions during Step 3 and Step 5.*

## Twin Station Single Cylinder

Perform Steps 1 – 6 at station no. 1. Then repeat Steps 2 – 5 at station no. 2.

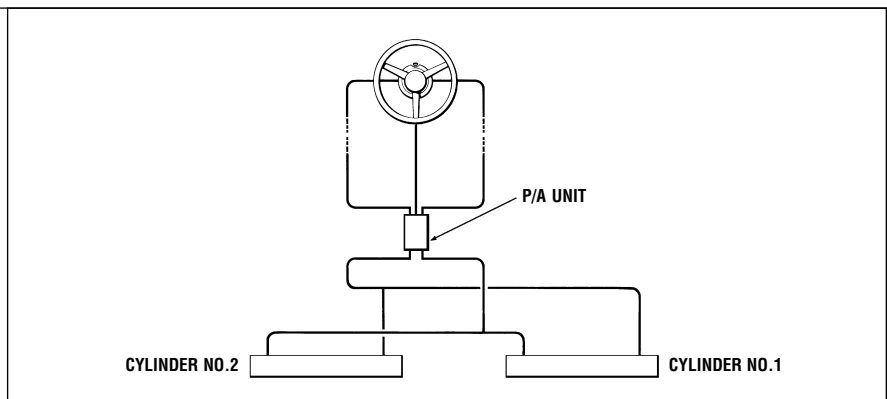
**Note:** Refer to Fluid Level and System Check on page 22.



## Single Station Twin Cylinder

When performing Steps 2 – 5, perform instructions in each step first on cylinder no. 1 and then on cylinder no. 2, before proceeding to the next step. i.e: Perform instructions referring to starboard side of cylinder first on cylinder no. 1 and then on cylinder no. 2.

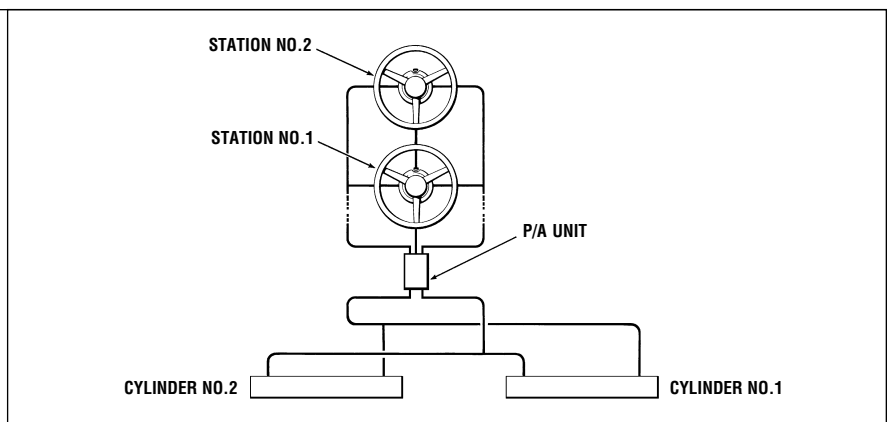
**Note:** Refer to Fluid Level and System Check on page 22.



## Twin Station Twin Cylinder

Follow same procedure as instructed for single station-twin cylinders, beginning at station no. 1, and repeat entire procedure at station no. 2.

**Note:** Refer to Fluid Level and System Check on page 22.



## Fluid Level and System Check

At this time the steering system must be checked for proper connections hose and fittings, possible leaks, and air removal. Please complete the following steps with the P/A Unit OFF.

- Turn steering wheel to hard over, then force the wheel another one quarter to one half turn past the stop point. Check the following areas for evidence of a leak.
  - Helm fitting connections
  - P/A fitting connections
  - Cylinder fitting connections
- Repeat above steps to the other steering direction.
- Any sign of a leak **MUST** be repaired prior to operating the boat.
- While turning steering wheel observe fluid level in the helm pump. If fluid level drops and rises as the wheel is being turned there is still air in the system. Complete bleeding instructions again until no obvious fluid level change is noticed.

### NOTICE

*Helms mounted with the wheel shaft completely horizontal must be filled to the bottom of the filler hole at all times. Do NOT allow the fluid level to drop more than one-quarter inch below the filler hole.*

### NOTICE

*Helms mounted on a 20 degree angle or with the wheel shaft vertical MUST have the fluid level within 1/2" of the filler hole, refer to the diagram below.*

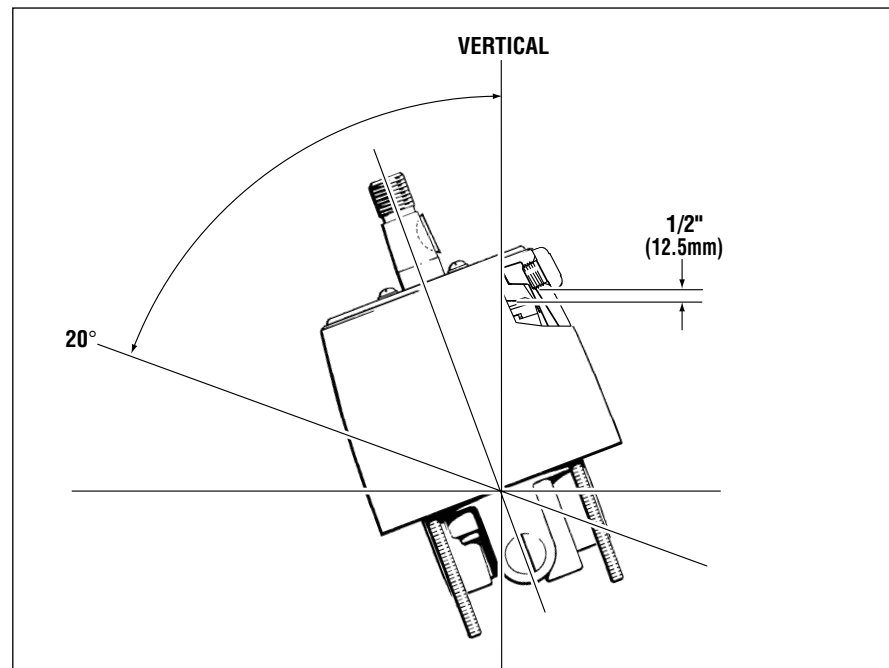


Figure 11.