

FILLING AND PURGING THE SYSTEM

Read First

1250V, 1275V systems are designed to operate with ATF, automatic transmission fluid type A or Dextron II or III as used in automobiles. 1350 systems are designed to operate with SAE 10 turbine oil.

NOTICE

1350 cylinders are not fitted with bleed fittings. In order to simplify filling and purging, it is recommended that tee fittings complete with bleed-off device (such as a simple ball valve) are installed.

⚠ WARNING

Before proceeding, ensure that all plastic shipping plugs in the helm pump(s) have been replaced with steel or brass pipe plugs. plastic shipping plugs will deteriorate over time.

⚠ CAUTION

On occasion, air purged out of the system may cause a sudden rise or spurting of oil. A funnel or filling container will prevent spillage of oil.

The filling and purging procedure is best accomplished by two people. One person to fill the steering system and one person to open and close the bleed fittings on the cylinder(s), as required.

During the entire filling and purging procedure, the fill and vent helm (upper helm in multi station systems) must always be full of oil. If the oil level inside the helm is too low, air will automatically be reintroduced into the steering system. This will needlessly prolong the filling procedure.

The female thread of the HA5450 remote filler kit is 1/4" NPT (national pipe thread).

Connect a large funnel or filling container to the HA5450 remote filler kit fitting as illustrated on page 16. SeaStar filler kit part # HA5438 may also be used. It is a short piece of vinyl tube with a 1/4" NPT male fitting on one end, and a bottle cap that will accept the threaded bottle spout of the plastic type ATF Dextron II automatic transmission fluid bottles. (North America only.)

To fill and purge the system proceed as follows:

Step 1

Fill the helm pump with oil (upper helm on multi station systems). As the system fills with oil and air bubbles rise up into the funnel or filling container add more oil as required.

NOTICE

Each helm pump reservoir has an approximate oil capacity of 3/4 of a quart (0.75 liters).

Slide vinyl bleed tubes onto cylinder bleed fitting nipples and place other end of bleed tube into container. Container should be large enough to hold at least one gallon (4 liters).

Now open starboard bleed fitting nipple by turning bleed nipple by turning hex. 1 1/2 turns counter clockwise.

⚠ CAUTION

Before proceeding, make certain that 1250V & 1275V helm pumps are set at their highest displacement. Adjusting knob below helm pump steering wheel shaft must be turned clockwise as far as it will go.

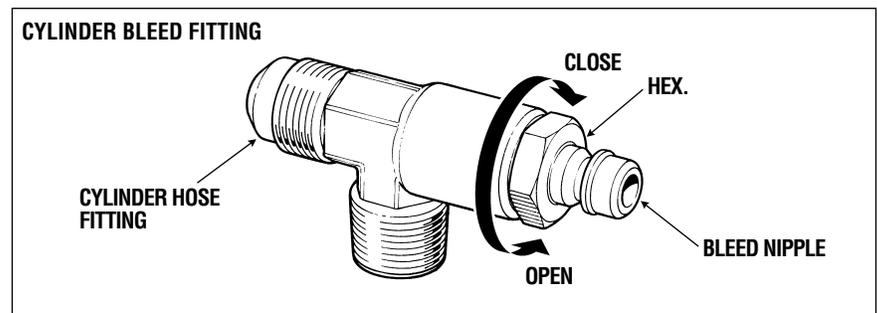


Figure 21.

HYDRAULIC STEERING

FILLING & PURGING

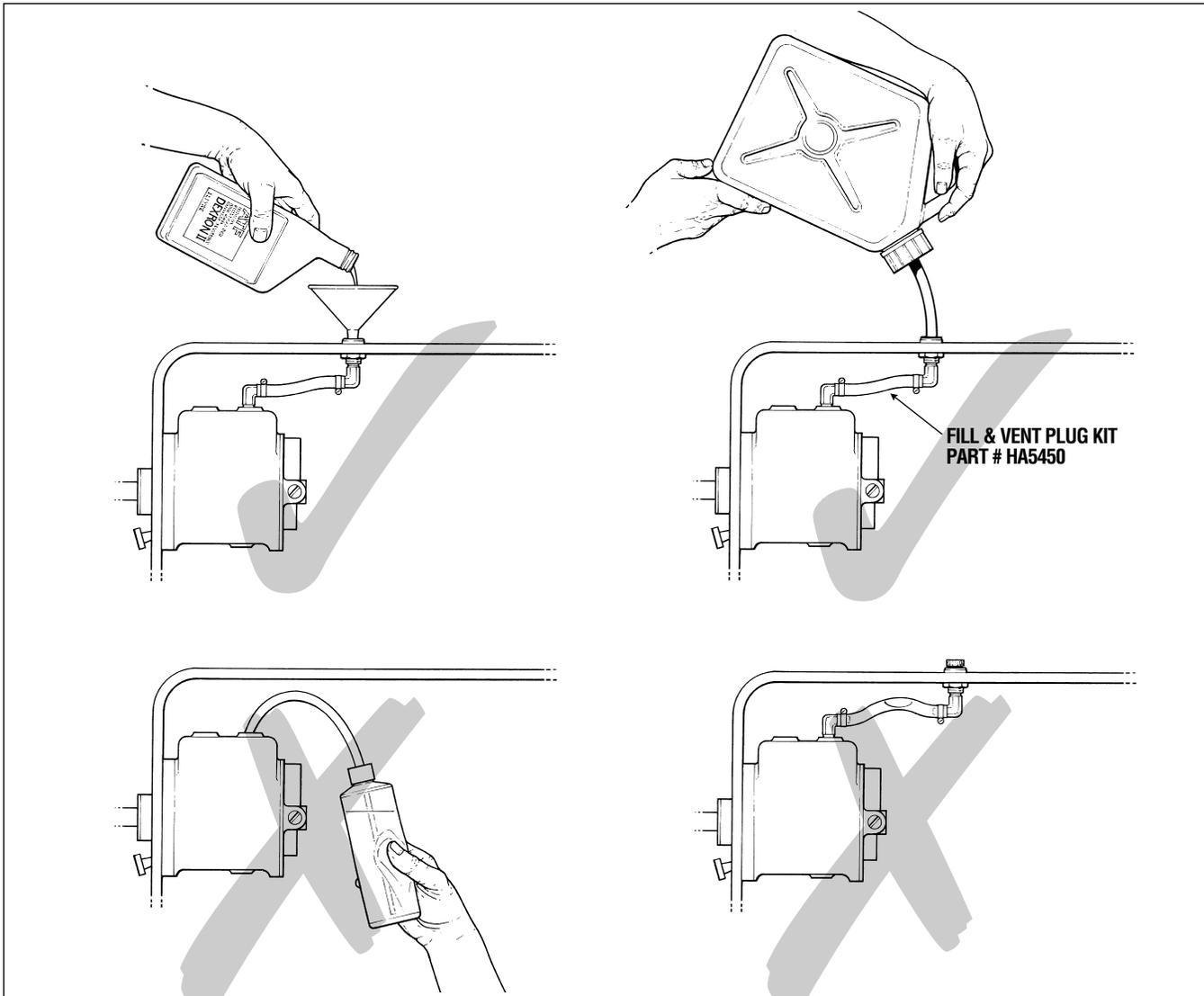


Figure 22.

Step 2

Turn the steering wheel at upper station helm to starboard (right) until a steady stream of oil comes out of the starboard bleed tube. Then turn the steering wheel to port (left) until a steady stream of oil comes out of the port bleed tube.

For single station steering systems proceed to step 3.

For multi station steering systems repeat step 2 at the next lower helm and again at the lowest helm, if more than two helm stations are installed. An autopilot must also be considered as a steering station. The autopilot hydraulic power pump must be turned on to pump oil out of the cylinder bleed fittings in the correct sequence, depending on where the autopilot power pump is connected into the steering system.

Step 3

Close cylinder bleed fitting nipples by turning bleed nipple hex. clockwise. See diagram on page 15.

Step 4

Starting at the upper steering station turn the steering wheel to hard over starboard (right). With as much force as possible, continue to turn the wheel to starboard and leave it in this position for one minute.

NOTICE

If pressure build up exceeds 1,000 PSI (70 Bar), the steering wheel will slip due to opening of the pressure relief valve. This will not harm the helm pump.

When the steering wheel is forced into the hard over position, air bubbles will once again rise up into the filling container.

Now force the steering wheel hard over to port (left) and leave in this position for one minute.

Alternating between port and starboard, repeat this procedure about 6 to 10 times at the upper station helm.

Step 5

Repeat step 4 at each at each additional helm in multi station steering systems.

Step 6

Check the steering system for complete air removal by forcing the steering wheel into both hard over positions at the upper steering station. If there is no noticeable drop and rise of the oil in the filling container, the steering system is correctly filled and purged. A noticeable drop and rise of the oil level indicates that air is still present in the system. If so repeat steps 4, 5 and 6.

⚠ CAUTION

Do not re-use oil that has been circulated through the system unless it has been properly filtered. Automotive type gasoline, oil type fine mesh funnel filters are acceptable to filter the oil.

Oil Level Setting and System Check

To set the correct oil level in the fill and vent fitting proceed as follows:

- Open starboard bleed nipple on cylinder fitting (only open one on twin cylinder installations).
- Turn steering wheel to starboard until oil level from filling container has reached the fill and vent fitting.
- Now continue to turn the steering wheel to starboard $1\frac{1}{2}$ turns for 1250V helm, 1 turn for 1275V helm and $1/4$ turn for 1350 helm.
- Close starboard bleed fitting.

This procedure will provide for sufficient air space to accommodate fluid expansion.

At this time the steering system should be checked for correct connection of hose, tube and fittings, and possible leaks. To do so, turn steering wheel (any one on multi steering station systems) and pressurize very hard to port. Apply enough force to the wheel to exceed pressure relief valve pressure. You will not harm the helm or system. While pressure is maintained on the steering wheel, check all port (left) fittings and line connections. Repeat procedure by turning wheel to starboard.

If no leaks are obvious, your steering system is ready for use.

⚠ WARNING

If leaks are found, correct before using. Failure to correct a leak can lower the oil level in the system and result in loss of steering

HYDRAULIC STEERING

FILLING & PURGING

Filling & purging improvement for twin station 1250V, 1275 and 1350 hydraulic steering systems

⚠ WARNING

For normal steering bleed valve must be in "CLOSED" position.

Removing the air from the lower helm station reservoir and a non gradual rise compensating line is the most difficult and time consuming part of the purging and filling procedure!

The installation of a ball type bleed valve, as shown below, will aid in the removal of trapped air, quickly and efficiently.

With the valve in the "OPEN" position, turning the wheel clockwise at the upper station helm (as shown below) will cause oil to push all trapped air up and into the filling container. A permanently installed valve will simplify servicing the system in the future.

The part # for the SeaStar Solutions bleed valve is HA5404.

For reasons of liability, ball bleed valves are supplied with a non-permanently attached handle which must be removed to prevent accidental opening during steering system use.

Instructions are supplied with each kit.

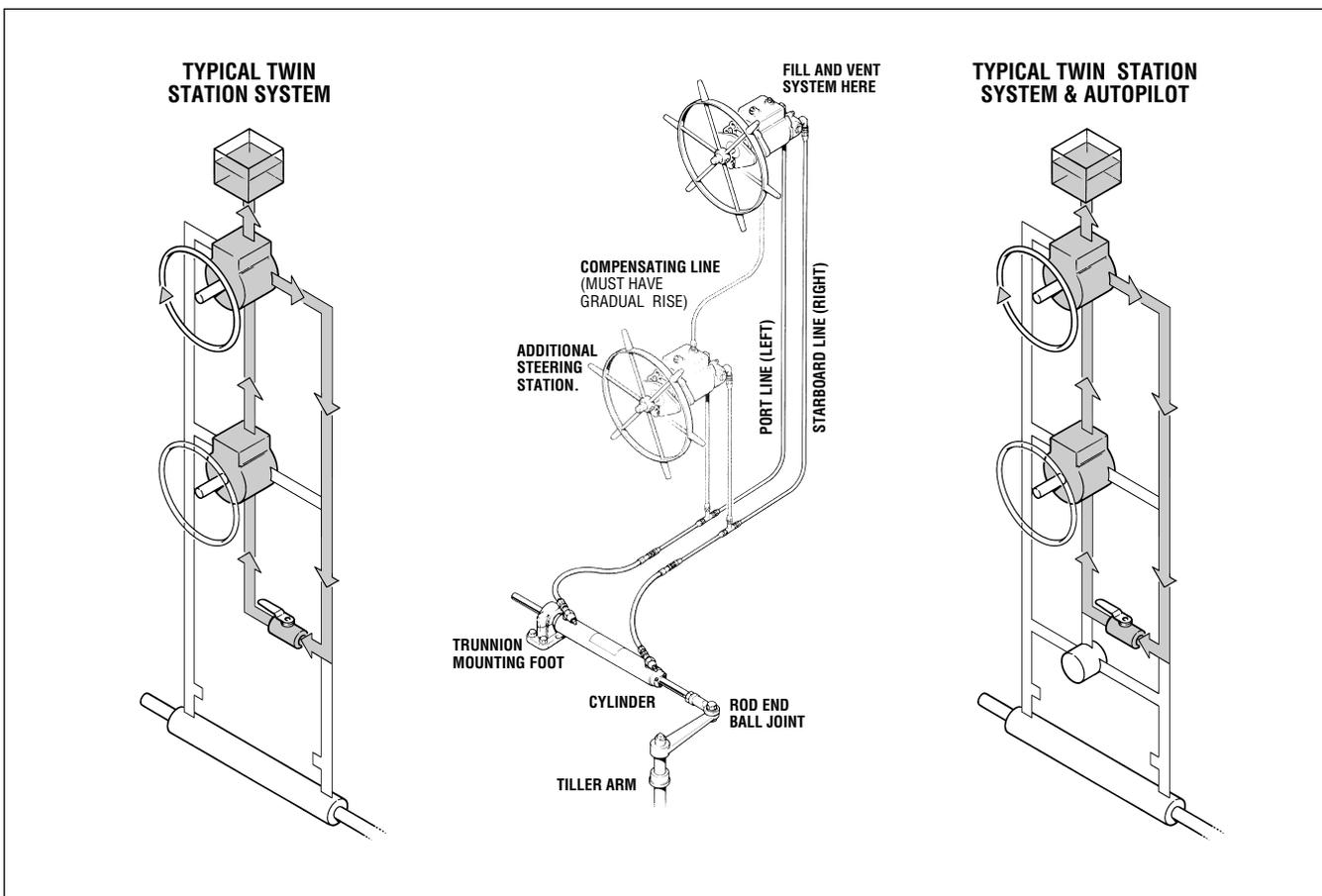


Figure 23.

MAINTENANCE

Maintenance requirements will vary with usage and climate. Inspection by a qualified marine mechanic is required:

- A.** A minimum of two times a year.
- B.** At the first sign or indication that the steering system is not operating normally or correctly.
 - 1.** Check the oil level in the helm pump. This should always be within 1/2" of the bottom of the filler hole.
 - 2.** Check mechanical linkages and connections. Tighten loose parts and replace badly worn parts.
 - 3.** Check for leaks. See page 17 for how to check for leaks.
 - 4.** Check hoses for chafing/rubbing marks, and replace if required.
 - 5.** Inspect steering cylinder shaft for any damage (nicks, scratches, etc.). Any damage to the steering cylinder shaft will not allow a new seal to seal correctly. In this case you **MUST** replace the steering cylinder with a new one.
 - 6.** Disconnect steering cylinder from rudder arm, clean and grease ball joint and/or clevis connection using a good quality marine grease.

! WARNING

Failure to comply with maintenance checks may result in loss of steering control resulting in property damage, personal injury and/or death.

Seal Kits/Spare Parts

COMPONENT PART #	DESCRIPTION	SEAL KIT	REPLACEMENT PARTS AVAILABLE
HH5250.....	1250V Helm Pump.....	HS5161.....	HA5400 (Front Cover Assembly) HA5450 (Remote Fill Kit)
HH5275.....	1275V Helm Pump.....	HS5161.....	HA5400 (Front Cover Assembly) HA5450 (Remote Fill Kit)
HH0426.....	1350 Helm Pump.....	HS5171.....	N/A
HC5349.....	BA150-7TM Steering Cylinder.....	HS5182.....	HP6068 (Mounting Foot) HP6093 (ball Joint)
HC5355.....	BA150-7TM Steering Cylinder.....	HS5182.....	HP6068 (Mounting Foot) HP6024 (Clevis)
HC5350.....	BA175-7TM Steering Cylinder.....	HS5183.....	HP6068 (Mounting Foot) HP6013 (ball joint)
HC5356.....	BA175-7TM Steering Cylinder.....	HS5183.....	HP6024 (Mounting Foot) HP5615 (Clevis)
HC5351.....	BA200-7TM Steering Cylinder.....	HS5184.....	HP6068 (Mounting Foot) HP6013 (ball joint)
HC5357.....	BA200-7TMC Steering Cylinder.....	HS5184.....	HP6068 (Mounting Foot) HP5615 (Clevis)
HC5378.....	BA200-11 Steering Cylinder.....	HS5185.....	HP6068 (Mounting Foot) HP5615 (Clevis)
HC5379.....	BA200-11TMC Steering Cylinder.....	HS5185.....	HP6068 (mounting foot) HP6123 (Clevis)