

FILLING AND PURGING THE SYSTEM

Read First

These instructions show how to fill and purge a Single Station Cylinder System. For twin station and/or twin cylinder filling and purging instructions read instructions on pages 18 and 19 first and then proceed with instructions on page 17.

NOTICE

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, oil **must** be visible in the filler tube. **Do not** allow the oil level to disappear into the helm pump, as this may introduce air into the system and increase your filling time.

Hydraulic Oil Requirements

2 bottles (2 quarts or litres) for single station and single cylinder systems.

1 additional bottle for each additional helm, cylinder, or auto pilot.

NOTICE

These instructions will result in hydraulic oil flushed in and out of the system. Oil can be re-used if filtered through a fine mesh screen such as used for gasoline. If unable to filter oil, an additional bottle of oil is required.

NOTICE

“Bleeder” refers to cylinders fitted with bleed tee fittings. If fitted with bleed tee fitting, open bleeder by unscrewing bleed nipple nut two turns.

If cylinder is not fitted with bleed tee fittings, disconnect hydraulic line from the cylinder fitting. Loosening the hose or tube fitting only, may not cause sufficient oil flow to purge the system.

⚠ CAUTION

Unbalanced Cylinders

The oil level in the helm must be set with the cylinder rod fully retracted. Failing to observe this caution will result in an oil spill at the helm.

Turning the wheel port (left) will retract the cylinder rod.

NOTICE

General

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.

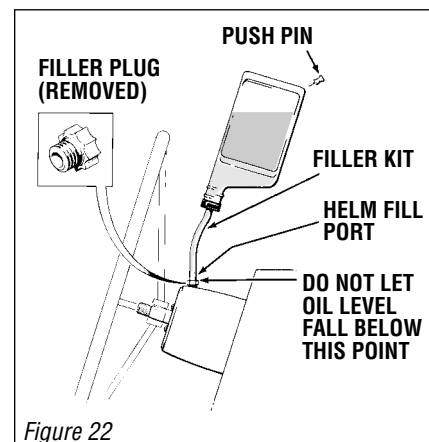


Figure 22

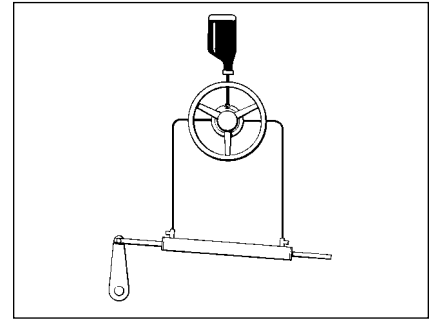
Single Station One Cylinder

HYDRAULIC STEERING

FILLING AND PURGING

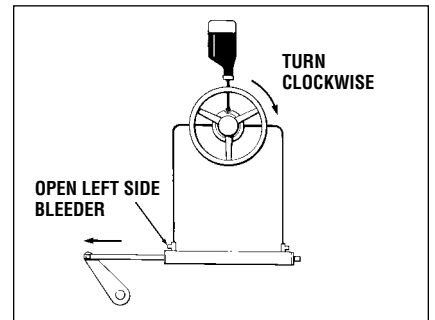
Step 1

- Screw the threaded end of the filler tube into the helm filler hole.
- Remove the cap from the oil bottle and holding upright, screw into the filler tube bottle cap. Poke hole in the bottom of the bottle.
- Fill the helm pump full of oil (Oil should always be visible in the filler tube). Use the next bottle at any time throughout the procedure when the oil level drops in the filler tube. Do not proceed with step two until helm is full of oil.



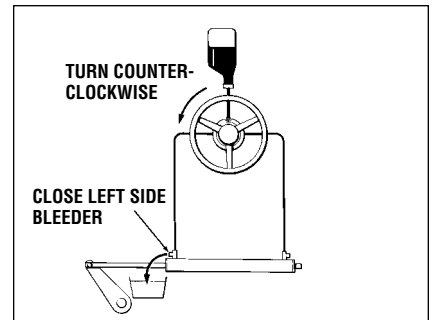
Step 2

- Turn the steering wheel clockwise until the cylinder rod is fully extended on the left side of the cylinder.
- Open left side bleeder.



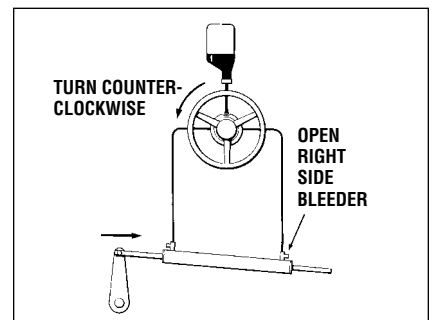
Step 3

- Holding the cylinder rod (to prevent it from moving back into the cylinder) turn the steering wheel counter-clockwise until a steady stream of air free oil comes out of the bleeder. (Drain out approx. 1/2 bottle of oil or as required.)
- While continuing to turn the wheel, close the left side bleeder and let go of the cylinder rod.



Step 4

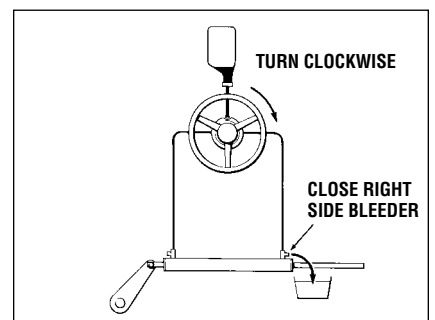
- Continue turning the steering wheel counter-clockwise until the cylinder rod is fully extended to the right. (Steering wheel will come to a stop)
- Open the right bleeder.



Step 5

- Holding the cylinder rod (to prevent it from moving back into the cylinder) turn the steering wheel clockwise until a steady stream of air free oil comes out of bleeder.
- While continuing to turn the wheel, close the right side bleeder and let go of the cylinder rod.

Fill and purge is now complete



HYDRAULIC STEERING

FILLING AND PURGING

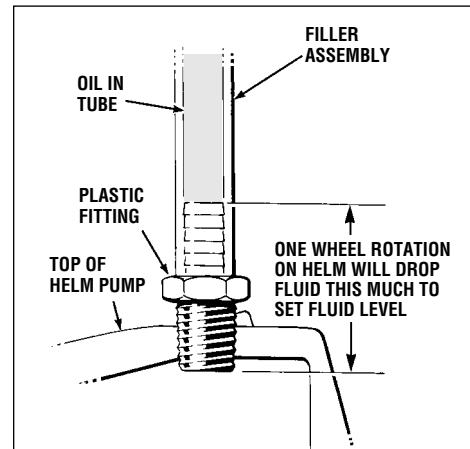
Oil Level Set

- Proper oil level set can be obtained by opening right bleeder and turning steering wheel to the right until fluid level reaches top of plastic filler fitting and then turning wheel one more full turn.

CAUTION

For unbalanced cylinders the oil level in the helm must be set with the cylinder rod fully retracted. Failing to observe this caution will result in an oil spill at the helm.

Turning the wheel port (left) will retract the cylinder rod.

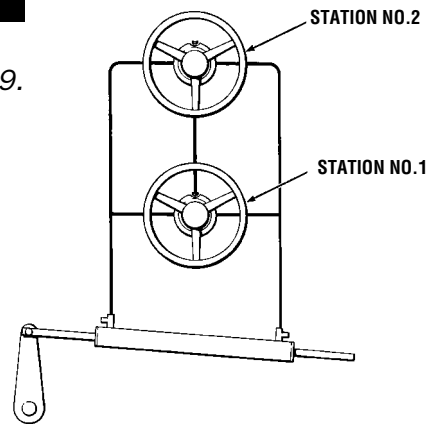


Twin Station Single Cylinder

Perform steps 1 through 5 at station no.1. Then repeat steps 1 - 5 at station no.2. Oil requirements 4 - 5 bottles.

NOTICE

Refer to Oil Level and System Check on page 19.

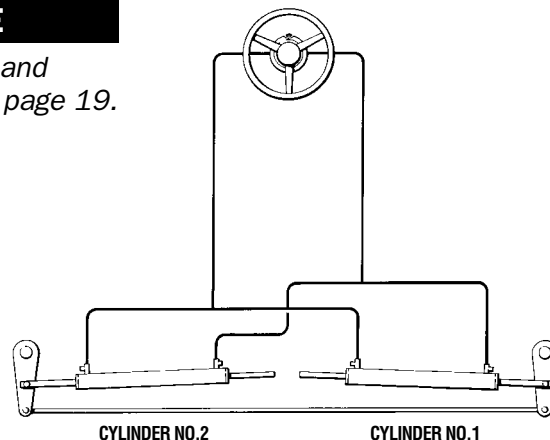


Single Station Twin Cylinder

When performing steps 1 through 5, perform instructions in each step first on cylinder no.1 and then on cylinder no.2, before proceeding to the next step. ie: Perform instructions referring to right side of cylinder first on cylinder no.1 and then on cylinder no.2. Oil requirements 4 - 5 bottles.

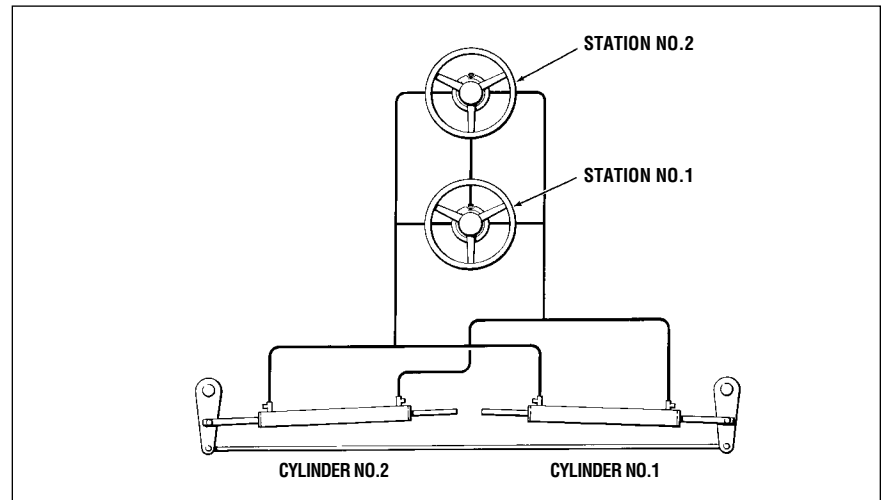
NOTICE

Refer to Oil Level and System Check on page 19.



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.



Oil level & System Check

Helm mounted with wheel shaft completely horizontal must be filled to bottom of filler hole at all times. Do not allow oil level to drop more than $\frac{1}{4}$ " (6.3mm)

Helms mounted on a 20° angle or with wheel shaft vertical, oil level should be within $\frac{1}{2}$ " (12.7mm) of hole. Check oil level periodically.

At this time the steering system should be checked for proper connections of hose, tube and fittings, possible leaks, and air removal. To do so, turn steering wheel (any one on a multi-steering station) and pressurize very hard to port. Apply enough force to the wheel to exceed pressure relief valve pressure. You will not harm the helm of the system. While pressure is maintained on the steering wheel, check all port (left) fittings and line connections. Repeat procedure by turning wheel to starboard. Watch the oil level in the helm pump when pressurizing the steering wheel in either hard over positions. If there is no obvious drop in oil level, air has been removed. If there is an obvious drop in oil level, you are compressing air and further filling and purging is required. Repeat Steps 1 thru 5.

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 oil level in system and result in loss of steering.