



Kit, Auxiliary Manual Steering, 1.7 in³ Helm

Purpose

This kit is required for class-certified systems in order to provide auxiliary manual steering in the event that the Optimus EPS steering system is inoperable. These instructions presume that the steering system has already been installed according to the instructions provided.



WARNING!

This auxiliary steering system is meant for emergency use only and when the Optimus EPS system is inoperable. Use at any other time may result in loss of steering control leading to possible property damage, injury and/or death.



NOTICE!

The power to the Optimus system must be switched off before using manual backup steering.

Planning the installation

What you need

- One HA6501 kit, containing:
 - One front mount helm, model HH5271-4.
 - Four auxiliary steering valve assemblies with straight fittings.
 - Two switches for Optimus EPS deactivation.
 - Fittings for plumbing the system as illustrated in figure 1.
- Five SeaStar Pro hose kits, ordered separately:
 - Two hose kits to connect the steering pumps to the auxiliary steering valves.
 - Three hose kits to connect the auxiliary steering valves to the helm.
- Steering wheel to operate the auxiliary steering helm.

Things to do

1. Determine where you will mount the helm. Ideally you can see the steering cylinders from the helm.
2. Determine where you will mount the auxiliary steering valves. Locate them as close as possible to the steering pump, because excessive hose length between the pump and valve may affect steering response in the EPS system. Hose length between the helm and valves is not as critical.



- Plan your hose runs and determine the length of hose you will require between the steering pump and valves, and between the valves and the helm. Use only SeaStar Pro hose.

Hose Kits – Each kit contains two equal-length hoses

'xx' denotes length in feet. Lengths from 2' to 30' available in 2' increments

Part No.	Description
HO57xx	SeaStar Pro Hose Kit
HO57xxSS	SeaStar Pro Hose Kit, stainless steel fittings

Table 1.

- Straight fittings are provided for the hose connection to the EPS pump. If you need 90° elbow fittings, you will need to order kit HF6004. One kit contains two fittings, so you will need one kit per pump.

Installation — Hydraulic

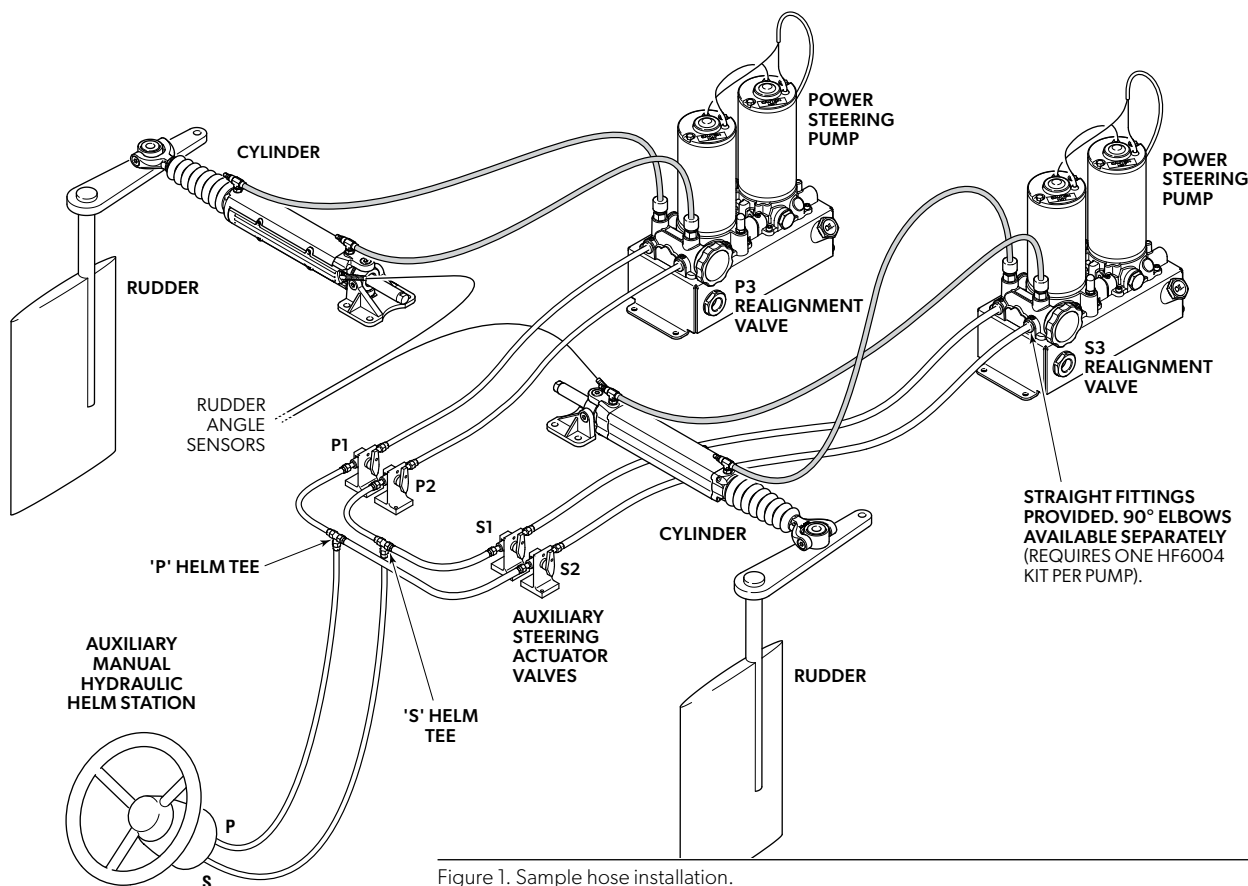


Figure 1. Sample hose installation.

- Remove the plugs from the steering pump body and install the ORB fittings provided, or optional 90° elbow fittings (see Planning section). Torque the fittings to 18 ft-lb (24 Nm).



2. Install the auxiliary steering valves using the mounting holes provided on the brackets. Mounting fasteners are not supplied with the kit.
3. Install the helm according to the instructions and mounting template included with it.
4. Use the decals included with the steering system to label the hoses. Each decal marks the start and end point of the hose, so each hose will have two identical decals.
5. Connect the hoses. A sample installation is shown in figure 1. Your hose connections from the auxiliary helm to the steering pump may need to be reversed, depending on the configuration of your steering cylinders and tillers.
6. Apply the decals (included with the steering system kit) to label the valves and the auxiliary steering helm.

Installation — Activation switches

The kit includes two rocker switches to activate the auxiliary steering system. They should be installed near to the auxiliary manual helm.

1. Mount the switches in a panel between .03" (.76 mm) and .188" (4.75 mm) thick. Figure 2 shows the required panel cut-out dimensions. These switches must always be actuated at the same time, so mount them close together.

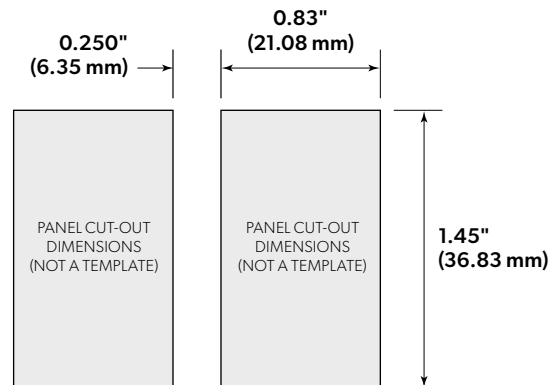


Figure 2.

2. Wire the switches in the Optimus EPS ignition sensing circuit as shown in figure 3. Use a sealed, heat-shrink quick disconnect terminal, such as Molex Perma-Seal P/N 0191640012, for connection to the switch.
 - Secure the wiring properly so there is no strain on the terminal.
 - Route the ignition wires to minimize exposure to water, high temperatures, and mechanical damage.
 - See additional instructions in the system installation manual, Book 50.3.



WARNING!

The integrity of the ignition connection is critical to the safe operation of the Optimus EPS steering system. Always connect both sensing leads and ensure that wiring and splices are properly strain-relieved and protected from damage, water, or other hazards.

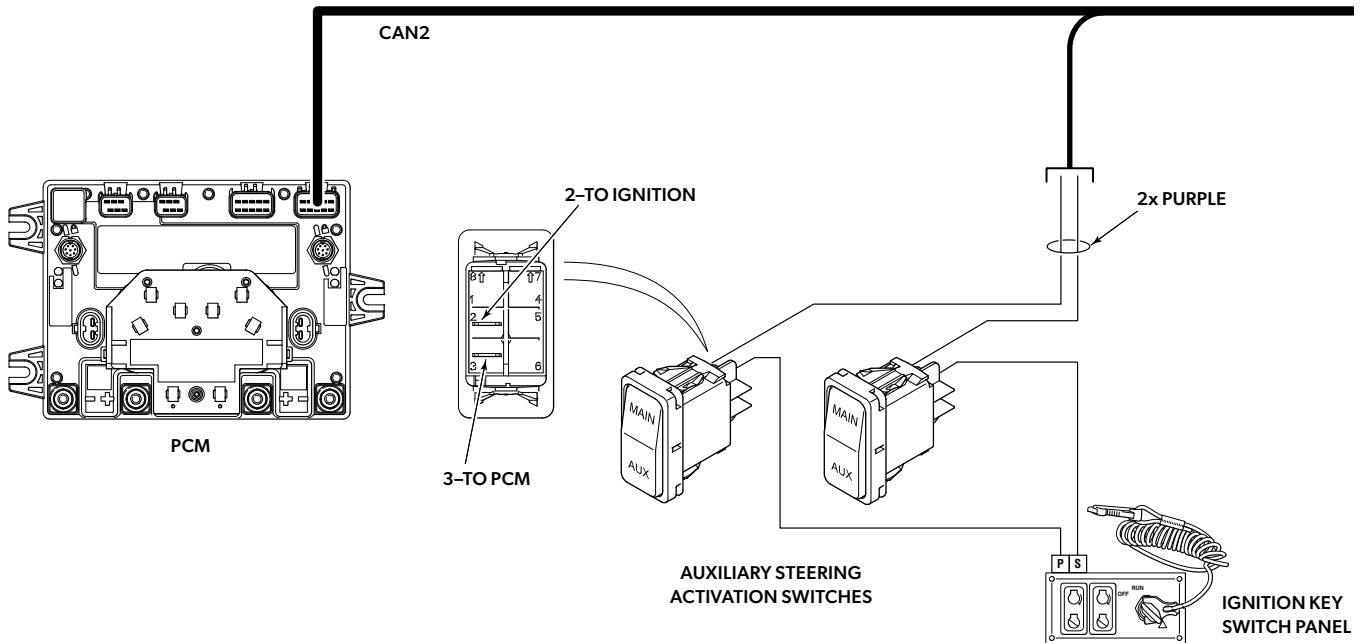


Figure 3.

3. Label the auxiliary switches with the decals provided in the steering system kit.

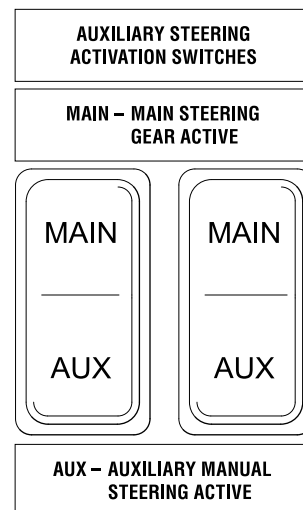


Figure 4.



Bleeding the system

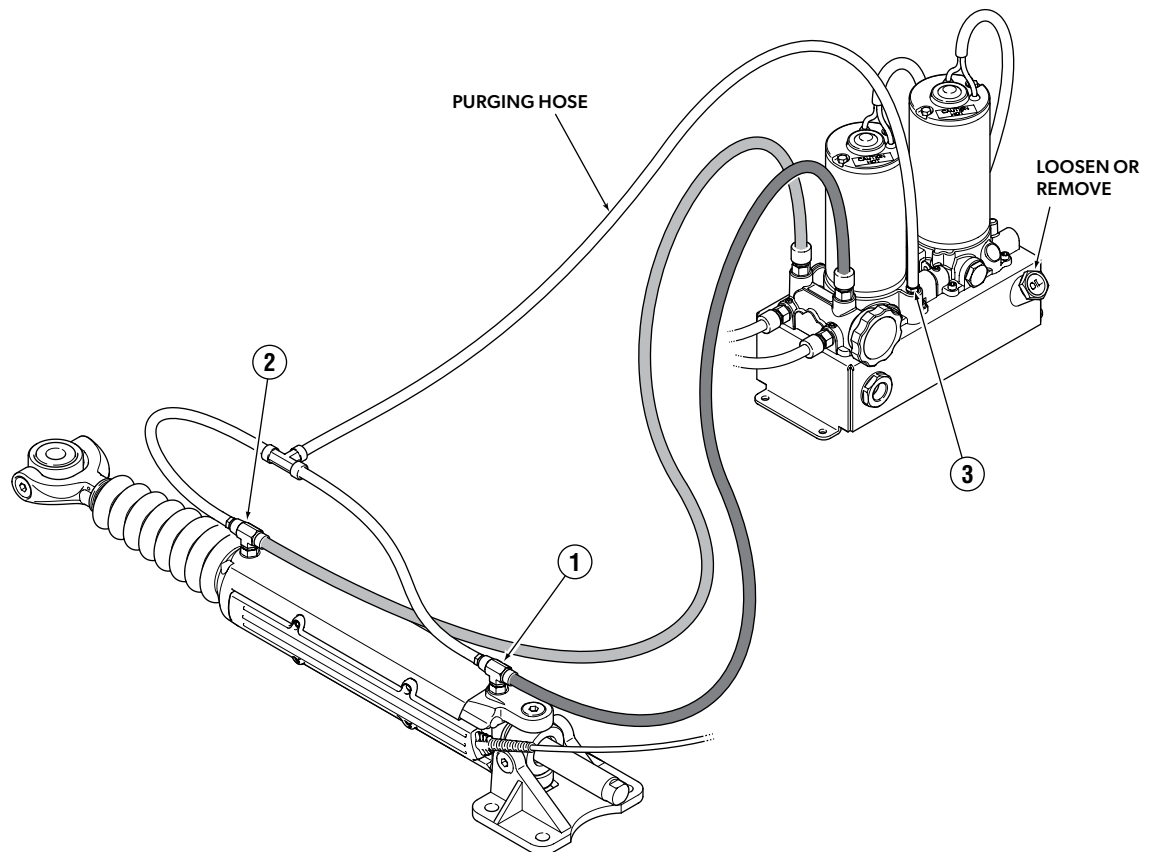


Figure 5.

1. Connect your purge hose to the starboard steering ram and tank as shown in figure 5. Open the tank bleed fitting (item 3 in figure 5) 1½ to 2 turns and loosen or remove the oil fill cap from the tank. Do not open the cylinder bleed fittings (items 1 and 2) yet.
2. For best results, disconnect the steering cylinder from the tiller.
3. Open both starboard auxiliary steering valves, S1 and S2. Make sure the port auxiliary steering valves, P1 and P2, are closed.
4. Screw the threaded end of the filler tube into the helm filler port.
5. Use the filler tube and a bottle of SeaStar Optimus EPS steering fluid to fill the helm. Make sure the filler tube always contains fluid during this procedure. (Refer to figure 5.)
6. Slowly turn the steering wheel on the helm clockwise until the cylinder reaches the end of its stroke.
7. If the steering shaft is extended, open bleed fitting #2 as shown in figure 5. If the steering shaft is retracted, open bleed fitting #1.
8. Turn the helm counter-clockwise until a steady stream of bubble-free fluid comes out. Replace the bottle of steering fluid if necessary.

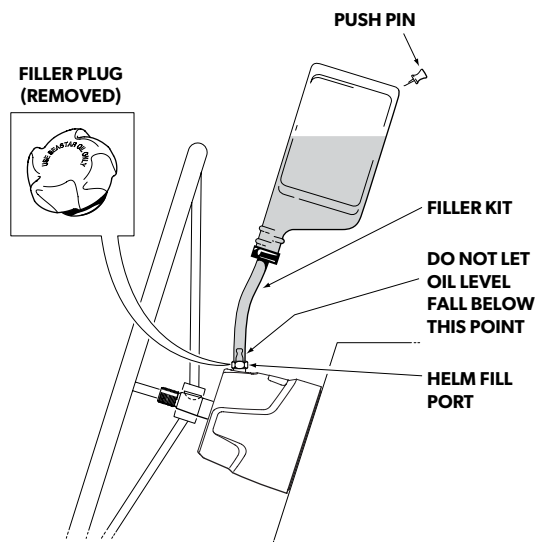


Figure 6. Filling the helm.

9. Close the bleed fitting and continue turning counter-clockwise until the cylinder reaches the other end of its stroke. This will consume steering fluid, so watch the fluid level in the fill tube and replace the bottle when necessary.
10. Open the other bleed fitting, then turn the helm clockwise until a steady stream of bubble-free fluid comes out. Check that the EPS pump tank does not overfill.
11. Close the bleed fitting and the starboard auxiliary steering valves, S1 and S2.
12. Move the purge hose to the port steering ram and tank and open the tank bleed fitting.
13. Open the port auxiliary steering valves, P1 and P2.
14. Repeat steps 6 through 10.
15. Close the bleed fitting and the port auxiliary steering valves, P1 and P2.
16. Fill both steering pump tanks to the minimum fluid level line if necessary. If you see any bubbles or foam in the sight window, wait 30 minutes before proceeding to allow trapped air to settle out of the fluid.
17. Purge the Optimus EPS system normally, as shown in the supplemental instruction included with your class-certified system. You will have to purge one pump/cylinder combination at a time. If the steering cylinders and hoses are already properly purged this procedure should use just a small amount of fluid.
18. Calibrate the Optimus EPS system as shown in the supplemental instruction.
19. Connect the steering cylinders to the tillers if you disconnected them for the purge process.
20. Once the EPS system is commissioned, switch off the EPS power and test the function of the auxiliary steering system. Verify the rudders turn smoothly in the correct direction and through full stroke.