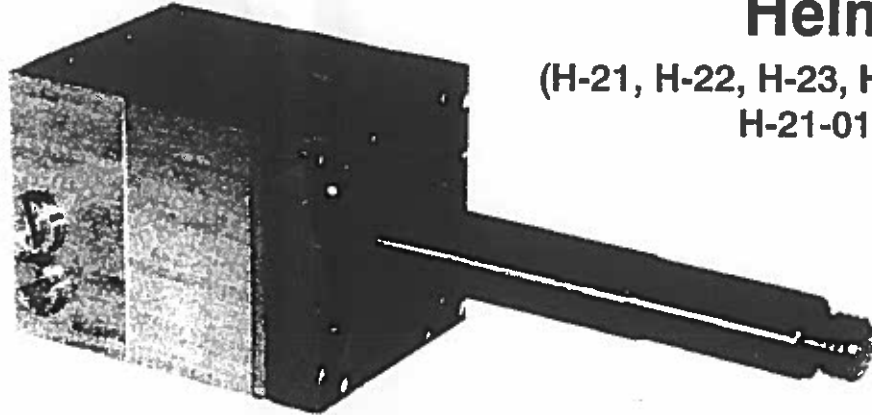
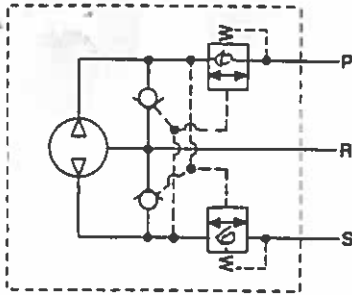


# COMPONENT FACT SHEET

## H-20 Series

### Helm Unit

(H-21, H-22, H-23, H-25, H-26  
H-21-01, H-25-01)



### Description

The Hynautic H-20 Series Hydraulic Helm Unit is a bi-directional, fixed displacement, axial piston pump, coupled to pilot-check and make-up check valving.

The patented pump section utilizes seven pistons, each stroked nine times with one shaft revolution, pushing fluid thru a porting block into the valve section.

The valve section includes holding valves to prevent feedback and to isolate the unit, and compensation valves to allow the use of unbalanced cylinders.

Clockwise rotation of the shaft discharges fluid thru the "S" port; counterclockwise rotation effects "P" port discharge. The "R" port is for the reservoir connection. Port size is 1/4" NPTF.

Service pressure is 1000 psi maximum with proof pressure established at 2000 psi. Maximum speed is 120 rpm.

### Construction

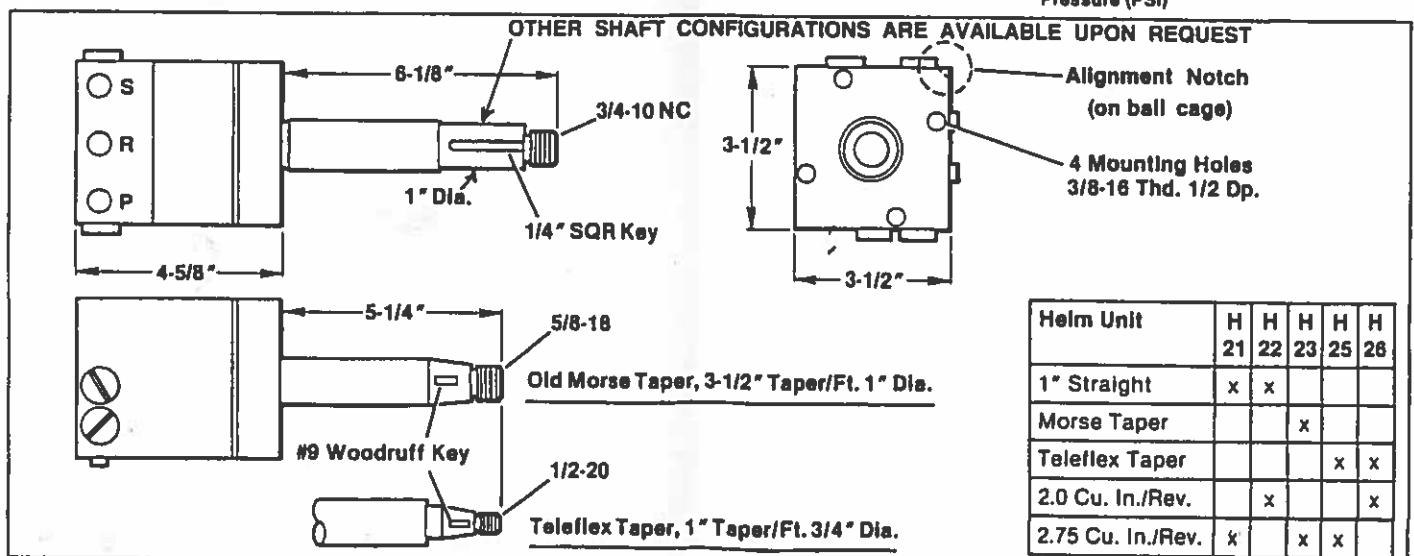
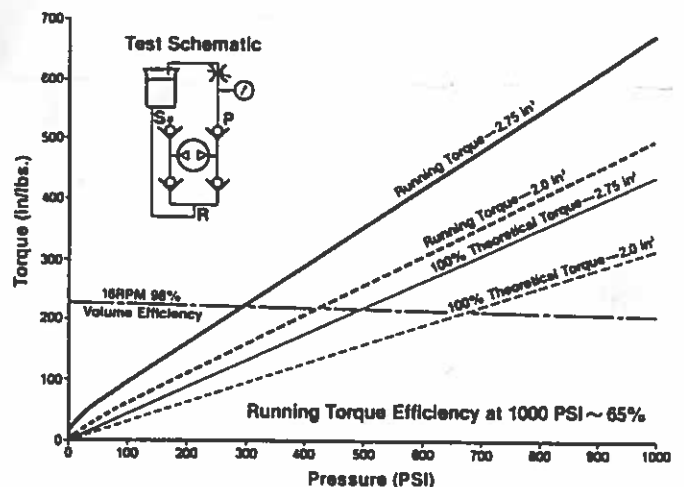
Exterior is corrosion resistant aluminum and stainless steel. Internal components — ferrous metal porting block and cylinder barrel with ground mating surfaces, hardened and ground steel pistons, drive keys, needle thrust bearings, Buna "N" seals, TFE

seal backups and piston glyd rings. Other components are of friction and wear resistance materials to reduce operating torque and prolong life.

### Performance

Volumetric efficiency: 90% at 1000 psi and 12 rpm.

Running torque vs. pressure:



# BREAKDOWN

This technical diagram illustrates the exploded view of a mechanical assembly, with components numbered 1 through 22. The assembly is shown in three main sections. The top right section features a vertical stack of components including a nut (11), washers (12, 13), a pin (14), a spring (15), a disc (16), a mesh (17), another disc (18), a flange (19), a plate (20), and a base (21). A dashed line 'A' indicates a cross-section through this stack. The middle section shows a central shaft assembly with a pin (1), a sleeve (2), a spring (3), a washer (4), a nut (5), and a series of small balls (6) leading to a cylindrical component (7). The bottom section shows a base unit (8) with a flange (9), a pin (10), and a complex assembly of various components including a spring, a disc, a mesh, and a flange. A dashed line 'A' also indicates a cross-section through this bottom assembly.

It is recommended the unit be returned to Hynautic, or an authorized Hynautic repair facility for repair.

<u>Item</u>	<u>Description</u>	<u>Helm Models</u>	<u>Part No.</u>	<u>Qty.</u>
1.	Shaft	H-21, H-22	400057	1
		H-21-01	400267	1
		H-23	400117	1
		H-25, H-26	400167	1
		H-25-01	400447	1
2.	Key	H-21, H-21-01, H-22	650047	1
		H-23, H-25, H-25-01	650027	1
		H-26	650027	1
3.	Washer	All	740078	1
4.	Bearing Race	All	190012	1
5.	Retaining Ring	All	300046	1
6.	Ball	All	234066	9
7.	Cyl. Barrel Asby.	H-21, H-21-01, H-23	510080	1
		H-25, H-25-01	510080	1
		H-22, H-26	510070	1
8.	Valve Body Asby.†	All	900220	1
9.	Screw	All	240317	2
10.	Gasket	All	390028	2
11.	Nut	H-21, H-22, H-21-01	340041	1
		H-23	270071	1
		H-25, H-25-01, H-26	270037	1
12.	Washer	H-21, H-22	740011	1
13.	Washer	H-21, H-22	740037	1
14.	Soc. Hd. Cap Screw	All	240367	4
15.	Body Asby.-Front Cover	All	900300	1
16.	Bearing Race - thin	All	190004	1
17.	Bearing Race - thrust	All	190001	1
18.	Bearing Race - thick	All	190003	1
19.	O-Ring	All	211040	1
20.	Ball Cage	All	620018	1
21.	O-Ring	All	211039	2
22.	Body Spacer	All	900264	1
A	Seal Kit (w spare O-Rings)	All	HS-02	

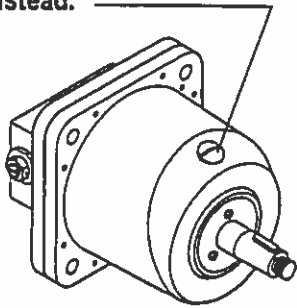
†Note: The valve assembly is tested at Hynautic. Replacement of individual valve parts may produce valve leakage or failure.

If you disassemble the entire unit, the ball cage (No. 20) must be properly aligned with the body spacer (No. 22) and valve body assembly (No. 8). Failure to do so will result in poor pump performance. To insure proper timing: Align the notched corner of the ball cage as illustrated with the corners of the body spacer (No. 22) and valve assembly (No. 8), using as a reference the two protruding bleed screws (No. 9).

# Air Purge Instructions 3-Line Pressurized Systems

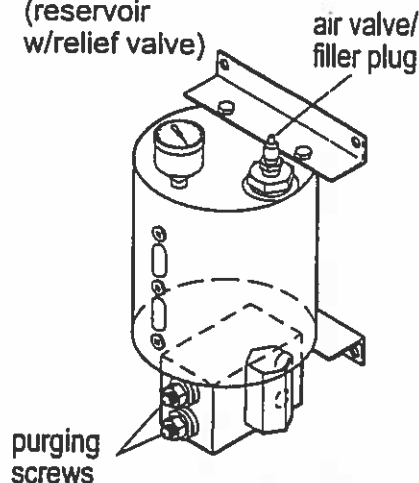
## IMPORTANT NOTE:

If Helm has a Filler Plug similar to this, **DO NOT USE** these instructions. Use 2-Line System Instructions instead.

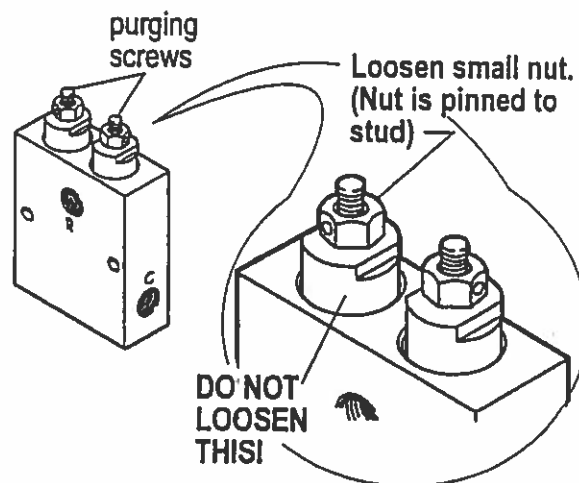


THESE SYSTEMS HAVE A SEPARATE PRESSURIZED RESERVOIR AND RELIEF VALVE. THE RELIEF VALVE MAY BE LOCATED ON THE BOTTOM OF THE RESERVOIR OR BY ITSELF IN THE REAR OF THE BOAT.

**Reservale**  
(reservoir  
w/relief valve)



**Relief Valve**



## USE HYNAUTIC STEERING FLUID MCO-06

1. Locate the 2 Purging Screws with the pinned  $\frac{1}{2}$ " brass nuts. (On separate Relief Valve, screws are located on top; on Relief Valve mounted under Reservoir, screws are located in front.) Loosen these 2 nuts and back off by hand, turning counterclockwise until they stop. **DO NOT FORCE!**
2. Remove the Hex Plug from the top of the Reservoir and fill with fluid  $\frac{2}{3}$  -  $\frac{3}{4}$  full; replace the Hex Plug. Never let the fluid level drop lower than 2" from the bottom of the Reservoir.
3. The Reservoir is equipped with a tire-type air valve so that any tire air pump or compressed air supply can be used to pressurize the system. Slowly pressureize the Reservoir to 35 - 40 PSI. As pressure is applied, fluid will flow into the system. Refill and repressurize as necessary. **DO NOT EXCEED 50 PSI.**
4. At the highest helm, bleed the air out of the Port (P) and Starboard (S) lines by opening the hose fitting connections, one at a time and allowing the air to escape until fluid appears; then retighten fittings.
5. Disconnect the Clevis or rod end of the Cylinder from its engine or rudder mounting if at all possible, making certain it is free to stroke without interference.
6. Bleed both ends of the Cylinder by backing off the socket-head cap screw Bleeders 1 turn. If the Cylinder is not equipped with Bleeders, open the hose fitting



connections, one at a time. Allow the air to escape until fluid appears, then close.

7. Verify that the Reservoir is at least  $\frac{3}{4}$  full and the gage reads between 35 and 40 PSI. Never allow fluid level in Reservoir to drop below 2".
8. The following procedure will remove the air from the system and fill it with fluid: Go to the highest helm and turn the wheel slowly (2-3 seconds per revolution) 60 times in one direction. Check Reservoir level frequently.
9. Repeat Step 8 at each successively lower helm and autopilot. (Purging air from the autopilot is accomplished by setting a course on the autopilot to the same direction you are steering the helms and allowing the pilot to run for about 1 minute.)
10. Repeat Steps 6 and 7.
11. Go to the highest helm and turn the wheel in the opposite direction 60 times.
12. Repeat Step 11 at each successively lower helm as in Step 9.
13. Close the 2 Relief Valve Screws, with pinned hex nuts, by hand, turning clockwise, and snug with wrench. Do not over tighten!
14. Reattach the Cylinder to the Engine or Tiller Arm. Reservoir should be  $\frac{2}{3}$  to  $\frac{3}{4}$  full. Adjust the pressure to 25 - 30 PSI.

FOR HYDRAULIC FLUID AND SERVICE PARTS...

CALL: IN NORTHERN USA 1-800-247-6324  
IN SOUTHERN USA 1-800-814-7070