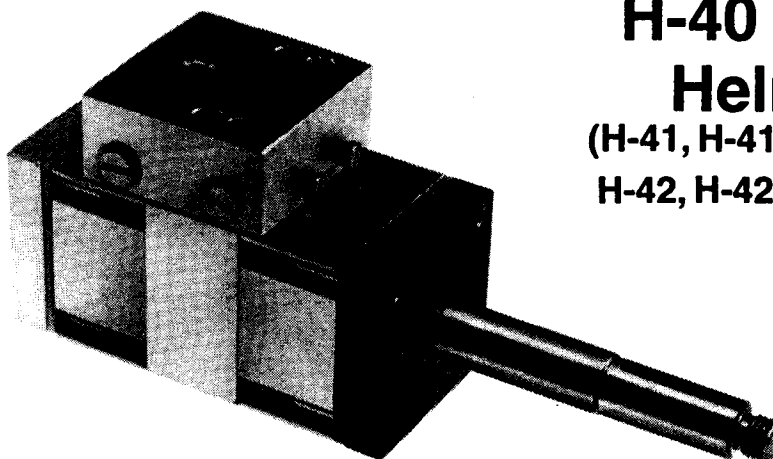




The Hynautic H-40 Series Hydraulic Helm Unit is a bi-directional, dual element, fixed displacement, axial piston pump, coupled to pilot-check and make-up check valving.

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.

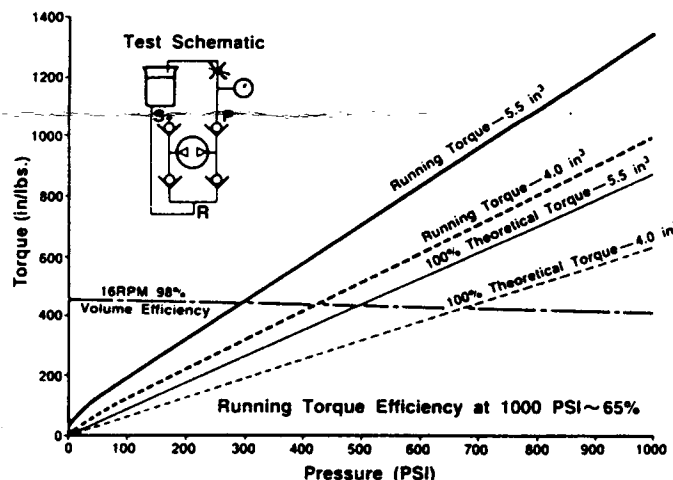
Construction

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

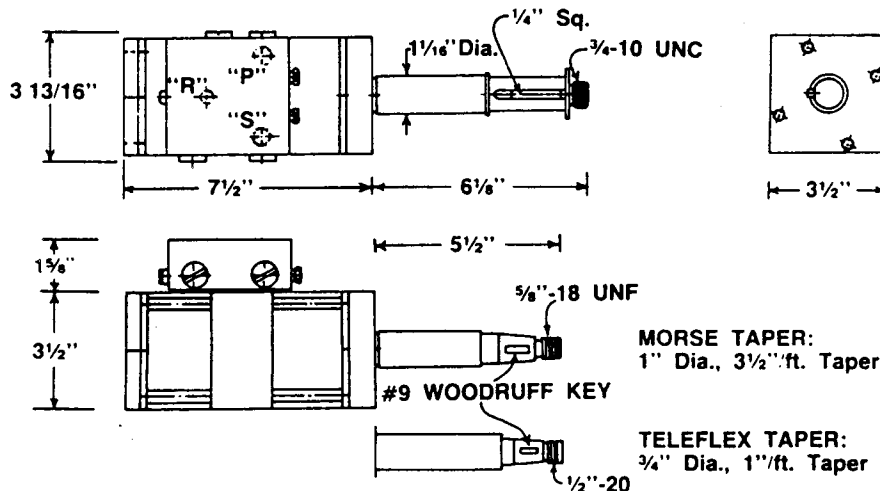
seal backups and piston glyd rings. Other components are of friction and wear resistance materials to reduce operating torque and prolong life.

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

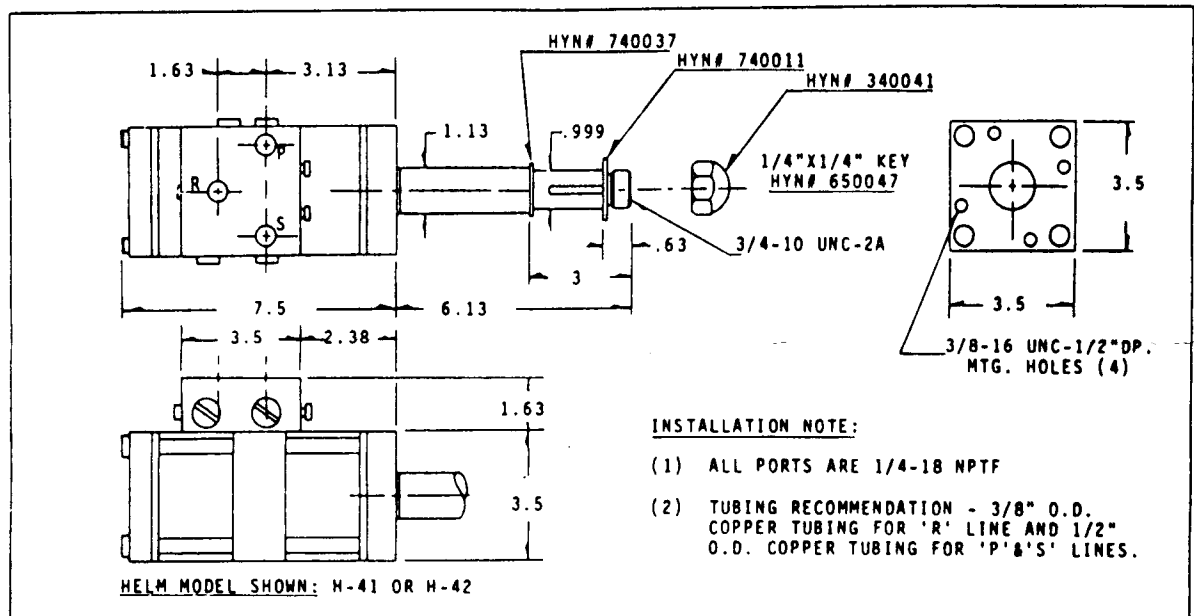
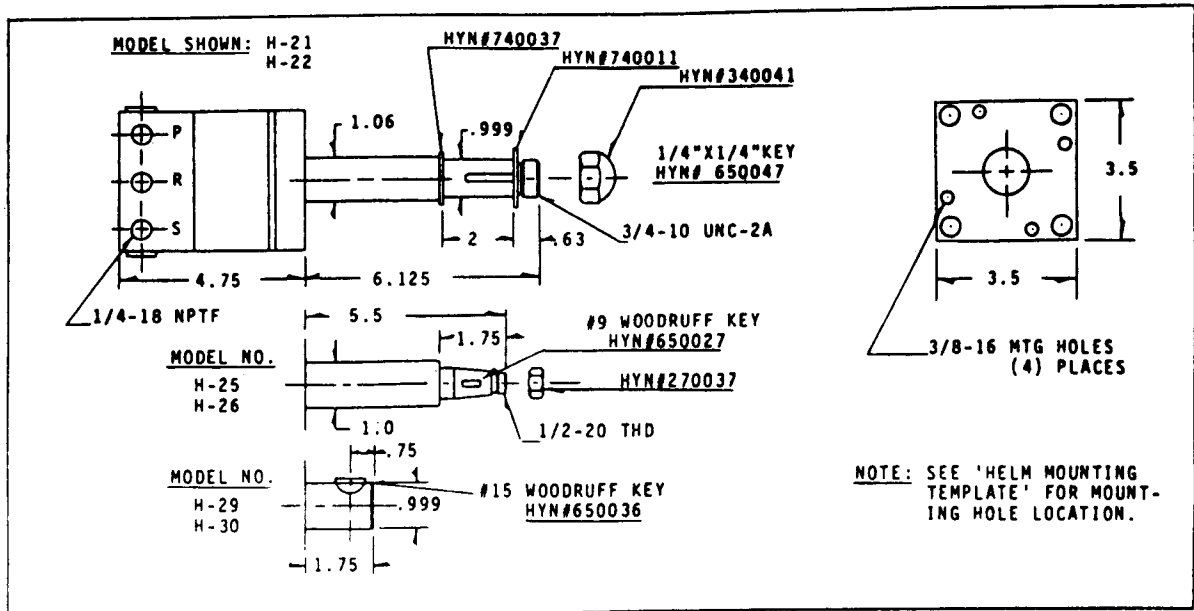
Running torque vs. pressure:



OTHER SHAFT CONFIGURATIONS ARE AVAILABLE UPON REQUEST



Helm Unit	H 41	H 42	H 41 01	H 41 02	H 42 02
1" Straight	x	x			
Morse Taper			x		
Teleflex Taper				x	x
4.0 Cu. In./Rev.		x			x
5.5 Cu. In./Rev.	x		x	x	



HELM UNIT SPECIFICATIONS

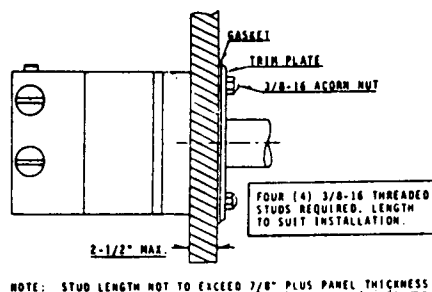
'S' Port Clockwise Rotation Discharge
 'P' Port Counter Clockwise Rotation Discharge
 'R' Port Reservoir

Service Pressure: 1000 psi.
 Maximum Shaft Speed: 75 rpm.
 Fluid: Clean Petroleum Oil, 50 to 200 S.U.S. @ 100 F

HELM UNIT NO.	H-21	H-22	H-25	H-26	H-29	H-30	H-41	H-41-02	H-42	H-42-02	H-45
SHAFT STYLE											
1" Straight	X	X					X	X	X	X	
Teleflex Taper (1"/ft.)			X	X				X		X	
Auto Pilot					X	X					
HELM DISPLACEMENT											
2.00 cu-in/rev.		X	X	X	X						
2.75 cu-in/rev.	X		X		X						
4.00 cu-in/rev.									X	X	
5.50 cu-in/rev.							X	X		X	

INSTALLATION INSTRUCTIONS: MOUNTING SERIES 20 AND SERIES 40 HELM UNITS

1. Helm unit dimensions and layouts are given on the back of this sheet.
2. The helm units may be mounted with the tubing ports up, down or in any position. The shaft may be at an angle if so desired. Verify after mounting that the helm unit's shaft does not bind on the panel.
3. A template is provided, this may be used for locating the shaft and mounting holes. If this template is used, the direction of the tubing ports will correspond to the horizontal and vertical lines drawn on the template.
4. For the helm unit's shaft a 1-1/4" diameter hole provides the proper clearance.



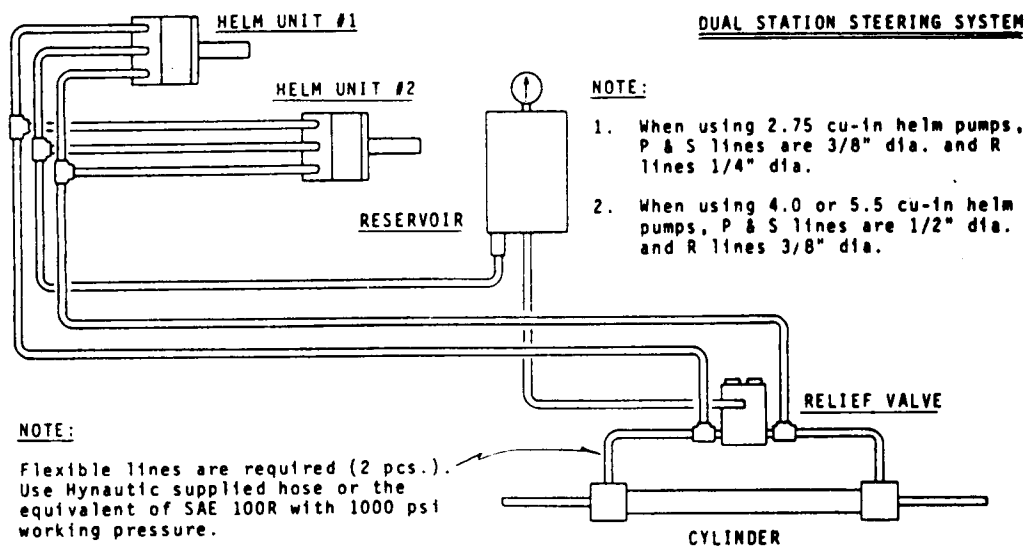
5. Extreme care must be taken to use the correct length 3/8-16 NF studs. These are provided by the boat builder, or owner, and should not exceed the thickness of the console by more than 7/8 of an inch.
6. The steering ports are marked 'S' and 'P'. Rotating the steering wheel in a clockwise direction will pressurize 'S', rotating it in the counterclockwise direction will pressurize 'P'.

INSTALLATION INSTRUCTION: TUBING

1. COPPER TUBING - .032" wall thickness. Copper tubing can be used on high pressure applications. P & S lines require 3/8" or 1/2" compression or flare fittings, R lines require 1/4" compression or flare fittings.
2. HOSE - High pressure hose may be used throughout your system. Use either Hynautic supplied hose or the equivalent of Aeroquip 2651 (SAE 100R with 1000 psi working pressure). P & S lines require 3/8" or 1/2" lines, R lines require 1/4".

INSTALLATION INSTRUCTION: FLUIDS

1. Use MIL-O-5606 Aircraft Hydraulic Fluid, Texaco #15, Shell Tellus 15 (ISO-Tellus 10) or Chevron EP-Machine Oil 10. LIGHT VISCOSITY OILS ARE RECOMMENDED, HEAVIER OILS WILL CAUSE SYSTEM STIFFNESS.



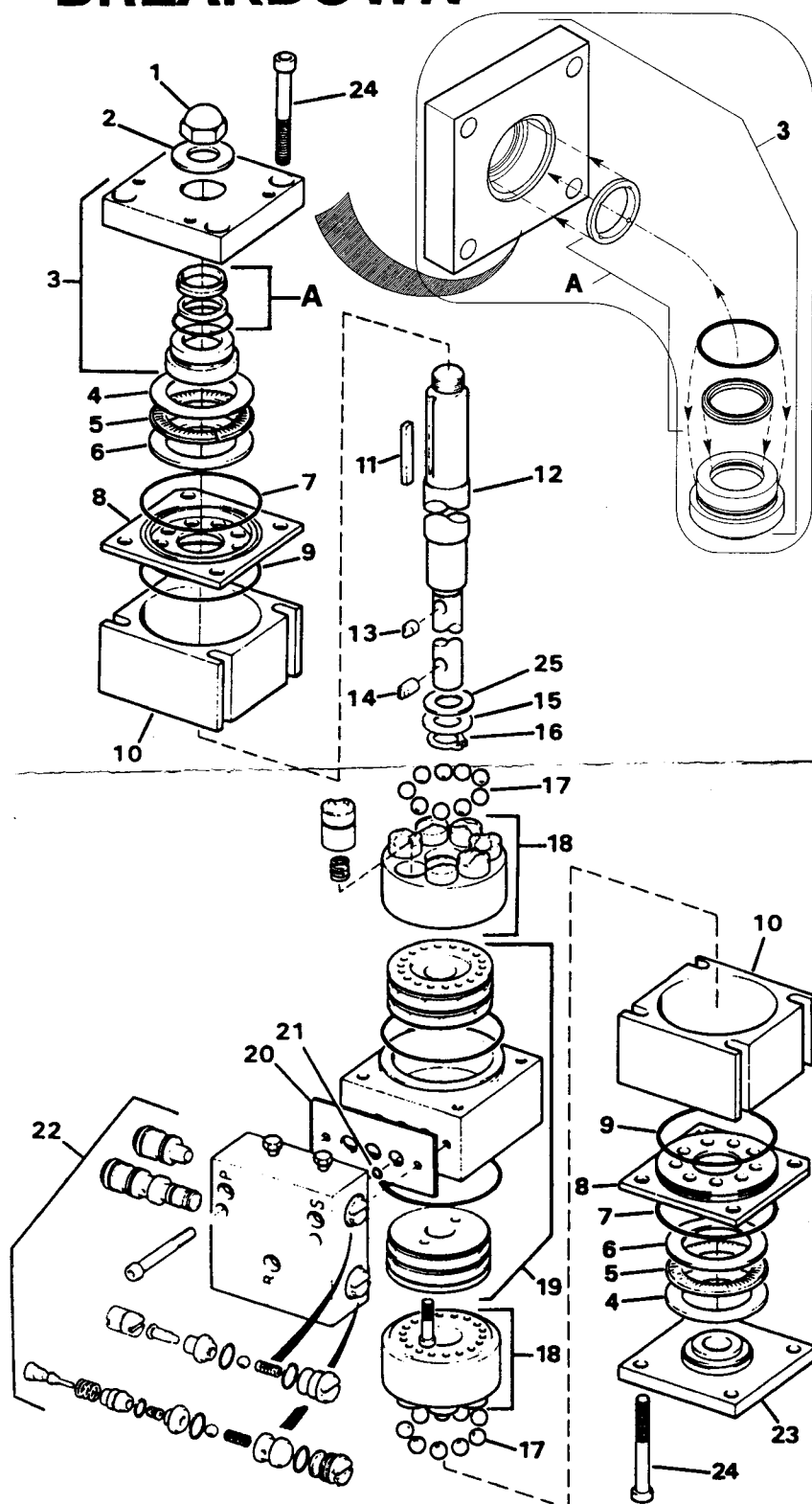
ILLUSTRATED PARTS BREAKDOWN

Parts Description

Item	Description	Helm Models	Part No.	Qty.
1.	Nut	H-41	340041	1
		H-42	340041	1
		H-41-01	270071	1
		H-42-01	270071	1
		H-41-02	270037	1
		H-42-02	270037	1
		H-45	340041	1
		H-41	740011	1
2.	Washer	H-42	740011	1
		H-45	740011	1
		H-41	740011	1
3.	Front Cover Assy	H-45	900310	1
		All Others	900300	1
4.	Bearing Race-thin	ALL	190004	2
5.	Bearing-thrust	ALL	190001	2
6.	Bearing Race-thick	ALL	190003	2
7.	O-Ring	ALL	211040	2
8.	Ball Cage	ALL	620018	2
9.	O-Ring	ALL	211039	4
10.	Body Spacer	ALL	900264	2
11.	Key	H-41/42/45	650047	1
		All Others	650027	1
12.	Shaft	H-41	400187	1
		H-42	400187	1
		H-41-01	400197	1
		H-42-01	400197	1
		H-41-02	400227	1
		H-42-02	400227	1
		H-45	400187	1
		ALL	650076	1
		ALL	650026	1
		ALL	190012	1
15.	Bearing Race	ALL	300046	1
16.	Retaining Ring	ALL	300046	1
17.	Ball	ALL	234066	18
18.	Cyl. Barrel Assy	H-41	510080	2
		H-42	510070	2
		H-41-01	510080	2
		H-42-01	510070	2
		H-41-02	510080	2
		H-42-02	510070	2
		H-45	510080	2
		ALL	900290	1
19.	Body Assy	ALL	520394	1
20.	Plate	ALL	211110	3
21.	O-Ring	ALL	860031	1
22.	Valve Body Assy	H-45	860030	1
		All Others	860030	1
23.	Rear Cover Assy	ALL	710010	1
24.	Soc. Hd. Cap Screw	ALL	240367	8
25.	Washer	ALL	740078	1
A.	Seal Kit	ALL	HS-04	

CAUTION

Disassembly of item no's. 19 & 22 will void any existing warranty. If you disassemble the entire unit, the ball cages (No. 8) must be properly aligned with the body spacers (No. 10) and body assembly (No. 19). Failure to do so will result in poor pump performance. To insure proper timing, align the notched corners of the ball cages as illustrated with the corners of the body spacers and body assembly, using as reference the porting of the body assembly.



TILLOTSON - PEARSON INC.

BEND BOAT BASIN
MELVILLE, NEWPORT RI 02840
401-683-3500

HYNAUTIC'S SYSTEM SYSTEM PURGING INSTRUCTIONS

Fluid: Automatic Transmission Type A Dexron Approved
OR

MIL-0-5606 Aircraft Hydraulic Fluid

1. Fill reservoir to within 2" of the top. Pressurize to 30-40 PSI.
2. Loosen valve screws on relief valve. *1/2 Socket, Crescent*
3. Using bleeder screws, bleed both ends of cylinder until solid oil appears. Single rod end cylinders bleed rod end first.
4. Go to highest helm and turn slowly 25-35 turns in one direction. Repeat at successively lower stations.
5. Again bleed at cylinder as in step 3.
6. Go to top station and turn slowly 25-35 turns in the opposite direction. Repeat at successively lower stations.
7. Again bleed at cylinder as in step 3.
8. Purging should be complete at this time.
9. Close valve screws on relief valve, check turns H.O. to H.O. per owner's manual.
10. Leave system pressure at 25-35 PSI, and the reservoir half full.

(Purging 55 PSI)