



Seastar[®] BayStar[™]

Hydraulic

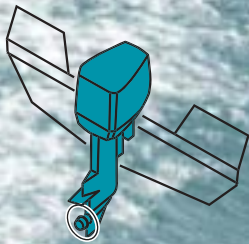


HYDRAULIC STEERING SELECTION GUIDE

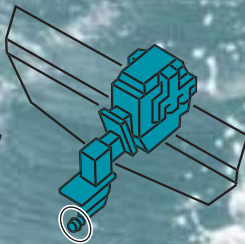
REVISION

11

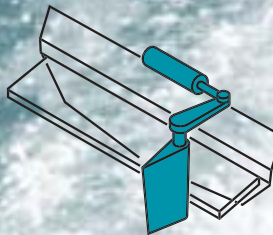
OUTBOARD



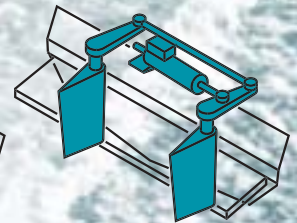
STERNDRIVE



INBOARD



POWER STEERING



www.seastarsteering.com

Boating safety is everyone's responsibility.


As a boater, you are responsible for having all required safety equipment, for operating your boat safely and for ensuring the safety of those on board your vessel as well as those sharing the waterways. Boaters exercising courtesy and common sense will not create a hazard, threat, stress or an irritant to themselves, to others, to the environment, or to wildlife.

1. Wear an approved Personal Flotation Device (PFD)
2. **Read your owner's manual.**
3. Attach engine stop switch securely to your body or PFD.
4. Respect the speed limits and other boating restrictions.
5. Be cautious and courteous.
6. Navigate with care.
7. Understand the behaviour characteristics of your vessel that might result from unexpected manoeuvres, such as sudden deceleration, high-speed obstacle avoidance, and other speed related issues.
8. It is good boating practice to rinse down your boat and exposed steering equipment with clean, fresh water after each use. DO NOT use corrosive materials on SeaStar products.

Become informed and stay informed!

"Take an accredited boating safety course"

Notice to Boat Manufacturer or Installer

Throughout this publication, Warnings and Cautions (accompanied by the International Hazard Symbol ) are used to alert the manufacturer or installer to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly.

Observe Them Carefully!

These "safety alerts" alone, cannot eliminate the hazards that they signal. Strict compliance to these special instructions when performing the installation and maintenance plus "common sense" operation are major accident prevention measures.

 DANGER	 WARNING	 CAUTION	NOTICE
Immediate hazards which WILL result in severe personal injury or death.	Hazards or unsafe practices which COULD result in severe personal injury or death.	Hazards or unsafe practices which COULD result in minor injury or product or property damage.	Information which is important to proper installation or maintenance, but is not hazard-related.

NOTICE

Help protect your boating environment by ensuring that all used oil is disposed of properly.

TABLE OF CONTENTS

The BayStar & SeaStar Hydraulic Steering Systems.		ii
1	BayStar Outboard Steering System.	1-1
	BayStar Compact Application Guide	1-5
	BayStar Plus	1-6
2	SeaStar Outboard Steering Systems.	2-1
	Front Mount Steering System	2-2
	Side Mount Steering System	2-8
	Outboard–Catamaran	2-10
	Splashwell Mount Steering System	2-11
3	SeaStar Sterndrive Systems.	3-1
4	SeaStar Inboard Steering Systems (Power & Sail)	4-1
5	Hynautic Steering.	5-1
	Application Guide	5-3
	Hynautic Seal Kits	5-6
	Crossover Hynautic to SeaStar Steering	5-7
6	Hynautic Trim Tabs	6-1
7	SeaStar/Hynautic Helms – General	7-1
	SeaStar Standard/Rear Mount Helms	7-4
	SeaStar Tilt/Sport Tilt Helms	7-5
	Hynautic Helms	7-7
8	SeaStar Hose, Tubing, Fittings, Accessories & Tools	8-1
	Outboard Hose	8-2
	Inboard/Sterndrive Tubing	8-6
	Fittings & Fitting Kits	8-9
	Liquid Tie Bar alignment Valve	8-17
	Tools	8-19
	Torque Data Sheets	8-21
9	SeaStar Power Steering	9-1
10	Hydraulic Fluid	10-1
11	SeaStar and Hynautic Volumes and Capacities.	11-1
12	Authorized Distributors	12-1
	USA Retailers	12-9
	Teleflex Canada Limited Partnership Warranty	12-10

BayStar and SeaStar Hydraulic Steering Systems

The BayStar Hydraulic Steering System is designed to add safety, reliability and comfort to single station outboard powered boats to a maximum 150HP (Total). The SeaStar Hydraulic Steering System is designed to provide that extra margin of muscle when needed. The SeaStar system easily handles Outboards, Sterndrive and Inboard boats.

System selection, installation and service is substantially simplified with just three major components — helm, cylinder and tube or hose. SeaStar has a comprehensive range of available cylinders to handle the variety of Outboard, Sterndrive and Inboard steering applications. These are suitable for both pleasure and commercial applications. Extra steering stations and/or autopilots are easily added.

SeaStar hydraulic steering is a total commitment to quality, performance and simplicity.

BayStar & SeaStar, the hydraulic steering systems that are;

Easy to install...

- Only three components: helm, cylinder & tube or hose
- Compact and attractive helm design
- Variety of helm mounting configurations
- Simple tube/hose fitting connections
- Clear, complete installation instructions

Easy to fill and purge...

- Engineered bleed fittings on the cylinders
- A helm and lock valve design that enhances air removal
- A no-mess filler device
- A filling and purging time of normally less than 30 minutes
- Easy to check for proper installation
- Easy purging check via filler device
- No searching for difficult-to-find air leaks

Easy to turn...

- Anti-friction piston points

Designed to provide many years of service...

- Precision built
- Heavy-duty bearings instead of bushings
- No corrosive materials exposed to marine environment
- Field replaceable helm and cylinder shaft seals
- A no-hassle warranty — 2 years for pleasure use
— 1 year for commercial use (SeaStar)

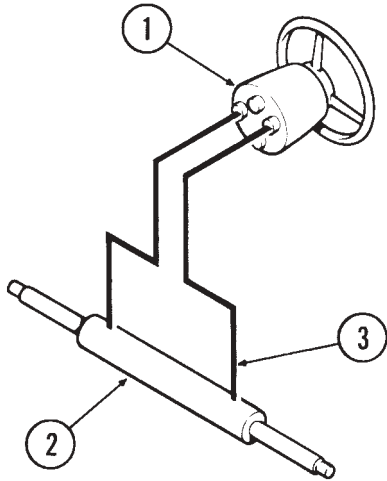
BayStar and SeaStar! Simply the best!

Teleflex Hydraulic Steering

Our manual hydraulic steering systems are simple and efficient. The basic system consists of three main components;

1) the helm pump, 2) the cylinder, and 3) the hose or tubing required to connect the cylinder to the helm pump.

These basic components are necessary in all applications. However as the system variables increase (ie: multiple engines, rudders, steering stations and autopilots), additional components may be required.



1. The Helm Unit.

The helm pump is an axial piston pump specifically designed for manual steering. It has a built-in lock valve to prevent the steering load from feeding back to the driver. The lock valve will not allow the rudder or drive unit to move until you move it with the steering wheel. The lock valve section of the helm also includes a relief valve. This relief valve provides over-pressure protection for mechanical components and hydraulic hoses and fittings.

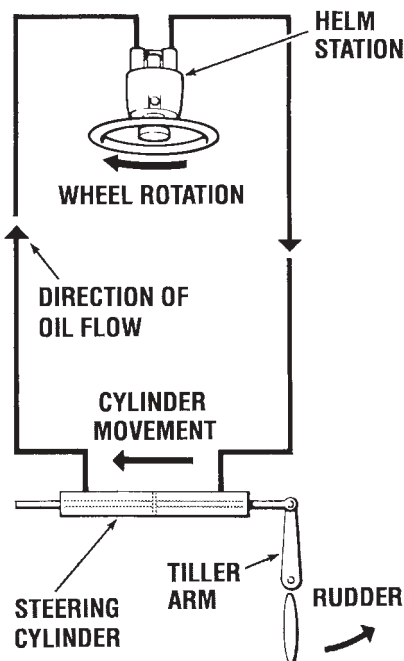
2. The Cylinder.

The most important differences between the variety of steering systems available is the cylinder selection. Both BayStar and SeaStar systems have a cylinder for most steering applications.

3. Hoses and Tubes.

Required to provide a path for the fluid to flow under pressure from the helm pump to the cylinder.

The System: How it works



The system is a two-line system. This makes operation very simple.

- 1) The steering wheel, which is attached to the helm pump, is rotated in the desired direction (ie: a turn to starboard or clockwise rotation).
- 2) Oil is pumped out the corresponding port from the rear of the helm into the starboard line and then into the cylinder.
- 3) This causes the cylinder rod, which is attached to the vessels rudder or drive unit, to move (ie: rod moves to port) thus causing the vessel to alter course.
- 4) Oil displaced from the opposite end (ie: the port end) of the cylinder flows (ie: into the port line) back to the helm pump.
- 5) For steering in the opposite direction, simply turn the helm the other way.
- 6) When no course corrections are required, the integral lock valve holds the rudder or drive unit stationary.

Selecting the System

The objective is to match the steering system to the requirements of the vessel. This depends on four things;

- 1) hull type (ie: planing or displacement),
- 2) type of propulsion system in the vessel (ie: inboard, outboard, sterndrive, etc.),
- 3) the number of engines or rudders,
- 4) the total power of the engines (ie: Horsepower).

Once the system and cylinder has been selected, the size of the helm pump is pre-determined. SeaStar systems also allow the following options to be specified;

- 1) the number of steering stations,
- 2) helm configuration (ie: standard or tilt helm),
- 3) additional features such as autopilots.

Notes on Steering Response versus Steering effort

Steering wheel effort is directly proportional to the number of wheel turns lock to lock. The number of wheel turns lock to lock is dependent on three things;

- 1) the volume of the cylinder,
- 2) the displacement of the helm pump,
- 3) the allowable movement of the rudder or drive unit.

Less wheel turns lock to lock results in more steering effort. More wheel turns lock to lock results in less steering effort.

However, additional factors that can influence steering effort are;

- 1) vessel speed,
- 2) rudder size,
- 3) unusual propeller selections,
- 4) hull type (ie: displacement, planing, etc.), and
- 5) improperly aligned counter balance skeg.

Syten Hydraulic Steering (Obsolete).

NOTICE

The Syten components were produced up until late 1984 when they were replaced by the SeaStar Steering systems. Teleflex Canada Limited Partnership no longer stocks any replacement parts, fittings or seal kits for this steering system or any component of this system.

Replacing or upgrading from a Syten inboard steering system to SeaStar Components.

Helms: The Syten helm pump should be replaced with the current model SeaStar Helm Pump HH5271 and Back mount kit HA5418. This should be done at each helm station.

Tube: The 5/16 nylon tube and fittings are obsolete and must be replaced with SeaStar 3/8" nylon extruded tube for all inboard applications.

Uniflow Valve: U-10 or Model 50: Obsolete, no replacement parts are available.

Cylinder: Adapter HA5425 is required for the conversion from a Syten steering cylinder to a current SeaStar Steering cylinder.

NOTICE

Recommendations made in this publication are guidelines based on average acceptance of steering effort.

BayStar™

OUTBOARD STEERING

BayStar™ hydraulic steering is brought to you by the manufacturers of SeaStar®, the most trusted name in pleasure boat steering. BayStar allows you to install all of the safety, reliability and comfort of hydraulic steering onto your boats rated up to **MAX. 150HP (Total)**. Combine this with the superior Teleflex Canada Limited Partnership design team, rigid ISO quality control and teamed with the finest materials and precision manufacturing—BayStar continues the tradition bringing comfort and safety to boating.

The BayStar steering system consists of a super low friction helm for smooth comfortable steering, a balanced cylinder—featuring a compact design that fits most splashwells. For your convenience two lengths of 20' cut to fit tubing are supplied (2 x 20' length), two bottles of hydraulic steering fluid, and one fill tube for easy fill and purge.

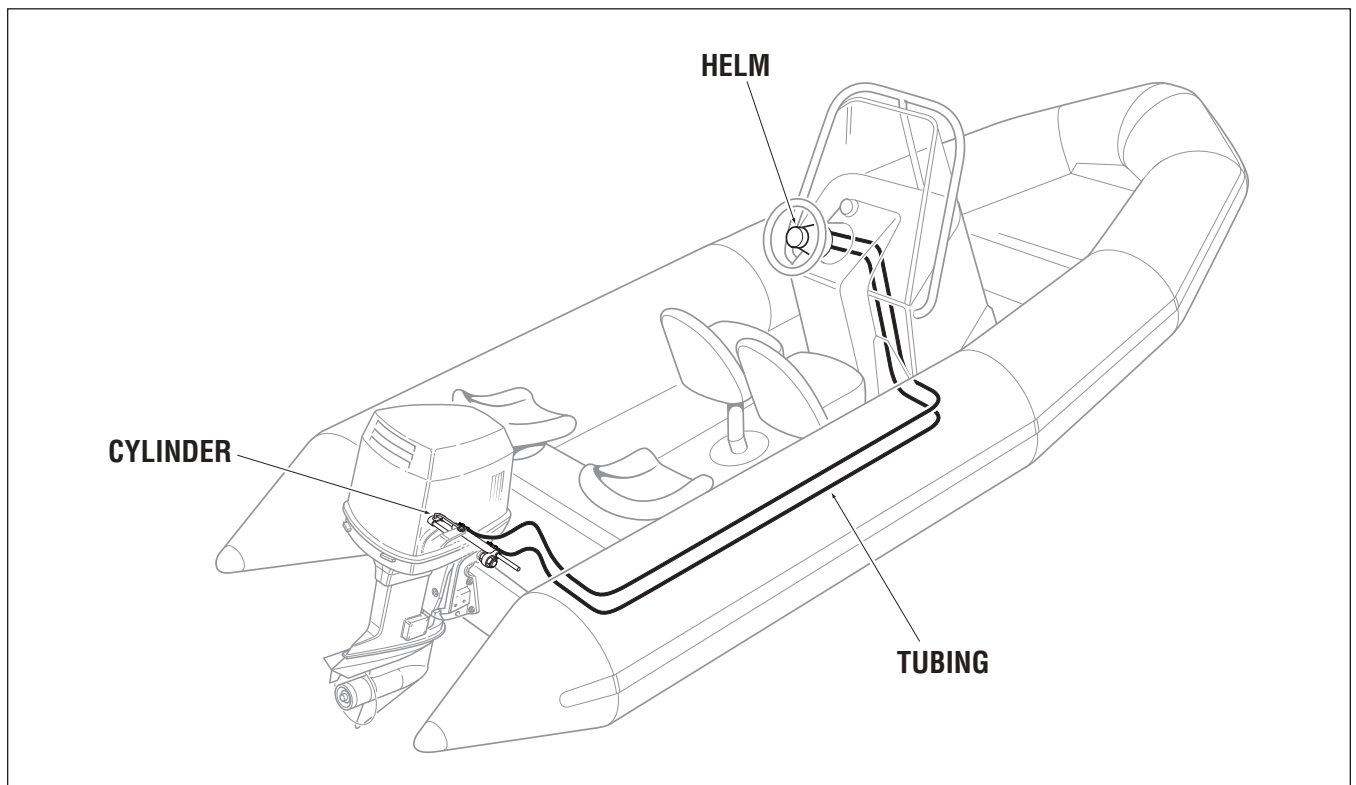
⚠ CAUTION

BayStar is **ONLY** applicable for single station steering.

DO NOT use BayStar on smaller HP outboard engines that use wing nut type transom mount clamping screws.

NOTICE

Tilt Helm #HH4015 is available separately. Currently not available in kit form.

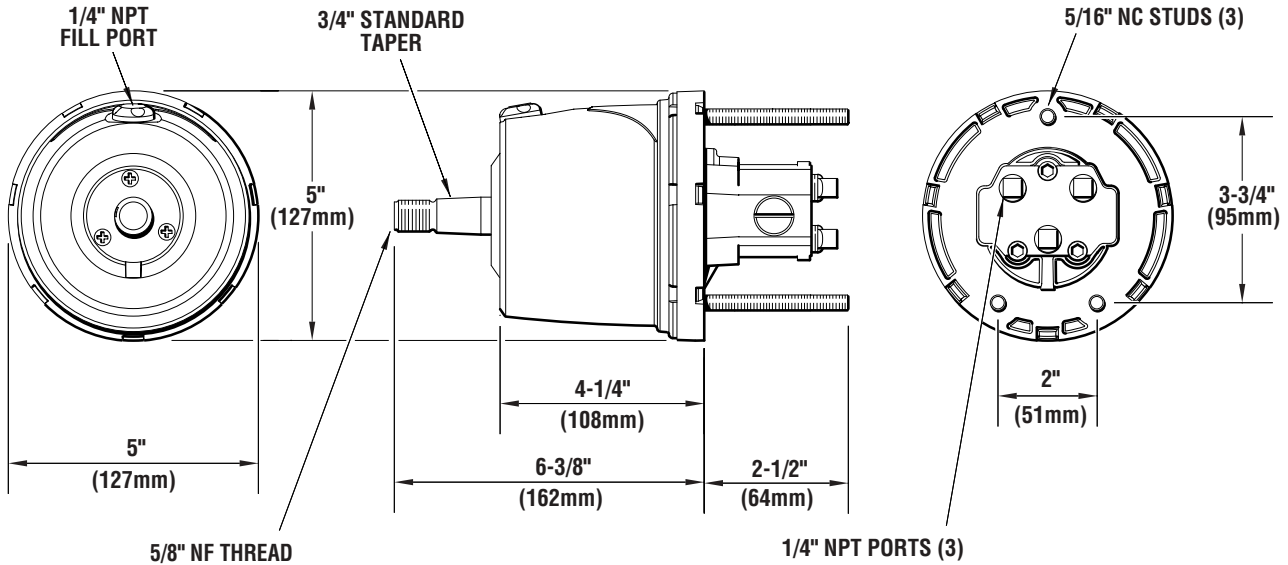


Typical BayStar Installation

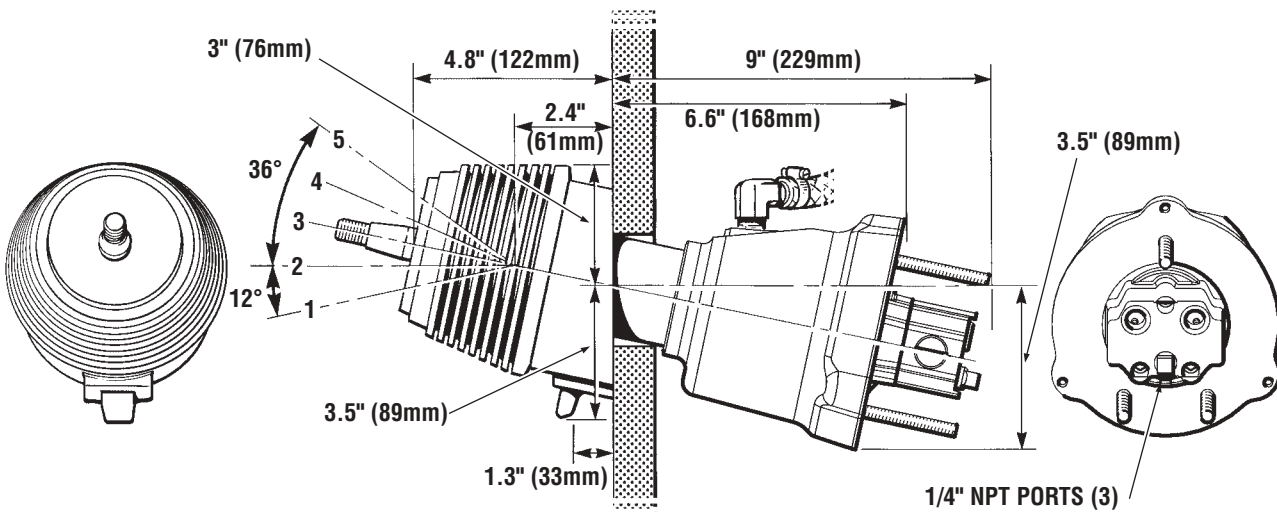
Three easy steps to select your BayStar System:

- 1) Check helm dimension. Both the Standard and Tilt helms require a 3" (76mm) cut-out hole in the dash.

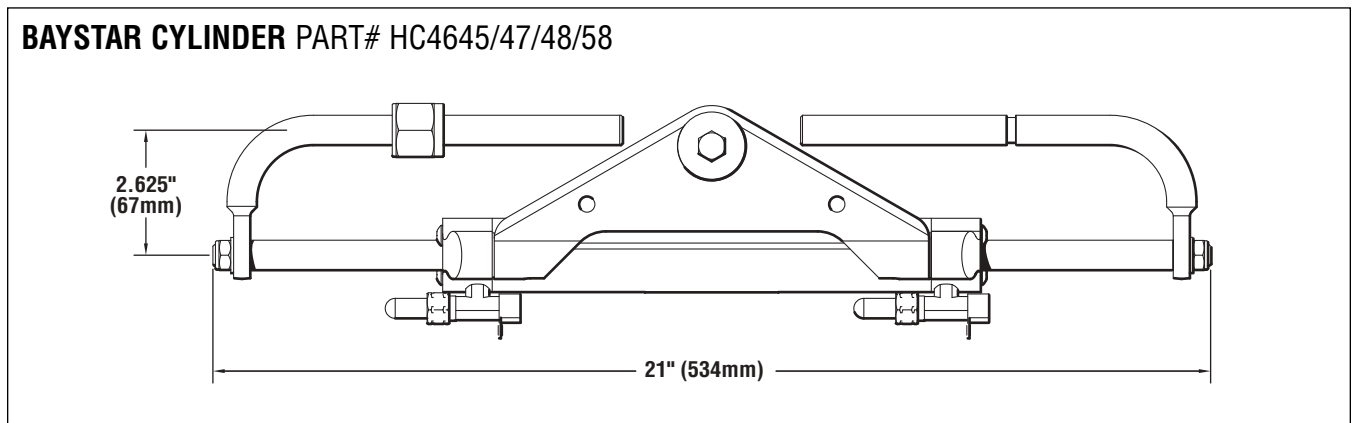
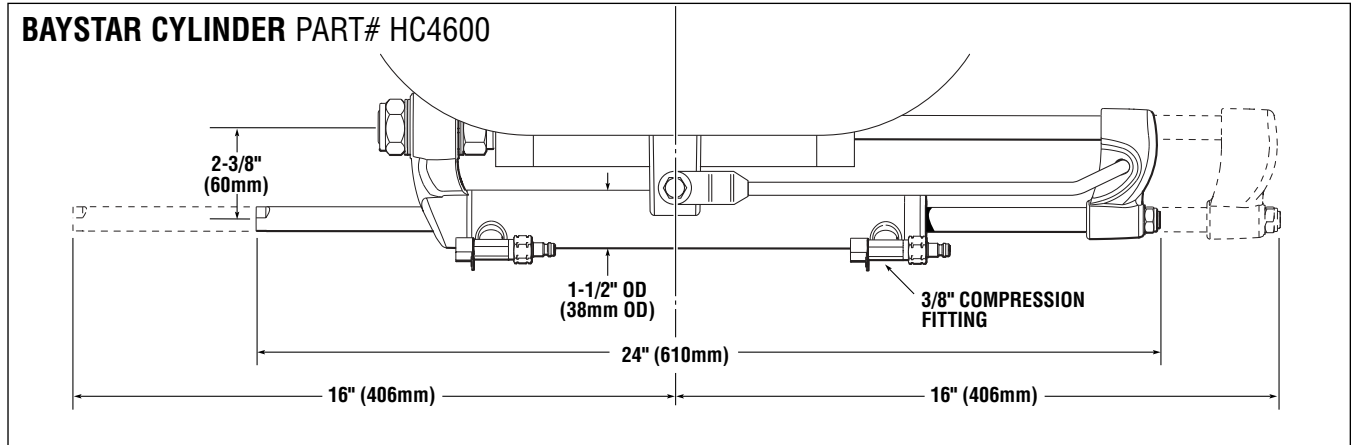
STANDARD HELM PART# HH4016



TILT HELM PART# HH4015



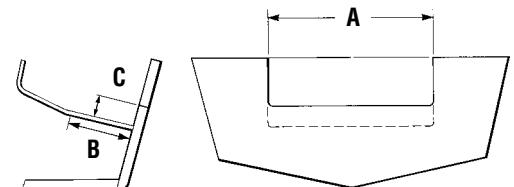
- 2) Check the BayStar cylinder dimensions through the full trim/tilt range of the engine. **IS THE SPLASHWELL WIDE ENOUGH?** The HC4600 BayStar cylinder requires 32" (813mm) splashwell width, and the HC4645/47/48/58 cylinder requires 21" (534mm).



- 3) Is there enough room in the splashwell for full engine tilt? Find the dimensions (A, B & C) of your splashwell. Check them against the minimum splashwell dimensions for full engine tilt for your engine and cylinder.

MOTOR WELL DIMENSIONS required for BayStar front mount outboard steering systems

CYLINDER MODEL NO.	# OF ENGINES	A	B	C	MIN. ENGINE CENTER DISTANCE
HC4600	1	32" (813mm)	5" (127mm)	4" (102mm)	N/A
	2	Twin engine applications not available at this time			
HC4645/47/48/58	1	21" (534mm)	6" (153mm)	5" (127mm)	N/A
	2	Twin engine applications not available at this time			



NOTES:

- i) Ensure there is no interference between the BayStar cylinder rod and the splashwell boot or engine controls & cables.
- ii) Dimensional restrictions also apply to external motor mount brackets.
- iii) Ensure dimension 'A' maintained through full trim/tilt range.
- iv) Maximum transom thickness 3" (76mm).
- v) **Engines less than 70HP may require up to an additional 1" (25mm) of splashwell clearance.**

**BayStar Steering Kits
PID# HK4200 & HK4230**

BayStar kits come complete with everything needed for an install. The cylinder utilizes the factory outboard engine supplied drag link for simplified installation. For your convenience two lengths of 20' cut to fit tubing are supplied (2 x 20' length) with HK4200 and two lengths of 30' cut to fit tubing are supplied (2 x 30' length) with HK4230.

BayStar Steering Kit (HK4200)

includes:

- BayStar Helm Pump (HH4016)
- BayStar Cylinder (HC4600)
- BayStar 20' Tubing Kit (HT4420)
- 2 Bottles of hydraulic steering fluid (HA5430)
- Filler Kit (HA5438)

BayStar Steering Kit (HK4230)

includes:

- BayStar Helm Pump (HH4016)
- BayStar Cylinder (HC4600)
- BayStar 30' Tubing Kit (HT4430)
- 2 Bottles of hydraulic steering fluid (HA5430)
- Filler Kit (HA5438)

NOTICE

HC4600 BayStar Standard Cylinder is a universal cylinder, however, ensure it will fit your splashwell as per page 1-3. If the splashwell measurements limit the engine to BayStar Compact Steering Cylinders HC4645, HC4647, or HC4658, please view the application chart on page 1-5 to determine which cylinder is to be used for your engine. BayStar Compact Cylinders are NOT available in kit form, all parts MUST be ordered separately.

BayStar Outboard Compact Application Guide

(BayStar Compact Cylinders HC4645/47/48/58)



MFG	YEAR	MODEL	CYLINDER	NOTES
FORCE	1985-DATE	90-150 HP	HC4645	
HONDA	1992-DATE	30-90 HP	HC4645	
	1998-DATE	115-130 HP	HC4647	
	2001-DATE	150 HP	HC4645	
	2003-DATE	BF135 HP	HC4645	
JOHNSON/ EVINRUDE	1977-1989	65-150 HP	HC4648	
	1991-DATE	40-150 HP	HC4645	
	1997-DATE	115 HP FICHT	HC4658	4
	1997-DATE	75-150 HP FICHT	HC4645	
	1998-DATE	40-140 HP 4-Stroke	HC4658	1, 4
MERCURY/ MARINER	1984-DATE	75-150 HP	HC4645	
NISSAN	1990-DATE	120-140 HP	HC4645	
SUZUKI	1986-DATE	150 HP	HC4645	
	1996 ONLY	115-140 HP	N/A	
	1987-2002	115-140 HP	HC4645	1
	1990-2000	90-100 HP	HC4645	
	1998-DATE	40-70 4-Stroke	HC4645	1
	2001-DATE	115-140 HP 4-Stroke	HC4658	1, 4
TOHATSU	1990-DATE	140-140 HP	HC4645	
YAMAHA	1998-DATE	40-50 HP	HC4645	2
	1998-DATE	60 HP	HC4645	3
	1986-DATE	70-90 HP	HC4645	1
	1997-DATE	80-150 HP 4-Stroke	HC4645	
	2000-DATE	40 & 60 HP 4-Stroke	HC4648	1
YANMAR	1990-DATE	27-36 HP	HC4645	

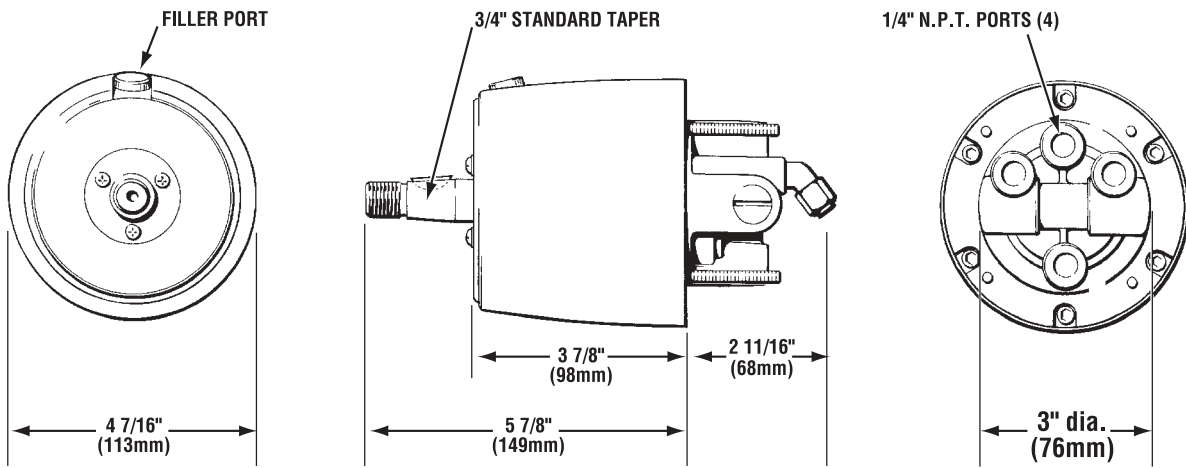
- Requires Spacer kit part # HO5090
- Engine clamp brackets must be cut or ground, and the engine through bolted onto the transom, or interference will occur, restricting engine trim and tilt.
- Steering hook Yamaha Part # 63D-48511-00-4D must be installed
- Cylinder HC4645 may be used in these applications. The pivot plate will need to be flipped before installation. Instructions provided with Owner's Manual.

REVISION DATE: SEPT. 17TH 2004

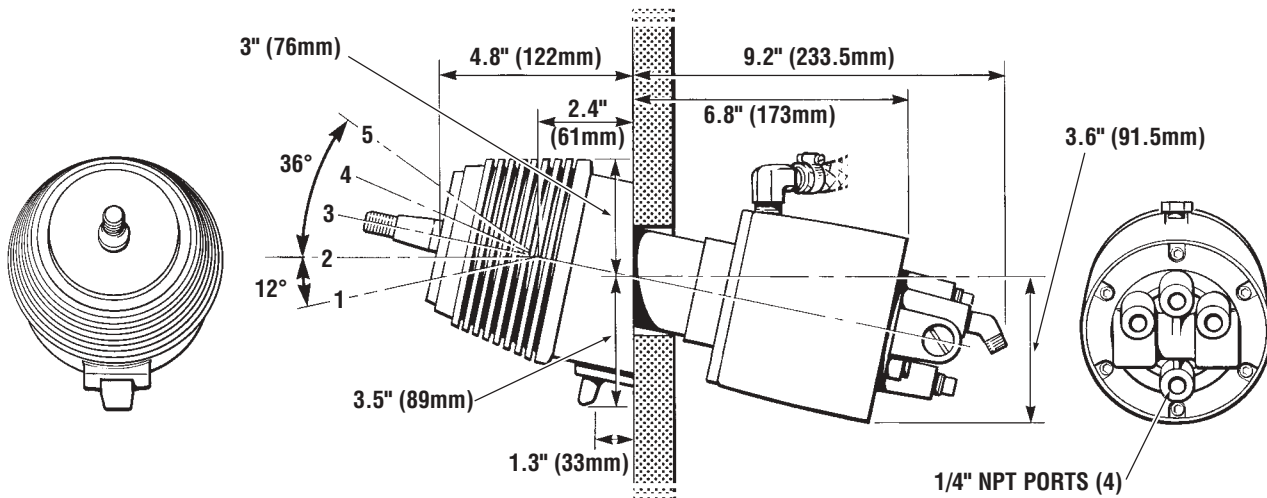
BayStar Plus

With the success of BayStar comes BayStar Plus. BayStar Plus provides enhanced steering ease over standard BayStar systems, and provides increased efficiencies and lighter steering at the wheel. As its predecessor, BayStar Plus is for boats rated to 150 HP total (some high horsepower performance 150 engines are exempt, i.e. Mercury 150 Optimax). Available in both standard mount and tilt helm versions BayStar Plus adds even more comfort to your bay style boat.

BAYSTAR PLUS HELM PART# HH4514



BAYSTAR PLUS TILT HELM PART# HH4513



OUTBOARD STEERING

SeaStar Outboard Hydraulic steering offers three models of steering cylinders to suit most applications. The standard and most commonly used model, Front Mount Pivot Cylinder part number HC5345. The Side Mount Cylinder part number HC5370 and the Splashwell Mount Cylinder part number HC5380. Review the following Order Guides, application charts and dimensional information for each cylinder to aid in your selection of the correct cylinder for your application needs.

Selecting the outboard steering system best suited for your boat:

- 1) Locate the type of boat you have in column A of the Outboard Steering Selection Guide below.
- 2) From the Guide, select the steering system best suited to your boat. You may want to review the specific features for each system.
- 3) Proceed to the appropriate section of the catalogue for a detailed component selection.
- 4) If your specific engine is not listed in the application charts, select the next alternative from the Steering System Selection Guide. Repeat step #3.

BOAT DESCRIPTION	FRONT MOUNT		SIDE MOUNT CYLINDER		SPLASHWELL MOUNT CYLINDER		NOTES CYLINDER
	SINGLE	TWIN	SINGLE	TWIN	SINGLE	TWIN	
COLUMN A							A: Best Application B: Good Application N/A: Not Applicable
CENTER CONSOLE*	A	A	B	B	B	B	
CRUISER*	A	A	B	B	B	B	
FISH 'N' SKI*	A	N/A	B	B	N/A	N/A	
OTHER FISHBOAT*	A	A	B	B	B	B	
RUNABOUT*	A	A	N/A	N/A	N/A	N/A	
BASS BOAT*	A	N/A	N/A	N/A	N/A	N/A	
INFLATABLES*	A	B	N/A	N/A	B	A	
WORK/COMMERCIAL/RESCUE*	A	A	B	B	B	B	

*Outboard engines featuring power steering require a steering input actuator.

PRODUCT REFERENCE TO TYPES OF OUTBOARD BOATS

BASS BOAT Single engine outboard powered boat designed specifically for fishing in protected waters. Typically performance oriented.

FISH 'N' SKI Single engine outboard powered boat designed for day fishing or skiing in protected waters.

RUNABOUT Intended for day boating. Typically a single engine but can be a dual engine boat. Includes tournament ski boats and performance outboards.

CENTER CONSOLE Boat with control station located on a centerline mounted console. Generally designed specifically for fishing. May be single or dual engine.

FISH BOAT Boat primarily designed and equipped for offshore fishing. May be rigged with a second steering station. Boats may be single or dual engine.

CRUISER Cuddy/express/bridge cruiser primarily designed for cruising. It has overnight accommodations. Typically rigged with two steering stations. Boats may be single or dual engine.

INFLATABLES Boats manufactured of waterproofed fabric which are inflated with air in order to achieve their shape. The bottom of the hull may be made of fabric or fiberglass. They typically have narrow transoms. Boats may be single or dual engine.

WORK/COMMERCIAL/RESCUE

Any of the previously listed applications involved in revenue producing or rescue activities. Typically a very severe service environment.

SEASTAR FRONT MOUNT OUTBOARD STEERING SYSTEM

Part# HC5345, HC5347, HC5348, HC5358

Features

- Independent engine tilt for twin engine installations.
- Easy steering.
- 5 turns lock to lock steering response.

Applications

- General purpose system.
- Single and multiple engine capability.
- Total power to 600 HP.
- Typical applications include center console fishboats and cruisers.

How to select a front mount outboard steering system

- 1) From the order guide on page 2-3 select the system configuration based on:
 - a) the number of engines, and
 - b) the total power of engine(s) to be installed.
- 2) From the application guides on page 2-4 to page 2-6 confirm that the Front Mount cylinder will fit your specific make, model, and year of engine. Select the adapter kit for single engines or the tie bar kit for dual engines.
- 3) From the order guide select the appropriate helms and accessory hardware for each steering station.
- 4) From the order guide select the fitting and hose kits required for the installation.
- 5) Confirm that there is sufficient space available in the splashwell and dash areas for the steering components.

⚠ CAUTION

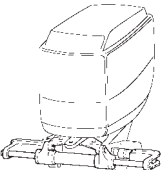
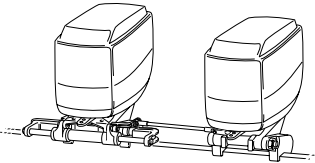
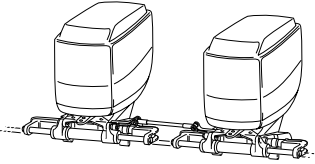
Not recommended for use in installations where;

- a) chopper, cleaver or surface piercing propellers are used,
- b) the engine is highly elevated on the transom,
- c) engine trim tabs have been removed,
- d) the boat speed exceeds 75 mph (120 km/h), or
- e) the power exceeds the maximum Coast Guard or M.O.T. recommendations for the boat.

HC5345



Order Guide

ENGINE/ CYLINDER CONFIGURATION	DESCRIPTION	QTY REQ	MODEL	PART NUMBER	REF. PAGE #	
SINGLE ENGINE (SINGLE CYLINDER) APPLICATIONS UP TO 300 HP MAX NUMBER OF TURNS 5 	CYLINDER	1	FRONT MOUNT	† HC5345		
	HELM	1	* SEASTAR I- STANDARD	HH5271	7-4	
	HOSE KIT	1	OUTBOARD HOSE	‡ HO51__	8-2	
	OIL	3	SEASTAR OIL	HA5430	10-1	
	FOR EXTRA STEERING STATION ADD:					
	HELM	1	* SEASTAR I- STANDARD	HH5271	7-4	
	FITTING KIT	1	ADD A STATION	HF5501	8-10	
	HOSE KIT	1	OUTBOARD HOSE	‡ HO51__	8-2	
	OIL	1	SEASTAR OIL	HA5430	10-1	
	† Refer to Application Guides on page 2-4 to page 2-6 for correct cylinder ‡ Refer to on page 8-2 for measuring hose distance					
DUAL ENGINE (SINGLE CYLINDER) NON-COUNTER ROTATING APPLICATIONS UP TO 450 HP MAX COUNTER ROTATING ENGINE APPLICATIONS UP TO 600 HP MAX NUMBER OF TURNS 5 	CYLINDER	1	FRONT MOUNT	† HC5345		
	TIE BAR KIT	1		HO60__		
	HELM	1	* SEASTAR I- STANDARD	HH5271	7-4	
	HOSE KIT	1	OUTBOARD HOSE	‡ HO51__	8-2	
	OIL	3	SEASTAR OIL	HA5430	10-1	
	FOR EXTRA STEERING STATION ADD:					
	HELM	1	* SEASTAR I- STANDARD	HH5271	7-4	
	FITTING KIT	1	ADD A STATION	HF5501	8-10	
	HOSE KIT	1	OUTBOARD HOSE	‡ HO51__	8-2	
	OIL	1	SEASTAR OIL	HA5430	10-1	
† Refer to Application Guides on page 2-4 to page 2-6 for correct cylinder ‡ Refer to on page 8-2 for measuring hose distance						
DUAL ENGINE (DUAL CYLINDERS) NON-COUNTER ROTATING APPLICATIONS UP TO 600 HP MAX ALL COUNTER ROTATING ENGINE APPLICATIONS NUMBER OF TURNS 6.5 	CYLINDER	2	FRONT MOUNT	† HC5345		
	TIE BAR KIT	1		HO60__		
	HELM	1	** SEASTAR II- STANDARD	HH5272	7-4	
	HOSE KIT	1	OUTBOARD HOSE	‡ HO51__	8-2	
	HOSE KIT	1	OUTBOARD HOSE	‡ HO51__	8-2	
	HOSE KIT	1	OUTBOARD HOSE	‡ HO51__	8-2	
	FITTING KIT	1	TEE FITTINGS	HF5530	8-1	
	OIL	3	SEASTAR OIL	HA5430	10-1	
	FOR EXTRA STEERING STATION ADD:					
	HELM	1	** SEASTAR II- STANDARD	HH5272	7-4	
FITTING KIT	1	ADD A STATION	HF5501	8-10		
HOSE KIT	1	OUTBOARD HOSE	‡ HO51__	8-2		
OIL	1	SEASTAR OIL	HA5430	10-1		
† Refer to Application Guides on page 2-4 to page 2-6 for correct cylinder ‡ Refer to on page 8-2 for measuring hose distance						
OPTIONAL EQUIPMENT	BACK PLATE KIT		(FOR STANDARD HELMS)	HA5418	7-6	
	20 DEGREE WEDGE		(FOR STANDARD HELMS)	HA5419	7-6	
	AUTOPILOT FITTING KIT		(FOR ALL HELMS)	HF5501	8-10	
	* TILT HELM- SEASTAR I			HH5741	7-5	
	REAR MOUNT HELM- SEASTAR I			HH5261	7-5	
	** TILT HELM- SEASTAR II			HH5742	7-5	
	REAR MOUNT HELM- SEASTAR II			HH5262	7-5	

Single Engine Application Guide

MFG	YEAR	MODEL	CYL	NOTES
FORCE	1985-DATE	90-150 HP	HC5345	
HONDA	1996-DATE	75-90HP	HC5345	See Note 1
	1998-DATE	115-130HP	HC5347	
	1998-DATE	30-50HP	HC5345	
	2001-DATE	135-225HP 4-Stroke	HC5345	
	2003-DATE	BF135HP	HC5345	
JOHNSON/ EVINRUDE	1977-1990	65-300HP	HC5348	See Note 1 See Note 1
	1988-1997	250-300HP V8	HC5342	
	1991-DATE	40-250HP	HC5345	
	1996-DATE	75-250HP Ficht	HC5345	
	1998-DATE	40-140HP 4-Stroke	HC5358	
	2000-DATE	115HP Ficht	HC5358	
	2002-DATE	200-225HP 4-Stroke	HC5345	
MERCURY	1984-1994	2.4/2.5HP EFI	HC5345	See Note 2
	1989-DATE	75-300HP	HC5345	See Note 1 See Note 3
	1996-DATE	75-225HP 4-Stroke	HC5345	
	1998-DATE	30-60HP	HC5345	
	2003-DATE	250-300HP XS	HC6345	
NISSAN	1990-DATE	90-140HP	HC5345	
SUZUKI	1986-DATE	100HP	HC5345	NOT 1996 See Note 1 See Note 1
	1986-2002	115-140HP	HC5345	
	1986-DATE	150-250HP 2 & 4-Stroke	HC5345	
	1996 ONLY	115-140HP	HC5348	
	1998-DATE	40-140HP 4-Stroke	HC5358	
	2003-DATE	90HP 4-Stroke	HC5358	
US MARINE	1996-DATE	90-120HP	HC5345	
YAMAHA	1990-2003	40-90HP	HC5345	See Note 1
	1986-DATE	100-250HP 2-Stroke	HC5345	
	1997-DATE	80-225HP 4-Stroke	HC5345	
	2000-DATE	150-250 HPDI	HC5345	
	2002-DATE	300 HPDI	HC5358	
	2003-DATE	40-60HP 4-Stroke	HC5348	
YANMAR	1994-DATE	90-120HP	HC5345	

1. Requires Spacer Kit# HO5090
2. May Require Extensive Cowling Modifications
3. Must use Mercury supplied tiller bolt for installation.

REVISION DATE: SEPT. 17TH 2004

Twin Engine Application Guide

MFG	YEAR	MODEL	CYL	TIE BAR KITS		NOTES
				TWIN x 1	TWIN x 2	
FORCE	1985-DATE	90-150 HP	HC5345	HO5008A	HO5008A	
HONDA	1996-DATE	75-90HP	HC5345	HO6001	HO6002	See Note 3
	1998-DATE	115-130HP	HC5347	HO5063	HO5064	See Note 5
	1998-DATE	30-50HP	HC5345	HO6001	HO6002	See Note 2
	2001-DATE	150HP 4-Stroke	HC5345	HO6003	HO6002	
	2001-DATE	225HP 4-Stroke	HC5345	HO6001	HO6002	
	2003-DATE	BF135HP	HC5345	HO6003	HO6002	
JOHNSON/ EVINRUDE	1977-1990	65-300HP	HC5348	HO6003	HO6002	
	1988-1997	250-300HP V8	HC5342	HO5001A	HO5030	See Note 5
	1991-DATE	40-250HP	HC5345	HO6003	HO6002	
	1996-DATE	75-250HP Ficht	HC5345	HO6003	HO6002	
	1998-DATE	40-140HP 4-Stroke	HC5358	HO6003	HO6002	See Note 2
	2000-DATE	115HP FICT	HC5358	HO6003	HO6002	See Note 2
	2002-DATE	200-225HP 4-Stroke	HC5345	HO6003	HO6002	
MERCURY	1984-1994	2.4/2.5HP EFI	HC5345	HO6001	HO6002	See Note 4
	1989-DATE	75-300HP	HC5345	HO6001	HO6002	See Note 3
	1996-DATE	75-200HP 2 & 4-Stroke	HC5345	HO6001	HO6002	
	1998-DATE	30-60HP	HC5345	HO6001	HO6002	See Note 2
	2002-DATE	225HP 4-Stroke	HC5358	HO6001	HO6002	See Note 1
	2003-DATE	250HP XS	HC5345	N/A	HO6002	See Note 6
NISSAN	1990-DATE	90-140HP	HC5345	HO6001	HO6002	
SUZUKI	1986-DATE	100HP	HC5345	HO6003	HO6002	
	1986-2002	115-140HP	HC5345	HO6001	HO6002	NOT 1996
	1986-DATE	150-250HP 2 & 4-Stroke	HC5345	HO6003	HO6002	
	1996 ONLY	115-140HP	HC5348	HO6001	HO6002	
	1998-DATE	40-140HP 4-Stroke	HC5358	HO6003	HO6002	See Note 2
	2003-DATE	90HP 4-Stroke	HC5358	HO6003	HO6002	See Note 2
US MARINE	1996-DATE	90-120HP	HC5345	HO6001	HO6002	
YAMAHA	1990-DATE	40-90HP	HC5345	HO6003	HO6002	
	1986-DATE	100-250HP 2-Stroke	HC5345	HO6001	HO6002	
	1997-DATE	80-225HP 4-Stroke	HC5358	HO6001	HO6002	See Note 1
	2000-DATE	150-250 HPDI	HC5358	HO6001	HO6002	See Note 1
	2002-DATE	300 HPDI	HC5358	HO6001	HO6002	
	2003-DATE	40-60HP 4-Stroke	HC5348	HO6003	HO6002	See Note 2
YANMAR	1994-DATE	90-120HP	HC5345	HO6001	HO6002	

1. HC5345 is optional for **SINGLE ENGINE ONLY** applications. **DO NOT** use HC5345 for twin engine applications as operational interference may occur.

2. Requires Kit HO5090

3. Minimum Engine Center = 27"

4. May Require Extensive Cowling Modifications

5. HO5030 and HO5064 comes without Tie Bar

6. One cylinder per engine. Must use Mercury supplied tiller bolt for installation.

REVISION DATE: SEPT. 17TH 2004

Triple Engine Application Guide

NOTICE

Two cylinders are required to operate a triple engine set up except on the Mercury 250HP XS where three cylinders are required.

MFG	YEAR	MODEL	CYL	PORT TO DRIVE CYL	STARBOARD TO DRIVE CYL	NOTES
FORCE	1995-DATE	90-120HP	HC5345	HO6001	HO6002	
HONDA	1996-DATE	75-90HP	HC5345	HO6001	HO6002	See Note 2
MERCURY	1989-DATE	75-275HP	HC5345	HO5081		See Note 3
	2003-DATE	250HP XS	HC5345	HO6002	HO6002	
JOHNSON/ EVINRUDE	1991-DATE	90-175HP	HC5345	HO5080		See Note 2 See Note 1
	1991-DATE	250-300HP	HC5345	HO6001	HO6002	
	1991-DATE	200-225HP	HC5345	HO6003	HO6002	
	1991-DATE	90-225HP Ficht	HC5345	HO5080		
	1998-DATE	65-70HP 4-Stroke	HC5345	HO6003	HO6002	
SUZUKI	1986-DATE	150-250HP 2 & 4-Stroke	HC5345	HO6003	HO6002	See Note 1
	1986-DATE	115-140HP	HC5345	HO6003	HO6002	
	1998-DATE	65-70HP 4-Stroke	HC5345	HO6001	HO6002	
YAMAHA	1990-DATE	100-200HP	HC5345	HO6001	HO6002	
	1990-DATE	225-250HP 4-Stroke	HC5358	HO5080		
	1998-DATE	80-100HP 4-Stroke	HC5358	HO6001	HO6002	

1. Requires Kit HO5090
2. Minimum Engine Center = 29"
3. For Mercury 250 XS models. One cylinder required per engine. Mercury supplied tiller bolt must be used on all cylinders.

REVISION DATE: JANUARY 12TH 2004

High Performance Offshore Fishing Boats

With the power and speed increasing for performance type SKA fishing boats, Teleflex felt it prudent to set up a dedicated application for these types of boats. If your application calls for a dual or triple Outboard Engine configuration, is capable of speeds exceeding 55mph, and runs in open water, please refer to the Application Chart below for your specific engine size and type for detailed system set up.

Twin Engine Applications

MFG	YEAR	MODEL	CYLINDER	EXTENSION PLATES	TIE BAR	NOTES
HONDA	2001-DATE	225-ABOVE, 4-STROKE	HC6345	HO5074	HO5009	2,5
JOHNSON EVINRUDE	1991-DATE	250 FICHT	HC6358	HO5072A	HO5009	1,2,5,7
	1993-DATE	250-300 HP 2-STROKE	HC6358	HO5073A	HO5009	2,5,7
SUZUKI	1998-DATE	225-ABOVE, 4-STROKE	HC6358	HO5088	HO5009	1,2,5,7
	1998-DATE	225-ABOVE, 2-STROKE	HC6358	HO5072A	HO5009	2,5
MERCURY	2002-DATE	225-ABOVE, 4-STROKE	HC6358	HO5038A	HO5009	2,5,7
	1998-DATE	225-300 HP 2-STROKE	HC6345	HO5038A	HO5009	2,5,7
	2002-DATE	ALL XS ENGINES	HC6345	HO5076	HO5009	2,3,5,7
YAMAHA	2000-DATE	225-ABOVE, 4-STROKE	HC6358	HO5047A	HO5009	2,5,7

Triple Engine Applications

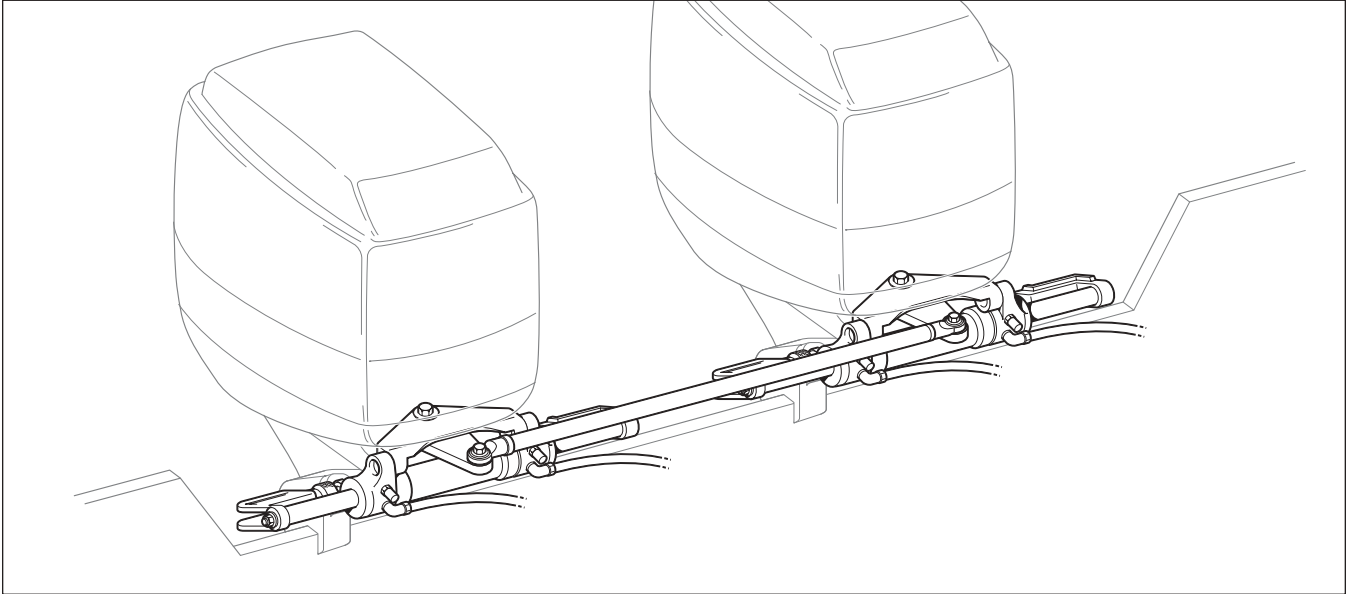
MFG	YEAR	MODEL	CYLINDER	EXTENSION PLATES	TIE BAR	NOTES
HONDA	2001-DATE	225-ABOVE, 4-STROKE	HC6345	HO5087	HO5009	4,6
JOHNSON EVINRUDE	1991-DATE	250 FICHT	HC6358	HO5085	HO5009	1,4,6,7
	1993-DATE	250-300 HP 2-STROKE	HC6358	HO5086	HO5009	4,6,7
SUZUKI	1998-DATE	225-ABOVE, 4-STROKE	HC6358	HO5089	HO5009	1,4,6,7
	1998-DATE	225-ABOVE, 2-STROKE	HC6358	HO5085	HO5009	1,4,6
MERCURY	2002-DATE	225-ABOVE, 4-STROKE	HC6358	HO5079	HO5009	4,6,7
	1998-DATE	225-300 HP 2-STROKE	HC6345	HO5079	HO5009	4,6,7
	2002-DATE	ALL XS ENGINES	HC6345	HO5077	HO5009	2,3,6,7
YAMAHA	2000-DATE	225-ABOVE, 4-STROKE	HC6358	HO5084	HO5009	4,6,7

Notes

- 1 Requires Spacer Kit# HO5090.
- 2 Requires one cylinder per engine.
- 3 One cylinder per engine. **MUST** use Mercury supplied tiller bolt.
- 4 Two cylinders required. Must be mounted on outside engines.
- 5 Requires one HO5009 tiebar.
- 6 Requires two HO5009 tiebars.
- 7 If interference occurs use Mercury tiebar.

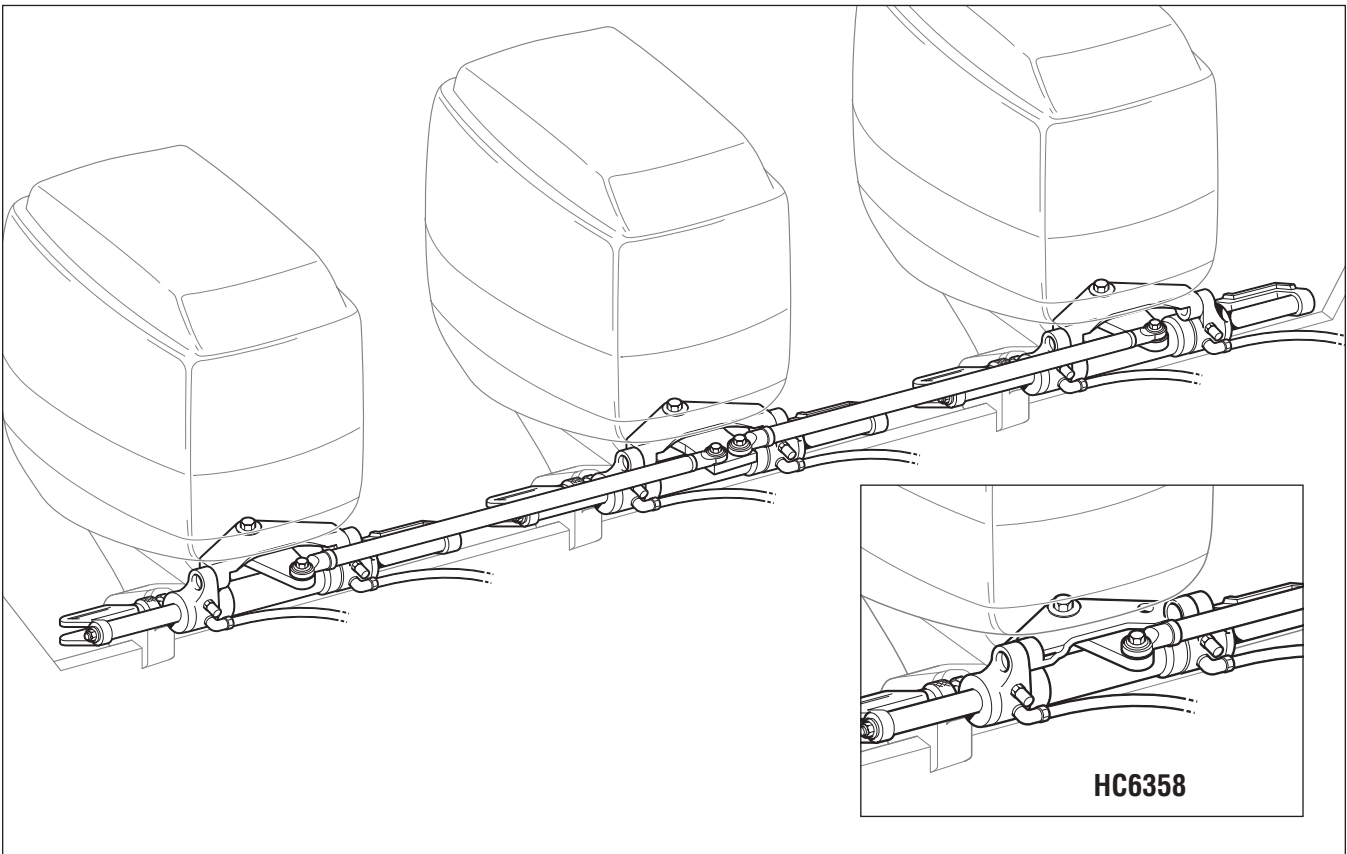
Twin Engine Applications

Mercury XS Set Shown



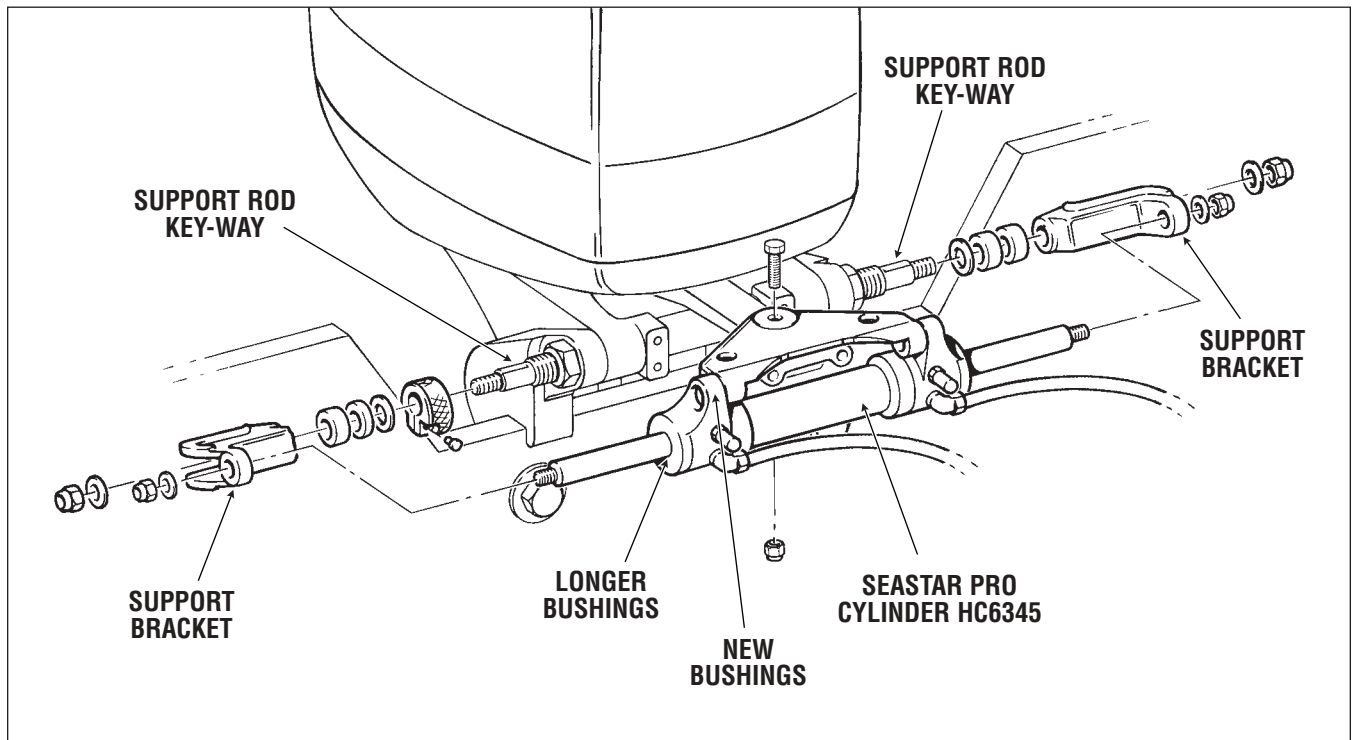
Triple Engine Applications

Mercury XS Set Shown



SeaStar Pro Cylinder

Innovation and collaboration are what SeaStar PRO cylinders are all about. The Pro cylinders gives the helmsman increased feel and when combined with a PRO helm pump gives immediate control that high speed boats demand. Longer shaft bushings and increased size in the pivot bushings yield a more robust cylinder. Engine applications are the same as SeaStar HC5345, HC5358 cylinders, please see the application guides on page 2-4 to page 2-6 for details on applications.



Cylinder Part# HC6345 Shown

Available Cylinders:

HC6345 and HC6358. Refer to page 2-7 for applications.

Cylinder Installation and General Dimensions

WARNING

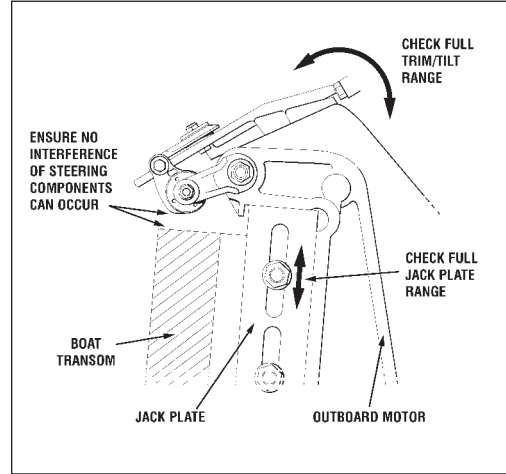
Operational interference of the steering cylinder/cylinder fittings and jackplates/transom/splashwell can occur under certain conditions. Check installation thoroughly throughout the full range of Motor Tilt, Jack Height and Trim before making final installation.

If interference does occur, contact:

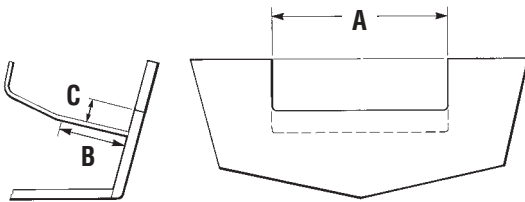
Teleflex Canada Limited Partnership for additional information/options.

Telephone: **604-270-6899** Fax: **604-279-2202**

If interference is not eliminated total steering loss can occur, causing property damage and/or personal injury.



Motor Well dimensions required for front mount outboard steering systems

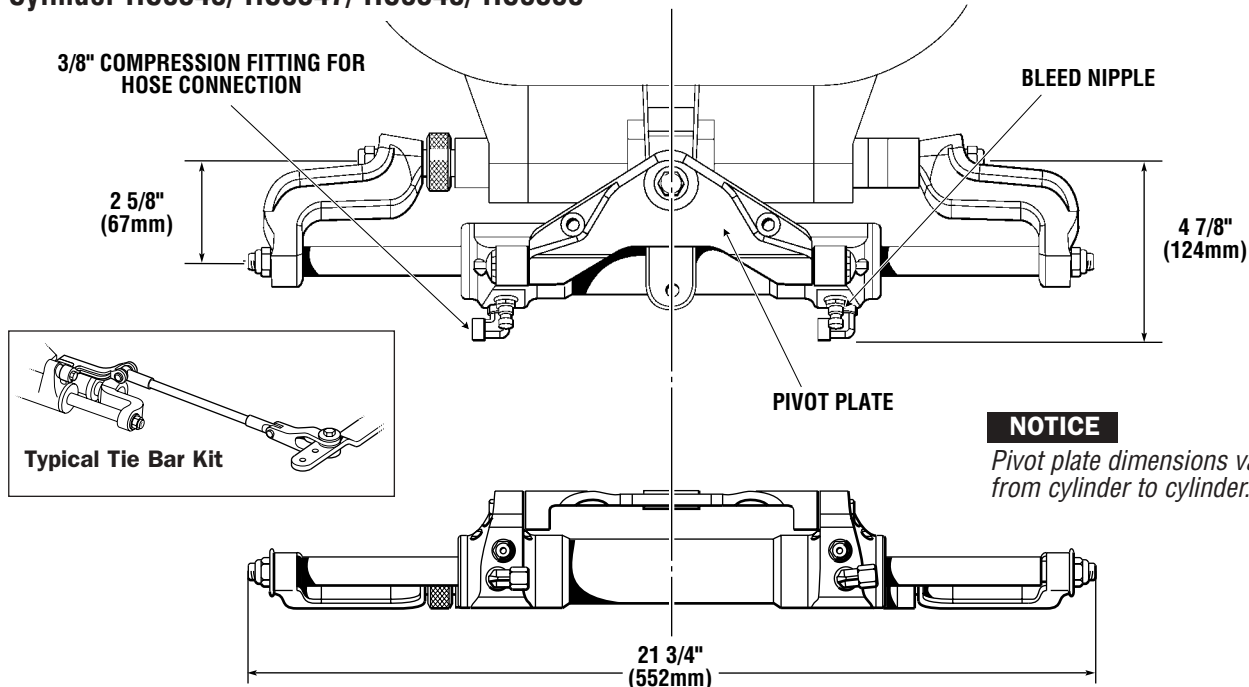


# OF ENGINES	A	B	C	MIN. ENGINE CENTER DISTANCE
1	22" (559mm)	6" (152mm)	5" (127mm)	N/A
2	49" (1244mm)	6" (152mm)	5" (127mm)	26" (660mm)

NOTES

- a) Dimensional restrictions also apply to external motor mount brackets.
- b) Maximum engine center distance for twin engine applications is 36" (914mm) using the standard tiebar. Dimension 'A' would have to be increased proportional to the tiebar length.
- c) Minimum engine center distance is 26" unless engine manufacturer recommendation is greater.

Cylinder HC5345/ HC5347/ HC5348/ HC5358



NOTICE

Pivot plate dimensions vary from cylinder to cylinder.

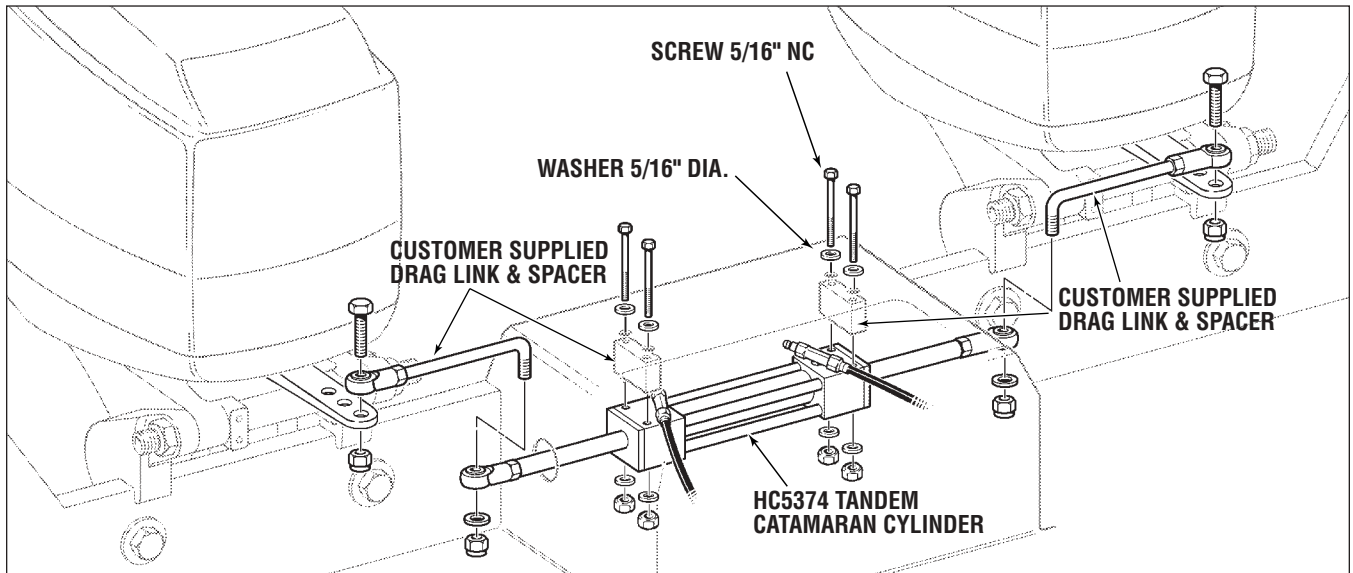
Outboard-Catamaran

Horsepower Limitations

ENGINE CONFIGURATIONS	MAXIMUM HORSEPOWER	CYLINDER	RECOMMENDED HELM PUMP	NO. OF STEERING WHEEL TURNS
NON COUNTER-ROTATING	UP TO 450HP	HC5343 HC5374	HH5271 HH5272	5 5.5
COUNTER-ROTATING	UP TO 600HP	HC5343 HC5374	HH5271 HH5272	5 5.5

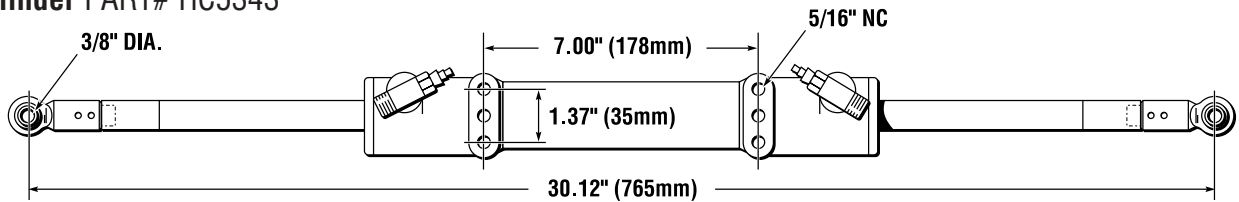
To establish whether or not this cylinder is suitable for your application, the following points should be considered:

1. Fore and aft alignment of cylinder. If not mounted in line, motors will have a different turning radius.
2. Distance between motors.
3. Distance of travel in tilt arc.
4. Horizontal alignment of cylinder.

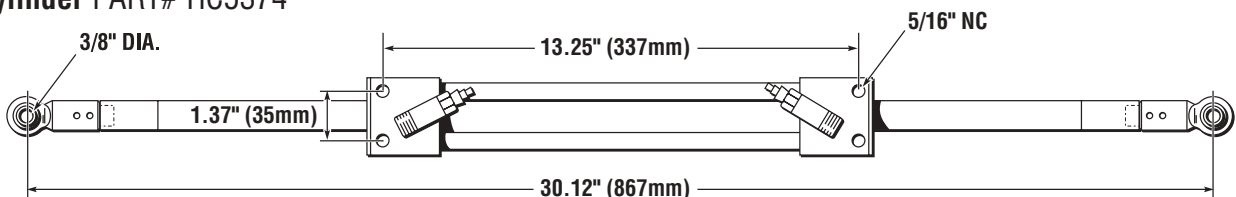


Cylinder Part# HC5374 Shown

Cylinder PART# HC5343



Cylinder PART# HC5374



SEASTAR SIDE MOUNT OUTBOARD STEERING SYSTEM

Part# HC5370

Features

- Ease of installation.
- Alternative to Front Mount Cylinder.
- Unbalanced cylinder with 4.8/5.7 turns lock to lock.
- Suitable for installation in shallow splashwells.
- Suitable for use on engines fitted with power steering.

Applications

- All engines with threaded tilt (steering) tubes complying with ABYC P17/ABYC P21/NMEA/BIA standards for mechanical steering.
- Cylinder attaches to the engine tilt tube as per ABYC/NMEA/BIA standard.
- Single and multiple outboard engine installations.
- Total power to 600 HP in counter rotating application. (see order guide)
- Typical applications include center console fishboats and cruisers.

How to select a side mount outboard steering system

⚠ WARNING

**Not for use with SeaStar-Pro
Helm Pumps.**

- 1) From the order guide on page 2-13 select the system configuration based on;
 - a) the number of engines, and
 - b) the total power of engine(s) to be installed.
- 2) From the order guide select the cylinder(s) and tie bar kits required.
- 3) From the order guide select the appropriate helms and accessory hardware for each steering station.
- 4) From the order guide select the fitting and hose kits required for the installation.
- 5) Confirm that there is sufficient space available in the splashwell and dash areas for the steering components.

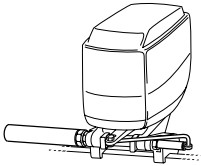
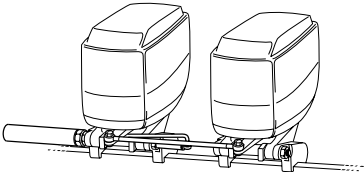
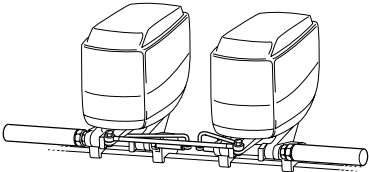
NOTICE

*Not recommended for use in
installations where;*

- a) chopper, cleaver, or surfacing
piercing propellers are used,*
- b) the engine is highly elevated
on the transom,*
- c) engine trim tabs have been
removed,*
- d) the boat speed exceeds
75 mph (120 km/h), or*
- e) the power exceeds maximum
Coast Guard or M.O.T.
recommendations for the boat.*

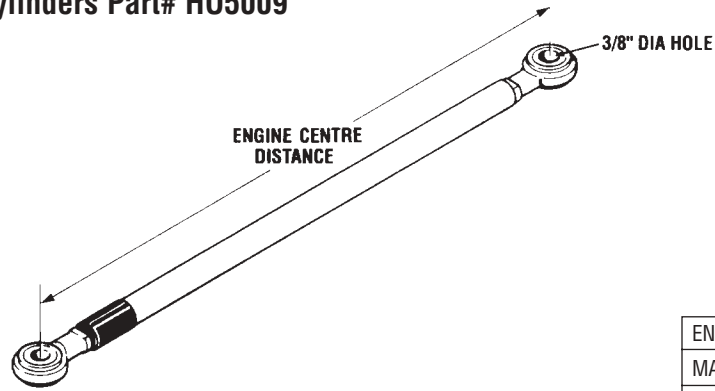


Order Guide

ENGINE/ CYLINDER CONFIGURATION	DESCRIPTION	QTY REQ	MODEL	PART NUMBER	REF. PAGE #	
SINGLE ENGINE (SINGLE CYLINDER) APPLICATIONS UP TO 300 HP MAX NUMBER OF TURNS 4.8/5.7 	CYLINDER	1	SIDE MOUNT	HC5370		
	HELM	1	* SEASTAR I- STANDARD	HH5271	7-4	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	8-2	
	OIL	3	SEASTAR OIL	HA5430	10-1	
	FOR EXTRA STEERING STATIONS ADD:					
	HELM	1	* SEASTAR I- STANDARD	HH5271	7-4	
	FITTING KIT	1	ADD A STATION	HF5501	8-10	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	8-2	
	OIL	1	SEASTAR OIL	HA5430	10-1	
	DUAL ENGINE (SINGLE CYLINDER) NON-COUNTER ROTATING APPLICATIONS UP TO 300 HP MAX COUNTER ROTATING ENGINE APPLICATIONS UP TO 600 HP MAX NUMBER OF TURNS 4.8/5.7 	CYLINDER	1	SIDE MOUNT	HC5370	
TIE BAR KIT		1	TIE BAR ONLY	HO5009		
HELM		1	* SEASTAR I- STANDARD	HH5271	7-4	
HOSE KIT		1	OUTBOARD HOSE	HO51__	8-2	
OIL		3	SEASTAR OIL	HA5430	10-1	
FOR EXTRA STEERING STATIONS ADD:						
HELM		1	* SEASTAR I- STANDARD	HH5271	7-4	
FITTING KIT		1	ADD A STATION	HF5501	8-10	
HOSE KIT		1	OUTBOARD HOSE	HO51__	8-2	
OIL		1	SEASTAR OIL	HA5430	10-1	
DUAL ENGINE (DUAL CYLINDERS) NON-COUNTER ROTATING APPLICATIONS UP TO 600 HP MAX ALL COUNTER ROTATING ENGINE APPLICATIONS NUMBER OF TURNS 7.5 	CYLINDER	2	SIDE MOUNT	HC5370		
	TIE BAR KIT	1	TIE BAR ONLY	HO5009		
	HELM	1	** SEASTAR II- STANDARD	HH5272	7-4	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	8-2	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	8-2	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	8-2	
	FITTING KIT	1	TEE FITTINGS	HF5530	8-1	
	OIL	3	SEASTAR OIL	HA5430	10-1	
	FOR EXTRA STEERING STATIONS ADD:					
	HELM	1	** SEASTAR II- STANDARD	HH5272	7-4	
FITTING KIT	1	ADD A STATION	HF5501	8-10		
HOSE KIT	1	OUTBOARD HOSE	HO51__	8-2		
OIL	1	SEASTAR OIL	HA5430	10-1		
OPTIONAL EQUIPMENT	BACK PLATE KIT		(FOR STANDARD HELMS)	HA5418	7-6	
	20 DEGREE WEDGE		(FOR STANDARD HELMS)	HA5419	7-6	
	AUTOPILOT FITTING KIT		(FOR ALL HELMS)	HF5501	8-10	
	* TILT HELM- SEASTAR I			HH5741	7-5	
	REAR MOUNT HELM- SEASTAR I			HH5261	7-5	
	** TILT HELM- SEASTAR II			HH5742	7-5	
			REAR MOUNT HELM- SEASTAR II	HH5262	7-5	

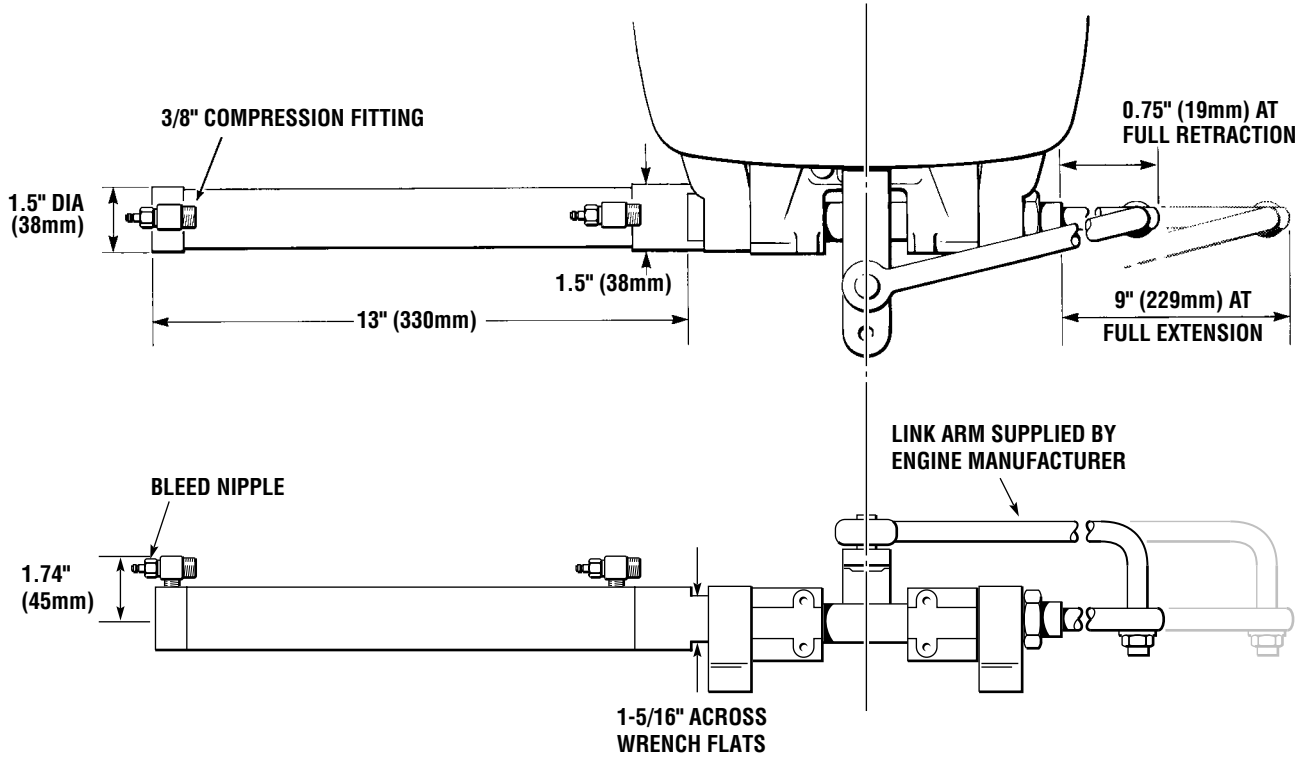
General Dimensions

Tie Bar for Side Mount Cylinders Part# H05009



ENGINE CENTRE DISTANCE	
MAXIMUM:	36" (914mm)
MINIMUM:	26" (660mm)

PART# HC5370



SEASTAR SPLASHWELL MOUNT OUTBOARD STEERING SYSTEM

Part# HC5380

NOTICE

Not for use with SeaStar Pro Helms.

Features

- Light duty alternative to front & side mount cylinders.
- Unbalanced cylinder with 5.5/6.5 turns lock to lock.
- Fits engines with/without support (steering) tube.

Applications

- Single & multiple engine capability.
- Total power to 600 HP in counter rotating application. (see order guide)
- Transom or hull mounted cylinder.
- Speeds to 60mph maximum (97km/h).

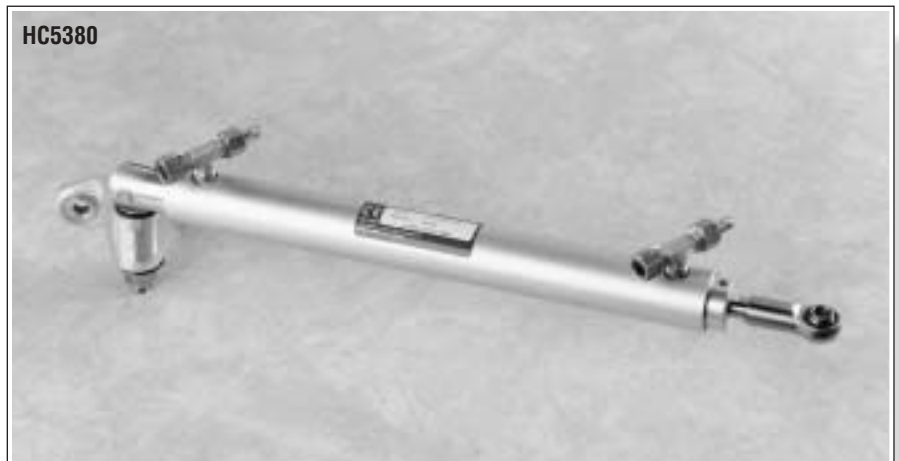
How to select a splashwell mount outboard steering system

- 1) From the order guide on page 2-16 select the system configuration based on;
 - a) the number of engines, and
 - b) the total power of engine(s) to be installed.
- 2) Select the cylinder and tie bar kit required.
- 3) From the order guide select the appropriate helms and accessory hardware for each steering station.
- 4) From the order guide select the fitting and hose kits required. You will have to determine the configuration, length, number of hose and fitting kits required for the installation (refer to page 8-2).
- 5) Confirm that there is sufficient space available in the splashwell and dash areas for the steering components.

NOTICE

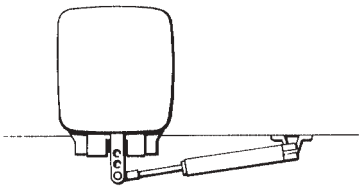
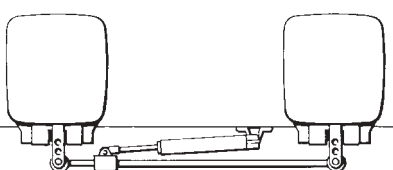
Not recommended for use in installations where;

- a) chopper, cleaver or surfacing piercing propellers are used,*
- b) the engine is highly elevated on the transom,*
- c) engine trim tabs have been removed,*
- d) the boat speed exceeds 60 mph (97 km/h), or*
- e) the power exceeds maximum Coast Guard or M.O.T. recommendations for the boat.*

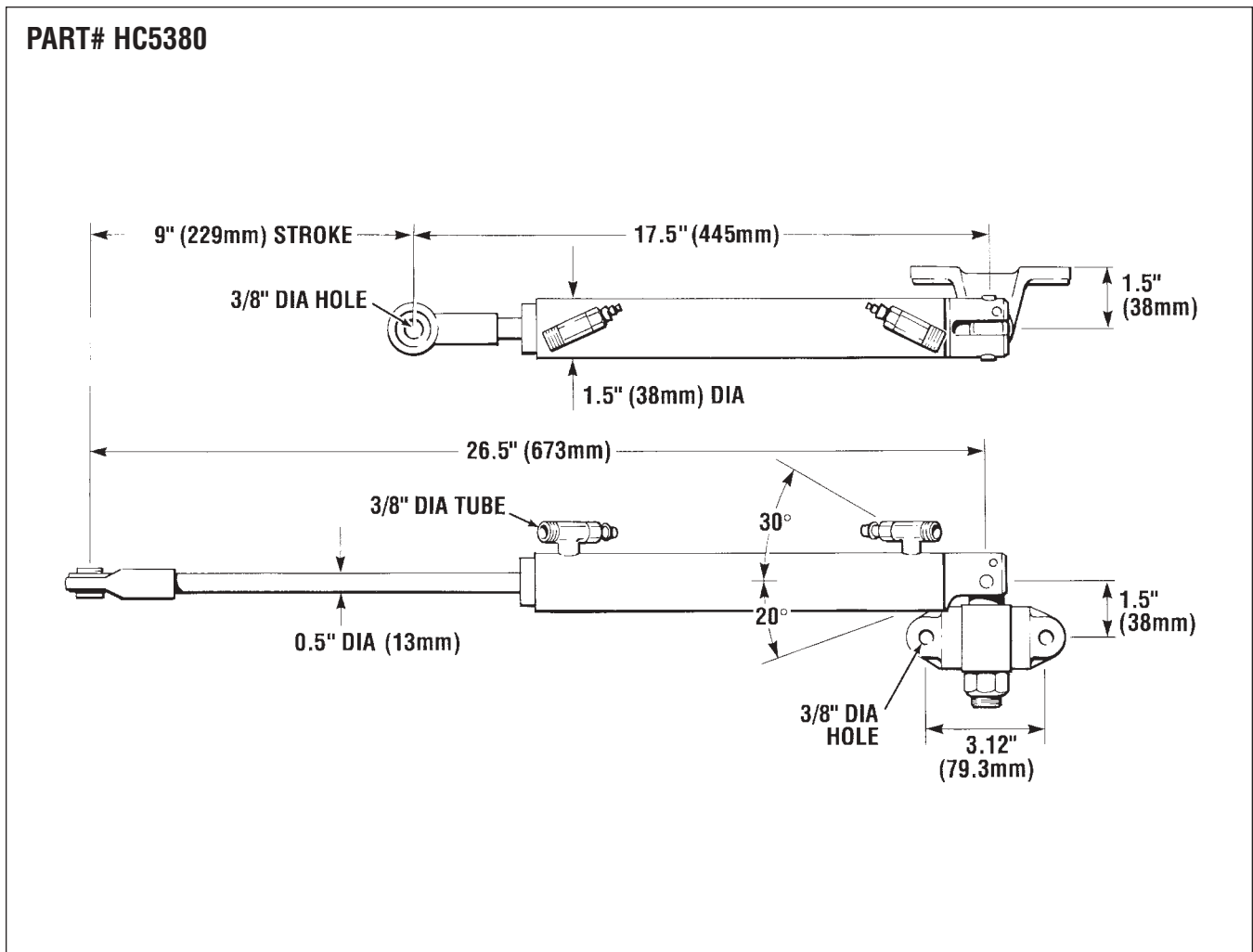
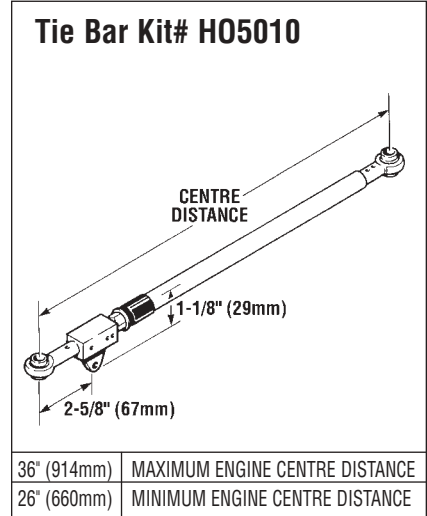
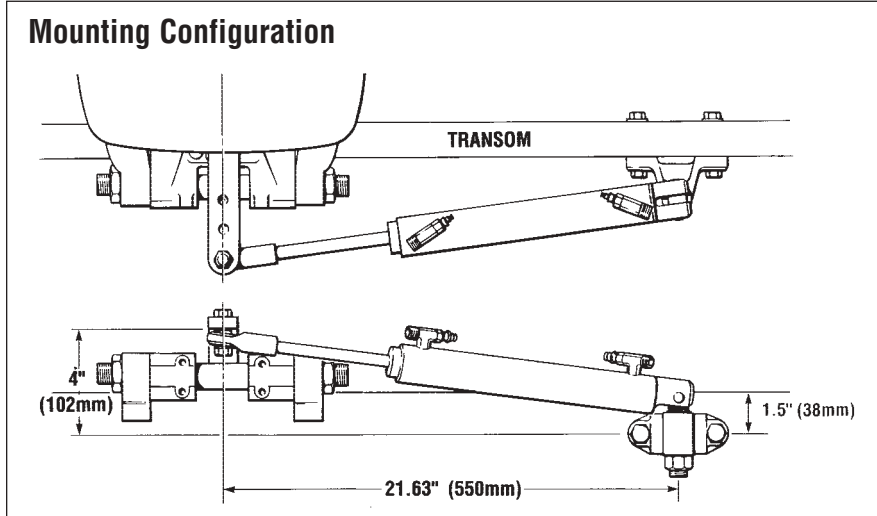


Order Guide

The splashwell mount cylinder (part no. HC5380) can be used on all engines complying with ABYC P17/NMEA/BIA standards provided they have a threaded attachment hole (3/8" – 24 UNF thread) in the steering arm. Not suitable for use on engines fitted with factory power steering.

ENGINE/ CYLINDER CONFIGURATION	DESCRIPTION	QTY REQ	MODEL	PART NUMBER	REF. PAGE #	
SINGLE ENGINE (SINGLE CYLINDER) APPLICATIONS UP TO 300 HP MAX NUMBER OF TURNS 5.5/6.5 	CYLINDER	1	SPLASHWELL	HC5380		
	HELM	1	* SEASTAR I- STANDARD	HH5271	7-4	
	HOSE KIT	1	OUTBOARD HOSE	H051__	8-2	
	OIL	3	SEASTAR OIL	HA5430	10-1	
	FOR EXTRA STEERING STATIONS ADD:					
	HELM	1	* SEASTAR I- STANDARD	HH5271	7-4	
	FITTING KIT	1	ADD A STATION	HF5501	8-10	
	HOSE KIT	1	OUTBOARD HOSE	H051__	8-2	
	OIL	1	SEASTAR OIL	HA5430	10-1	
	DUAL ENGINE (SINGLE CYLINDER) NON-COUNTER ROTATING APPLICATIONS UP TO 300 HP MAX COUNTER ROTATING ENGINE APPLICATIONS UP TO 600 HP MAX NUMBER OF TURNS 5.6/6.5 	CYLINDER	1	SPLASHWELL	HC5380	
TIE BAR KIT		1	SPLASHWELL MOUNT TIE BAR	H05010		
HELM		1	* SEASTAR I- STANDARD	HH5271	7-4	
HOSE KIT		1	OUTBOARD HOSE	H051__	8-2	
OIL		3	SEASTAR OIL	HA5430	10-1	
FOR EXTRA STEERING STATIONS ADD:						
HELM		1	* SEASTAR I- STANDARD	HH5271	7-4	
FITTING KIT		1	ADD A STATION	HF5501	8-10	
HOSE KIT		1	OUTBOARD HOSE	H051__	8-2	
OIL		1	SEASTAR OIL	HA5430	10-1	
OPTIONAL EQUIPMENT	BACK PLATE KIT		(FOR STANDARD HELMS)	HA5418	7-6	
	20 DEGREE WEDGE		(FOR STANDARD HELMS)	HA5419	7-6	
	AUTOPILOT FITTING KIT		(FOR ALL HELMS)	HF5501	8-10	
	* TILT HELM- SEASTAR I			HH5741	7-5	
	REAR MOUNT HELM- SEASTAR I			HH5261	7-5	

General Dimensions



STERNDRIVE STEERING

Features

- Easy installation.
- Simple autopilot interface.
- Simple multiple steering station connection.

Applications

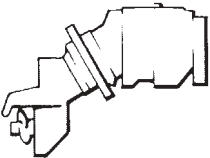
- Fits most power and non-power assist sterndrives.
- Single and multiple drives.

How to select a steering system for a stern drive

- 1) From the order guide on page 3-2 select the drive configuration based on the number of drives.
- 2) From the application guide on page 3-3 confirm that a cylinder is available for your specific make, model and year of drive unit. Select the cylinder that is appropriate for the drive.
- 3) From the order guide select the appropriate helm and accessory hardware. Note that two helm pumps of different displacements are available for power steered sterndrives. The displacement of the helm affects the number of turns lock to lock. Select the helm displacement on the basis of the desired steering response.
- 4) Select the appropriate tube or hose and fitting kits.
- 5) Confirm that sufficient space is available in the dash and engine compartments for the equipment.



Order Guide

SYSTEM CONFIGURATION	COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF #	
<p>SINGLE & DUAL STERNDRIVE (For dual sterndrive applications use engine manufactures supplied tie bar.)</p> 	CYLINDER	1	SEE APPLICATION GUIDE			
	HELM	1	* SEASTAR I STANDARD (SEE NOTE 1)	HH5271	7-4	
			** SEASTAR II-STANDARD (SEE NOTE 2)	HH5272	7-4	
	OIL	3	SEASTAR OIL	HA5430	10-1	
	TUBE/HOSE		SEE NOTE 3		8-6	
	FOR EXTRA STEERING STATION ADD:					
	HELM	1	* SEASTAR I STANDARD (SEE NOTE 1)	HH5271	7-4	
			** SEASTAR II-STANDARD (SEE NOTE 2)	HH5272	7-4	
	FITTING KIT	1	ADD A STATION			
			- FOR SEASTAR I HELMS	HF5502	8-11	
		- FOR SEASTAR II HELMS	HF5501	8-10		
	OIL	1	SEASTAR OIL		10-1	
	EXTRA TUBE/HOSE		SEE NOTE 3		8-6	
OPTIONAL EQUIPMENT	BACK PLATE KIT		(FOR STANDARD HELMS)	HA5418	7-6	
	20 DEGREE WEDGE KIT		(FOR STANDARD HELMS)	HA5419	7-6	
	AUTOPILOT FITTING KIT		(FOR ALL HELMS)	HF5502	8-11	
	* TILT HELM-SEASTAR I			HH5741	7-5	
	REAR MOUNT HELM-SEASTAR I			HH5261	7-5	
	** TILT HELM-SEASTAR II			HH5742	7-5	
	REAR MOUNT HELM-SEASTAR I			HH5262	7-5	

1. Seastar I helms are the standard recommendation for both non-power and power steered applications.
2. Seastar II helms can be specified for power steered applications where faster steering response is desired. Review the application chart on page 3-3 for recommendations.
3. * **For Seastar I systems:** use 3/8" dia nylon tubing ref part No. HT5_ _ (Refer to page 8-6)

- * **For Seastar II systems:** Use the following option **A** or **B**
- A)** Outboard hose:
Hoses must be ordered in standard lengths. They cannot be cut to length. (Refer to page 8-2)
- B)** Copper tube:
3/8" diameter copper tube and hose kit part No. HF5508 (Refer to page 8-6)
4. For dual stern drives – use the tie bar supplied by the engine manufacturer.

NOTICE

These recommendations apply to factory stock stern drives only. Modified installations may require a higher capacity steering system. If in doubt, contact our technical service for assistance.

Application Guide



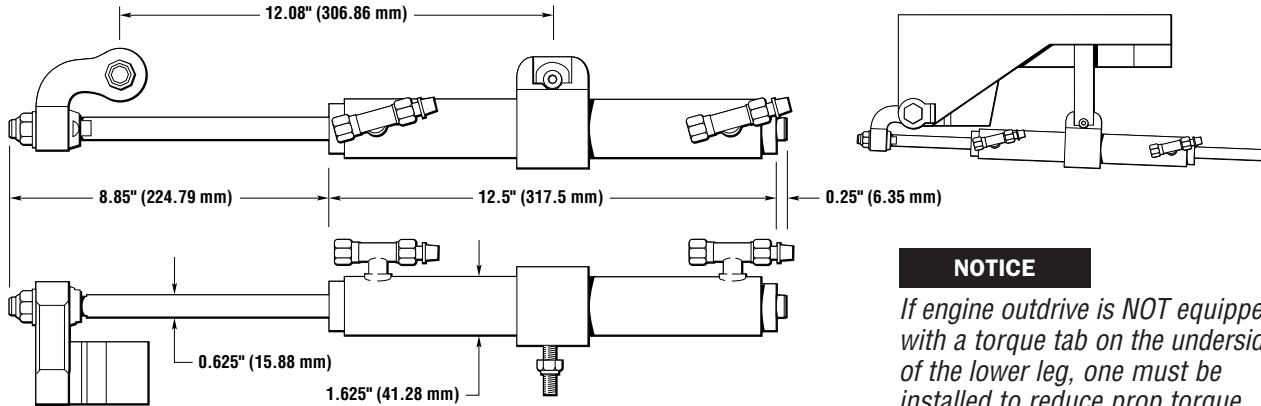
ENGINE MANUFACTURER	STEERING CONFIGURATION	ENGINE/DRIVE DESCRIPTION	YEAR	CYLINDER DESCRIPTION		NUMBER TURNS LOCK TO LOCK		NOTES
				MODEL No.	PART No.	SEASTAR I HELM	SEASTAR II HELM	
BMW	NON POWER ASSIST	ALL	TO DATE	BA125-8EMV	HC5330	4.9	N/A	1
	POWER ASSIST	ALL	TO DATE	125-8EM	HC5328	4.9/5.8	3.4/4.1	2
MERCUISER	NON POWER ASSIST	MERCUISER 1	1983 & PRIOR	BA125-8EMV	HC5330	4.9	N/A	1,7
		ALPHA I	1984 TO DATE	BA135-7EM	HC5332	5.0	3.5	1,5,6,7
		BRAVO I	1984 TO DATE	BA135-7EM	HC5332	5.0	3.5	1,5,6,7
		BRAVO II	1984 TO DATE	BA135-7EM	HC5332	5.0	3.5	1,5,6,7
	BRAVO III	1984 TO DATE	BA135-7EM	HC5332	5.0	3.5	1,5,6,7	
	POWER ASSIST	MERCUISER I	1983 & PRIOR	125-8EM	HC5328	4.9/5.8	3.4/4.1	2
ALPHA I		1984 TO DATE	125-8EM	HC5328	4.9/5.8	3.4/4.1	2	
BRAVO I		1984 TO DATE	125-8EM	HC5328	4.9/5.8	3.4/4.1	2	
BRAVO II		1984 TO DATE	125-8EM	HC5328	4.9/5.8	3.4/4.1	2	
BRAVO III		1984 TO DATE	125-8EM	HC5328	4.9/5.8	3.4/4.1	2,8	
OMC	NON POWER ASSIST	400/800 SERIES	1985 & PRIOR	N/A	N/A	N/A	N/A	
		COBRA	1986 TO DATE	BA150-7EM	HC5326	6.0	N/A	1,4
		KING COBRA	1986 TO DATE	BA150-7EM	HC5326	6.0	N/A	1,4
	POWER ASSIST	400/800 SERIES	1985 & PRIOR	N/A	N/A	N/A	N/A	
COBRA		1986 TO DATE	125-8EM	HC5328	4.9/5.8	3.4/4.1	2	
KING COBRA	1986 TO DATE	125-8EM	HC5328	4.9/5.8	3.4/4.1	2		
VOLVO	NON POWER ASSIST	275	TO DATE	BA150-7ATM	HC5314	6.0	N/A	1,7
		280	TO DATE	BA135-7EM	HC5332	5.0	3.5	1,5,6,7
		290	TO DATE	BA135-7EM	HC5332	5.0	3.5	1,5,6,7
		DIESEL	TO DATE	BA135-7EM	HC5332	5.0	3.5	1,5,6,7
	POWER ASSIST	275	TO DATE	N/A	N/A	N/A	N/A	
		280	TO DATE	125-8EM	HC5328	4.8/5.8	3.4/4.1	2
		290	TO DATE	125-8EM	HC5328	4.8/5.8	3.4/4.1	2
		DIESEL	TO DATE	125-8VEM	HC5329	4.9/5.8	3.4/4.1	2
		32, DIESEL	1997 TO DATE	92-VPS	HC5331	4.8/5.5	3.4/4.1	2
		41-42, DIESEL	1992 TO DATE	92-VPS	HC5331	4.8/5.8	3.4/4.1	2
DPS & SX	1996 TO DATE	92-VPS	HC5331	4.8/5.5	3.4/4.1	2		
YAMAHA	NON POWER ASSIST	ALL	1989 TO DATE	N/A	N/A	N/A	N/A	
	POWER ASSIST	ALL	1989 TO 1992	125-8EM	HC5328	4.9/5.8	3.4/4.1	2

- Balanced system – ie: the number of turns lock to lock is equal port to starboard or vice-versa.
- Unbalanced system – ie: the number of turns lock to lock is not equal port to starboard or vice-versa.
- Requires additional clevis supplied by engine manufacturer. Reference Quicksilver part No. B98735A1. Refer to diagram on page 3-4.
- Requires cylinder rod end adapter HA5424 supplied by Teleflex Canada Limited Partnership. Refer to diagram on page 3-4.
- HC5332 replaces HC5326 as of January 2000.** If installing HC5326 additional clevis supplied by engine manufacturer required (part number B98735A1).
- The installation of the HC5332 sterndrive cylinder requires the use of SeaStar Outboard hose only. DO NOT use 3/8" copper or nylon tube.
- If engine outdrive is NOT equipped with a torque tab on the underside of the lower leg one must be installed to reduce prop torque.
- Yanmar Engines using the Bravo III drives require the use of cylinder HC5326.

REVISION DATE: JANUARY 12TH 2004

General Dimensions

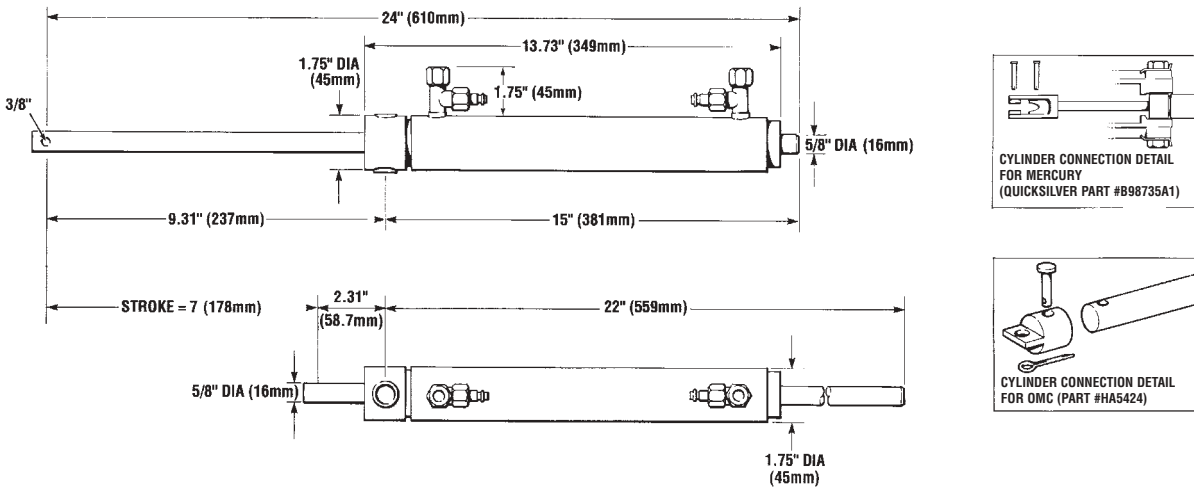
HC5332 135-7EM



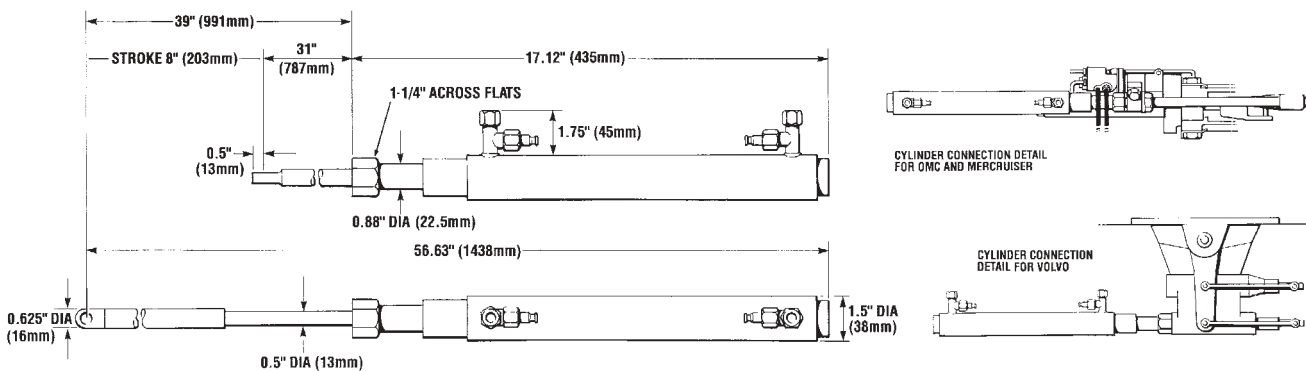
NOTICE

If engine outdrive is NOT equipped with a torque tab on the underside of the lower leg, one must be installed to reduce prop torque.

HC5326 BA150-7EM

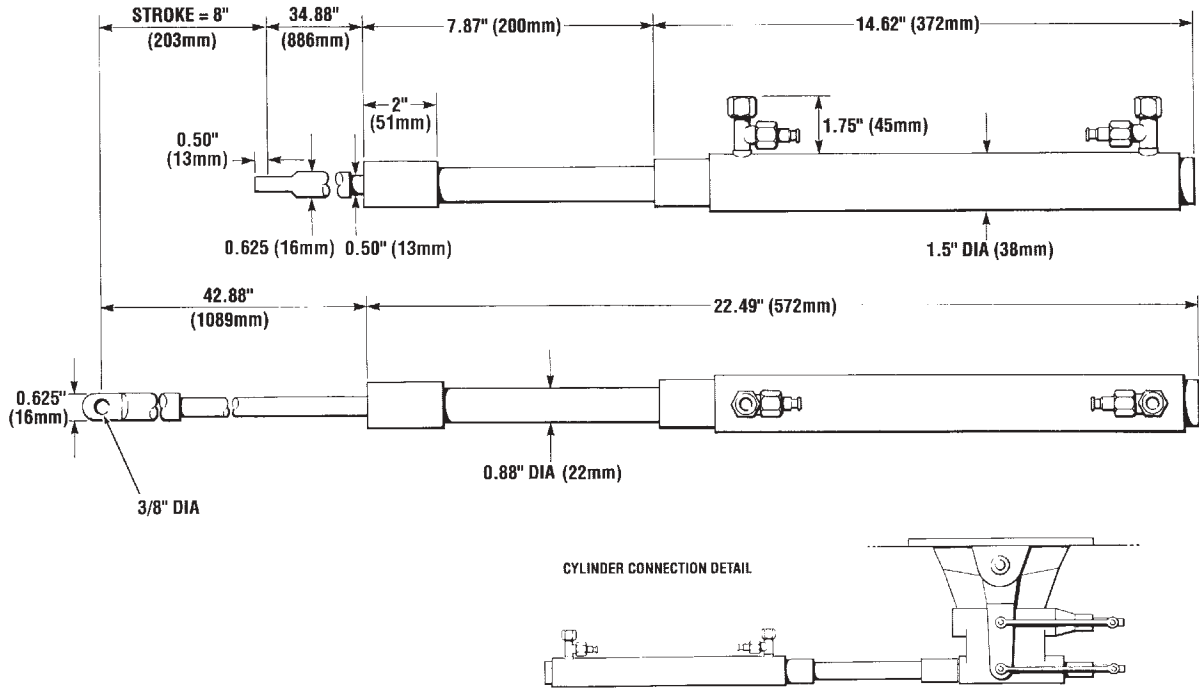


HC5328 125-8EM

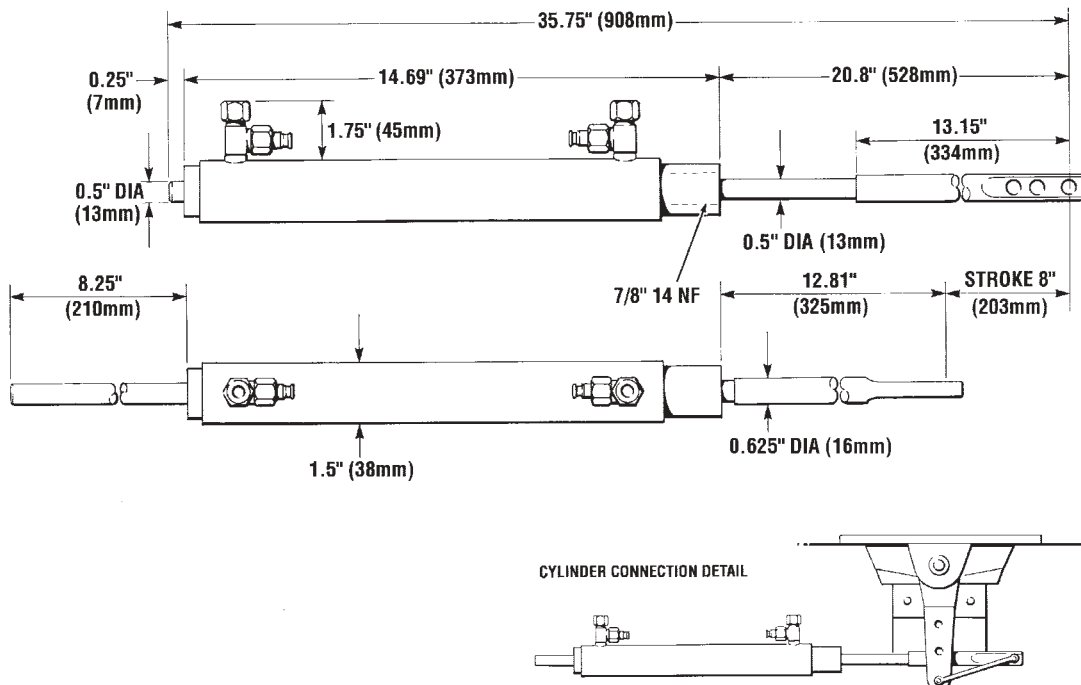


General Dimensions

HC5329 125-8VEM



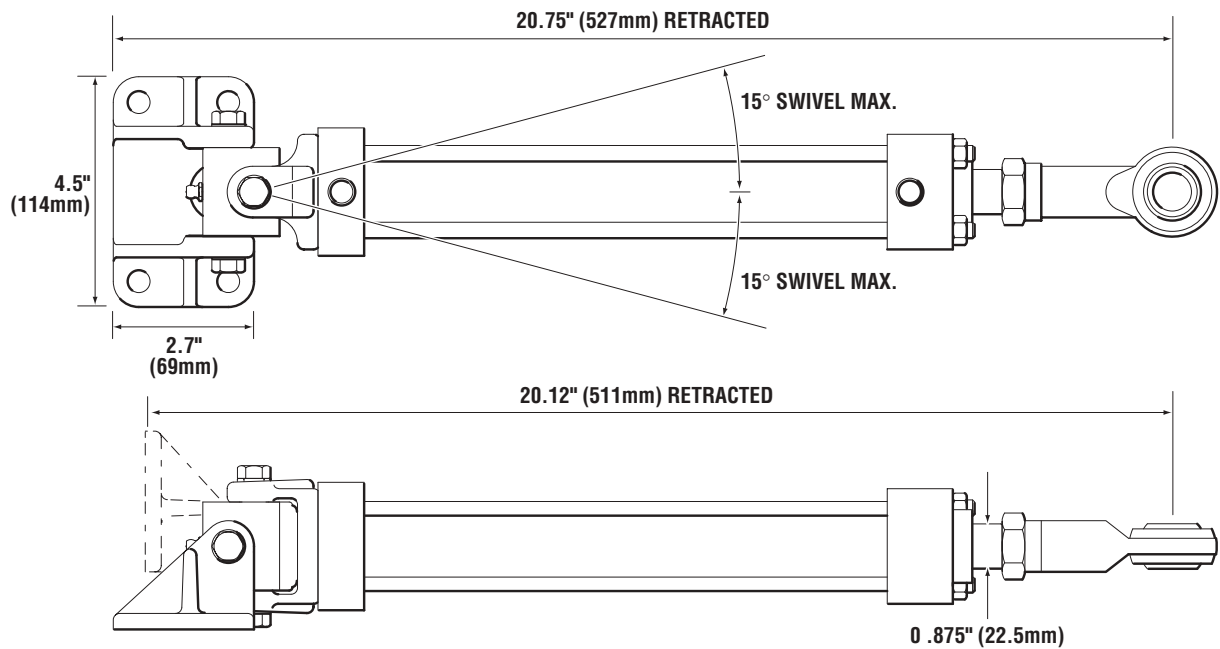
HC5330 BA125-8EMV



Performance I/O and Outboard Cylinders

The K-5-B cylinder was designed for inboard/outboard boats requiring external cylinders of substantial size and strength. The K-5 cylinders are nickel plated for aesthetics and protection against the elements. This cylinder does not include the wing plates or hardware required for mounting to the outdrive. Porting is through two through-transom 1/4" NPT ports located at the mounting end of the cylinder.

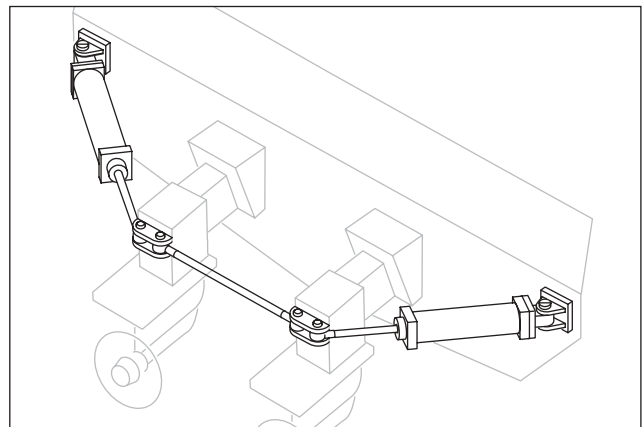
K-5-B



BORE	STROKE	DISP EXT.	DISP RET.
1.5" (38mm)	9" (229mm)	15.9cu in	10.5cu in

NOTICE

K-5 Cylinders are UN-balanced Cylinders, unequal amount of fluid on either side of the piston.



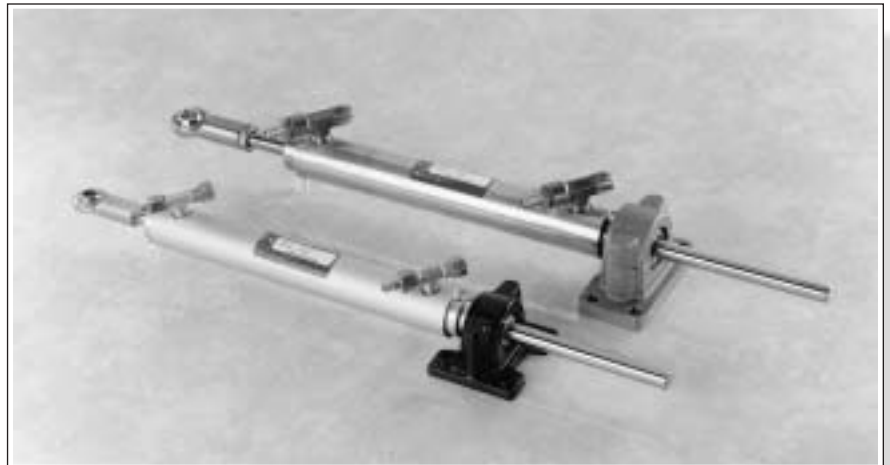
INBOARD STEERING

Features

- Regular duty aluminum cylinders.
- Heavy duty brass cylinders.
- Easy installation for single and dual rudder vessels.
- Cylinders supplied with bleeder fittings.
- Two axis articulation.
- Easy autopilot interface.

Four steps to select a steering system for an inboard powered boat

- 1) From the Application Guide on page 4-2 select the System Number appropriate for the vessel based on;
 - a) hull type - displacement or planing,
 - b) length of vessel,
 - c) number of rudders, and
 - d) usage of vessel.
- 2) From the Order Guide on page 4-2 select the appropriate helms and accessory hardware for each steering station.
- 3) From the Order Guide select the fitting and hose kits required for the installation.
- 4) Confirm that you have sufficient space available in;
 - a) the area the cylinder is to be mounted, and
 - b) the dash area for the steering components.



Application Guide

BOAT LENGTH UP TO	PLANING HULL				DISPLACEMENT HULL				SAIL	
	SINGLE ENGINE		TWIN ENGINE		SINGLE ENGINE		TWIN ENGINE		SINGLE ENGINE	
	PLEASURE	WORK	PLEASURE	WORK	PLEASURE	WORK	PLEASURE	WORK	PLEASURE	WORK
26FT (8m)	1	4	1	4	2	4	2	4	4	4
32FT (10m)	2	4	1	4	3	4	3	4	4	4
38FT (11.5m)	3	5	2	5	5	5	3	5	4	5
44FT (13.5m)	5	-	3	5	-	-	5	-	5	-
50FT (15m)	-	-	5	-	-	-	-	-	-	-

a) Displacement Hull - maximum hull speed does not normally exceed 18 knots.
 b) Planing Hull - maximum hull speed normally exceeds 18 knots.

ORDER GUIDE

COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF
1	4 TURNS LOCK TO LOCK			
HELM	1	* SEASTAR I- STANDARD	HH5271	7-4
CYLINDER	1	BA125 - 7ATM	HC5312	
OIL	3	SEASTAR OIL	HA5430	10-1
TUBE	1	3/8" DIA NYLON (NOTE 1 & 3)	HT5_ _	8-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	* SEASTAR I- STANDARD	HH5271	7-4
FITTING KIT	1	ADD A STATION	HF5502	8-11
OIL	1	SEASTAR	HA5430	10-1
EXTRA TUBE		3/8" DIA NYLON (NOTE 1 & 3)		8-6

COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF
4	4-1/4 TURNS LOCK TO LOCK			
HELM	1	** SEASTAR II- STANDARD	HH5272	7-4
CYLINDER	1	BA150 - 7TM	HC5318	
OIL	3	SEASTAR OIL	HA5430	10-1
HOSE KIT	1	HOSE KIT	HF5508	8-12
COPPER TUBE		3/8" DIA.(NOTE 2 & 3)		8-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	** SEASTAR II- STANDARD	HH5272	7-4
FITTING KIT	1	ADD A STATION	HF5502	8-11
OIL	1	SEASTAR	HA5430	10-1
EXTRA TUBE		AS ABOVE (NOTE 2 & 3)		8-6

COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF
2	5 TURNS LOCK TO LOCK			
HELM	1	* SEASTAR I- STANDARD	HH5271	7-4
CYLINDER	1	BA135 - 7ATM	HC5313	
OIL	3	SEASTAR OIL	HA5430	10-1
TUBE	1	3/8" DIA NYLON (NOTE 1 & 3)	HT5_ _	8-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	* SEASTAR I- STANDARD	HH5271	7-4
FITTING KIT	1	ADD A STATION	HF5502	8-11
OIL	1	SEASTAR	HA5430	10-1
EXTRA TUBE		3/8" DIA NYLON (NOTE 1 & 3)		8-6

COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF
5	5-1/2 TURNS LOCK TO LOCK			
HELM	1	** SEASTAR II- STANDARD	HH5272	7-4
CYLINDER	1	BA175 - 7TM	HC5319	
OIL	3	SEASTAR OIL	HA5430	10-1
HOSE KIT	1	HOSE KIT	HF5508	8-12
COPPER TUBE		3/8" DIA.(NOTE 2 & 3)		8-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	** SEASTAR II- STANDARD	HH5272	7-4
8-11 OIL	1	SEASTAR	HA5430	10-1
EXTRA TUBE		AS ABOVE (NOTE 2 & 3)		8-6

COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF
3	6 TURNS LOCK TO LOCK			
HELM	1	* SEASTAR I- STANDARD	HH5271	7-4
CYLINDER	1	BA150 - 7ATM	HC5314	
OIL	3	SEASTAR OIL	HA5430	10-1
TUBE	1	3/8" DIA NYLON (NOTE 1 & 3)	HT5_ _	8-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	* SEASTAR I- STANDARD	HH5271	7-4
FITTING KIT	1	ADD A STATION	HF5502	8-11
OIL	1	SEASTAR	HA5430	10-1
EXTRA TUBE		3/8" DIA NYLON (NOTE 1 & 3)		8-6

OPTIONAL EQUIPMENT			
BACK PLATE KIT (FOR STANDARD HELMS)	HA5418	7-6	
20 DEGREE WEDGE KIT (FOR STANDARD HELMS)	HA5419	7-6	
AUTOPILOT FITTING KIT (FOR ALL HELMS)	HF5502	8-11	
* TILT HELM-SEASTAR I	HH5741	7-5	
REAR MOUNT HELM-SEASTAR I	HH5261	7-5	
** TILT HELM-SEASTAR I	HH5742	7-5	
REAR MOUNT HELM-SEASTAR I	HH5262	7-5	

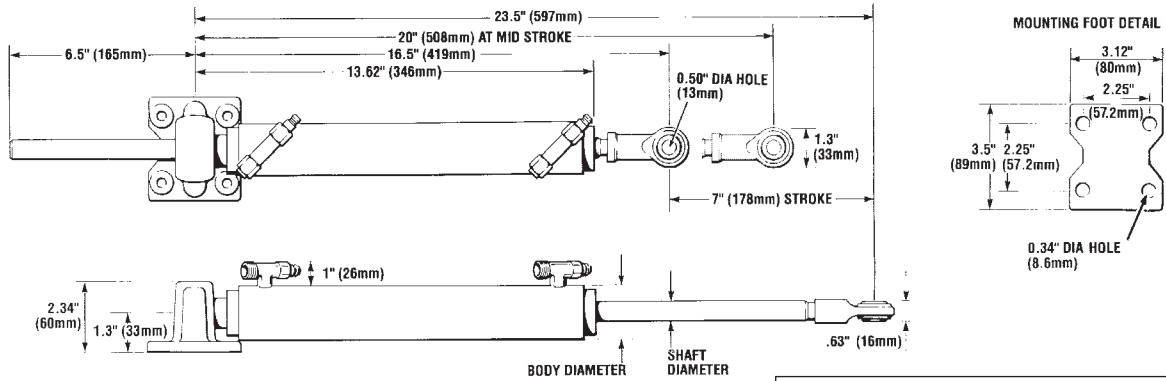
1. For systems 1, 2 & 3 - nylon tubing (3/8" diameter) is the standard requirement for plumbing the system. Copper tubing (3/8" diameter) can be substituted but Fitting Kit HF5507 is required. (Refer to page 8-12).

2. For systems 4 & 5 - copper tubing (3/8" diameter) is the standard requirement for plumbing the system. Fitting Kit HF5508 is required. (Refer to page 8-12).

3. For systems 1, 2, 3, 4, & 5 Seastar outboard hose can be substituted for nylon or copper tube. These hoses must be ordered in standard lengths. They cannot be cut to length. (Refer to page 8-2).

General Dimensions—SeaStar

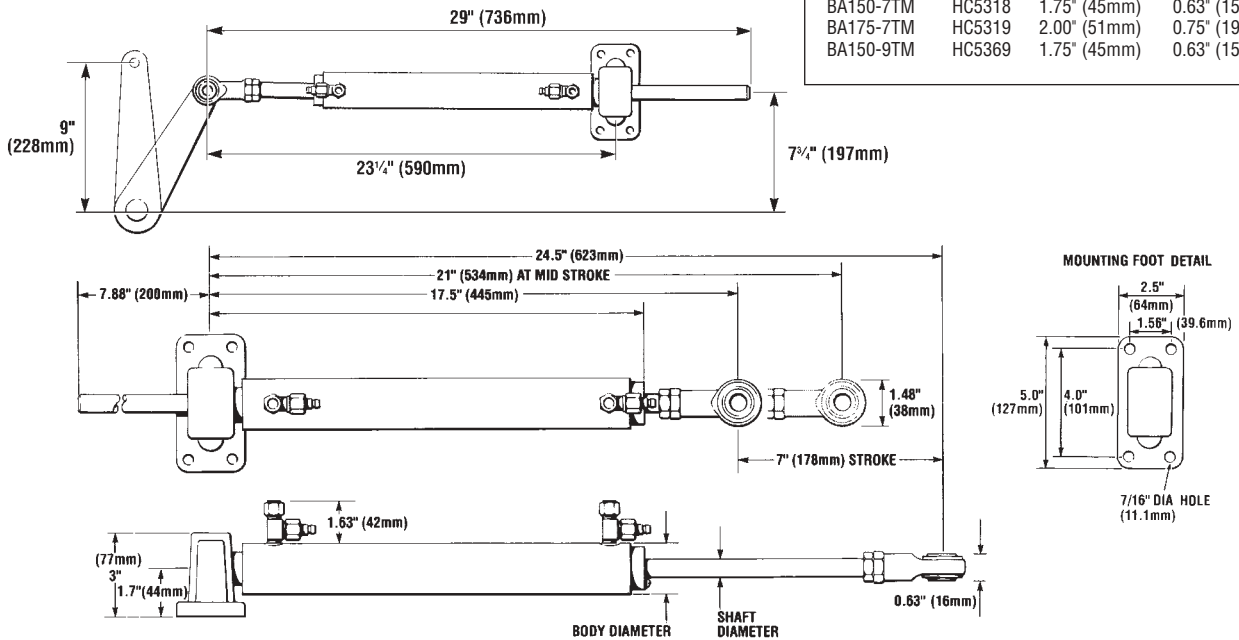
ATM CYLINDERS (ALUMINUM): HC5312/ HC5313/ HC5314



CYLINDER DIMENSIONS SPECIFIC TO MODEL

CYLINDER MODEL	PART #	BODY DIAMETER	SHAFT DIAMETER
BA125-7ATM	HC5312	1.38" (35mm)	0.50" (12.7mm)
BA135-7ATM	HC5313	1.50" (38mm)	0.63" (15.9mm)
BA150-7ATM	HC5314	1.75" (45mm)	0.63" (15.9mm)
BA150-7TM	HC5318	1.75" (45mm)	0.63" (15.9mm)
BA175-7TM	HC5319	2.00" (51mm)	0.75" (19.1mm)
BA150-9TM	HC5369	1.75" (45mm)	0.63" (15.9mm)

TM CYLINDERS (BRASS): HC5318/ HC5319/ HC5369

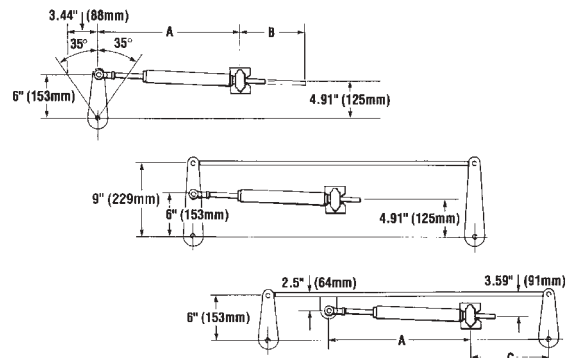


CYLINDER MOUNTING CONFIGURATIONS

MOUNTING CONFIGURATION DIMENSIONS

CYLINDER MODEL	PART #	A	B	C
BA125-7ATM	HC5312	20" (508)	6.5" (165)	8.5" (216)
BA135-7ATM	HC5313	20" (508)	6.5" (165)	8.5" (216)
BA150-7ATM	HC5314	20" (508)	6.5" (165)	8.5" (216)
BA150-7TM	HC5318	21" (534)	8" (204)	10" (254)
BA175-7TM	HC5319	21" (534)	8" (204)	10" (254)
BA150-9TM	HC5369	21" (534)	8" (204)	10" (254)

Figures in parenthesis are in millimetres

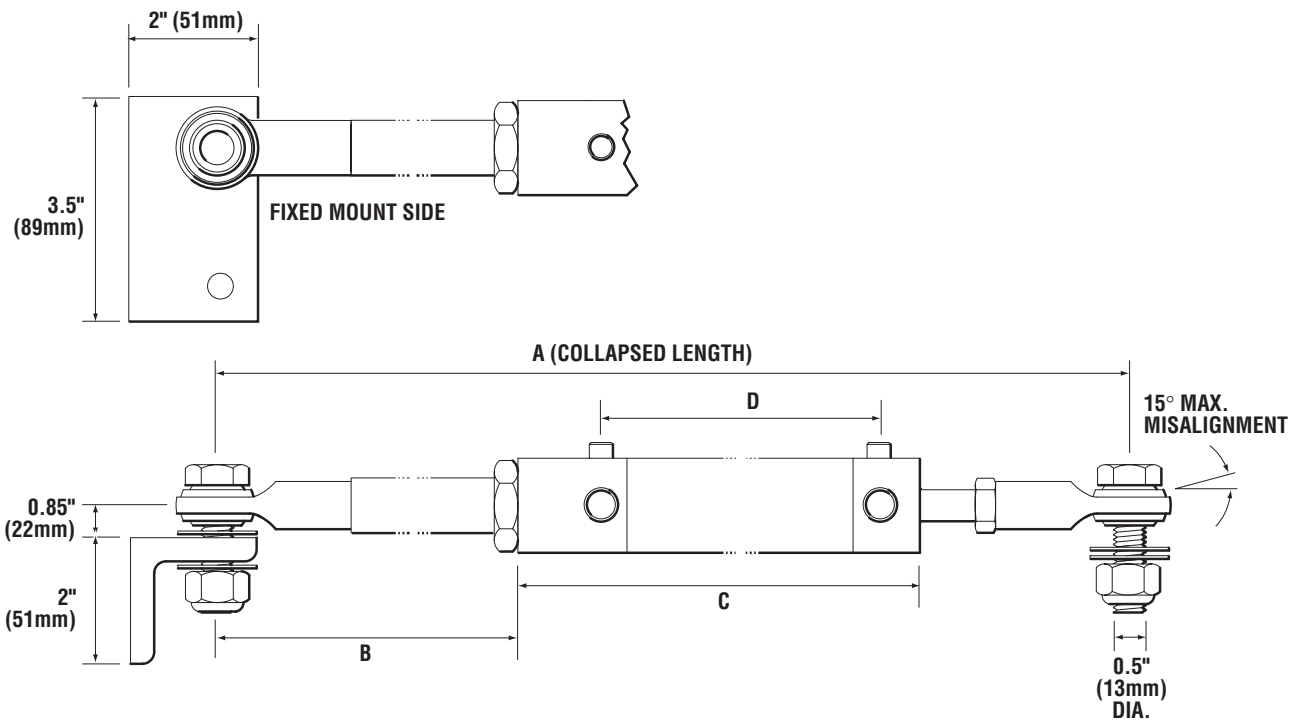


General Dimensions—Hynautic

Universal Mount Cylinders K-18/K-19

The K-18 and K-19 balanced cylinders are double rod ended, each end held in place with internal wire ties. Every cylinder is equipped with a swivel joint at each end. One provides for a fixed mount attachment point at the end of the housing to protect the moving rod. The other swivel joint, located at the rod end, allows for free movement of the cylinder without binding when attached to the rudder arm.

K-18 & K-19

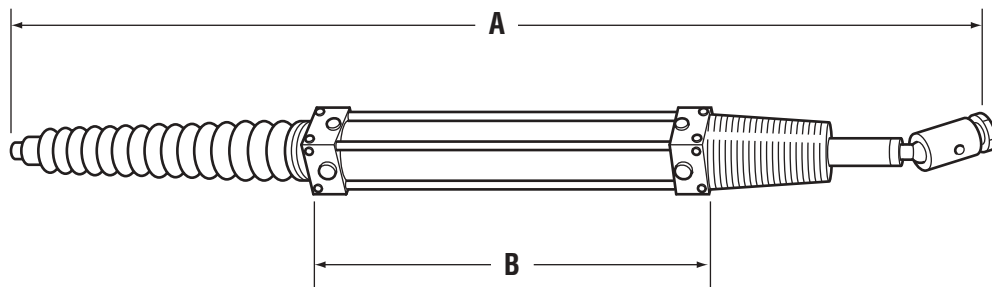


CYL MODEL	DIMENSIONS				BORE	STROKE	DISP
	A	B	C	D			
K-18	24.5" (662mm)	9.31" (237mm)	11.75" (299mm)	9.875" (251mm)	1.25" (32mm)	7" (178mm)	7cu in
K-19	28.5" (724mm)	11.31" (287mm)	13.75" (350mm)	11.875" (302mm)	1.25" (32mm)	9" (229mm)	9cu in

**Fixed Mount and Pivot Mount models:
K-22, K-27 and K-31**

These Brass cylinders are for larger boats up to approximately 70 ft. Tubes, ends, and external rods are brass: cylinder rods are 17-4 stainless steel: mounts are manganese bronze. There are two different types of mounting packages for Brass cylinders: fixed mount and pivot mount.

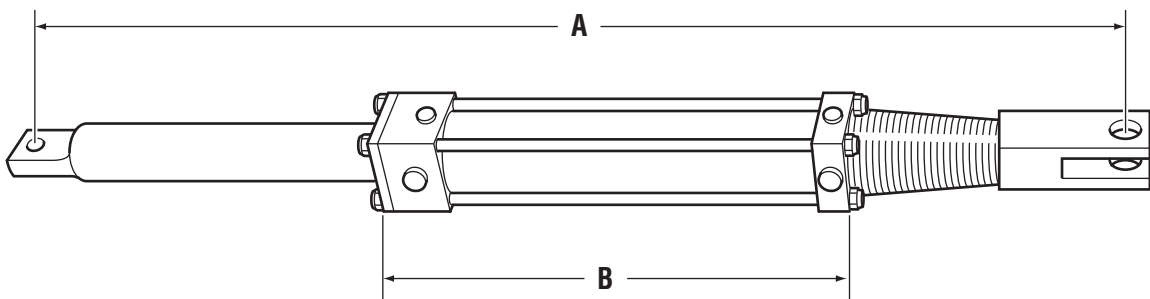
K-22 & K-27



CYL MODEL	DIMENSIONS		BORE	STROKE	DISP
	A	B			
K-22	*34.12" (867mm)	13.25" (337mm)	1.5" (38mm)	10" (254mm)	13.20cu in
K-27	*36.75" (934mm)	13.25" (337mm)	1.5" (38mm)	10" (254mm)	13.20cu in

**Dimensions are with the cylinder rod centered.*

K-31



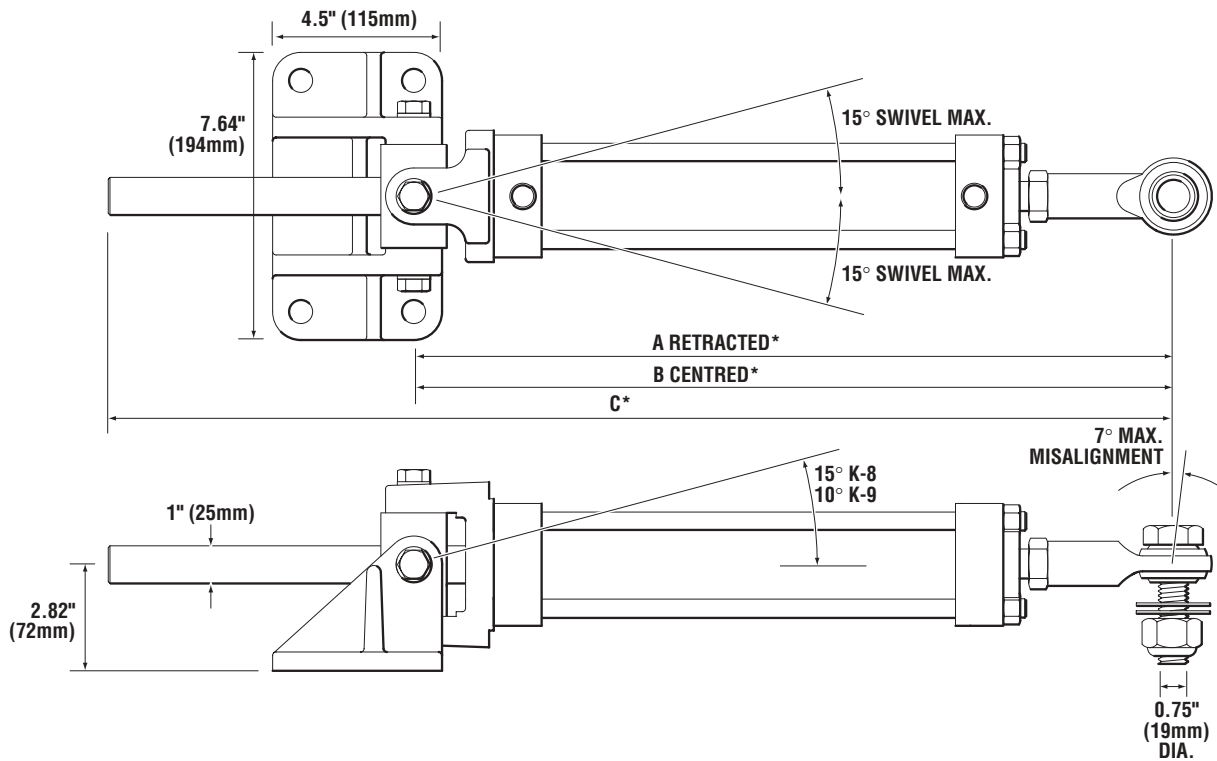
CYL MODEL	DIMENSIONS		BORE	STROKE	DISP
	A	B			
K-31	*38.37" (975mm)	14.12" (359mm)	2.0" (51mm)	10" (254mm)	25.5cu in

**Dimensions are with the cylinder rod centered.*

Large I/B Cylinders K-8/K-9

The K-8 and K-9 cylinders are double rod end, tie rod constructed hydraulic cylinders. Each has a universal mount, which allows two planes of pivot freedom. Each cylinder is equipped with a stainless steel ball joint. Porting is through two 1/4" NPT ports at each end of the cylinder.

K-8 & K-9



CYL MODEL	DIMENSIONS			BORE	STROKE	DISP
	A*	B*	C*			
K-8	19.74" (502mm)	24.47" (622mm)	27.92" (710mm)	2.5" (64mm)	9.5" (242mm)	39.2cu in
K-9	24.74" (629mm)	31.99" (813mm)	37.92" (962mm)	2.5" (64mm)	14.5" (369mm)	59.8cu in

* Clevis option increases length by 0.44" (12mm)

*Hynautic***HYNAUTIC 3-LINE
INBOARD STEERING****Introduction**

SeaStar offers rugged 3-line Hynautic Heavy Duty steering systems for most work and pleasure vessels up to 70 feet.

Heavy Duty helms combine one or two bi-directional axial piston pumps with pilot check and make-up check valving. The result is a unit which prevents rudder feedback, is very efficient (even at low RPM), and is immediately adaptable to multi-station use.

A wide choice of helm displacements and cylinder configurations make it easy to spec a system which can handle a variety of large boat performance requirements and accommodate most user preferences.

Features

- Low friction heavy duty hydraulic steering.
- Helm/cylinder combinations for most inboards. Marine grade materials.
- Heavy duty helms available in three displacements, to accommodate most applications and user preferences.
- Helms available with 1" straight shaft or 3/4" tapered. Mount facing any direction.
- Quick air purge relief valve.
- Fluid fill at remote reservoir.
- Heavy duty brass cylinders. Two-axis articulation. Easy installation for single or dual rudder vessels.
- Meets or exceeds applicable standards.
- Accepts most steering wheels.

How to Spec a System

- 1** From the application guide select components appropriate for the vessel based on:
 - a) hull type—displacement or planing
 - b) length of vessel, and
 - d) number of steering wheel turns desired
- 2** Select the fitting and hose kits required, based on type of plumbing (1/2" or 5/8" tubing or hose) and based on number of steering stations.
- 3** Confirm that there is sufficient space available in the dash and engine compartment(s) for the steering components. Refer to helm and cylinder dimensions on page 7-7 and page 4-4.

Components

H-21	Hynautic 2.75 cu. in. helm (1" straight shaft) or
H-25	Hynautic 2.75 cu. in. helm (3/4" tapered shaft) or
H-42	Hynautic 4.0 cu. in. helm (1" straight shaft) or
H-42-02	Hynautic 4.0 cu. in. helm (3/4" tapered shaft) or
H-41	Hynautic 5.5 cu. in. helm (1" straight shaft) or
H-41-02	Hynautic 5.5 cu. in. helm (3/4" tapered shaft) or <i>(See application guide page 5-3.)</i>
HF-10	H-20 Fittings Kit for Main Station
HF-21	H-40 Fittings Kit for Main Station
HC53__ or K-__	Inboard Cylinder <i>(See application guide page 5-3. 1 or 2 required.)</i>
R06	Reservoir - Standard (2 quart)
MSV-21	Relief Valve (950 PSI)
MSVF-07	Relief Fittings (1150 & 1175-21-1)
MSVF-13	Relief Fittings (1175-42-1 & up)
1/2" or 5/8" OD Copper Tubing	<i>(See application guide page 5-3.)</i>
HF5590	Fitting Kit (for 1/2" Copper Tubing) or
HF5592	Fitting Kit (for 5/8" Copper Tubing) <i>(See application guide page 5-3. These fitting kits are for one steering station, purchase add-a-station kit for 2nd station.)</i>
HA5731	Hose Kit for Copper Tubing (2 hoses) <i>Contains two 18" (.45m) hoses for single-cylinder installations.</i>
HA5440	SeaStar Oil (1 Gallon) <i>(Other fittings may be required. Contact Teleflex Canada.)</i>

Options

K-31	Pivot Mount Inboard Cylinder <i>(K-31 can be used in place of HC5378 or HC5379, see application chart page 5-3 for details.)</i>
HA5732	Dual Cylinder Hose 2' (.6m)
HA5733	Dual Cylinder Hose 3' (.9m)
HA5734	Dual Cylinder Hose 4' (1.2m)
HA5735	Dual Cylinder Hose 5' (1.5m)
HA5736	Dual Cylinder Hose 6' (1.8m) <i>These hoses are sold individually (four are required for dual cylinder installations).</i>
R07	Reservoir (2 quart, with hand pump)
R11	Reservoir (1 quart, with hand pump)
R12	Reservoir (2 quart)
MSV-19	Relief Valve (500 PSI)
RV-55	Reserv valve (500 PSI, top read, 3/8)
RV-55P	Reserv valve (500 PSI, top read, 3/8, w/pump)
RV-57	Reserv valve (500 PSI, top read, 5/16, w/pump)
RV-60	Reserv valve (950 PSI, top read, 5/16)
RV-67	Reserv valve (950 PSI, frt.read, 5/16, w/pump)
HF-11	H-20 Fittings Kit for Second Station
HF-22	H-40 Fittings Kit for Second Station

Hynautic 3-Line Inboard Steering Application Guide

VESSEL SIZE	HELM PUMP	WHEEL TURNS	CYLINDER MODEL	TUBING DIAMETER		MAX HP or AREA
				CYL. TO FARTHEST HELM <40'	>40'	
Planing Hulls:						
35–50' (11–15m)	H-21 or H-25	5.0	HC5350 or HC5356	1/2"	5/8"	450 HP
40–50' (12–15m)	H-21 or H-25	6.8	HC5351 or HC5357	1/2"	5/8"	750 HP
40–50' (12–15m)	H-42	4.7	HC5351 or HC5357	1/2"	5/8"	750 HP
45–60' (14–18m)	H-42	7.4	HC5378 or HC5379	1/2"	5/8"	950 HP
45–60' (14–18m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	950 HP
55–65' (17–20m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	1200 HP
To 70' (To 21m)	H-41	10.8	2 x HC5378 or HC5379	1/2"	5/8"	1500 HP
To 70' (To 21m)	H-41	14.2	2 x K-8	1/2"	5/8"	1500 HP
Displacement Hulls—Tug Boats, Net Haulers:						
To 30' (To 9m)	H-21 or H-25	5.0	HC5350 or HC5356	1/2"	5/8"	200 HP
30–35' (9–11m)	H-21 or H-25	6.8	HC5351 or HC5357	1/2"	5/8"	250 HP
30–35' (9–11m)	H-42	4.7	HC5351 or HC5357	1/2"	5/8"	250 HP
26–40' (8–12m)	H-42	7.4	HC5378 or HC5379	1/2"	5/8"	400 HP
26–40' (8–12m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	400 HP
30–45' (9–14m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	150 HP
To 50' (To 15m)	H-41	10.8	2 x HC5378 or HC5379	1/2"	5/8"	500 HP
To 50' (To 15m)	H-41	14.2	2 x K-8	1/2"	5/8"	500 HP
To 50' (To 15m)	H-41	20.0	2 x K-9	1/2"	5/8"	500 HP
Displacement Hulls—Work and Pleasure Boats:						
To 40' (To 12m)	H-21 or H-25	5.0	HC5350 or HC5356	1/2"	5/8"	300 HP
40–45' (12–14m)	H-21 or H-25	6.8	HC5351 or HC5357	1/2"	5/8"	350 HP
40–45' (12–14m)	H-42	4.7	HC5351 or HC5357	1/2"	5/8"	350 HP
40–55' (12–17m)	H-42	7.4	HC5378 or HC5379	1/2"	5/8"	500 HP
40–55' (12–17m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	500 HP
45–65' (14–20m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	650 HP
To 75' (To 32m)	H-41	10.8	2 x HC5378 or HC5379	1/2"	5/8"	750 HP
To 75' (To 32m)	H-41	14.2	2 x K-8	1/2"	5/8"	750 HP
Sail Boats—Skeg Rudder:						
To 40' (To 12m)	H-21 or H-25	5.0	HC5350 or HC5356	1/2"	5/8"	9' (.9m)
40–45' (12–14m)	H-21 or H-25	6.8	HC5351 or HC5357	1/2"	5/8"	10' (1m)
40–45' (12–14m)	H-42	4.7	HC5351 or HC5357	1/2"	5/8"	10' (1m)
40–52' (12–16m)	H-42	7.4	HC5378 or HC5379	1/2"	5/8"	17' (1.6m)
40–52' (12–16m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	17' (1.6m)
50–60' (15–18m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	18' (1.7m)
To 65' (To 20m)	H-41	10.8	2 x HC5378 or HC5379	1/2"	5/8"	20' (1.9m)
To 65' (To 20m)	H-41	14.2	2 x K-8	1/2"	5/8"	20' (1.9m)
Sail Boats—Spade Rudder:						
To 40' (To 12m)	H-21 or H-25	5.0	HC5350 or HC5356	1/2"	5/8"	7' (.6m)
40–45' (12–14m)	H-21 or H-25	6.8	HC5351 or HC5357	1/2"	5/8"	8' (.7m)
40–45' (12–14m)	H-42	4.7	HC5351 or HC5357	1/2"	5/8"	8' (.7m)
35–46' (11–14m)	H-42	7.4	HC5378 or HC5379	1/2"	5/8"	15' (1.4m)
35–46' (11–14m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	15' (1.4m)
40–50' (12–15m)	H-41	5.4	HC5378 or HC5379	1/2"	5/8"	15.5' (1.4m)
To 60' (To 18m)	H-41	10.8	2 x HC5378 or HC5379	1/2"	5/8"	16.5' (1.5m)
To 60' (To 18m)	H-41	14.2	2 x K-8	1/2"	5/8"	16.5' (1.5m)

Helm Options

Four helms are offered in 3 displacements, as noted in the chart at right. The H-21 helm has a 1" straight wheel shaft; H-25 has a 3/4" tapered shaft. The H-42 and H-41 helms both have a 1" straight wheel shaft.

HELM PART#	DISPLACEMENT RANGE	RELIEF VALVE SETTING
H-21	2.75 cu.in.	950 psi (66Bar)
H-25	2.75 cu.in.	950 psi (66Bar)
H-42	4.00 cu.in.	950 psi (66Bar)
H-41	5.50 cu.in.	950 psi (66Bar)

Tubing/Hose Options

Use soft refrigeration type copper tubing for optimum performance. For tube-to-cylinder flex hoses, select a hydraulic hose rated for 1000 PSI (70 bar) working pressure, and with a very low volumetric expansion rating.

HELM TYPE	DISTANCE—CYLINDER TO FURTHEST HELM	
	40 FEET OR LESS	MORE THAN 40 FEET
All	1/2" O.D. Copper Tubing	5/8" O.D. Copper Tubing

Cylinder Options

Cylinders are made from brass & stainless steel. Available with stainless rod & ball joint (TMB models) or stainless rod & bronze clevis (TMC models.) Cylinders with ball joints have 2-axis articulation.

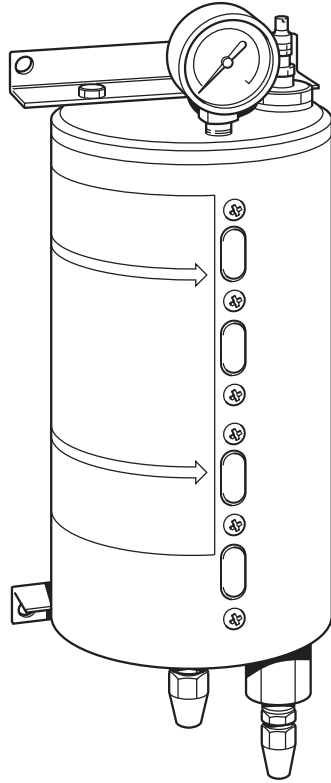
The K-31 is an optional pivot mount cylinder which can be used in the systems numbered "8a" and "8b" on the opposite page. With this cylinder, the number of wheel turns becomes 6.4 (using the H-42 helm) or 4.6 (H-41 helm).

MODEL	PART#	DESCRIPTION / MODEL / ROD END CONFIG
7" Stroke:	HC5350	Cylinder BA175-7TMB (Rod End Ball Joint)
	HC5356	Cylinder BA175-7TMC (Rod End Clevis)
	HC5351	Cylinder BA200-7TMB (Rod End Ball Joint)
	HC5357	Cylinder BA200-7TMC (Rod End Clevis)
9.5" Stroke:	K-8	Hynautic Cylinder, 2.5" (Rod End Ball Joint)
11" Stroke:	HC5378	Cylinder BA200-11TMB (Rod End Ball Joint)
	HC5379	Cylinder BA200-11TMC (Rod End Ball Clevis)

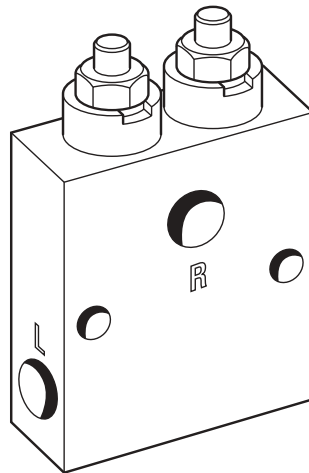
NOTICE

The application guide on page 5-3 should be used with discretion. The chart is only a guide to selecting a steering system. A steering system manufacturer cannot anticipate all the variables in boat-rudder design that affect the steering loads. It is the final responsibility of the boat builder/designer to specify maximum expected steering loads. If the required information is not available, please see the Displacement and Planning Hull data sheets on page 8-21 and page 8-22. These sheets after being completely filled out can be faxed to Teleflex Technical Support at 604-279-2202.

Reservoir Part# R-06



Relief Valve Part# MSV-21



Hynautic Seal Kits

Helms

SEAL KIT#	DESCRIPTION
HS-01	H-20 Series Helms, 1978 and earlier
HS-02	H-20 and H-30 Series Helms, 1979 and later
HS-03	H-40 Series Helms, 1978 and earlier
HS-04	H-40 Series Helms, 1979 and later
HS-05	H-50 Series Helms
HS-06	H-60 Series Helms
HS-08	H-80 Series Helms, before date code 8000
HS-09	H-80 Series Helms, after date code 8000
HS-10	H-100 and H-200 Series Helm Pumps

Cylinders

SEAL KIT#	DESCRIPTION
KS-01	K-11 thru K-17
KS-02	K-18 thru K-20
KS-03	K-02, H1010 (old style)
KS-04	K-21 thru K-29 (prior to Aug. 1983)
KS-05	K-31 thru K-33
KS-06	K-21 thru K-29 (after Aug. 1983)
KS-07	K-10
KS-08	K-07
KS-09	K-08, K-09 (prior to April 15, 1994)
KS-11	K-01, PSK-10
KS-12	K-02
KS-13	K-03, K-04, PSK-11, PSK-12 (prior to April 15, 1994)
KS-14	K-51
KS-15	K-05
KS-17	K-03, K-04, PSK-11, PSK-12 (after April 15, 1994)
KS-18	K-08, K-09 (after April 15, 1994)
KS-19	K-06 Models

Reservoirs

SEAL KIT#	DESCRIPTION
RS-01	R-04, R-10, R-13, R-14

Crossover Hynautic to SeaStar Steering

To review Advisory Notices, please view on line at www.seastarsteering.com or contact Teleflex Canada Limited Partnership directly at 604-270-6899.

Cylinders	HYNAUTIC CYLINDER	REPLACED WITH SEASTAR PART#	ADVISORY NOTICE#
	K-51	HC5314HY	764626
	K-1-B/C	HC5369HY/HYC	764624
	K-2-B/C	HC5373HY/HYC	764625
	K-3-B/C	HC5802HY/HYC	764615
	K-4-B/C	HC5378HY/HYC	764616
	K-10	HC5345HY	764612
	K-11, K-11S, K-12	HC5380HY	764613
	K-13, K-14	HC5370HY	764614

Helm Cross Over H-800 Series	HYNAUTIC#	SEASTAR#	ADVISORY NOTICE#
	H-816	HH5271	764622
	H-820	HH5273	764622
	H-824	HH5272	764622

BH-800 Series	HYNAUTIC#	SEASTAR#	ADVISORY NOTICE#
	BH-816	HH5779	764617 Hose MUST be replaced
	BH-820	HH5770	764617 Hose MUST be replaced
	BH-824	HH5772	764617 Hose MUST be replaced

H-100 Series	HYNAUTIC#	SEASTAR#	ADVISORY NOTICE#
	H-116	HH5260	764618
	H-120	HH5261	764618
	H-124	HH5262	764618

H-200 Series	HYNAUTIC#	SEASTAR#	ADVISORY NOTICE#
	BH-216	HH5741	764619
	BH-220	HH5743	764619
	BH-224	HH5742	764619

H-300 Series	HYNAUTIC#	SEASTAR#	ADVISORY NOTICE#
	H-316	HH5271	764621
	H-320	HH5273	764621
	H-324	HH5272	764621

H-50 Series	HYNAUTIC#	SEASTAR#	ADVISORY NOTICE#
	BH-50	HH5273	764623
	BH-51	HH5272	764623
	BH-52	HH5271	764623

Hydraulic Kits	HYNAUTIC#	SEASTAR#	ADVISORY NOTICE#
	KF-100	H05035 Single H05038A Single	764633
	All Hynautic Hose/Tube	H051XX Hose HT5XXX Tube	764632
	All Hynautic Steering Kits	Misc. SeaStar Items	764631
	All Hynautic Hose/Tube	SeaStar Power Steering System	764630

HYNAUTIC TRIM TABS

Introduction

The effort required to keep large pleasure yachts and commercial boats trim and level is usually too great for most fiberglass nylon trim cylinders, even when used in multiple combinations. This is especially true when backing down hard.

Based on an understanding of these forces, Hynautic offers a heavy duty brass trim cylinder powerful enough to move and maintain the position of even the largest trim planes.

And, this patented product is more durable because it resists corrosion by eliminating all external hoses, isolating dissimilar metals, and protecting vital seals.

Coupled with a Hynautic 12 volt or 24 volt pump the cylinder will extend quickly enough to make an immediate difference in the trim of your yacht or work boat.

Applications

The Hynautic cruiser trim system is designed for yachts and commercial vessels. One brass trim cylinder provides a force equal to approximately 2.5 times that of the typical nylon cylinders.

Therefore, a Hynautic TCS-1-02 trim system, which includes separate port and starboard cylinder/pump assemblies is effective for most yachts to 65 feet using properly reinforced stainless planes. When more hydraulic muscle is needed, two cylinders per tab may be pressurized from a single pump as in the TCS-2-01 system.

Similarly, Hynautic can supply a system as complex as four cylinders moving a single trim plane from a single power pump source.

Because of the diversity of tab shapes and materials, the design is left to the builder and not included in the basic system.

Features

Double acting brass cylinder with a patented porting design:

All plumbing is left inside the transom. No external plumbing fittings to be damaged or corroded. The patented, double wall cylinders are pressurized in each direction which means they work equally as well at either holding the plane down against a force from below or preventing it from being pushed down from a force from above.

Simple, effective marine power pumps:

Available in 12 or 24 volt, and easy to install and purge. The use of marine rated relays and switches adds to the product's durability.

A design mechanics can appreciate:

The cylinder is designed to be disassembled from outside the boat without removing the complete assembly from the transom. Where dissimilar metals might come in contact, they are separated by a neutral material to reduce the effects of electrolytic corrosion.

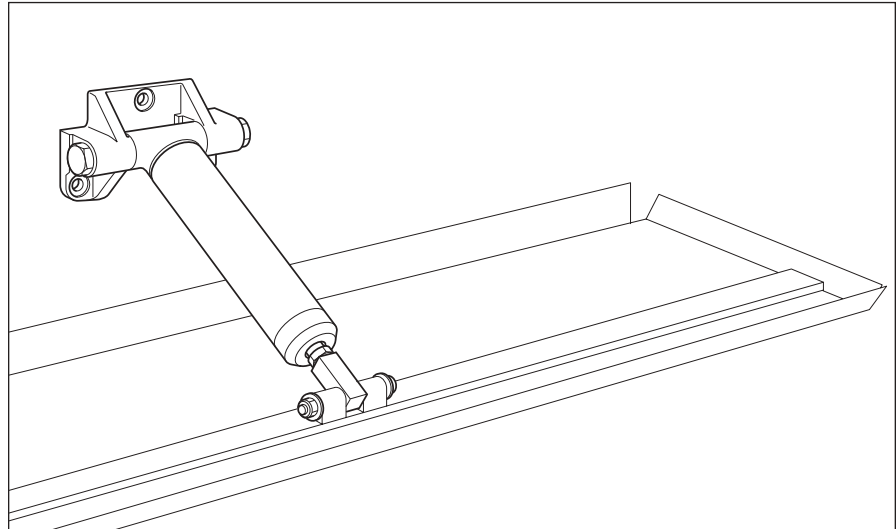
Designed to be filled with Dextron III Automatic Transmission Fluid or equivalent.

Order Guide

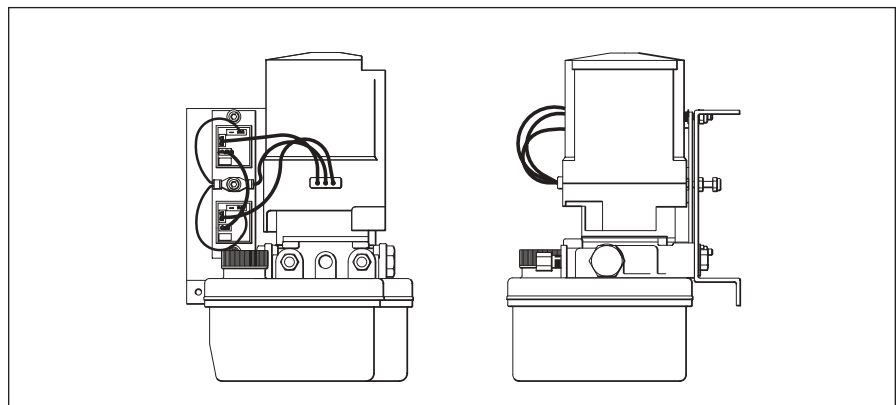
TCS-1-01 TAB CYLINDER SYS, 24 VOLT:		
Control switch	1 ea	TC-03
Tab cyl. - cruiser	2 ea	TK-01
Power pump	2 ea	TP-01
Manual	1 ea	182037
Hose - 2ft.	4 ea	207402
TCS-1-02 TAB CYLINDER SYS, 12 VOLT:		
Control switch	1 ea	TC-03
Tab cyl. - cruiser	2 ea	TK-01
Power pump	2 ea	TP-02
Manual	1 ea	182038
Hose - 2ft.	4 ea	207402
TCS-2-02 TAB CYLINDER SYS, 12 VOLT:		
Control switch	1 ea	TC-03
Tab cyl. - cruiser	4 ea	TK-01
Power pump	2 ea	TP-02
Manual	1 ea	182038
Hose - 2ft.	4 ea	207402
OPTIONAL PUMP:		
Pump 24V DC (110cu. in./minute).....		TP-03

Tab Cylinder

Part# TK-01

**Optional Pump**

Part# TP-03



SeaStar® HELMS

The SeaStar helm pump is the heart of the hydraulic steering system. SeaStar helm pumps are the product of many years of research and experience by the world's foremost builder of manual hydraulic steering systems. Our efforts have resulted in a design which represents the ultimate in efficiency, safety and reliability, yet is easy to install and maintain. Superior design, teamed with the finest materials, precision manufacturing and rigid quality control all add up to an outstanding product which is certain to set industry standards for years to come.



Standard helm features

- Compact, stylish design.
- Available in 1.7, 2.0 and 2.4 cubic inch displacements.
- Convenient front of dash fill.
- Small 3.0" hole cutout on dash.
- Can be retrofitted into old SeaStar 4.5" hole cutout.
- Complete with elbow fittings.

Rear mount helm features (CONTACT YOUR LOCAL DISTRIBUTOR FOR AVAILABILITY)

- Behind dash mounting configuration.
- Available in 1.4, 1.7 and 2.4 cubic inch displacements.
- Top of dash fill point.
- Complete with elbow fittings.

Sport Tilt helm features

- 5 wheel positions allow adjustment to most comfortable steering position.
- 48 degree tilt range (12 down - 36 up).
- Available in 1.7, 2.0 and 2.4 cubic inch displacements.
- Remote fill point.
- Complete with elbow fittings.

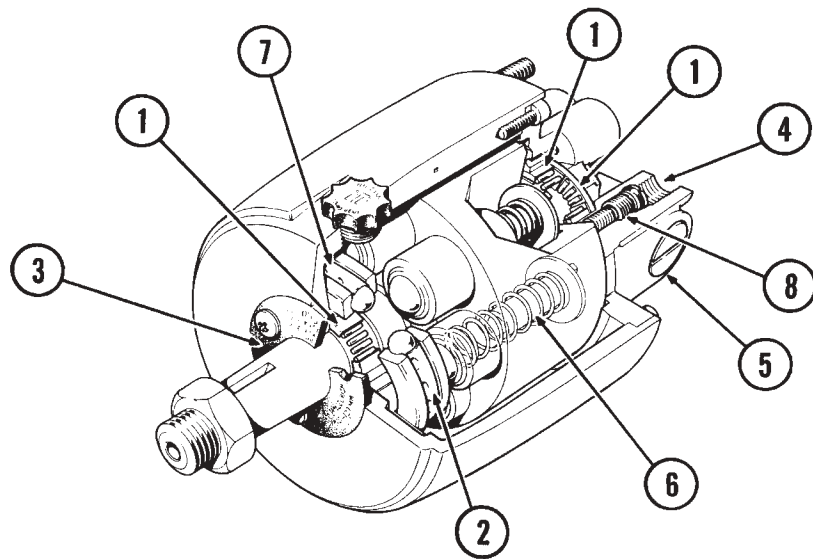
Traditional Tilt helm features

- 5 wheel positions allow adjustment to most comfortable steering position.
- 48 degree tilt range (18 down - 30 up).
- Available in 1.7, 2.0 and 2.4 cubic inch displacements.
- Convenient front of dash fill.
- Complete with elbow fittings.

Features of SeaStar Helm Pumps

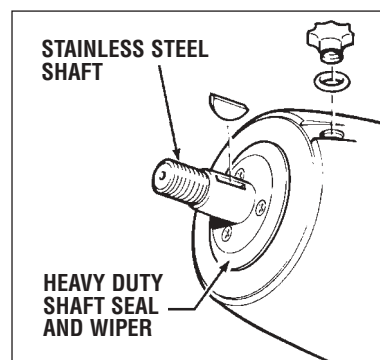
Features

- 1 Helm rotor supported by three roller bearings.
- 2 Ball bearing piston race.
- 3 Field replaceable shaft seal.
- 4 1/4" NPT ports.
- 5 Built-in lock valve for positive rudder lock.
- 6 Patented bleed tubes.
- 7 Internal air pocket eliminates oil expansion overflow.
- 8 Integral relief valve.



Commercial Helms

Part# HH5217, HH5224



Specifically designed to be used on smaller fishing vessels involved in the Lobster and Crabbing Industries. The Commercial Helm Pumps are designed with a stainless steel shaft and heavy duty shaft seal and wiper. This new shaft and seal help protect the Helm Pump from the abrasive effects of sediment that is brought on board by the operator handling Traps or Pots.

NOTICE

For Commercial Use ONLY.

Order Guide



HELMS

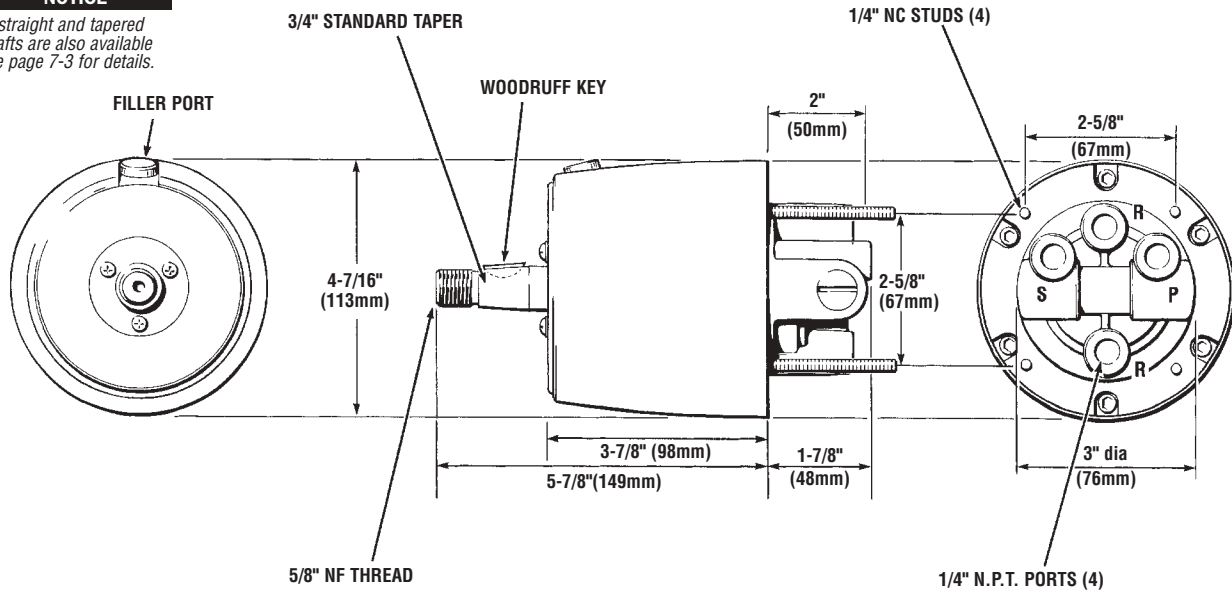
HELM DESCRIPTION	PART NUMBER	DISPLACEMENT CU. IN./REV (CC/REV)		RELIEF VALVE SETTING PSI (BAR)		NOTES
* SEASTAR 1.4 – STANDARD MOUNT	HH5269	1.4	(23.0)	1000	(70)	
SEASTAR 1.4 – REAR MOUNT	HH5260	1.4	(23.0)	1000	(70)	
SEASTAR 1.4 – REAR MOUNT FULL FEEDBACK	HH5231	1.4	(23.0)	1000	(70)	
SEASTAR 1.4 – REAR MOUNT 1" STRAIGHT SHAFT	HH5279	1.4	(23.0)	1000	(70)	
SEASTAR 1.4 – REAR MOUNT 1" TAPERED SHAFT	HH5280	1.4	(23.0)	1000	(70)	
SEASTAR 1.4 – TILT	HH5744	1.4	(23.0)	1000	(70)	
* SEASTAR 1.7 – STANDARD MOUNT	HH5271	1.7	(27.8)	1000	(70)	
* SEASTAR 1.7 – STANDARD MOUNT FULL FEEDBACK	HH5761	1.7	(27.8)	1000	(70)	
SEASTAR 1.7 – REAR MOUNT	HH5261	1.7	(27.8)	1000	(70)	
SEASTAR 1.7 – REAR MOUNT 1" TAPERED SHAFT	HH5281	1.7	(27.8)	1000	(70)	
SEASTAR 1.7 – TILT	HH5741	1.7	(27.8)	1000	(70)	
SEASTAR 1.7 – SPORT TILT	HH5291	1.7	(27.8)	1000	(70)	
* SEASTAR 1.7 – COMMERCIAL, STD. MOUNT	HH5217	1.7	(27.8)	1000	(70)	
* SEASTAR PRO 1.7 – STANDARD MOUNT	HH5779	1.7	(27.8)	1500	(103)	1
SEASTAR PRO 1.7 – REAR MOUNT	HH5778	1.7	(27.8)	1500	(103)	1
SEASTAR PRO 1.7 – TILT	HH5773	1.7	(27.8)	1500	(103)	1
* SEASTAR 2.0 – STANDARD MOUNT	HH5273	2.0	(33.0)	1000	(70)	
* SEASTAR 2.0 – STANDARD MOUNT FULL FEEDBACK	HH5760	2.0	(33.0)	1000	(70)	
SEASTAR 2.0 – TILT	HH5743	2.0	(33.0)	1000	(70)	
SEASTAR 2.0 – SPORT TILT	HH5745	2.0	(33.0)	1000	(70)	
SEASTAR PRO 2.0 – STANDARD MOUNT	HH5770	2.0	(33.0)	1500	(103)	1
SEASTAR PRO 2.0 – REAR MOUNT	HH5771	2.0	(33.0)	1500	(103)	1
SEASTAR PRO – TILT	HH5774	2.0	(33.0)	1500	(103)	1
SEASTAR PRO 2.0 – SPORT TILT	HH5290	2.0	(33.0)	1500	(103)	1
* SEASTAR 2.4 – STANDARD MOUNT	HH5272	2.4	(39.3)	1000	(70)	
* SEASTAR 2.4 - STANDARD MOUNT FULL FEEDBACK	HH5762	2.4	(39.3)	1000	(70)	
SEASTAR 2.4 – REAR MOUNT	HH5262	2.4	(39.3)	1000	(70)	
SEASTAR 2.4 – REAR MOUNT 1" TAPERED SHAFT	HH5282	2.4	(39.3)	1000	(70)	
SEASTAR 2.4 – TILT	HH5742	2.4	(39.3)	1000	(70)	
SEASTAR 2.4 – SPORT TILT	HH5292	2.4	(39.3)	1000	(70)	
* SEASTAR 2.4 – COMMERCIAL, STD. MOUNT	HH5224	2.4	(39.3)	1000	(70)	
* SEASTAR PRO 2.4 – STANDARD MOUNT	HH5772	2.4	(39.3)	1500	(103)	1
* OPTIONAL EQUIPMENT	BACK PLATE KIT	HA5418		REF. PAGE 7-6		
	20 DEGREE WEDGE	HA5419		REF. PAGE 7-6		
	ROUND BEZEL KIT	HA5417		REF. PAGE 7-6		
NOTES	1. SeaStar PRO helms cannot be used with an unbalanced cylinder. SeaStar reinforced Kevlar Outboard style hose MUST be used with ALL SeaStar PRO helms.					

Standard/Rear Mount Helm Dimensions

STANDARD FRONT MOUNT HELM PUMPS

NOTICE

1" straight and tapered shafts are also available see page 7-3 for details.

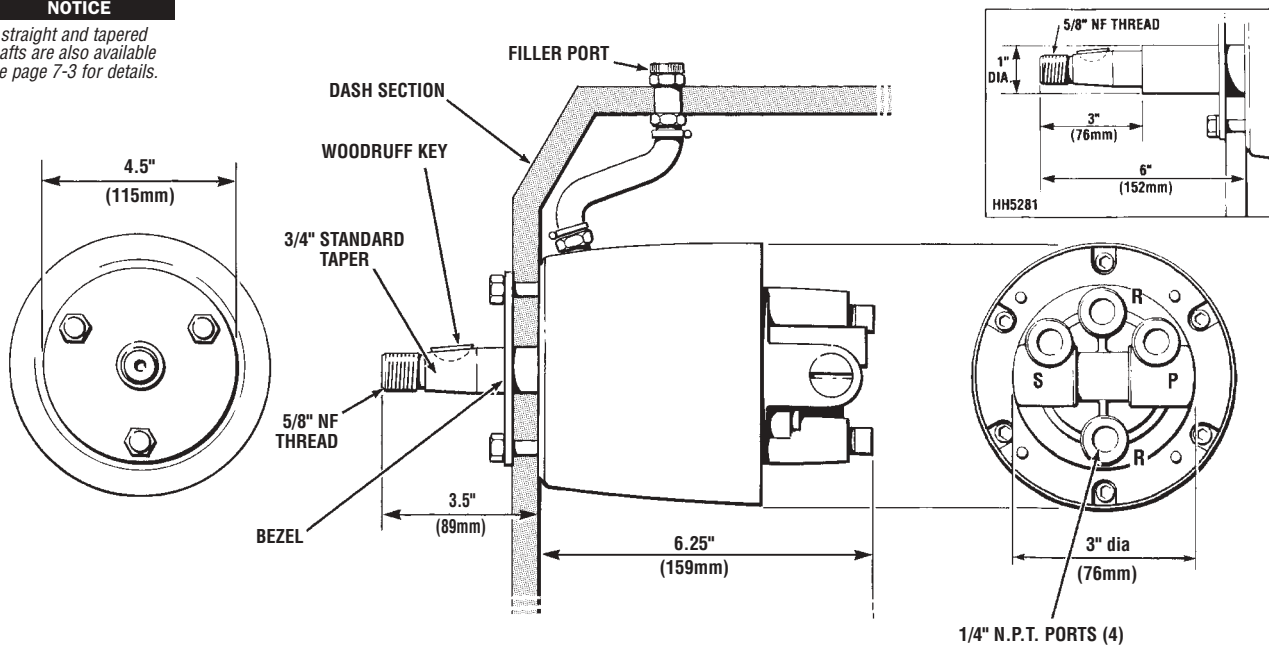


NOTICE Max. steering wheel diameter 28" (711mm).

REAR MOUNTING HELM PUMPS

NOTICE

1" straight and tapered shafts are also available see page 7-3 for details.

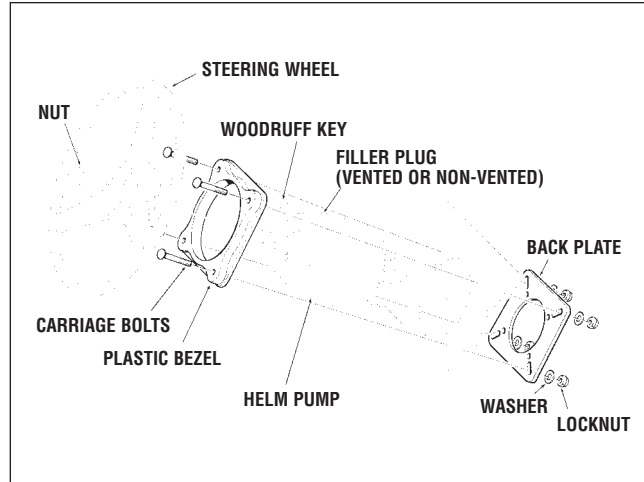


NOTICE Max. steering wheel diameter 28" (711mm). Min. dash thickness 1" (25.5mm), Max. dash thickness 1.5" (38mm).

Backplate Kit (part # HA5418)

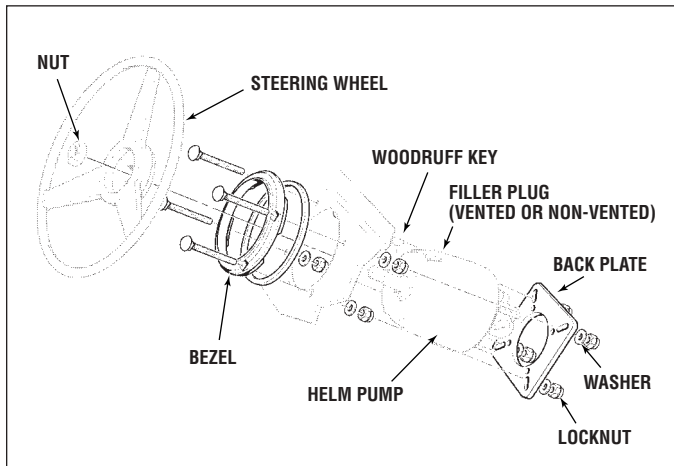
- a) Used to retrofit a new SeaStar standard helm in the old 4.5" (115mm) diameter hole, or
- b) reduce the helm protrusion from the dash by the thickness of the dash, or
- c) retrofit new SEASTAR standard helm into hole cutouts for mechanical and hydraulic steering as per chart.

STEERING MANUFACTURER	HELM MODEL TYPE	SYSTEM	BACKPLATE KIT REQ
TELEFLEX	SAFE-T	MECHANICAL	YES
	BIG-T	MECHANICAL	YES
	ROTARY	MECHANICAL	NO
	RACK AND PINION	MECHANICAL	NO
	SYTEN	HYDRAULIC	YES
MORSE	ROTARY	MECHANICAL	NO
	RACK AND PINION	MECHANICAL	NO
HYNAUTIC	H-50 SERIES	HYDRAULIC	YES
	H-60 SERIES	HYDRAULIC	YES
	H-80 SERIES	HYDRAULIC	YES
	H-300 SERIES	HYDRAULIC	YES



Round Bezel (part # HA5417)

Reduces the distance the helm protrudes from the front of the dash to 3.75" (93mm).

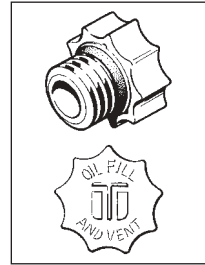


Vent Plug (part # HA5431)

Supplied with SeaStar Helm Pump

Must Be used with Helm Pump on all single steering station systems.

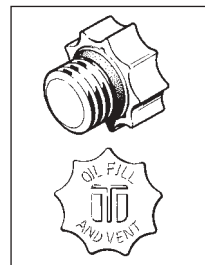
Must be used on uppermost Helm Pump on multi steering station systems.



Non-Vent Plug (part # HA5432)

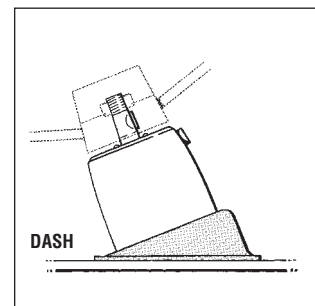
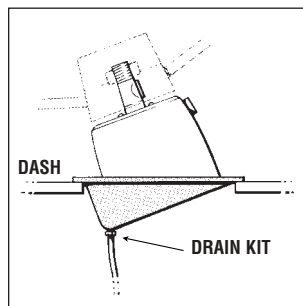
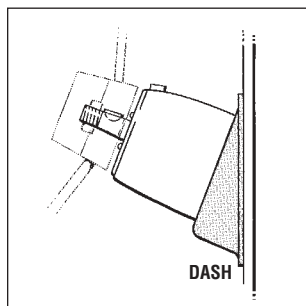
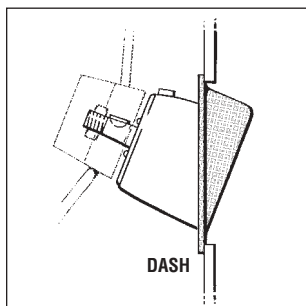
Must be used on all Helm Pumps other than uppermost Helm Pump on multi steering station systems.

This Non-Vent Plug is supplied with additional Fitting Kit No. HF5501 & HF5502



20° Wedge (part # HA5419 & HA5408 c/w Drain kit)

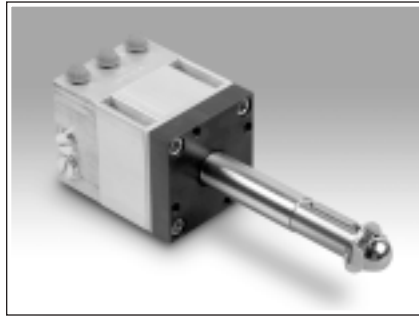
This kit is designed to mount the helm at a 20° angle to the mounting surface. 4 possible mounting configurations are available.



▲ For this configuration use **HA5408**

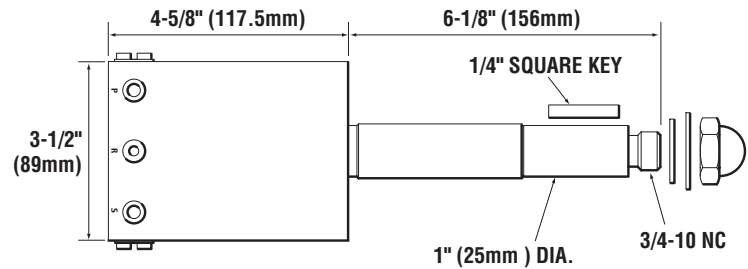
Hynautic Helm Pumps

Heavy Duty Helm Pump H-20 Series

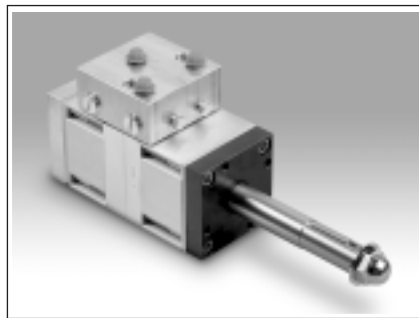


HELM	DISPL	SHAFT STYLE DIA. & TYPE	KEYWAY	INTEGRAL VALVING	
20 Series	H-21	2.75cu in	1 Straight	1/4" Square	Yes
	H-25	2.75cu in	3/4", 1"/ft Tapered	#9 Woodruff	Yes
	H-26	2.00cu in	3/4", 1"/ft Tapered	#9 Woodruff	Yes

H-21

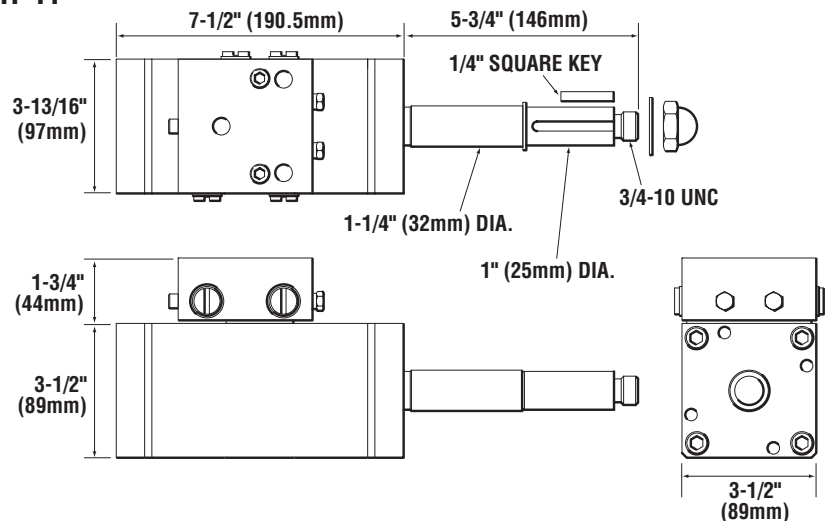


Heavy Duty Helm Pump H-40 Series



HELM	DISPL	SHAFT STYLE DIA. & TYPE	KEYWAY	INTEGRAL VALVING	
40 Series	H-41	5.50cu in	1 Straight	1/4" Square	Yes
	H-41-2	5.50cu in	3/4", 1"/ft Tapered	#9 Woodruff	Yes
	H-42	4.00cu in	1 Straight	1/4" Square	Yes
	H-42-02	4.00cu in	3/4", 1"/ft Tapered	#9 Woodruff	Yes

H-41



NOTICE

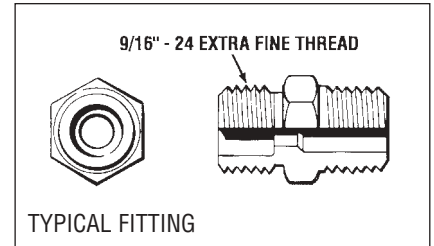
If using a Hynautic H-20 or H-40 series helm pump, use of a Hynautic Reservoir and Relief Valve, see page 5-4 for details.

Fitting kits sold separately for both H-20 and H-40 series, please see page 5-2 for which fitting kit is to be used."

HOSE, TUBING, FITTINGS, ACCESSORIES AND TOOLS

Fittings

All SeaStar Manual Hydraulic steering systems utilize the same style of fittings for all applications. These are 3/8" compression fittings which utilize a 9/16"-24 extra fine thread.



Tubing/Hose

The tubing or hose requirements depend on the type of steering system being considered. Please double check the application in which you are using as in some cases Nylon or copper tube is not to be used.

⚠ WARNING

DO NOT CUT OUTBOARD HYDRAULIC HOSE.

APPLICATION	TUBING/HOSE REQUIREMENTS	PAGE #
OUTBOARDS INBOARDS, SSII	OUTBOARD HOSE	8-2- 8-4
STERNDRIVES SEADRIVES INBOARDS, SSI	3/8" DIA. NYLON OR COPPER TUBE	8-6- 8-8
CAUTION: DO NOT USE NYLON TUBING IN OUTBOARD STEERING INSTALLATIONS.		

General Considerations

⚠ WARNING

DO NOT use extruded nylon tube for outboard installations.

In most hydraulic steering installations the cylinder body moves as the motor, outdrive or tiller arm is articulated. Provide sufficient hose length to allow full-uninterrupted steering motion including trim and tilt. If your splashwell is rated for a dual engine application or you are mounting the engines on a gill bracket you must provide enough steering hose to rig either twin or single engines. Inboard or Sterndrive steering installations that use 3/8" copper or extruded nylon tube must have a swaged hydraulic hose kit (HF5508) between the steering cylinder and the rigid tube to provide a flexible connection.

SEASTAR OUTBOARD HOSE

SeaStar Outboard hoses are available in kit's (includes two hoses) ranging in length from 2' – 30'. Hydraulic Hose must be protected from chaffing and any possible contact or interference with assembly screws or sharp edges of any type.

The Hydraulic hoses should be secured along the routing path wherever possible and should not be allowed to hang free in any area where they could become a safety hazard. Teleflex Canada Limited Partnership recommends the use of a rigging tube, PVC piping or conduit for the safe secure installation of hydraulic hoses. Do not install hoses in such a way that they may become exposed to high heat areas such as engine components (i.e.; manifold or exhaust components) or highly corrosive areas such as battery fumes or electrical connections.

Continuous kinking, chaffing, rubbing or twisting may eventually weaken hose(s) to a point where it could rupture from normal steering pressure causing loss of steering, resulting in personal or property damage. Visually inspect all hoses and fittings for wear and or damage as part of your regular annual maintenance. Replace any hose or components suspect of excessive wear.

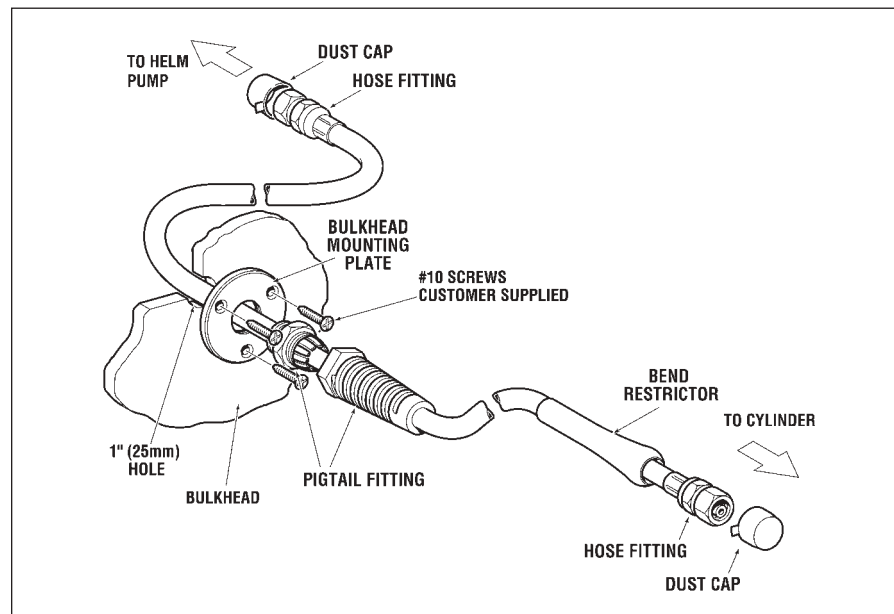
Measuring Hose Lengths:

NOTICE

Correct hose length is crucial to the operation of your SeaStar steering system, please be sure that you take all the following measurements correctly to avoid damage to the steering hose.

- 1 Measure from the center of the steering wheel to the Starboard side wall.
- 2 Measure from the Starboard side wall to the transom.
- 3 Measure from the transom into the center of the engines (if this is a twin engine twin cylinder application please measure to the center of the Port side engine.)
- 4 Add up the above three measurements, round up to the nearest even number, then add two feet. This is the length of hose required for your application.

Bulkhead Hose Kit:



Available SeaStar Hose Kits: How to order

Each part number contains two hoses of equal length.

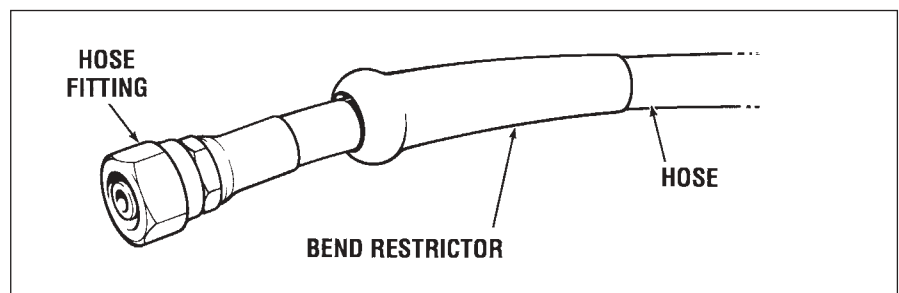
PART NUMBER	KIT DESCRIPTION
* H051XX	SeaStar Standard Outboard Hose Kit (2 hoses)
* H057XX	SeaStar Pro Hose Kit (2 hoses)
** H081XX	SeaStar Bulkhead Hose Kit, Standard (2 hoses)
** H082XX	SeaStar Bulkhead Hose Kit, Pro(2 hoses)

NOTICE

Outboard hoses are supplied with pre- attached hose fittings on both ends.

In order to prevent hose kinking, bend restrictors are supplied on one end of each hose in the kit. The end of the hose with the bend restrictor is to be attached to the cylinder.

- * SeaStar Standard and Pro Hose Kits are available in lengths from 2' – 30'. 40' Hose Kits are available by special order only.
- ** SeaStar Standard and Pro Bulkhead Hose Kits are available in lengths from 12' – 30'. 40' Hose Kits are available by special order only.



Standard Hose Kit

To determine the required hose lengths for outboard steering installations.

From the illustrations on the following pages (figures A through I), select the situation which best suits your application and note the:

- a) cylinder location,
- b) number of cylinders,
- c) type of cylinders,
- d) number of steering stations, and
- e) the number of hose and fitting kits required.

Single Station System

- 1) From the illustration that suits your application note the number of hose and fitting kits required.
- 2) Measure along the intended path of the hose routing for each of the required hose kits.
- 3) Round up the measurement to the next even digit and add 2 feet (0.6m). This is the length of hose kit required.
- 4) Order hose kit(s) part no. H051_ _ . The last two digits correspond to the length of hose kit.

NOTICE

- a) Measure from center of the cylinder(s) and helm(s)
- b) Some installations require more than 1 hose kit and additional fitting kits (see parts list for each figure).
- c) Minimum bend radius for outboard hose is 2-1/2" (6 cm).
- d) Outboard cylinders move. They are subject to engine trim & tilt. Enough slack must be left in the hoses to prevent kinking.

⚠ CAUTION

DO NOT cut the hose. This will destroy the hose. Once cut there is no means to field swage fittings to the ends of the hose.

Single Station

Figure A: HC5345
Single Front Mount Cylinder
Note: cylinder body moves

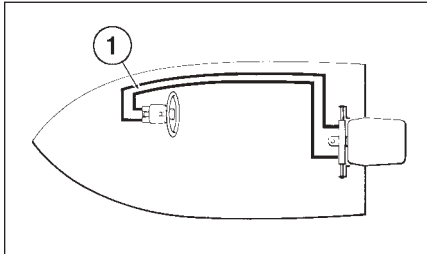


Figure B: HC5370
Single Side Mount Cylinder
Note: cylinder body stationary

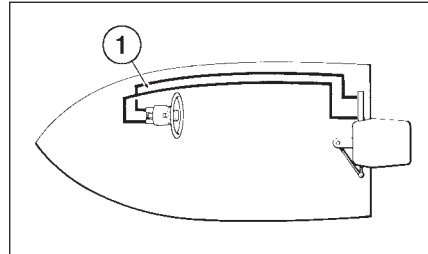


Figure C: HC5380
Single Splashwell Mount Cylinder
Note: cylinder body stationary

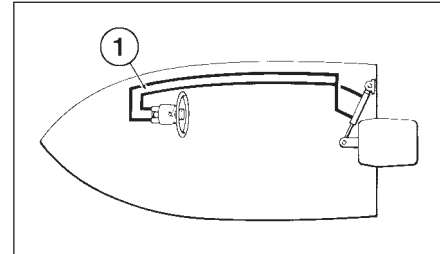


Figure D: HC5345
Dual Front Mount Cylinders
Note: cylinder body moves

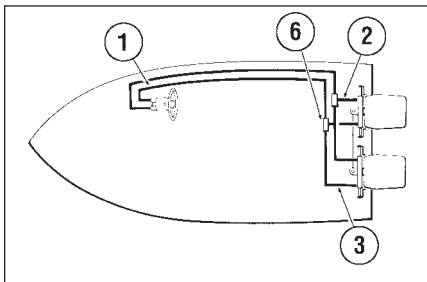


Figure E: HC5370
Dual Side Mount Cylinders
Note: cylinder body stationary

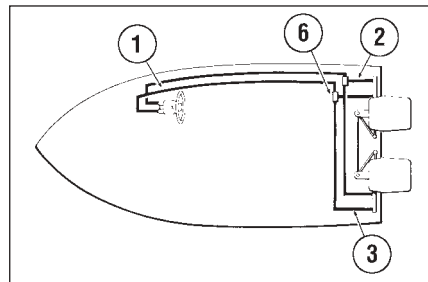


Figure F: HC535
Single Front Mount Cylinder
c/w bulkhead fittings
Note: cylinder body moves

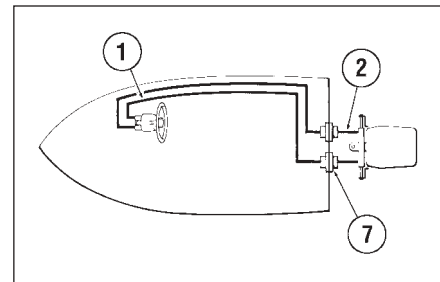


Figure G: HC5370
Single Side Mount Cylinder
c/w bulkhead fittings
Note: cylinder body stationary

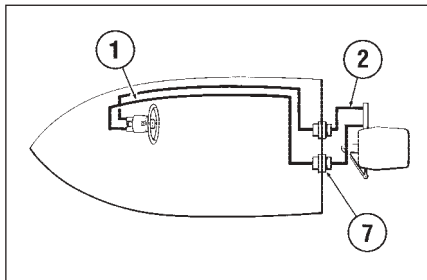


Figure H: HC5345
Dual Front Mount Cylinders
c/w bulkhead fittings

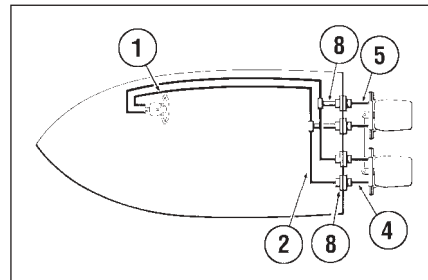
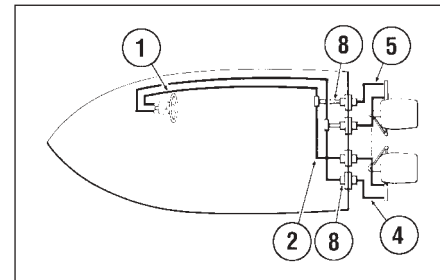


Figure I: HC5370
Dual Side Mount Cylinders
c/w bulkhead fittings



ITEM	PART #	QTY	DESCRIPTION
1	H051__	1	Hose Kit
2	H051__	1	Hose Kit
3	H051__	1	Hose Kit
4	H051__	2	Hose Kit
5	H051__	2	Hose Kit
6	HF5530	1	Tee Fitting (3 per Kit)

ITEM	PART #	QTY	DESCRIPTION
7	HF5512	1	Bulkhead Fitting Kit (2 fittings per Kit)
	HF5513	1	3/4" Thick Bulkhead
8	HF5514	1	Bulkhead Fitting Kit (4 fittings per Kit)
	HF5515	1	3" Thick Bulkhead

Additional Stations or Autopilot Integration

Additional Steering Station or Autopilot Power pack

- 1) Determine the location of the 2nd station or power pack.
- 2) Measure along the intended path of the hose routing from the upper helm pump to the 2nd station or autopilot power pack.
- 3) Round up the measurement to the next even digit. This is the length of hose kit required.
- 4) Order hose kit(s) part number H051_ _ the last two digits correspond to the length of hose.

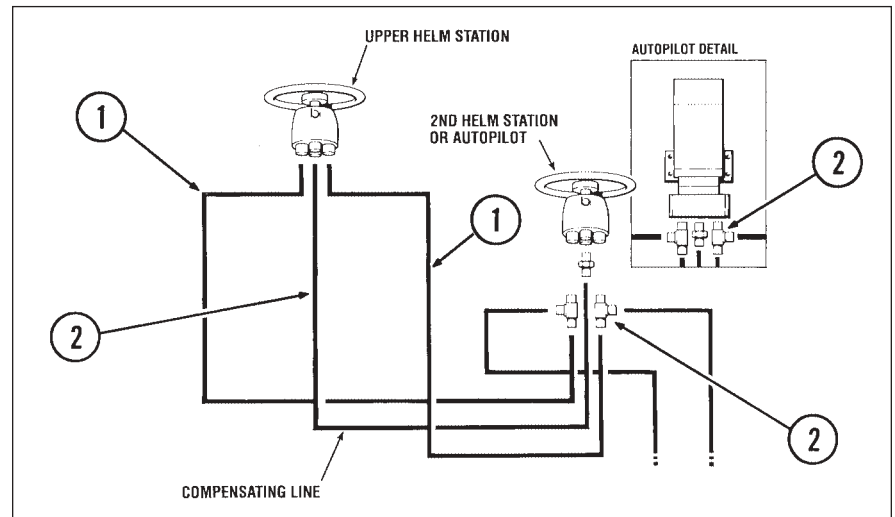
Note:

- a) **All hoses should be routed with a gradual rise so that air will not be trapped in the lower station.**
- b) Some installations require more than 1 hose kit and additional fitting kits.
- c) Minimum bend radius for outboard hose is 2-1/2" (6 cm).
- d) A compensating line is required between helm stations or the helm and autopilot power pack.

Figure J

2nd Steering Station or Autopilot Power Pack Installation

⚠ WARNING
DO NOT CUT HYDRAULIC HOSE.



Parts list

For Figure J

ITEM #	DESCRIPTION	PART NUMBER	QUANTITY REQUIRED	REF PAGE #
1	HOSE KIT	H051_ _	1	
2	FITTING KIT*	HF5501	1	42

* Includes 3/8" dia. Nylon tube for compensating line

SEASTAR INBOARD/STERNDRIVE TUBING

Two types of tubing materials are available for plumbing Inboards and Sterndrives.

- 1) SeaStar 3/8" outside diameter nylon tubing
- 2) 3/8" outside diameter copper refrigeration tubing

Nylon Tubing

SeaStar 3/8" outside diameter nylon tubing is recommended for;

- a) Inboard,
- b) Sterndrive, and
- c) Seadrive steering systems with SeaStar I (1.7 cubic inch/rev displacement) helms only.

SeaStar 3/8" outside diameter nylon tubing is available in the following lengths:

LENGTH FEET	(METERS)	TUBING PART #'S
25'	(7.6m)	HT5092
50'	(15.2m)	HT5095
75'	(22.8m)	HT5097
100'	(30.5m)	HT5100
1000'	(305.0m)	HT5101

NOTICE

SeaStar 3/8" nylon tubing is not recommended for use in systems with SeaStar II helms or SeaStar HP helms. It is also not recommended for use in SeaStar I systems where the total tubing run exceeds 100 feet. In these cases outboard hose or 3/8" dia. copper tubing must be used.

Copper Tubing

3/8" outside diameter copper tubing is recommended for;

- a) inboard,
- b) sterndrive, and
- c) seadrive steering systems with SeaStar II (2.4 cubic inch/rev displacement) helms only, or where the length of tubing run exceeds 100 feet (30.5m).

Additional SeaStar hose kit part number HF5508 is required to connect the tubing to the cylinder.

3/8" copper tubing should be obtained through a local vendor based on the following tubing specifications.

Specification for copper tubing:

Annealed Copper Refrigeration Tubing, 0.032 wall thickness, 3/8" outside diameter

To determine the required length of tubing for single and dual configurations:

From the illustrations (figures A through E), select the situation which best suits your application and note;

- a) the type of drive system, and
- b) the number of steering stations.

Single Station

- 1) From the illustration which best suits your application note the number of lengths of tubing and fitting kits required.
- 2) Measure along the intended path of tube routing for each of the tubing runs.
- 3) Determine if 3/8" nylon tube can be used or if copper tubing is required based on lengths of tubing runs required.
- 4) Total up the entire length of tubing required and round up to the next available tube kit length.

Figure A

Single Inboard Cylinder

- fittings required supplied with helm and cylinder

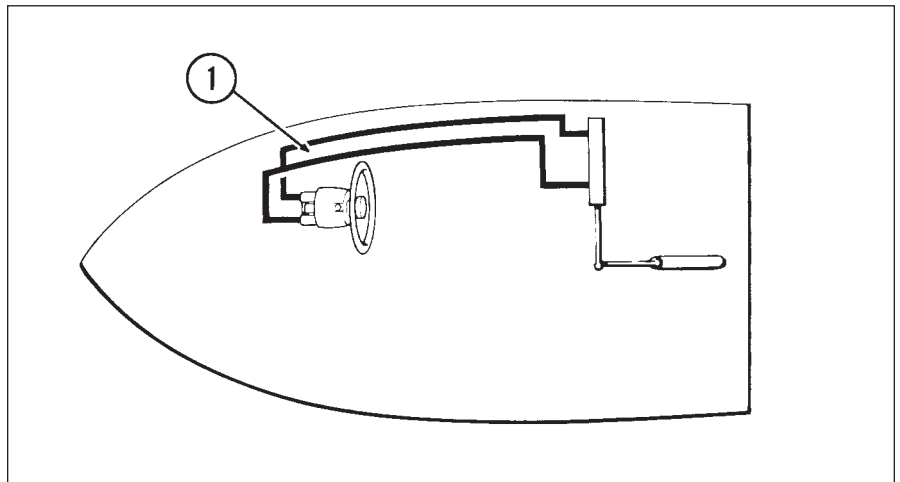
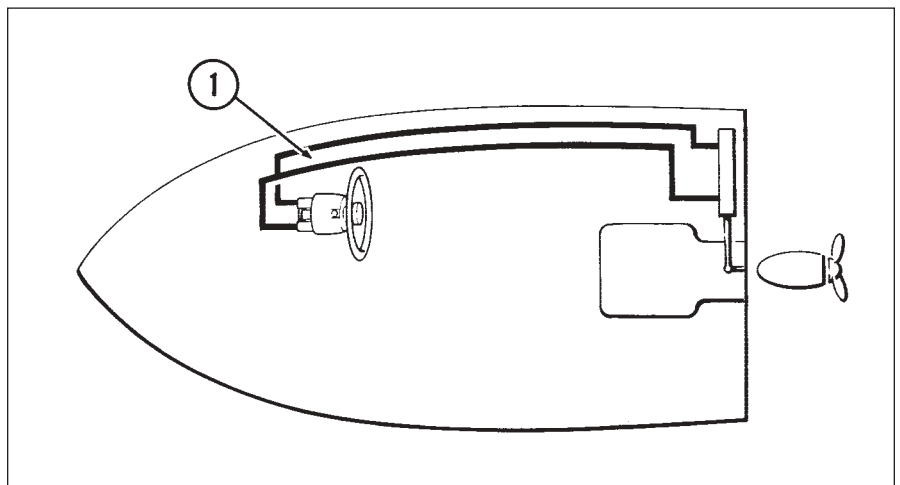


Figure B

Single Sterndrive Cylinder

- fittings required supplied with helm and cylinder



Parts list

For Figures A, B

ITEM #	DESCRIPTION	PART NUMBER	QUANTITY REQUIRED
1	3/8" DIA NYLON OR COPPER TUBE		AS MEASURED

ADDITIONAL SEASTAR STEERING STATION OR AUTOPILOT KIT

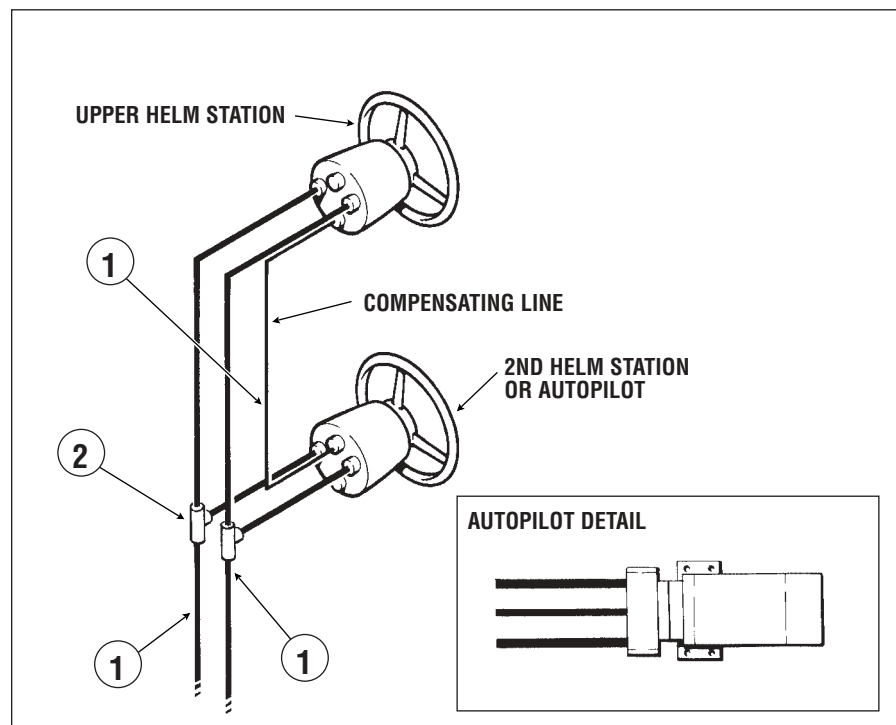
- 1) Refer to illustration Figure E.
- 2) Determine the location of the second station or autopilot power pack.
- 3) Measure along the path of the tube routing from the upper helm pump to the second station or autopilot power pack. Multiply this length by three for the amount of tubing required.
- 4) Select the tubing kit based on the total system tubing requirement.

Figure E

2nd Steering Station or Autopilot

NOTICE

- a) A compensating line is required between helm stations or the helm and autopilot power pack.
- b) All hoses should be routed with a gradual rise (particularly the compensating line) so that air will not be trapped in the lower helm station.
- c) The second helm station or autopilot power pack may be connected at any location between the upper helm station and the cylinder. For existing single station installations the nylon or copper tubing may be cut and the tee fittings installed at any convenient location.

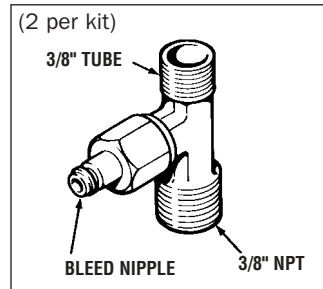


ITEM #	DESCRIPTION	PART NUMBER	QUANTITY REQUIRED	REF PAGE #
1	3/8" DIA NYLON OR COPPER TUBE	HT5_ _ _	AS MEASURED	
2	FITTING KIT	HF5502	1	43

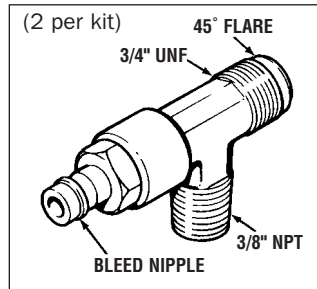
FITTINGS

All SeaStar Manual Hydraulic steering systems utilize the same style of fittings for all applications. These are 3/8" compression fittings which utilize a 9/16"-24 extra fine thread. Refer to page 8-1.

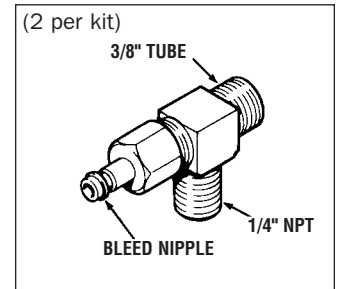
HF5518 Vertical Bleeder Tee



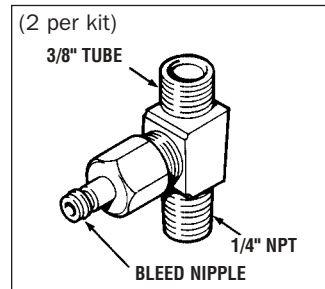
HF5519 Bleed Tee (TM Cylinders)



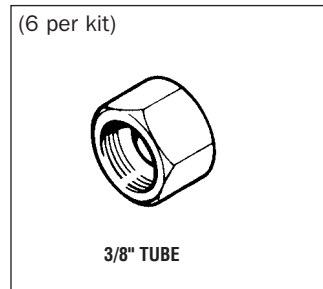
HF5520 Horiz. Bleeder Tee



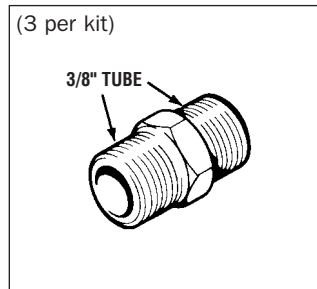
HF5521 Vertical Bleeder Tee



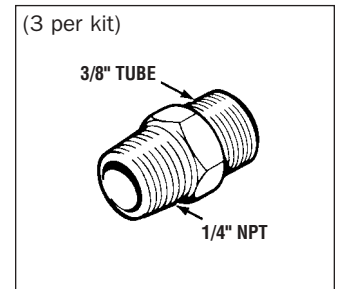
HF5526 Tube Nut



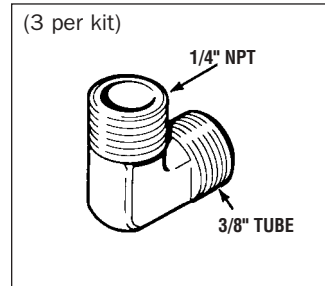
HF5527 Union Coupling Fitting



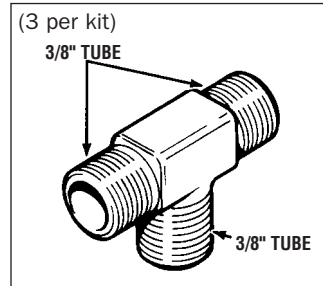
HF5528 Straight Fitting



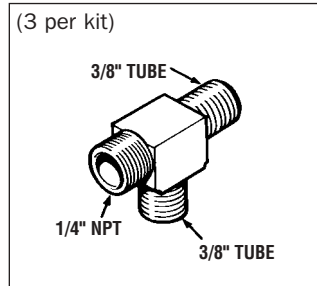
HF5529 Elbow Fitting



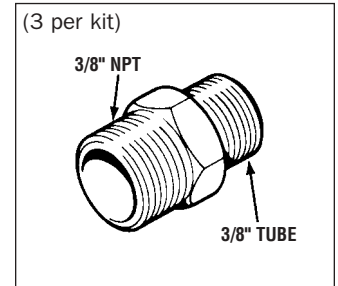
HF5530 Tee Fitting



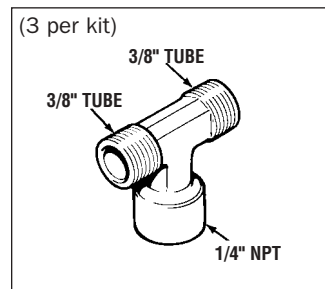
HF5531 Tee Fitting



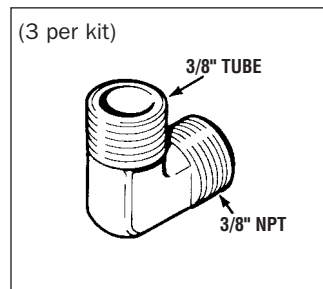
HF5532 Connector Fitting



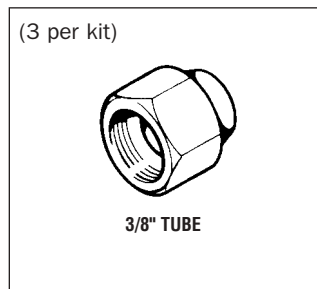
HF5533 Tee Fitting



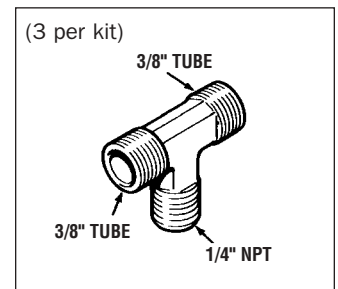
HF5534 Elbow Fitting



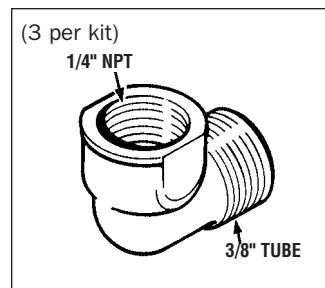
HF5524 Cap Plug Nut



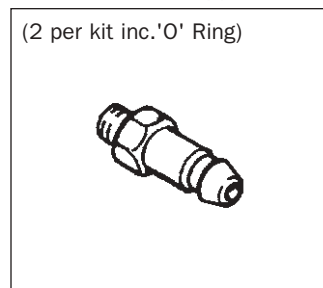
HF5536 Tee Fitting



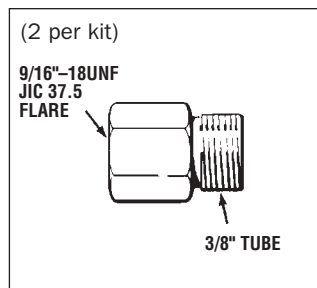
HF5538 Street Elbow



HF5548 Bleed Nipple



HF5566 Adapter Fitting



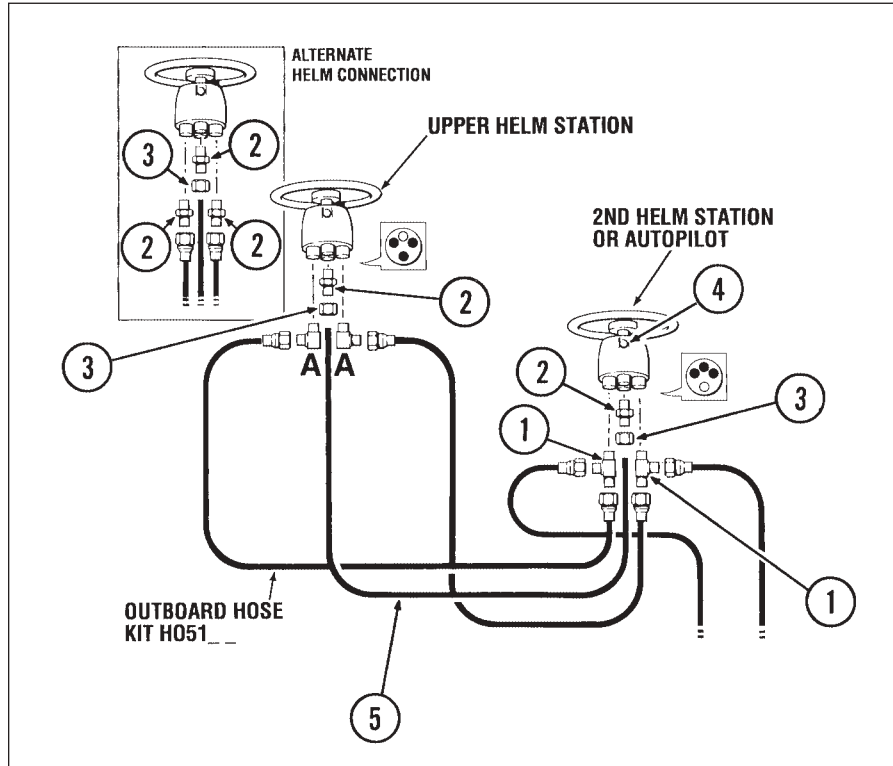
HF5501

Application

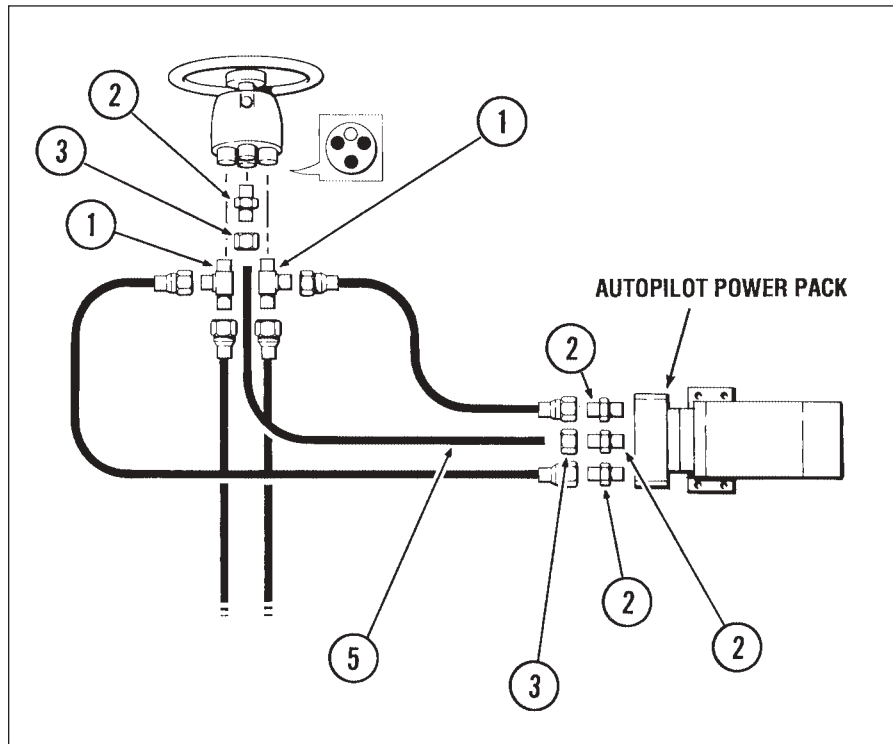
Fitting kit to add a 2nd station or autopilot to an outboard system.

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Tee Fitting 1 End - 3/8" NPT (M) 1 End - 1/4" NPT (M) Center - 3/8" Tube (M)	2	600603
2	Connector Fitting 3/8" Tube (M) - 1/4" NPT (M)	4	600602
3	Tube Nut - 3/8" Dia.	4	280327
4	Non-Vented Filler Plug	1	HA5432
5	SeaStar Nylon Tube 3/8" Dia.	25ft	HT5092
A*	Elbow 3/8" Tube (M) - 1/4" NPT (M)	2	

* SUPPLIED WITH HELM PUMP
NOTE: USED IN SYSTEMS PLUMBED WITH
OUTBOARD HOSE



Autopilot powerpack connection



HF5502

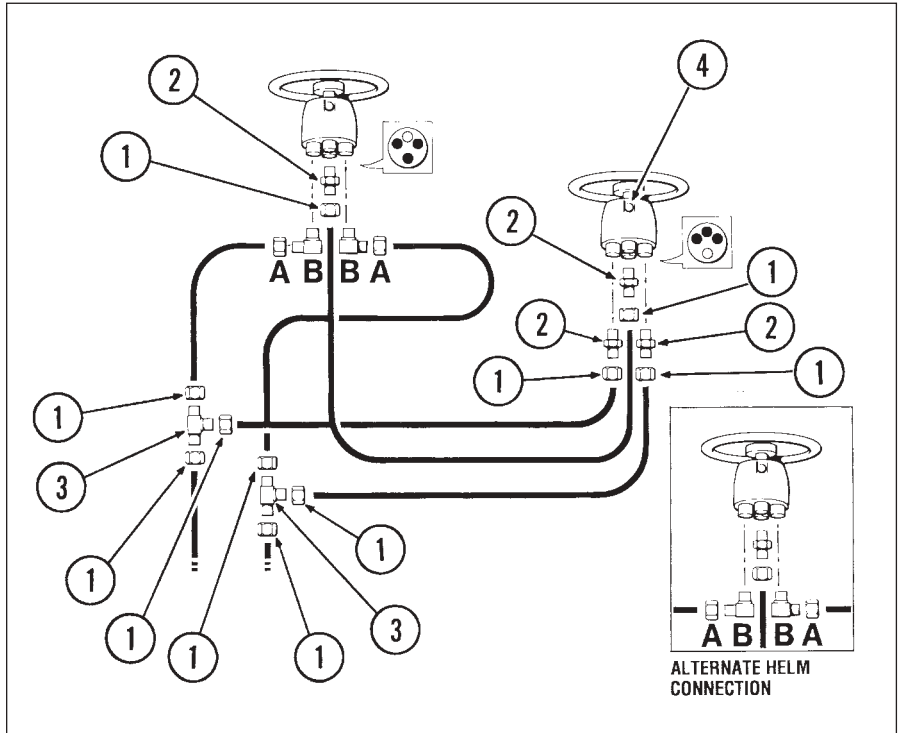
Application

Fitting kit to add a 2nd station or autopilot to an inboard or sterndrive system

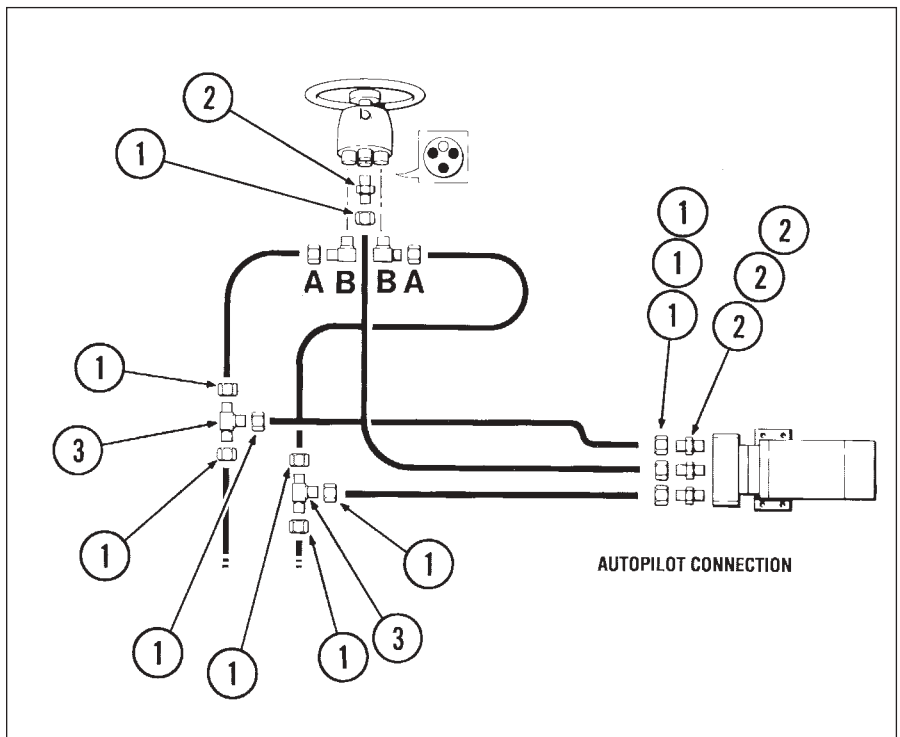
ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Tube Nut – 3/8" Dia.	10	280327
2	Connector Fitting 3/8" Tube (M) – 1/4" NPT (M)	4	600602
3	Tee Fitting 3 Ends – 3/8" Tube	2	600605
4	Non-Vented Filler Plug	1	HA5432
A*	Tube Nut – 3/8" +Dia.	2	
B*	3/8" Elbow 1/4" NPT (M)	2	

* SUPPLIED WITH HELM

NOTE: USED IN SYSTEMS PLUMBED WITH 3/8" DIAMETER NYLON OR COPPER TUBE



Autopilot powerpack connection

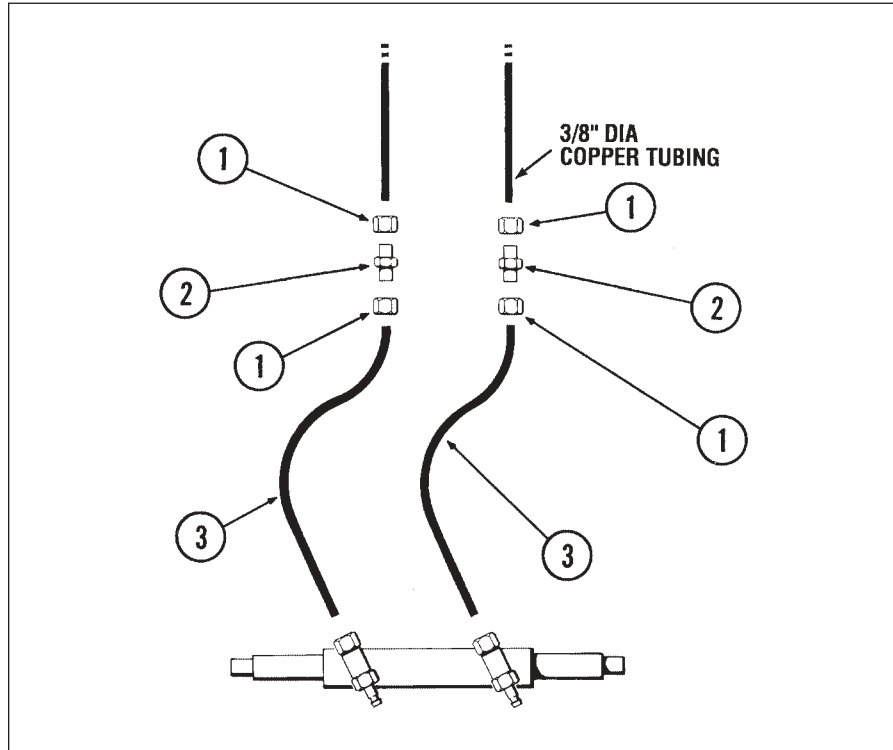


HF5507

Application

Kit to connect 3/8" diameter copper tubing to SeaStar cylinders (using 3/8" diameter nylon tubing)

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Tube Nut – 3/8" Dia.	10	280327
2	Connector Fitting 3/8" Tube (M) – 3/8" Tube (M)	2	280929
3	Nylon Tubing 3/8" Dia.	6ft	795628

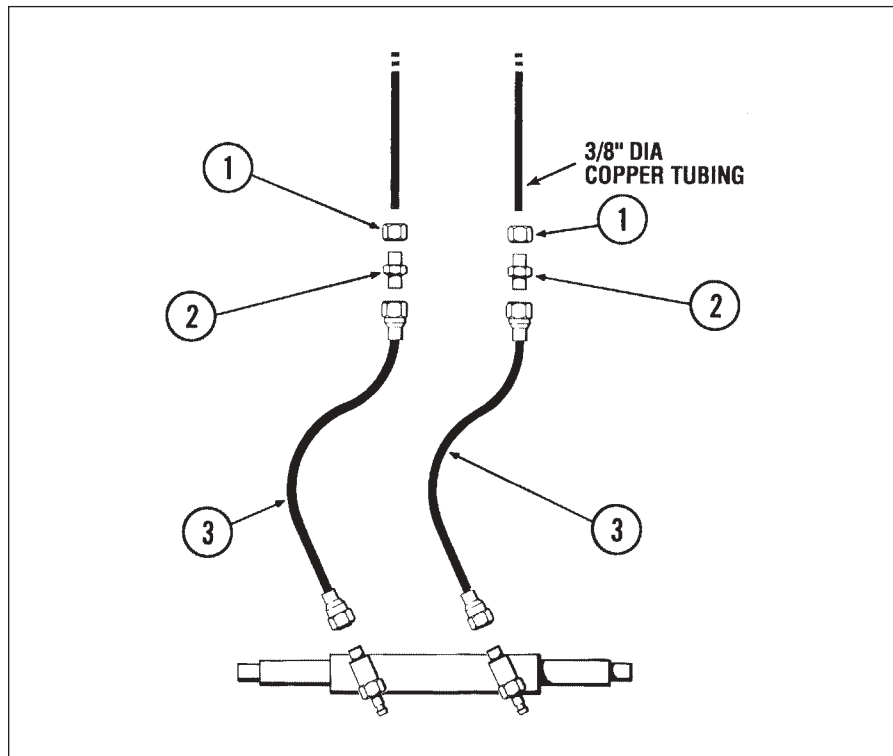


HF5508

Application

Kit to connect 3/8" diameter copper tubing to SeaStar cylinders (using SeaStar outboard hose)

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Tube Nut – 3/8" Dia.	10	280327
2	Connector Fitting 3/8" Tube (M) – 3/8" Tube (M)	2	280929
3	18" Hose c/w Fittings	2	338621



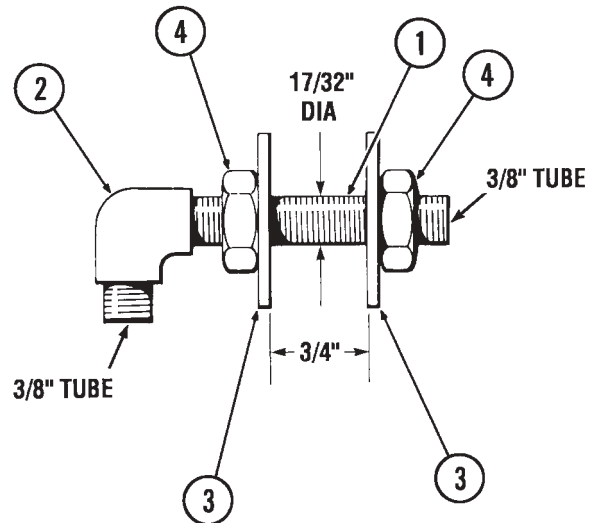
HF5512

3/4" bulkhead fitting kit

Application: Single cylinder installations

2 Assemblies per kit

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Connector Fitting	2	286323
2	Street Elbow 3/8" Tube (M) – 1/4" NPT(F)	2	600606
3	Washer	4	202224
4	Nut	4	191621



2 OF EACH ILLUSTRATED INCLUDED IN KIT

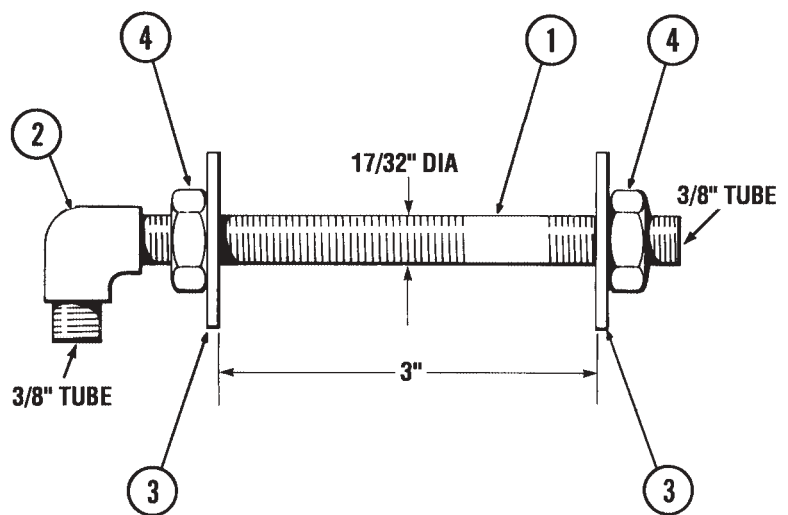
HF5513

3" bulkhead fitting kit

Application: Single cylinder installations

2 Assemblies per kit

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Connector Fitting	2	600608
2	Street Elbow 3/8" Tube (M) – 1/4" NPT(F)	2	600606
3	Washer	4	202224
4	Nut	4	191621



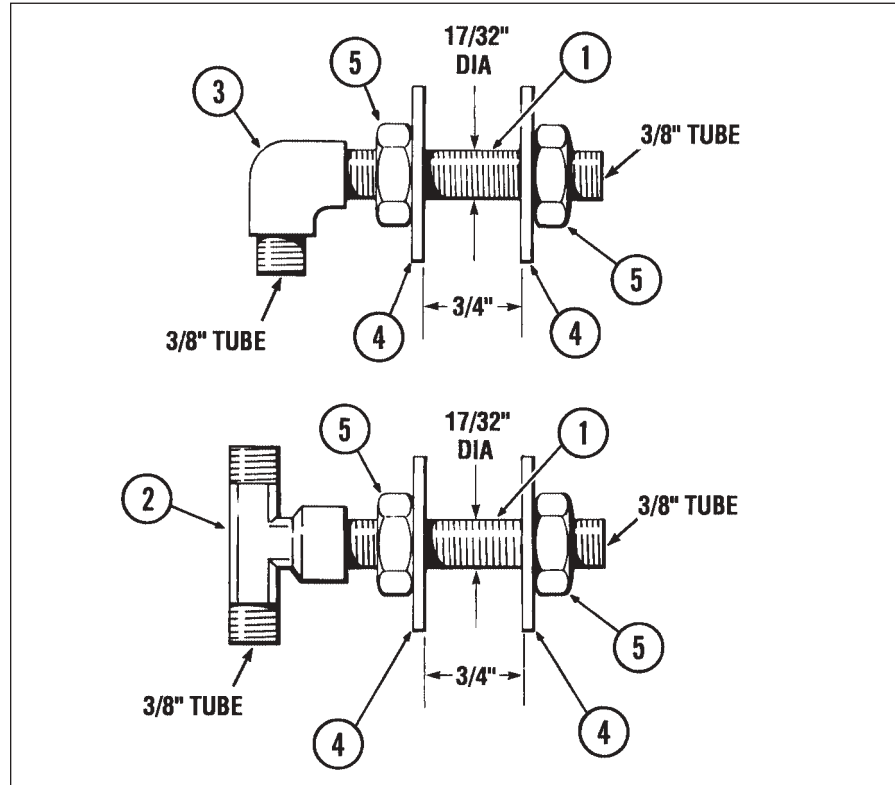
2 OF EACH ILLUSTRATED INCLUDED IN KIT

HF5514

3/4" bulkhead fitting kit
Application: Dual cylinder installations

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Connector Fitting	4	286323
2	Tee Fitting 2 Ends - 3/8" Tube (M) Center - 1/4" NPT (F)	2	284826
3	Street Elbow 3/8" Tube (M) - 1/4" NPT(F)	2	600606
4	Washer	8	202224
5	Nut	4	191621

2 OF EACH ILLUSTRATED INCLUDED IN KIT

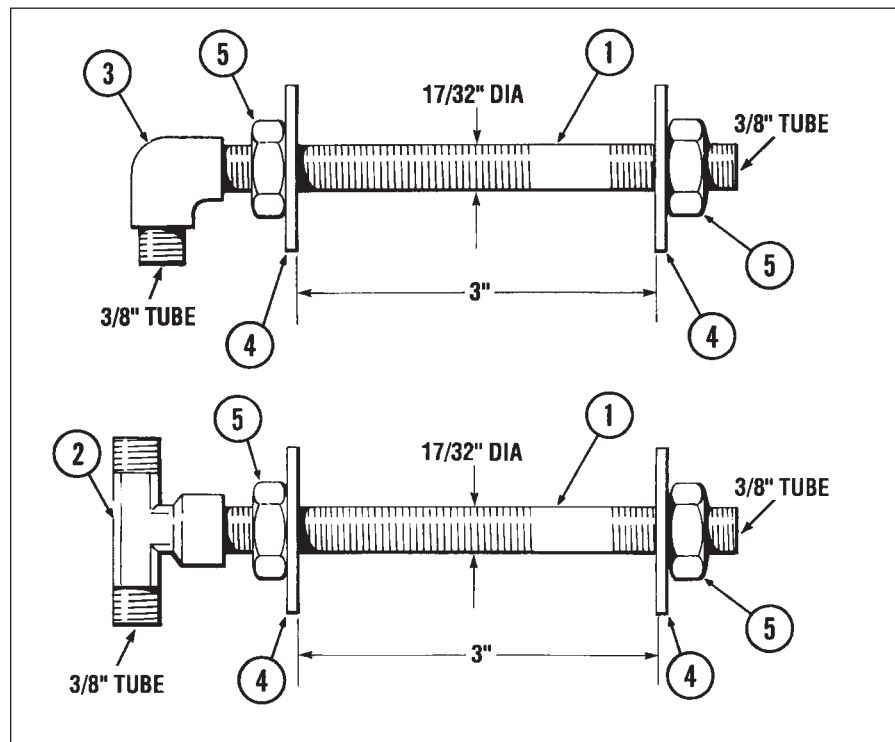


HF5515

3" bulkhead fitting kit
Application: Dual cylinder installations

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Connector Fitting	4	286323
2	Tee Fitting 2 Ends - 3/8" Tube (M) Center - 1/4" NPT (F)	2	284826
3	Street Elbow 3/8" Tube (M) - 1/4" NPT(F)	2	600606
4	Washer	8	202224
5	Nut	4	191621

2 OF EACH ILLUSTRATED INCLUDED IN KIT

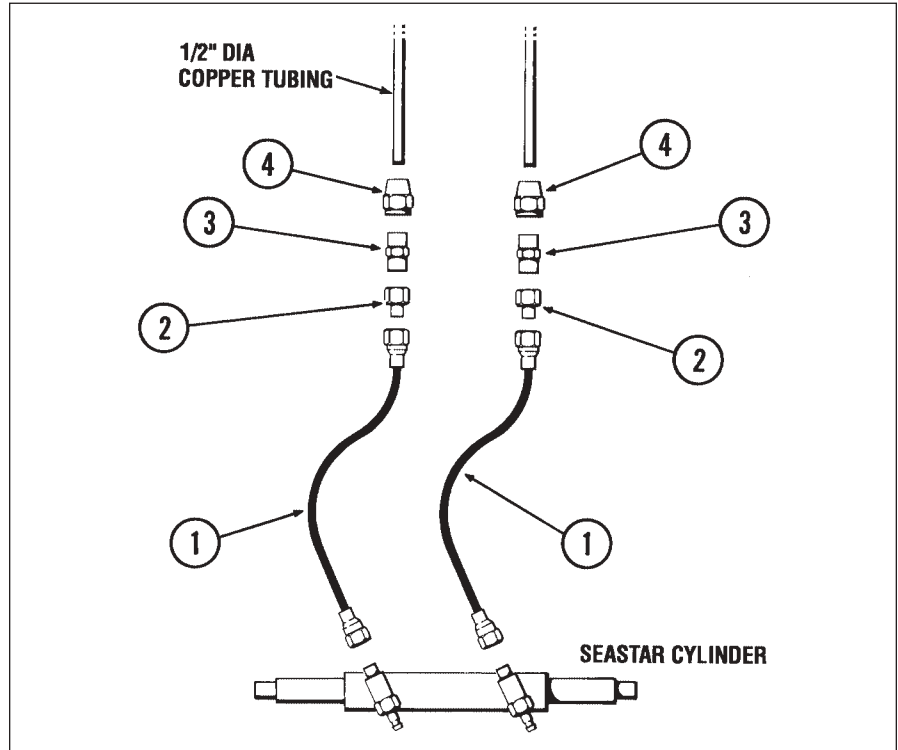


HF5568

Application

Kit to connect 1/2" diameter copper tubing to SeaStar cylinders

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	18" Hose Kit	2	338621
2	Connector Fitting 3/8" NPT(F) – 3/8" Tube (M)	2	653624
3	Connector Fitting 1 End – 3/8" NPT(M) 1 End – 1/2" Dia. 45° Flare	2	555421
4	Tube Nut 1/2" Dia. Flare	2	555027

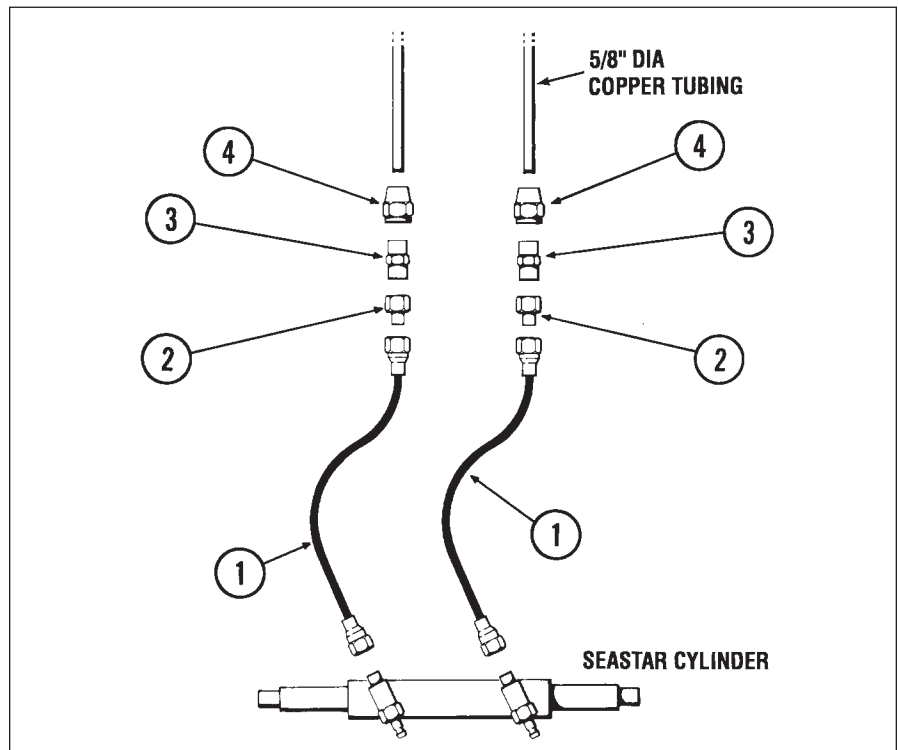


HF5569

Application

Kit to connect 5/8" diameter copper tubing to SeaStar cylinders

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	18" Hose Kit	2	338621
2	Connector Fitting 3/8" NPT(F) – 3/8" Tube (M)	2	653624
3	Connector Fitting 1 End – 3/8" NPT(M) 1 End – 5/8" Dia. 45° Flare	2	288028
4	Tube Nut 5/8" Dia. Flare	2	555121

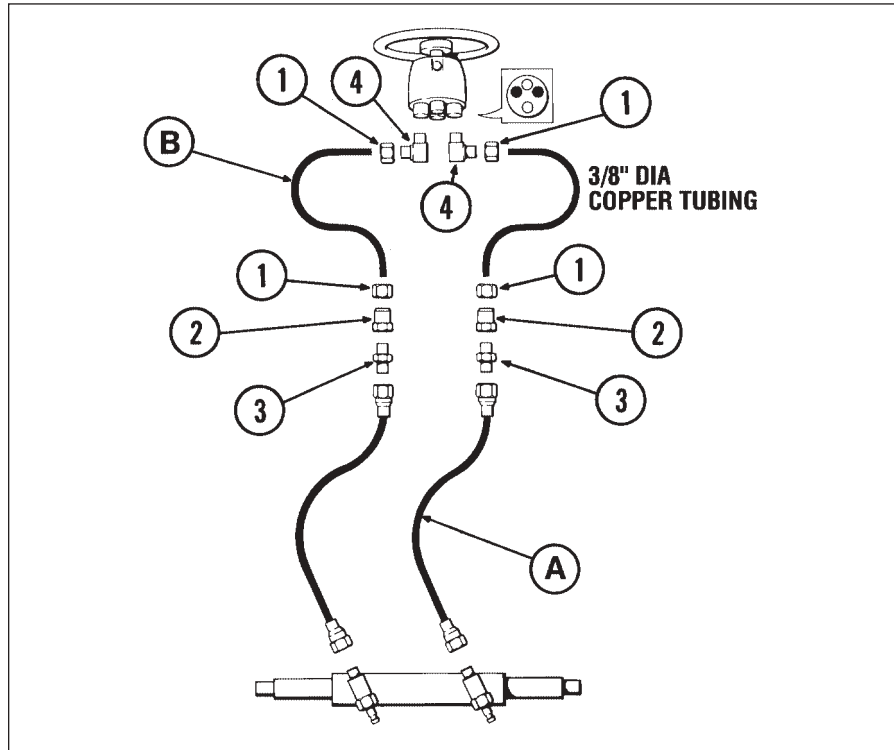


HF5581

Application
45° flare fitting connection kit
for SeaStar systems

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Tube Nut 3/8" Dia. 45° Flare	4	653022
2	Connector Fitting 1 End - 3/8" Dia. 45° Flare (M) 1 End - 3/8" NPT (F)	2	653126
3	Connector Fitting 3/8" Tube (M) - 3/8" NPT (F)	2	600602
4	Elbow 1 End - 1/4" NPT (M) 1 End - 3/8" Dia. 45° Flare (M)	2	288526
A*	Outboard Hose Kit		H051__
B*	Copper Tube 3/8" Dia.		

* NOT SUPPLIED WITH FITTING KIT



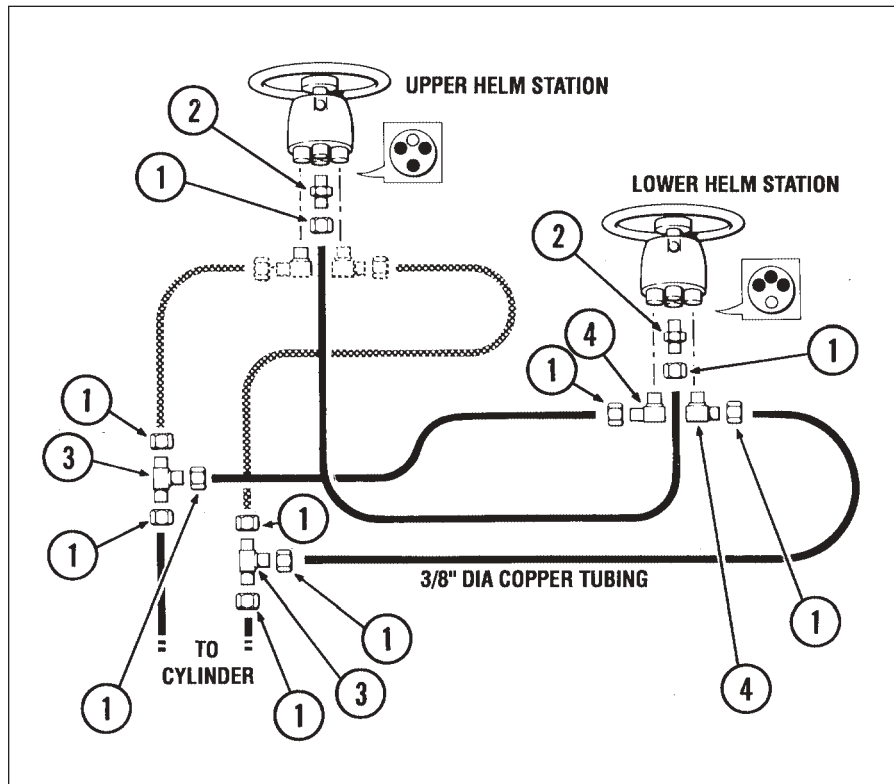
HF5582

Application
Add a station or autopilot kit
using 3/8" 45° flare fittings

ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Tube Nut 3/8" Dia. 45° Flare	10	653022
2	Connector Fitting 1 End - 3/8" Dia. 45° Flare (M) 1 End - 1/4" NPT (M)	2	653323
3	Tee Fitting Both Ends - 3/8" Dia. 45° Flare (M)	2	653220
4	Elbow 1 End - 1/4" NPT (M) 1 End - 3/8" Dia. 45° Flare (M)	2	288526

NOTICE

Fittings for port and starboard lines in upper station not included.



SEASTAR LIQUID TIE BAR ALIGNMENT VALVE Part# HA5471-2

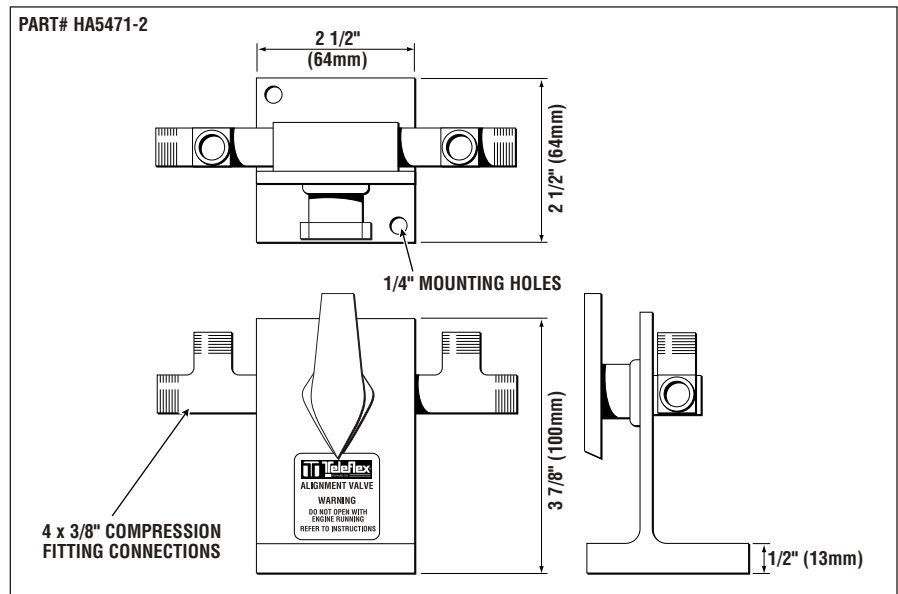
General

The Cylinder Alignment Valve (part# HA5471-2) will allow for the periodic required realignment of two outboard motors or rudders that are not linked together with a mechanical tie bar.

A standard helm and SeaStar hoses may be used on vessels not exceeding speeds of 55mph.

For vessels exceeding speeds of 55mph a SeaStar Pro helm and Pro hoses must be used.

⚠ CAUTION
Side mount cylinders, such as SeaStar cylinder HC5370 can only be used with the valve by re-orienting the port engine tilt tube, to allow for mounting cylinder on the port (left) side of the port engine. Cylinder rods must face each other.



⚠ WARNING
The use of a standard helm under high speed (55mph +) and a high load, ie: full throttle forward/reverse, may cause a vacuum in the liquid tie bar and cause engine/rudders to misalign, resulting in momentary loss of steering control. This will be less likely to occur if a SeaStar pro Helm Pump is used.

Catamaran Bleeding Instructions

⚠ WARNING
Do Not open bleed screw with engines/boat running. Loss of steering will result.

⚠ CAUTION

Referencing the cylinder alignment valve installation schematic.

- Fill helm with oil and attach filler device/container to helm
- Open valve
- Open bleed fitting no. 1 and pull cylinder shaft all the way out on fitting no. 1 side of cylinder
- Turn steering wheel clockwise until an air free stream of oil comes from bleed fitting no. 1

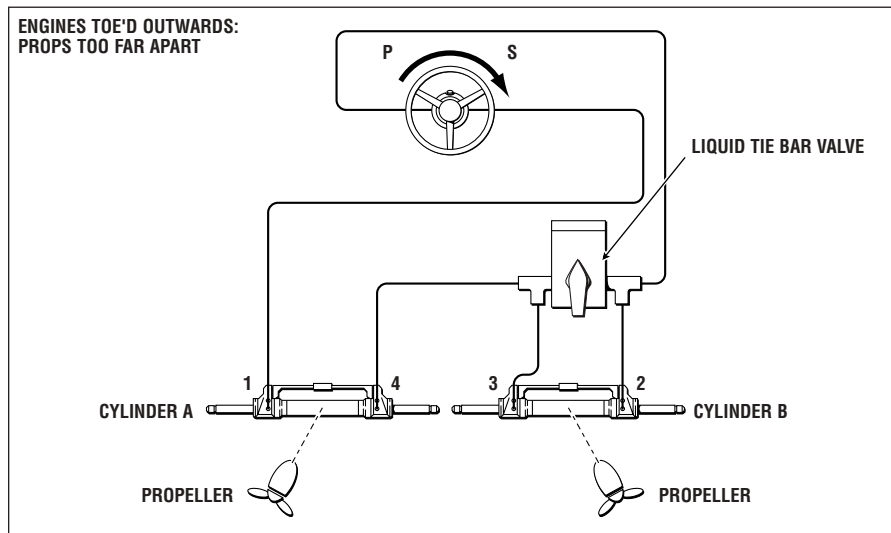
DO NOT ALLOW SHAFT TO MOVE BACK INTO CYLINDER. DO NOT USE A WRENCH TO HOLD SHAFT.

- Close bleed fitting no. 1
- Open bleed fitting no. 2 and pull cylinder shaft all the way out on fitting no. 2 side of cylinder

- Turn steering wheel counter-clockwise until an air free stream of oil comes from bleed fitting no. 2, then close bleed fitting no. 2
- Open bleed fitting no. 3 and pull cylinder shaft all the way out on fitting no. 3 side of cylinder
- Turn steering wheel counter-clockwise until an air free stream of oil comes from bleed fitting no. 3, then close bleed fitting no. 3
- Open bleed fitting no. 4 and pull cylinder shaft all the way out on fitting no. 4 side of cylinder
- Turn steering wheel counter-clockwise until an air free stream of oil comes from bleed fitting no. 4, then close bleed fitting no. 4
- Turn steering wheel back and forth from hardover to hardover a couple of times. Align cylinders by pulling cylinder rod all the way out on the same side of each cylinder and close valve

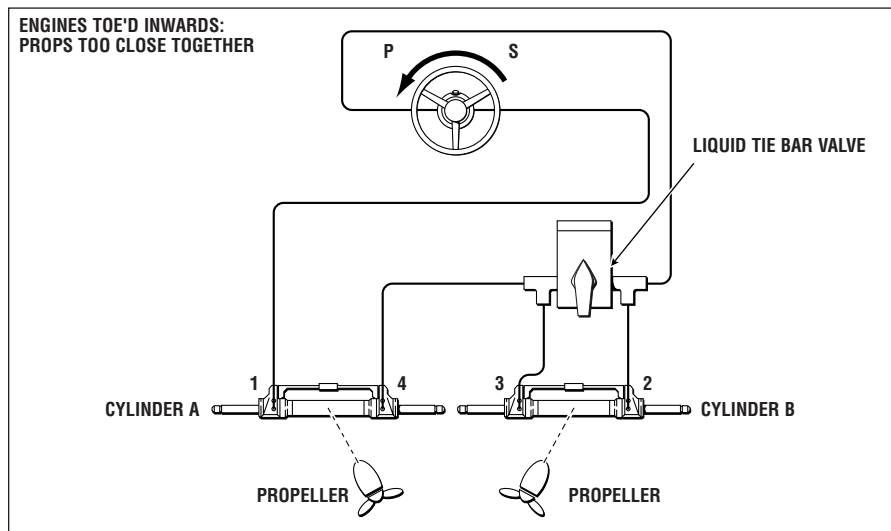
Realignment Instructions

- 1 Turn the wheel hard over to Starboard. (Both cylinders move; cylinder B reaches hard over first)
- 2 Open the valve
- 3 Continue to turn the wheel hard over to Starboard. (Only cylinder A moves and reaches hard over)
- 4 Close the valve



Realignment Instructions

- 1 Turn the wheel hard over to Port. (Both cylinders move; cylinder B reaches hard over first)
- 2 Open the valve
- 3 Continue to turn the wheel hard over to Port. (Only cylinder A moves and reaches hard over)
- 4 Close the valve



TOOLS AND TORQUE DATA SHEETS

SeaStar Power Purge JR.

Part# HA5445



SeaStar®/BayStar™ Power Purge Jr. is the quickest way to bleed a SeaStar®/BayStar™ system in the field and assure a rock-solid steering feel every time!

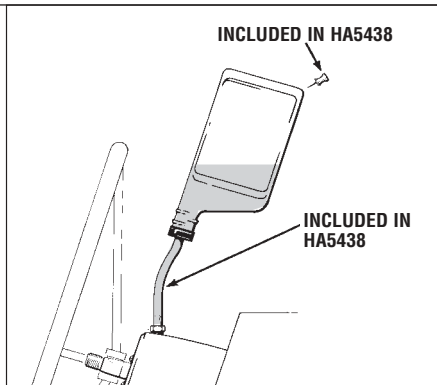
The Power Purge Jr. reduces installation and warranty costs while enhancing the quality of the boat to the end user. A typical manual fill and purge takes the average experienced installer or service technician about 30 minutes per boat — by using the Power Purge Jr. this can be reduced to 10 minutes or less.

Advantages:

- Steering feel is solid every time
- Complete Fill & Purge in 10 minutes or less
- Fast and efficient
- Easy to operate
- Screens contaminants from oil
- Quick connect fittings
- Convenient portable size
- Convenient electrical hook-up utilizing 12 volt boat battery
- Optional Dual Cylinder Purging Kit HA5461 available
- Optional 50' Hose Extension Kit HA5462, for those longer runs

SeaStar Bleed Hose

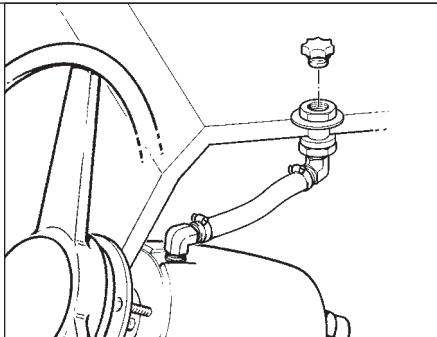
Part# HA5438



- This kit is needed to properly bleed the SeaStar Outboard steering kit
- Screws onto the SeaStar and equivalent fluid to bleed the SeaStar system
- Makes for a clean bleed when used properly

SeaStar Remote Fill

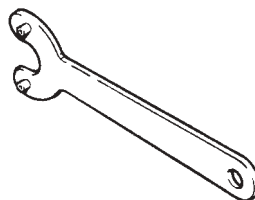
Part# HA5450



- Can be used with ALL SeaStar Helm pumps
- Relocate your fill plug to a more convenient or hidden place

SeaStar Front Mount Gland Removal Tool

Part# 745225

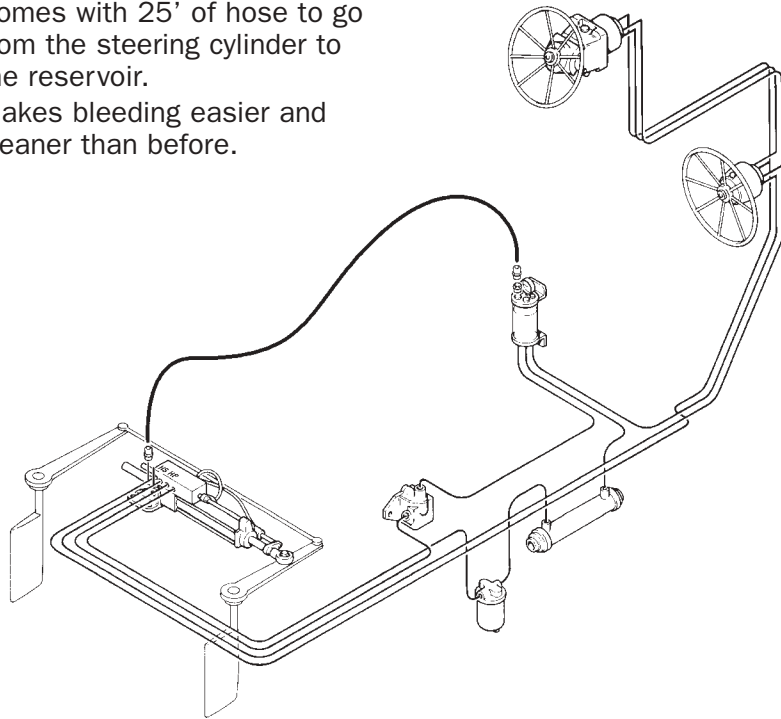


- Makes changing the end glands on the front mount cylinder easy.
- Avoid damage to the gland by using the proper tool.
- Lightweight and durable.

SeaStar Power Steering Purge Kit

Part# HA5456

- Comes with 25' of hose to go from the steering cylinder to the reservoir.
- Makes bleeding easier and cleaner than before.



SeaStar Helm Pump Drill Jigs

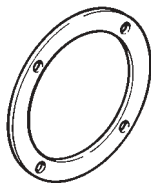
HA5405 Mounting washer for SeaStar helm studs for applications where the dashboard hole is 3-1/4 inches in diameter.

HA5465 Pilot Drill Jig for enlarging a 2 inch diameter dashboard hole to a 3 inch diameter hole. As required for all standard SeaStar and SeaStar Pro helms when using a standard 3 inch diameter hole saw.

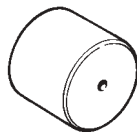
HA5466 Drill Jig for drilling mounting holes for standard SeaStar and SeaStar Pro helms. A 3 inch dashboard hole is required.

HA5467 Drill Jig for drilling mounting holes for standard SeaStar and SeaStar Pro helms where dashboard has a 3-1/4 inch hole from a previously mounted mechanical helm.

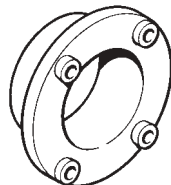
HA5468 Drill Jig for drilling mounting holes for SeaStar and SeaStar Pro traditional tilt helms (HH5741, HH5742, HH5743). Also back Mount Kit (HA5418). A 4-1/2 inch dashboard hole is required.



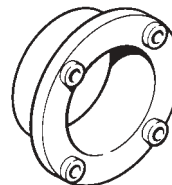
HA5405



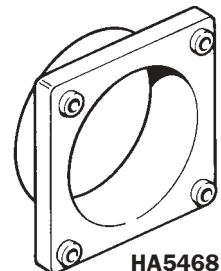
HA5465



HA5466



HA5467



HA5468

Steering Torque Data Sheet

DISPLACEMENT HULLS ONLY

NAME: _____

CONTACT: _____

HULL DATA	POWER DATA
-----------	------------

HULL DIMENSIONS:

LOA _____ SAIL _____

BEAM _____ OTHER _____

DISPLACEMENT _____ TOP SPEED _____ Knots

DRAFT _____ USE: _____

NO. STEERING STATIONS _____

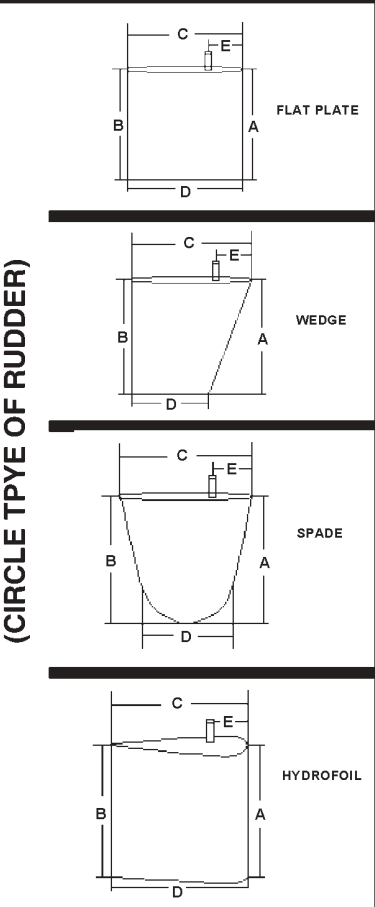
EACH SHAFT HORSEPOWER _____

PROP DIAMETER: _____

SINGLE ENGINE

TWIN ENGINE

RUDDER DATA



RUDDER ARC (Midship to Hardover): _____ Degrees

RUDDER AREA: _____ Square Ft.

NO. RUDDERS One Two

RUDDER DIMENSIONS:

(A) Height _____ In.

(B) Height _____ In.

(C) Width _____ In.

(D) Width _____ In.

(E) Counter-balance _____ In.

Rudder Torque Data Sheet

To: _____

Phone Number: _____

Fax Number: _____

From: _____

Date: _____

PLANING HULLS ONLY

NAME: _____
ADDRESS: _____

BUILDER: _____
DESIGNER: _____
BOAT NAME: _____
NO. STEERING STATIONS: _____

HULL DATA

HULL DIMENSIONS:
LOA _____ SAIL _____
BEAM _____ OTHER _____
DISPLACEMENT _____ TOP SPEED _____ Knots
DRAFT _____ USE: _____

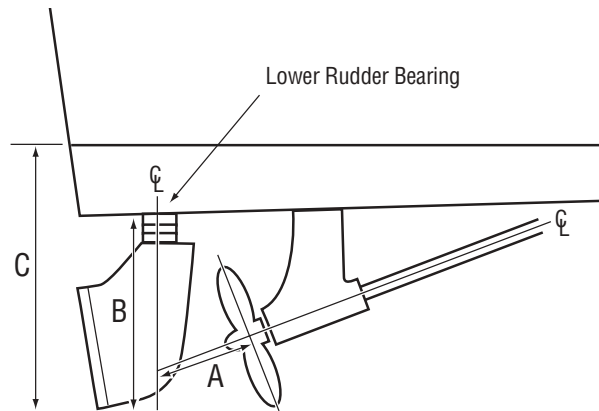
POWER DATA

EACH SHAFT HORSEPOWER _____
PROP DIAMETER: _____
SINGLE ENGINE
TWIN ENGINE

DATA

FORMULA

Projected area of rudder = $(H+W) - (C+B)$



A = Perpendicular distance from the rudder shaft to the propeller.

B = Distance parallel to rudder shaft from rudder base to center of lower rudder bearing.

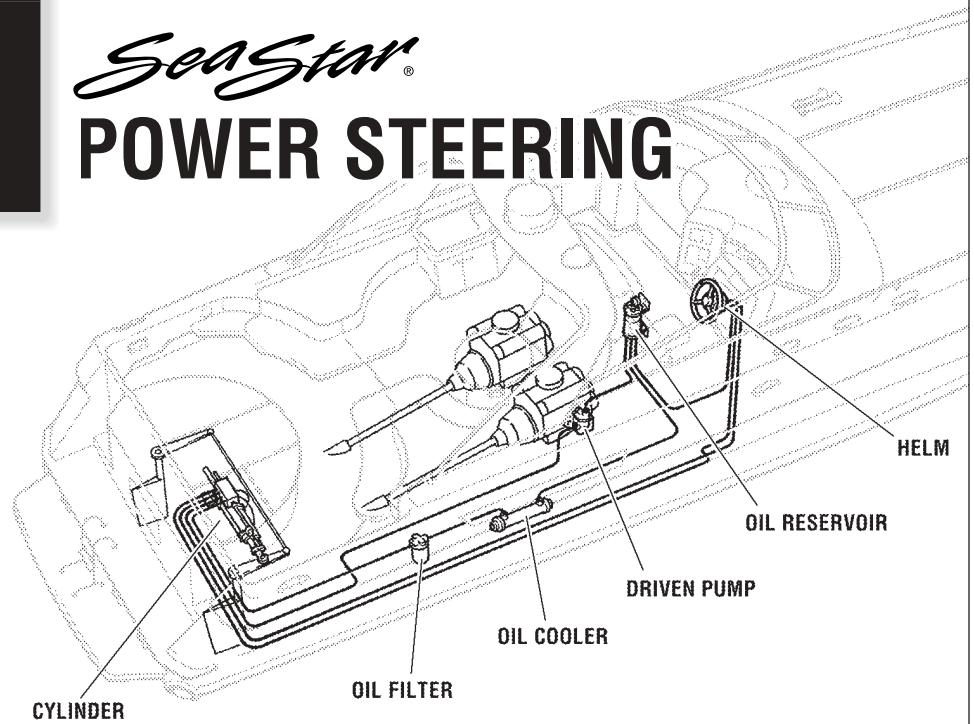
C = Perpendicular distance from waterline to rudder base.

Note: Formula presumes 23-27% counterbalance

Boat speed:..... knots
Number of rudders:.....
Rudder area (projected area):..... square feet
Propeller diameter: feet
Perpendicular distance from the rudder shaft to the propeller:..... feet
Distance measured parallel to the rudder shaft from the base of the rudder to the center of the lower bearings: feet
Average rudder chord length: feet
Perpendicular distance from the waterline to the rudder base:..... feet
Rudder shaft diameter:..... inches
Shaft power:..... horsepower

PLEASE TAKE A MOMENT TO COMPLETE THIS FORM AND RETURN IT VIA FAX TO: 604-279-2202

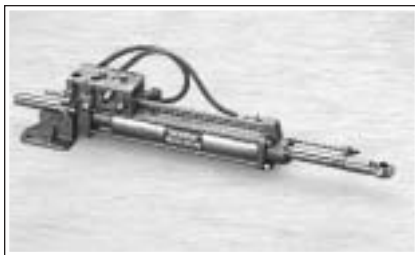
SeaStar® POWER STEERING



Features:

- Effortless steering from docking to top speed
- Responsive steering 3-1/2, turns lock to lock (or to suit)
- Automatic manual back up steering
- Simplified installation
- Multiple steering stations
- Easy autopilot interface

How it works:



SeaStar hydraulic power steering uses the ship's engine(s) to provide the "power" for the steering system, via an engine or electric motor driven hydraulic pump.

A manual hydraulic steering system, consisting of a standard SeaStar helm and a hydraulic steering cylinder, (fitted with an integral servo cylinder and a power steering valve) supplies the "control" portion of the steering system.

Under normal conditions, with engines running, a hydraulic oil supply is in a stand-by mode, ready to be directed to the steering cylinder as dictated by the steering wheel, servo cylinder and power steering valve. Turning the steering wheel left or right makes the system go from stand-by into operating mode and move the steering cylinder accordingly.

In the event of a power source failure, hydraulic oil, from the steering helm, is automatically diverted directly into the servo and steering cylinder, providing the helmsman with manual back-up steering.

An engine room mounted oil reservoir allows easy system fill and assists the in-line oil cooler in cooling the hydraulic oil. An in-line oil filter helps to protect the steering system components against contaminants.

Hose, Tube and Hydraulic Fluid:

Recommend 100R1 for power circuit, 5/16"ID hose or tube for manual circuit.
*If using 1/4"ID tube, runs should be short and SeaStar oil must be used.

System designed to use SeaStar oil (Mil spec H5606) or Dexron II (ATF) if using 1250V or 1275V helms.

Cylinder Selection Guide: ** All boats over 70' should have steering loads reviewed by factory.*

CYLINDER PART NUMBER	DISPLACEMENT HULLS (standard)	DISPLACEMENT HULLS (heavy duty)	PLANING HULLS
SINGLE 9" x 1 CYLINDER (HC5801-2)	UP TO50' (15m)	UP TO40' (12m)	UP TO65' (20m)
TWIN 9" x 2 CYLINDER (HC5802)	UP TO75' (22m)	UP TO55' (17m)	UP TO85' (26m)
SINGLE 11" x 1 CYLINDER (HC5803-2)	UP TO60' (18m)	UP TO50' (15m)	UP TO75' (23m)
TWIN 11" x 2 CYLINDER (HC5804)	UP TO85' (26m)	UP TO60' (18m)	UP TO100' (31m)
*SINGLE 9" x 2.5 CYLINDER (HC5805)	UP TO100' (31m)	UP TO70' (22m)	UP TO110' (34m)
*TWIN 9" x 2.5 CYLINDER (HC5806)	UP TO110' (34m)	UP TO80' (25m)	UP TO120' (37m)

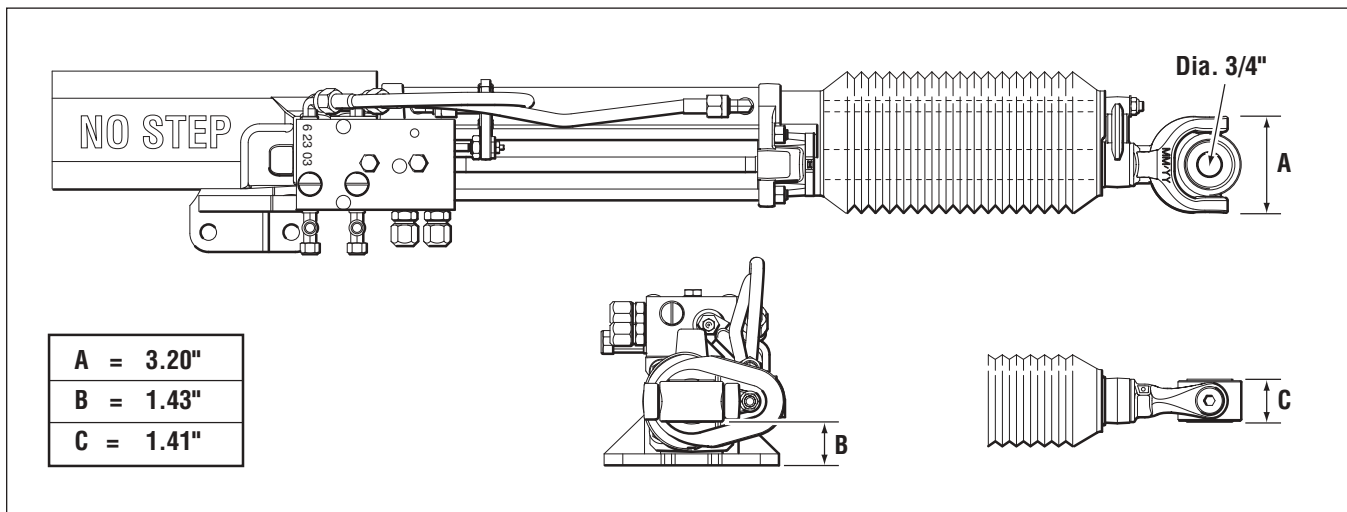
* Larger 2.5" cylinder bore than HC5801-2 and HC5802.

Technical Data:

CYLINDER PART NUMBER	DISPLACEMENT	BORE	STROKE	OUTPUT FORCE	MAX. TORQUE (35° from centre)
SINGLE 9" CYLINDER (HC5801-2)	21.25 in ³ (348cc)	2.0" (51mm)	9" (229mm)	2946 lbs _f (13,090 N)	18,900 in-lbs (2130 Nm)
SINGLE 11" CYLINDER (HC5803-2)	26.00 in ³ (426cc)	2.0" (51mm)	11" (280mm)	2946 lbs _f (13,090 N)	23,140 in-lbs (2610 Nm)
TWIN 9" CYLINDER (HC5802)	42.50 in ³ (697cc)	2.0" (51mm)	9" (229mm)	5892 lbs _f (26,190 N)	37,800 in-lbs (4260 Nm)
TWIN 11" CYLINDER (HC5804)	52.00 in ³ (853cc)	2.0" (51mm)	11" (280mm)	5892 lbs _f (26,190 N)	46,280 in-lbs (5220 Nm)
SINGLE 9" CYLINDER (HC5805)	37.11 in ³ (608cc)	2.5" (64mm)	9" (229mm)	5154 lbs _f (22,926 N)	33,065 in-lbs (3736 Nm)
TWIN 9" CYLINDER (HC5806)	74.33 in ³ (1216cc)	2.5" (64mm)	9" (229mm)	10,308 lbs _f (45,852 N)	66,130 in-lbs (7472 Nm)

Basic System Selection Guide:

Power Steering Cylinders	Part #	Power Steering Pumps	Part #	Oil Reservoir, Cooler & Filter	Part #
9" (228mm) Stroke, for vessels under 75' (22m).....	HC5801-2	Outlet Check Power Pump.....	HP5820	Oil Reservoir.....	HP5810
11" (279mm) Stroke, for vessels over 75' (22m).....	HC5803-2	Press Relief Twin Pump.....	HP5822	Oil Cooler, 2.25 Kw, 1" water lines.....	HP5825
9" (228mm) Stroke, additional cylinder option.....	HC5802	Belt Drive, Right Rotation (Universal).....	HP5830	Oil Cooler, 6.25 Kw, 2" water lines.....	HP5826
11" (279mm) Stroke, additional cylinder option.....	HC5804	Belt Drive, Left Rotation (Universal).....	HP5831	Oil Filter.....	HP5815
Steering Helms (For 3-1/2 Turn System)		Direct Drive, Right Rotation (for Detroit Diesel).....	HP5832	Miscellaneous	
SSI Helm, Standard Mount.....	HH5271	Direct Drive, Right Rotation (for Caterpillar – special order).....	HP5833	Outlet Check Valve (Power Pump).....	HP5820
SSI Helm, Rear Mount.....	HH5261	Direct Drive, Right Rotation (Spline).....	HP5833	Auto Flow Control (Twin Pump).....	HP5821
SSI Helm, Tilt.....	HH5741	Direct Drive, Right Rotation (2 GPM).....	HP5834	Crossover Pressure Relief.....	HP5822
SSI Helm, Rear Mount, 1" Shaft.....	HH5281	Direct Drive, (for Twin Disk).....	HP5835	System Pressure Gauge Kit.....	HA5821
				Adapter Kit, Twin Disk #5050.....	HA5823
				Adapter Kit, Twin Disk #5061.....	HA5824
				Adapter Kit, MAN to V10 Pump.....	HA5827
				SeaStar Oil, 1 liter.....	HA5430
				SeaStar Oil, 4 liter.....	HA5440



A = 3.20"
B = 1.43"
C = 1.41"

BayStar™ SeaStar® Hynautic

HYDRAULIC FLUID

SeaStar hydraulic steering systems require the use of a special high quality hydraulic fluid meeting MIL SPEC H-5606 G. This fluid is available in 1 liter (33.8 US fluid ounce) bottles as:

SeaStar Hydraulic Fluid: **Part Number HA5430 - 1 Litre**
HA5440 - 4 Litres

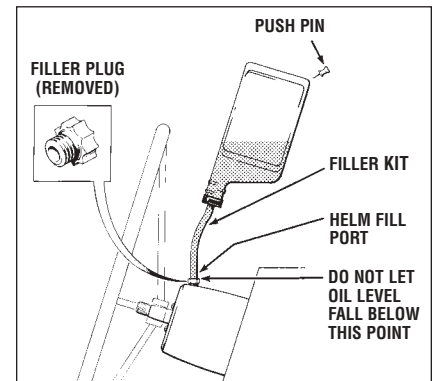


Alternate recommended hydraulic fluids for SeaStar steering systems.

Oil Manuf.	Brand Name
SeaStar	SeaStar oil part# HA5430
Shell	Aero Shell Fluid #41
Esso	Univis N15 or J13
Texaco	H015
Chevron	Aviation Hydraulic Fluid A
Mobil	Aero HFA
Petro Canada	Harmony HV115 (In Canada Only)

Optional Filler Kit

Part# HA5438



⚠ CAUTION

Substitution of non-recommended fluids may result in heavier steering and/or irreparable damage to your steering system.

NOTICE

SeaStar Hydraulic Steering Fluid can be used in Hynautic, BayStar and BayStar Plus steering systems.

NOTICE

Help protect your boating environment by ensuring that all used oil is disposed of properly.

SeaStar[®] Hynautic[™]

VOLUMES & CAPACITIES

NOTICE

Contact your nearest dealer or distributor to order replacement parts.

SeaStar Helm Pump Shaft Details:

Taper: 3/4" Standard Taper (1" PER FOOT), **WHEEL SHAFT Threads:** 5/8" - 18 UNF,
Key: #606 Woodruff Key (3/16"), **PORT SIZES:** 1/4" NPT (F)

Table A: SeaStar/Hynautic Helm Pumps

HELM DESCRIPTION	PART NUMBER	DISPLACEMENT CU. IN./REV (cc)	RELIEF VALVE SETTING PSI (BAR)	MAXIMUM WHEEL DIA. INCHES (mm)	SEAL KIT	SHAFT SEAL
SEASTAR 1.4 – STANDARD MOUNT	HH5269	1.4 (23.0)	1000 (70)	26 (660)	HS5176	225226
SEASTAR 1.4 – REAR MOUNT	HH5260	1.4 (22.9)	1000 (70)	26 (660)	HS5176*	225226*
SEASTAR 1.4 – REAR MOUNT FULL FEEDBACK	HH5231	1.4 (23.0)	1000 (70)	26 (660)	HS5176	225226
SEASTAR 1.4 – REAR MOUNT 1" STRAIGHT SHAFT	HH5279	1.4 (23.0)	1000 (70)	26 (660)	HS5151	225320
SEASTAR 1.4 – REAR MOUNT 1" TAPERED SHAFT	HH5280	1.4 (23.0)	1000 (70)	26 (660)	HS5151	225320
SEASTAR 1.4 – TILT	HH5744	1.4 (23.0)	1000 (70)		HS5176	225226
SEASTAR 1.7 – STANDARD FRONT MOUNT	HH5271	1.7 (27.8)	1000 (70)	26 (660)	HS5176*	225226*
SEASTAR 1.7 – STANDARD MOUNT FULL FEEDBACK	HH5761	1.7 (27.8)	1000 (70)	26 (660)	HS5176	225226
SEASTAR 1.7 – REAR MOUNT	HH5261	1.7 (27.8)	1000 (70)	26 (660)	HS5176*	225226*
SEASTAR 1.7 – REAR MOUNT 1" TAPERED SHAFT	HH5281	1.7 (27.8)	1000 (70)	26 (660)	HS5151	225320
SEASTAR 1.7 – TRADITIONAL TILT	HH5741	1.7 (27.8)	1000 (70)	20 (508)	HS5176*	225226*
SEASTAR 1.7 – SPORT TILT	HH5291	1.7 (27.8)	1000 (70)	26 (660)	HS5176*	225226*
SEASTAR PRO 1.7 – STANDARD MOUNT	HH5779	1.7 (27.8)	1500 (103)	26 (660)	HS5176	225226
SEASTAR PRO 1.7 – REAR MOUNT	HH5778	1.7 (27.8)	1500 (103)	26 (660)	HS5176	225226
SEASTAR PRO 1.7 – TILT	HH5773	1.7 (27.8)	1500 (103)		HS5176	225226
SEASTAR – 2.0 STANDARD FRONT MOUNT	HH5273	2.0 (33.0)	1000 (70)	26 (660)	HS5176*	225226*
SEASTAR – 2.0 STANDARD MOUNT FULL FEEDBACK	HH5760	2.0 (33.0)	1000 (70)	26 (660)	HS5176	225226
SEASTAR PRO 2.0 – STANDARD FRONT MOUNT	HH5770	2.0 (33.0)	1500 (103)	26 (660)	HS5176*	225226*
SEASTAR PRO 2.0 – REAR MOUNT	HH5771	2.0 (33.0)	1500 (103)	26 (660)	HS5176	225226
SEASTAR PRO 2.0 – TRADITIONAL TILT	HH5774	2.0 (33.0)	1500 (103)	20 (508)	HS5176*	225226*
SEASTAR PRO 2.0 – SPORT TILT	HH5290	2.0 (33.0)	1500 (103)	20 (508)	HS5176*	225226*
SEASTAR 2.4 – STANDARD FRONT MOUNT	HH5272	2.4 (39.3)	1000 (70)	26 (660)	HS5176*	225226*
SEASTAR 2.4 – STANDARD MOUNT FULL FEEDBACK	HH5762	2.4 (39.3)	100 (70)	26 (660)	HS5176	225226
SEASTAR 2.4 – REAR MOUNT	HH5262	2.4 (39.3)	1000 (70)	26 (660)	HS5176*	225226*
SEASTAR 2.4 – REAR MOUNT 1" TAPERED SHAFT	HH5282	2.4 (39.3)	1000 (70)	26 (660)	HS5151	225320
SEASTAR 2.4 – TRADITIONAL TILT	HH5742	2.4 (39.3)	1000 (70)	20 (508)	HS5176*	225226*
SEASTAR 2.4 – SPORT TILT	HH5292	2.4 (39.3)	1000 (70)	26 (660)	HS5176*	225226*
SEASTAR PRO 2.4 – STANDARD MOUNT	HH5772	2.4 (39.3)	1500 (103)	26 (660)	HS5176*	225226*

* SeaStar Helm Pumps manufactured from 1984 through 1990 require Seal Kit #HS5151 or individual Shaft Seal #225320

HELM DESCRIPTION	PART NUMBER	DISPLACEMENT CU. IN./REV (cc)	SHAFT STYLE	KEY WAY	SEAL KIT
HYNAUTIC	H-21	2.75 (45.1)	1" STRAIGHT	1/4" SQUARE	HS-02
HYNAUTIC	H-25	2.75 (45.1)	3/4" TAPERED	#9 WOODRUFF	HS-02
HYNAUTIC	H-26	2.00 (32.8)	3/4" TAPERED	#9 WOODRUFF	HS-02
HYNAUTIC	H-41	5.50 (90.1)	1" STRAIGHT	1/4" SQUARE	HS-04
HYNAUTIC	H-42	4.00 (65.5)	1" STRAIGHT	1/4" SQUARE	HS-04
HYNAUTIC	H-42-2	4.00 (65.5)	3/4" TAPERED	#9 WOODRUFF	HS-04

NOTICE

Theoretical torque about pivot point at 35 degrees articulation with 1000 psi (70 bar) system pressure.

Table B: SeaStar/Hynautic Cylinders

CYLINDER MODEL	PART NUMBER	BORE DIAMETER IN (mm)	NOMINAL SHAFT DIA IN (mm)	STROKE IN (mm)	SEAL KIT	VOLUME CUBIC IN (cc)	TORQUE (See Notice) IN-LB (KG-M)
BA135-7	HC5332	1.37 (34.9)	.625 (15.9)	7 (178)	HS5155	8.3 (135.2)	5741 (66.1)
BA125-7ATM	HC5312	1.25 (31.7)	.50 (12.7)	7 (178)	HS5154	7.2 (118.2)	5025 (57.9)
BA135-7ATM	HC5313	1.375 (34.9)	.625 (15.9)	7 (178)	HS5155	8.3 (135.2)	5741 (66.1)
BA150-7ATM	HC5314	1.50 (38.1)	.625 (15.9)	7 (178)	HS5156	10.2 (167.5)	7117 (82.0)
BA150-7TM	HC5318	1.50 (38.1)	.625 (15.9)	7 (178)	HS5182	10.2 (167.5)	7117 (82.0)
BA175-7TM	HC5319	1.75 (44.4)	.75 (19.0)	7 (178)	HS5183	13.7 (225.4)	9569 (110.2)
BA135-7EM	HC5332	1.375 (34.9)	.625 (15.9)	7 (178)	HS5155	8.3 (135.2)	5741 (66.1)
BA150-7EM	HC5326	1.50 (38.1)	.625 (15.9)	7 (178)	HS5156	10.2 (167.5)	8853 (102.0)
BA150-9TM	HC5369	1.50 (38.1)	.625 (15.9)	9 (229)	HS5182	13.1 (214.7)	9375 (107.7)
125-8EM	HC5328	1.25 (31.7)	.50 (12.7)	8 (203)	HS5154	8.3 (135.2)	7142 (82.3)
92VPS	HC5331	1.25 (31.7)	.50 (12.7)	8 (203)	HS5153	8.3 (135.2)	N/A
BA125-8EMV	HC5330	1.25 (31.7)	.50 (12.7)	8 (203)	HS5154	8.3 (135.2)	7142 (82.3)
PIVOT MOUNT	HC5345	1.375 (35)	.75 (19.0)	8 (203)	HS5157	8.34 (136.6)	N/A
PIVOT MOUNT	HC5347	1.375 (35)	.75 (19.0)	8 (203)	HS5157	8.34 (136.6)	N/A
PIVOT MOUNT	HC5348	1.375 (35)	.75 (19.0)	8 (203)	HS5157	8.34 (136.6)	N/A
PIVOT MOUNT	HC5358	1.375 (35)	.75 (19.0)	8 (203)	HS5157	8.34 (136.6)	N/A
FRONT MOUNT	HC5342	1.262 (32.56)	.75 (19.0)	10 (254)	HS5157	8.13 (133.2)	N/A
SIDE MOUNT	HC5370	1.25 (31.7)	.50 (12.7)	8 (203)	HS5153	8.3 (135.2)	N/A
SPLASHWELL MOUNT	HC5380	1.25 (31.7)	.50 (12.7)	9 (228)	HS5155	9.3 (152.1)	N/A
HYNAUTIC	K-5	1.50 (38.1)	0.875 (22.2)	9.0 (229)	KS-15	15.9 (260.5)	10790 (124.6)
HYNAUTIC	K-8	2.50 (63.5)	1.000 (25.4)	9.5 (241)	KS-18	39.2 (642.4)	26575 (306.9)
HYNAUTIC	K-9	2.50 (63.5)	1.000 (25.4)	14.5 (368)	KS-18	55.0 (901.3)	39850 (460.2)
HYNAUTIC	K-18	1.25 (31.7)	0.625 (15.9)	7.0 (178)	KS-02	7.0 (114.7)	5972 (68.8)
HYNAUTIC	K-19	1.25 (31.7)	0.625 (15.9)	9.0 (229)	KS-02	9.0 (147.5)	7685 (88.54)
HYNAUTIC	K-22	1.50 (38.1)	0.750 (19.0)	10.0 (254)	KS-04	13.3 (217.9)	8990 (103.8)
HYNAUTIC	K-27	1.50 (38.1)	0.750 (19.0)	10.0 (254)	KS-04	13.3 (217.9)	8990 (103.8)
HYNAUTIC	K-31	2.00 (50.8)	0.875 (22.2)	10.0(254)	KS-05	25.5 (417.9)	17320 (200.0)

NOTICE

Theoretical torque about pivot point at 35 degrees articulation with 1000 psi (70 bar) system pressure.

DISTRIBUTOR LIST

CANADA

ALBERTA

Coast Distribution
707 Barlow Trail SE, Bay C
Calgary
Alberta
Canada
Tel (403) 273-9066 Fax (403) 273-8340

BRITISH COLUMBIA

Anchorage Holdings
1520 Stewart Avenue
Nanaimo
British Columbia
V9 4E1
Canada
Tel (250) 754-5587 Fax (250) 754-7144
Toll Free 1-800-661-5353

Payne's Marine Supply Inc.
1856 Quadra Street
Victoria
British Columbia
V8T 4B9
Canada
Tel (250) 382-7722 Fax (250) 382-4043
web: www.paynesmarine.com

Payne's Marine Supply Inc.
1853 Meredith Road
Campbell River
British Columbia
V9W 4R7
Canada
Tel (250) 286-6263 Fax (250) 286-0171
web: www.paynesmarine.com

Payne's Marine Supply Inc. - Burnaby
201 - 3765 E. First Avenue
Burnaby
British Columbia
V5C 3V8
Canada
Tel (604) 299-7771 Fax (604) 299-3471
web: www.paynesmarine.com

Western Marine Ltd.
1494 Powell Street
Vancouver
British Columbia
V5L 5B5
Canada
Tel (604) 253-7721 Fax (604) 253-2656

MANITOBA

Outboard Rebore
Trans Canada Hwy East & PR 207 Box 2722
Winnipeg
Manitoba
R3C 4B3
Canada
Tel 204-222-3782 Fax 204-224-2826

NEWFOUNDLAND

Mercer's Marine Equipment
Marine Drive
Clareville
Newfoundland
A0E 1J0
Canada
Tel (709) 466-7430 Fax (709) 466-3279
email: scott.mercer@nf.sympatico.ca
web: www.mercersmarine.com

NOVA SCOTIA

Stright-MacKay Ltd.
Harbour Drive P.O. Box 1030
Pictou
Nova Scotia
B0K 1H0
Canada
Tel (902) 928-1900 Fax (902) 485-8779
email: info@stright-mackay.com
web: www.stright-mackay.com

ONTARIO

Barclay's Marine
131 Caldari Rd. Unit #2
Vaughan
Ontario
L4K 3Z9
Canada
Tel (905) 669-0090 Fax 800-959-1696
Toll Free 800-959-5926

C.C. Marine Distribution Ltd.
300 Enford Road
Richmond Hill
Ontario
L4C 3E8
Canada
Tel (905) 883-4300

Hutchings Marine
21 Armstrong Street
P.O. Box 1379"
Bracebridge
Ontario
P1L 1V5
Canada
Tel (705) 645-5031 Fax (705) 645-8933

Kimpex Action
311 Soversion Rd.
London
Ontario
N6M 1A6
Canada
Tel (519) 659-0508 Fax (519) 659-6428

Payne's Distributors
1173 N. Service Road,W
Oakville
Ontario
L6M 2V9
Canada
Tel (905) 825-0200 Fax (905) 825-0202
Toll Free 1-800-668-8223

Payne's Marine Supply
2360 Industrial St.
Burlington
Ontario
L7P 1A1
Canada
Tel (905) 332-8291 Fax (905)332-0557
web: www.paynesmarine.com

PRINCE EDWARD ISLAND

Mermaid Marine Engines
26 Fourth Street
Charlottetown
Prince Edward Island
C1E 2B3
Canada
Tel (902) 566-1220 Fax (902) 368-3660
Toll Free 800-565-0231
email: mail@mermaidmarine.com
web: www.mermaidmarine.com

QUEBEC

Coast Distribution
1545 Marie-Vicorin
St. Bruno
Quebec
J3V 6B7
Canada
Tel (514) 866-3613 Fax (514) 441-2708

DISTRIBUTOR LIST

U.S.A.

ALABAMA

Hardware & Marine Co. (Wholesale)
1875 North Conception Street
Mobile
Alabama
36610
USA
Tel (504) 467-9200 Fax (251) 452-3425
Toll Free 800-462-9500
email: hsales@beaconsupply.com
web: www.beaconsupply.com

ALASKA

LFS Inc. (Retail)
2315 Airport Beach
Dutch Harbor
Alaska
99692
USA
Tel (907) 581-2178 Fax (907) 581-2188
email: dutch@lfsinc.com
web: www.lfsinc.com

LFS Inc. (Retail)
PO Box 3010
Dillingham
Alaska
99576
USA
Tel (907) 842-5376 Fax (907) 842-2350
email: bellingham@lfsinc.com
web: www.lfsinc.com

LFS Inc. (Retail)
PO Box 215
Naknek
Alaska
99633
USA
Tel (907) 246-4490 Fax (907) 246-4446
email: bellingham@lfsinc.com
web: www.lfsinc.com

Redden Marine (retail)
PO 2323
Cordova
Alaska
99574
USA
Tel (907) 424-3188 Fax (907) 424-3788
email: reddenc@worldnet.att.net
web: www.reddenmarine.com

Redden-Kachemak Gear
59385 East rd.
Homer (Retail)
Alaska
99603
USA
Tel (907) 235-8617 Fax (907) 235-2605
Toll Free 800-478-8612
email: reddenc@worldnet.att.net
web: www.reddenmarine.com

VIP Distributors (Wholesale)
1220 East 68th Avenue, Unit 101
Anchorage
Alaska
99518
USA
Tel (907) 349-8924 Fax (907) 349-2628
Toll Free 800-770-8924
email: vipdist@alaska.net

ARIZONA

Marine Wholesale
2335 East Jones Ave.
Phoenix
Arizona
85040
USA
Tel 800-501-8333 Fax (602) 243-5998
Toll Free 800-501-8333

ARKANSAS

Benrock Inc. (Wholesale)
6900 Alcoa Road
Benton
Arkansas
72015
USA
Tel (501) 778-2002 Fax (501) 778-3438
Toll Free 800-643-9762
web: www.benrock.com

CALIFORNIA

Boatech Inc.
795 Miraflores Avenue
San Pedro
California
90731
USA
Tel (310) 519-1114 Fax (310) 519-8982
web: www.boatech.com

Coast Distribution System
1705 Junction Court
San Jose
California
95112
USA
Tel (408) 436-0771 Fax (408) 436-0788

Diversified Marine Products
1914 S. Mateo Street
Los Angeles
California
90021
USA
Tel (213) 624-5595 Fax (213) 689-0986

Diversified Marine Products
4105 South Market
Sacramento
California
95834
USA
Tel (916) 929-2696 Fax (916) 929-7192

Englund Marine Supply (Retail)
2 Commercial Street
Eureka
California
95501
USA
Tel (707) 444-9266 Fax (707) 444-9268
Toll Free 800-228-7051
email: englund@pacifier.com
web: www.englundmarine.com

Englund Marine Supply (Retail)
201 Citizens Dock Road
Crescent City
California
95531
USA
Tel (707) 464-1650 Fax (707) 464-3708
Toll Free 800-228-7051
email: englund@pacifier.com
web: www.englundmarine.com

Fox Marine Co.
646 West Esther st.
Long Beach
California
90813
USA
Tel (562) 983-6500

L & L Marine
4572 East Eisenhower Circle
Anaheim
California
92806
USA
Tel (714) 777-5505 Fax (714) 777-5736

L & L Marine Distributors
4572 East Eisenhower Circle
Anaheim
California
92806
USA
Tel (714) 777-5505 Fax (714) 630-3188

Port Supply/West Marine
500 Westridge Drive
Watsonville
California
95076
USA
Tel (408) 728-4417 Fax (408) 728-3014

Port Supply/West Marine
2450 17th Avenue
Nedder
California
90731
USA
Tel (408) 476-1900

San Diego Marine Exchange
2636 Shelter Island Drive
San Diego
California
92106
USA
Tel 619-223-7159

CONNECTICUT

Kellogg Marine Supply*
5 Enterprise Drive
P.O. Box 877"
Old Lyme
Connecticut
6371
USA
Tel (860) 434-6002 Fax 800-628-1304
Toll Free 800-243-9303

* REPLACEMENT PARTS FOR SEASTAR HYDRAULIC STEERING MAY BE ORDERED DIRECTLY FROM THESE STOCKING DISTRIBUTORS

U.S.A.

Brunger Exports
2200 S. Andrews Avenue
Fort Lauderdale
Florida
33316
USA

Tel (954) 525-3379 Fax (954) 760-9617
email: brung@earthlink.net
web: www.brungerexports.com

FLORIDA

Byfield Marine Supply Inc. (Wholesale)
175 Olive Road
Pensacola
Florida
32514
USA

Tel (850) 477-8011 Fax (850) 478-3077
Toll Free 800-237-3741

Coast Distribution System
203A Kelsey Lane
Tampa
Florida
33619
USA

Tel (813) 622-7427 Fax (813) 621-5216
Toll Free 800-538-7973

Donovan Marine
3199 SW 42 nd street
Ft. Lauderdale
Florida
33312
USA

Tel (954) 581-2453 Fax (954) 581-7368
Toll Free 877-936-4722
web: www.donovanmarine.com

Donovan Marine Inc. (Wholesale)
6545 Trade Center
Jacksonville
Florida
32256
USA

Tel (904) 786-3008 Fax (904) 786-2995
Toll Free 1-800-582-9749
web: www.donovanmarine.com

Donovan Marine Inc. (Wholesale)
1342 - 46 N.W. 78th Avenue
Miami
Florida
33126
USA

Fax 800-780-5627
Toll Free 800-226-4562
web: www.donovanmarine.com

Donovan Marine Inc. (Wholesale)
3636 B North L Street
Pensacola
Florida
32505
USA

Tel (850) 432-7775 Fax (850) 432-4509
Toll Free 800-347-4464
web: www.donovanmarine.com

Donovan Marine Inc. (Wholesale)
3071 - 118th Street
Petersburg
Florida
33716
USA

Tel (727) 572-0192 Fax (727) 573-1930
Toll Free 1-800-226-4562
web: www.donovanmarine.com

Glenn Mar Inc.
6870 - 142nd Avenue North
Largo
Florida
33771
USA

Tel (727) 536-1955 Fax (727) 539-1248
web: www.glenmarmarine.com

Jerry's Marine
100 SW 16 St.
Ft. Lauderdale
Florida
33315
USA

Tel 800-432-2231
Toll Free 1-800-432-2231

Jerry's Marine
100 SW 16 St.
Ft. Lauderdale
Florida
33315
USA

Tel 800-432-2231
Toll Free 1-800-432-2231

Land 'N' Sea (East) Dist.
3131 N. Andrews Ave. Extension
Pompano Beach
Florida
33064
USA

Tel 800-732-7652 Fax 800-942-1947
Toll Free 800-732-7652
web: www.landnsea.com

Land 'N' Sea Distributors (Wholesale)
12355 S.W. County Rd. 769
Lake Suzy
Florida
34266
USA

Tel (941) 764-0722 Fax (941) 764-0832
Toll Free 1-800-521-3744
web: www.landnsea.net

Land 'N' Sea Distributors (Wholesale)
2968 Ravenswood Road
Ft. Lauderdale
Florida
33312
USA

Tel (954) 792-5436 Fax (954) 581-4867
Toll Free 800-432-7652
web: www.landnsea.net

Lewis Marine Supply Inc.
220 S.W. 32nd Court
Ft. Lauderdale
Florida
33315
USA

Tel (954) 523-4371 Fax (954) 463-7715
Toll Free 800-327-3792
email: lms@lewismarine.com
web: www.lewismarine.com

Lewis Marine Supply of Central Florida
636 Clearlake Road
Cocoa
Florida
32922
USA

Tel (321) 632-8484 Fax (321) 631-4431
Toll Free 800-432-2158

Lewis Marine Supply of Stuart
3385 S.E. Dixie HWY
Stuart
Florida
34997
USA

Tel (561) 286-2118 Fax (561) 220-4529
web: www.lewismarine.com

GEORGIA

Benrock Inc. (Wholesale)
4841 Lewis Road
Stone Mountain
Georgia
30083
USA

Tel (501) 778-2002 Fax 800-544-5697
Toll Free 800-643-9762
web: www.benrock.com

Coast Distribution System
1795 Continental Way
Atlanta
Georgia
30316
USA

Tel (404) 241-5050 Fax (404) 241-9985

Land
3105 Sweetwater Road
Building 300 Suite N
Lawrenceville
Georgia
30044
USA

Tel 800-432-7652 Fax 800-942-1947
Toll Free 800-432-7652
web: www.landnsea.net

HAWAII

Servco Marine Supply
1125 Ala Moana Blvd.
Honolulu
Hawaii
96814
USA

Tel (808) 524-6150

* REPLACEMENT PARTS FOR SEASTAR HYDRAULIC STEERING MAY BE ORDERED DIRECTLY FROM THESE STOCKING DISTRIBUTORS

DISTRIBUTOR LIST

U.S.A.

West Marine
111 Sand Island Access Road
Honolulu
Hawaii
96819
USA
Tel (808) 845-9900 Fax (808) 842-0454

ILLINOIS

Coast Distribution System
3002 Coast Court
Elkhart
Illinois
46514
USA
Tel (219) 262-1551 Fax (219) 264-9743

INDIANA

Charman Enterprises*
107 West Harris
Eaton
Indiana
47338
USA
Tel (765) 396-9683 Fax 800-647-8449
Toll Free 1-800-247-6324
email: charmanent@insightbb.com
web: www.charment.com

IOWA

Lorenz & Jones
3402 S.E. Convience Boulevard
Ankeny (wholesale)
Iowa
50021-9422
USA
Tel (515) 964-4205 Fax (515) 964-0678

KANSAS

Medart Inc. KC
2644 south 96 th street
Edwardsville
Kansas
66111-3483
USA
Tel 800-888-7181 Fax 888-510-3101
Toll Free 800-888-7181
web: www.medarmarine.com

LOUISIANA

Beacon Supply Co. (Wholesale)
821 Industry Road
Kenner
Louisiana
70062
USA
Tel (504) 467-9200 Fax (504) 467-7888
Toll Free 800-462-9500
email: sales@beaconsupply.com
web: www.beaconsupply.com

Benrock Inc. (Wholesale)
1041 Hawn Avenue
Shreveport
Louisiana
71101
USA
Tel (501) 778-2002 Fax 800-544-5697
Toll Free 800-643-9762
web: www.benrock.com

Donovan Marine Inc. (Wholesale)
6316 Humphreys Street
Harahan
Louisiana
70123
USA
Tel (504) 488-5731 Fax (504) 488-5731
Toll Free 800-347-4464
web: www.donovanmarine.com

MAINE

Hamilton Marine Supply
155 East Main Street
Searsport
Maine
4974
USA
Tel (207) 548-6302 Fax 800-548-6352
email: mail@hamiltonmarine.com
web: www.hamiltonmarine.com

Manset Marine Supply Co.
50 New County Road
Rockland
Maine
4841
USA
Tel (207) 596-6464 Fax (207) 596-5615

MARYLAND

Boater's World
6711 Ritz Way
Beltsville
Maryland
20705
USA
Tel (301) 419-000

Fawcett Boat Supplies
2017 Renard Court
Annapolis
Maryland
21401
USA
Tel (410) 267-8681 Fax (410) 224-0979

MASSACHUSETTS

C. E. Beckman Co.
11 - 35 Commercial Street
New Bedford
Massachusetts
2741
USA
Tel (508) 994-9674 Fax (508) 990-2785

Rose Marine
375 Main Street
Gloucester
Massachusetts
1930
USA
Tel (978) 283-0293 Fax (978) 283-3308

MICHIGAN
Barclay Marine Dist. Corp.
24600 Maplehurst Drive
Mt. Clemons
Michigan
48036
USA
Tel (313) 469-9910 Fax 800-959-1694
Toll Free 800-959-5904

Barclay Marine Dist. Corp.
3513 Iousma Drive S. E.
Grand Rapids
Michigan
49548
USA
Tel (616) 243-6464 Fax 800-959-1692
Toll Free 800-959-5902

McDurmon Distributor
G12238 Fenton Rd
Fenton
Michigan
48430
USA
Tel (810) 750-0411 Fax 888-366-2424
Toll Free 800-621-4130
email: mcdurmon1@AOL.com

Midwest Marine Supply Co.
24300 Jefferson Avenue
St. Clair Shores
Michigan
48080
USA
Tel (810) 778-8950 Fax (810) 778-6108

MINNESOTA

Barclay Marine Dist. Corp.
1755 Buerkle Road
White Bear Lake
Minnesota
55110
USA
Tel (651) 770-8515 Fax 800-959-5907
Toll Free 800-959-5903
web: www.landnsea.net

Bell Industries
580 Yankee Doodle Rd. Suite 1200
Eagan
Minnesota
55121
USA
web: www.bellrpg.com

Bell Industries Inc.
500 Hardman Avenue
South St. Paul
Minnesota
55075
USA
Tel (612) 450-9020 Fax (612) 450-0844

Hannay's Inc.
1708 Central Avenue N. E.
Minneapolis
Minnesota
55413
USA
Tel (612) 781-7416 Fax (612) 781-4325
Toll Free 800-462-5321
web: www.hannaysinc.com

Northern Wholesale Supply
6800 Otter Lake Road
Lino Lakes
Minnesota
55038
USA
Tel (651) 429-1515 Fax (651) 429-5757

* REPLACEMENT PARTS FOR SEASTAR HYDRAULIC STEERING MAY BE ORDERED DIRECTLY FROM THESE STOCKING DISTRIBUTORS

U.S.A.

DISTRIBUTOR LIST

MISSISSIPPI

Medart Inc. Memphis Area
10310 High Point Road
Olive Branch
Mississippi
38654
USA

Tel 800-888-7181 Fax 888-510-3101
Toll Free 800-888-7181
web: www.medartmarine.com

MISSOURI

Barclay Marine
55 Design Drive
N. Kansas City
Missouri
64116
USA

Tel 800-959-5945 Fax 800-959-1695

Medart Inc. St. Louis
124 Manufacturers Drive
Arnold
Missouri
63010-4727
USA

Tel 800-888-7181 Fax 888-510-3103
Toll Free 800-888-7181
web: www.medartmarine.com

O'Reilly Marine (Retail/Wholesale)
233 South Patterson
Springfield
Missouri
65802
USA

Tel (417) 862-6708 Fax (417) 874-7101

NEW JERSEY

Jerry's Marine
1000 Airport Rd.
Lakewood
New Jersey
8701
USA

Tel 888-244-4735
Toll Free 1-888-244-4735

Marine Equipment & Supply
1401 Metropolitan Avenue
Thorofare
New Jersey
8086
USA

Tel (856) 853-8320 Fax (856) 853-8158

Shoreway Marine Inc.
313 State Highway
Berlin
New Jersey
8009
USA

Tel (609) 768-8102 Fax (609) 768-2409

NEW YORK

Freeport Marine Supply Co.
47 West Merrick Road
Freeport, Long Island
New York
11520
USA

Tel (516) 379-2610 Fax (516) 379-2909

Lewis Marine Supply of Greenport
230 Corwin Street
P.O. Box 2103
Greenport
New York
11944
USA

Tel (631) 477-1900 Fax (631) 477-1215
Toll Free 800-832-1752

Morgan Recreational Supply
7263 Victor Pittsford Road
Victor
New York
14564
USA

Tel (716) 924-7188 Fax (716) 924-4410

Seacoast Distributors*
105 Wartburg Avenue
Copiague
New York
11726
USA

Tel (631) 842-2338 Fax (631) 842-2021
Toll Free 1-800-645-5857

NORTH CAROLINA

Paxton Company
301B North Greenmeadows Drive
Wilmington
North Carolina
28405
USA

Tel (910) 452-1955 Fax 800-475-0096
Toll Free 800-475-8889
web: www.paxtonco.com

OHIO

Barclay Marine
327 Detroit Ave
Cleveland
Ohio
44113
USA

Tel 800-959-5907 Fax 800-959-1697

Vita-Plate Battery Inc.
304 Buckeye Blvd., P.O. 727
Port Clinton
Ohio
43452
USA

Tel (419) 732-3181 Fax (419) 732-3167

OKLAHOMA

Benrock Inc. (Wholesale)
15233 E. Skelly Drive
Tulsa
Oklahoma
74116
USA

Tel (918) 437-2371 Fax 800-544-5697
Toll Free 800-643-9762
web: www.benrock.com

OREGON

Coast Distribution System
7914 S.E. 82nd Street
Portland
Oregon
97266
USA

Tel (503) 777-3991 Fax (503) 775-4989

Englund Marine Supply (Retail)
Foot of 15th Street, Box 296
Astoria
Oregon
97103
USA

Tel (503) 325-4341 Fax (503) 325-6421
Toll Free 800-228-7051
email: englund@pacifier.com
web: www.englundmarine.com

Englund Marine Supply (Retail)
880 SE Bay Blvd
Newport
Oregon
97365
USA

Tel (541) 265-9275 Fax (541) 265-3515
Toll Free 800-228-7051
email: englund@pacifier.com
web: www.englundmarine.com

Englund Marine Supply (Retail)
5080 Cape Arago Highway
Charleston
Oregon
97420
USA

Tel (541) 888-6623 Fax (541) 888-9332
Toll Free 800-228-7051
email: englund@pacifier.com
web: www.englundmarine.com

Fisherman's Marine Supply (Retail)
901 N. Columbia Blvd
Portland
Oregon
97217
USA

Tel (503) 283-8310 Fax (503) 285-9461

U.S. Distributing Inc. (Wholesale)
7911 N.E. 33rd Drive, Unit 140
Portland
Oregon
97211
USA

Tel (503) 284-7245 Fax (503) 281-2127
Toll Free 800-621-3454

* REPLACEMENT PARTS FOR SEASTAR HYDRAULIC STEERING MAY BE ORDERED DIRECTLY FROM THESE STOCKING DISTRIBUTORS

U.S.A.

PENNSYLVANIA

Blackburn Marine Distributing, Inc.
1200 Lake Shore Road
Friedens
Pennsylvania
115541
USA

Tel (814) 267-3075 Fax (814) 267-3670
Toll Free 800-726-3075
email: blackburn@wpia.net

Coast Distribution System
175 Greenfield Road
Lancaster
Pennsylvania
17601
USA

Tel (717) 299-2501 Fax (717) 295-7490

Keller Marine Service
Routes 11 & 15
Port Treverton
Pennsylvania
17864
USA

Tel (717) 374-8169 Fax (717) 374-5356

SOUTH CAROLINA

Donovan Marine
7289 Spa Road, Unit B
North Charleston
South Carolina
29418
USA

Tel (904) 786-3008 Fax 800-582-9749
Toll Free 800-865-5299
web: www.donovanmarine.com

Ellett Brothers
267 Columbia Avenue
Chapin
South Carolina
29036
USA

Tel (803) 345-3751 Fax (803) 345-1820

Jerry's Marine
3601-B Meeting St. Rd.
Charleston
South Carolina
29405
USA

Tel 800-788-2231
Toll Free 1-800-788-2231

Lewis Marine Supply of Charleston
624 Marina Dr.
Charleston
South Carolina
29492
USA

Fax 800-823-0311

McGill Distributing
1903 Longstreet Street
Kingstree
South Carolina
29556
USA

Tel (803) 354-7404 Fax (803) 354-3263

TENNESSEE

Donovan Marine
603 Davidson Street
Nashville
Tennessee
37213
USA

Tel (615) 834-8262 Fax (615) 726-3696
web: www.donovanmarine.com

TEXAS

Coast Distribution System
7133 Burns Street
Fort Worth
Texas
76118
USA

Tel (817) 595-0158 Fax (817) 284-1833

Donovan Marine Inc. (Wholesale)
3130 Pawnee
Houston
Texas
77054
USA

Tel (713) 734-4171 Fax (713) 734-1674
Toll Free 800-669-8392
web: www.donovanmarine.com

Gunterland Marine Supply
1221 Cantwell Lane
Corpus Christi
Texas
78469
USA

Tel (512) 882-4231 Fax (512) 888-5622

Houston Marine Supply Co.(Wholesale)
1707 Velasco
Houston
Texas
77003
USA

Tel (713) 236-8190 Fax (713) 236-0831

Marine & Industrial Supply
8330 Harry Hines Blvd.
Dallas
Texas
75235
USA

Tel (214) 631-2300 Fax (214) 631-5124

V & V Marine Products
6642 Baker Blvd.
Fort Worth
Texas
76118
USA

Tel (817) 284-1125 Fax (817) 284-1219

UTAH

Coast Distribution System
3800 W. 2100 S.
Salt Lake City
Utah
84120
USA

Tel (801) 973-4900 Fax (801) 973-4900

VIRGINIA

Land 'N' Sea Distributors (Wholesale)
1340 Azalea Garden Road
Norfolk
Virginia
23503
USA

Tel (757) 853-7658 Fax (757) 857-3726
Toll Free 800-446-8142
web: www.landnsea.net

Paxton Co.
1111 Ingleside Road
Norfolk
Virginia
23502
USA

Tel (757) 853-6781 Fax 800-853-7709
Toll Free 800-234-7290
web: www.paxtonco.com

WASHINGTON

Coast Distribution Seattle
5301 Shilshole Avenue, N.W.
Seattle
Washington
98107
USA

Tel (206) 789-1500 Fax (206) 784-6393

Englund Marine Supply (Retail)
280 East Wilson
Westport
Washington
98595
USA

Tel (360) 268-9311 Fax (360) 268-9752
Toll Free 800-228-7051
email: englund@pacifier.com
web: www.englundmarine.com

Englund Marine Supply (Retail)
123 Howerton Way
Ilwaco
Washington
98624
USA

Tel (360) 642-2308 Fax (360) 642-0210
Toll Free 800-228-7051
email: englund@pacifier.com
web: www.englundmarine.com

Fisheries Supply
1900 N. Northlake Way
Seattle
Washington
98103
USA

Tel (206) 632-4462 Fax (206) 634-4600
Toll Free 800-426-6930
email: mail@fisheriessupply.com
web: www.fisheriessupply.com

GO2Marine
330 Madison Ave, South
Bainbridge Island
Washington
98110
USA

Tel 877-780-5670 Fax 877-780-5673
web: www.go2marine.com

U.S.A. & INTERNATIONAL

Harbour Marine Distributors
1210 West Marine View Drive
Everett
Washington
98201
USA
Fax (425) 259-7248
Toll Free 800-824-0882

Kolstr & Marine Supply (Retail)
4733 Ballard Avenue, N.W.
Seattle
Washington
98107
USA
Tel (206) 784-2500 Fax (206) 7891105
Toll Free 800-334-3224
email: kolstrand@msn.com
web: www.kolstrand.com

LFS Inc. (Retail)
851 Coho Way
Bellingham
Washington
98226
USA
Tel (360) 734-3336 Fax (360) 734-4058
Toll Free 800-426-8860
email: bellingham@lfsinc.com
web: www.lfsinc.com

Redden Marine*
1411. Roeder Avenue
Bellingham
Washington
98225
USA
Tel (360) 733-0250 Fax (360) 733-7180
Toll Free 1-800-426-9284
email: kevinp@reddeninc.com
email: joeyh@reddeninc.com
web: www.reddeninc.com

Seattle Marine
2121 West Commodore Way
Seattle
Washington
98199
USA
Tel (206) 285-5010 Fax (206) 285-7925
email: seamar@seamar.com
web: www.seamar.com

WISCONSIN
Bell Industries
N117 W18456 Fulton Drive
Germantown
Wisconsin
53022
USA
Tel (262) 253-0450 Fax (262) 253-0220
Toll Free 800-766-2355
web: www.bellrpg.com

Moe's Marine Service
2022 Westwind Rd.
Oshkosh
Wisconsin
54901
USA
Tel 920-231-2731 Fax 920-231-0442
Toll Free 800-242-2264

INTERNATIONAL

ALBANIA
GJE
Rruga 4 Heronjte 10, Vlore,
Tel 00 355 6323294
Fax 00 35 63223294

ARGENTINA
See Brunger Exports, Florida

ARUBA
See Brunger Exports, Florida

AUSTRALIA
Bob Littler Agencies (Wholesale)
83 Proprietary Street
Tingalpa, Queensland, 4173, Australia
Tel 00-6173-890-1115
Fax 00-6173-890-1119
email: admin@bla.com.au
web: www.bla.com.au

AUSTRIA
G Ascherl GmbH
Erlengrund 38 6971, Hard,
Tel 00 43 5574 899000
Fax 00 43 5574 8990010
email: g.ascherl@vol.at

BAHAMAS
See Brunger Exports, Florida

BAHRAIN
See Brunger Exports, Florida

BELGIUM
Allpa Marine Equipment
P.O. Box 6630 6530 GC Nijmegen-NL,
Kerkenbos 10-15 6546 BB,
Nijmegen - NL,
Tel +31 (0) 24 3777773
Fax +31 (0) 24 3777770
email: info@allpa.nl

BERMUDA
See Brunger Exports, Florida

BRAZIL
See Brunger Exports, Florida

COLUMBIA
See Brunger Exports, Florida

CYPRUS
PAS Mediterranean
223 St. Andrew Street, P.O. Box 210,
Limassol, Cyprus,
Tel 00-357-5364-755
Fax 00-357-5364-995

DENMARK

Columbus Marine A/S
Brordrupvej 44, DK 4621,
Gadstrup, Denmark
Tel 00-45-4619-1166
Fax 00-45-4619-1353
email: columbus@columbus-marine.dk
web: www.columbus-marine.dk

EGYPT
See Brunger Exports, Florida

ENGLAND
Hypro Marine (Wholesale)
Mount Pleasant Lane,
Lymington, Hampshire, SO41 8LS, England
Tel 0044 590 681445
Fax 0044 590 681446
email: info@hypromarine.co.uk
web: www.hypromarine.com

EQUADOR
See Brunger Exports, Florida

FINLAND
US Parts Oy
Laivalahdenkatu 2, 00810, Helsinki, Finland,
Tel 00-358-9-759-41544
Fax 00-358-9-759-2199
email: marine@usparts.fi web:
www.usparts.fi

FRANCE
Proxam Distribution
Village d'Enterprises St. Henri,
Rue Anne Gacon, 13016, Marseille, France
Tel 00-33-491-463434
Fax 00-33-491-460400

FRENCH WEST INDIES
See Brunger Exports, Florida

GIBRALTAR
See Brunger Exports, Florida

GREECE
Motocraft SA
48 Alimou Ave 17455 Athens,
Tel +3010 98.88.288
Fax +3010 98.50.102
email: alexzeis@motocraft.gr
web: www.motocraft.gr

GUATEMALA
See Brunger Exports, Florida

HOLLAND
Allpa B.V. (Wholesale)
Kerkenbos 10-15, 6546, BB,
Nijmegen, Holland
Tel 00-31-24-3777773
Fax 00-31-24-3777770
email: info@allpa.nl
web: www.allpa.nl

* REPLACEMENT PARTS FOR SEASTAR HYDRAULIC STEERING MAY BE ORDERED DIRECTLY FROM THESE STOCKING DISTRIBUTORS

INTERNATIONAL

HONG KONG

Boven Marine Technology (Wholesale)
5D Skyline Mansion, 51 Conduit Road,
Hong Kong

Tel 00-852-2548-5008

Fax 00-852-2546-4233

email: boven@netvigator.com

web: www.boven.com

Chong Kui (Group)Co Ltd.
Unit 16, 11/F Tower B, Regent Center,
70 Chuen Ping Street,
Kwai Chung, Hong Kong

Tel 00-852-244-11271

Fax 00-852-244-11247

email: yingwai@netteens.net

See also Brunger Exports, Florida

INDONESIA

See Brunger Exports, Florida

IRELAND

Western Marine
Bulloch Harbour, Dalkey, County Dublin,
Ireland,

Tel 00-353-128-00321

Fax 00-353-128-00327

email: marine@iol.ie

ISRAEL

See Brunger Exports, Florida

ITALY

Belgarda SPA (Wholesale)
Via Tinelli 67 - 69, 20050 Gerno di Lesmo,
Milan, Italy,

Tel 00-390-39-60961

Fax 00-390-39-6064371

email: giuseppe.scarpino@yamaha-motor.it

web: www.belgarda.it

Svama Nautica S.R.L. (Wholesale)

Via Beneficio 2, Tronco, 57/B-48015,
Montaletto Di Cervia, (Ravenna), Italy

Tel 00-390-544-965689

Fax 00-390-544-965734

email: svama-nautica@svama-nautica.com

web: www.svama-nautica.com

JAMAICA

See Brunger Exports, Florida

JAPAN

See Brunger Exports, Florida

KOREA

Saehan Johnson
P.O. Box 232, Young Dong, Seoul, Korea,
Tel 00-822-542-6363

Fax 00-822-546-1951

See also Brunger Exports, Florida

KUWAIT

See Brunger Exports, Florida

MALTA

RGC Marine
1 Marine Louise Building, Garden Street,
Tax'Biex, Malta,

Tel 00-356-319-338

Fax 00-356-318-873

MEXICO

See Brunger Exports, Florida

NETHERLAND ANTILLES

See Brunger Exports, Florida

NEW ZEALAND

Lusty & Blundell
38 Tawa Drive, Albany,
Auckland, 1001, New Zealand

Tel 00-649-415-8303

Fax 00-649-415-8304

email: sales@lusty-blundell.co.nz web:

www.lusty-blundell.co.nz

NORWAY

Telma Control - A/P
P.O. Box 2906, Toyen Rolph
Hofmosgatan 18

Oslo, Norway

NO-0608

Tel 011-4723180810

Fax 011-4723180814

OMAN

See Brunger Exports, Florida

PANAMA

See Brunger Exports, Florida

PERU

See Brunger Exports, Florida

PHILLIPINES

See Brunger Exports, Florida

POLAND

Marco Motors SP. ZOO
Lady 2, 71-605, Szczecin, Poland,

Tel 00-48-91-4500552

Fax 00-48-91-4223942

See also Brunger Exports, Florida

PORTUGAL

Krautli Portugal Lda.
Horta dos Barcelos, Lote 2,
P 2695 390 Sta, Iria de Azoia, Portugal

Tel 00-351-21-953-5600

Fax 00-351-21-953-5633

Toll Free 00-356-319-338

email: j.pires@krautli.pt

web: www.krautli.com

PUERTO RICO

See Brunger Exports, Florida

QATAR

See Brunger Exports, Florida

SAUDI ARABIA

See Brunger Exports, Florida

SINGAPORE

Mengsina PTE Ltd.
No. 63 Janlan Pemimpin, 05-09,
Pemimpin Ind., Singapore,

Tel 00-65-258-1595 Fax 00-65-258-7296

email: mengsina@mbox4.signet.com.sg

SOUTH AFRICA

Boating Distributors (Wholesale)
P.O. Box 84, Northriding, 2194,
Johannesburg, Gauteng, South Africa

Tel 00-27-11-462-4390

Fax 00-27-11-704-1669

email: craig@boating-distributor.co.za

web: www.waterworld.com

SPAIN

F.J. Blasco S.L.
C/Bolivia 340, Local 64, 2a PLANTA, 08019,
Barcelona, Spain

Tel 00-34-93-3034300

Fax 00-34-93-3033252

email: blasco@larapita.com

SRI LANKA

FRP Services (Lanka)
ABC Building, 148 Galle Road,
Dhiewela, Sri Lanka,

Tel 00-94-1712-183

Fax 00-94-1933-684

SWEDEN

Jan Comstedt Ab
Box 12022, SE 402, 41,
Gothenburg, Sweden

Tel 00-46-31-775-6530

Fax 00-46-31-24-53-17

email: info@comstedt.se

web: www.comstedt.se

SWITZERLAND

Marine Parts Heimgartner
Pfaffikerstr. 6, CH 8604,
Volketswil, Zurich, Switzerland

Tel 00-41-1997-4090

Fax 00-41-1997-4094

email: marineparts@pilatusnet.ch

TUNISIA

Majimpex
26 Av, Chedly, Zouiten, 1082, Tunisia

Tel 00-216-1-802617

Fax 00-216-1-802617

email: info@majimpex.com

TURKEY

See Brunger Exports, Florida

UNITED ARAB EMIRATES

See Brunger Exports, Florida

US VIRGIN ISLANDS

See Brunger Exports, Florida

VENEZUELA

See Brunger Exports, Florida

VIETNAM

Minh Long Co. Ltd. (System Power)
451b - 453 Hai Ba Trung,
Ho Chimnh, Vietnam

Tel 00-84-8844-4297

Fax 00-84-8843-9666

ZIMBABWE

See Brunger Exports, Florida

U.S.A. RETAILERS

CALIFORNIA

West Marine Prod.
203 N. Harbor Blvd.
San Pedro, CA 90731
Tel (408) 728-2700

CONNECTICUT

Boat America - Norwalk
9 Washington Street
So. Norwalk, CT 06854
Tel (860) 866-4426

FLORIDA

Boat America - Clearwater
11477 U.S. Highway 19
Clearwater, FL 34624
Tel (813) 573-2678

Boat America - Ft. Lauderdale
505 W. Broward Blvd.
Ft. Lauderdale, FL 33312
Tel (954) 523-7993

Boat America - Ft. Myers
12901 McGregor Blvd.
Ft. Myers, FL 33919
Tel (941) 481-7447

Boat America - Palm Beach
1900-B Okeechobee Blvd.
West Palm Beach, FL 33409
Tel (407) 684-4900

Boat America - Tampa
8203 N. Dale Mabry Hwy.
Tampa, FL 33614
Tel (941) 933-5515

MASSACHUSETTS

Boat America - Boston
411 Waverly Oaks Road
Waltham, MA 02154
Tel (617) 899-2000

MARYLAND

Boat America
27 W Long Meadow Rd.
Hagerstown, MD 21740
Tel (301) 739-2606

Boat America - Glen
6651-20 Ritchie Hwy. Rt. 2
Glen Burnie, MD 21061
Tel (301) 761-5901

Boat America - Maryland
5640-E Sunnyside Ave.
Beltsville, MD 20705
Tel (301) 474-0150

Boat America - Towson
6863 Loch Raven Blvd.
Towson, MD 21204
Tel (301) 296-0451

MICHIGAN

Boat America - Detroit
2212 E. 14 Mile Road
Warren, MI 48092
Tel (313) 939-5050

NEW JERSEY

Boat America - Holmdel
2145 Rte. 35 North
Holmdel, NJ 07733
Tel (201) 739-8890

West Marine
201 Meadow Rd.
Edison, NJ 08818
Tel (908) 819-7400 Fax (908) 819-4771

NORTH CAROLINA

Overton's Sport Center
111 Red Banks Rd.
Greenville, NC 27835
Tel (919) 355-7600 Fax (919) 355-2923

OHIO

Boat America - Cleveland
3419 Carnegie Ave.
Cleveland, OH 44115
Tel (216) 391-2922

TEXAS

Boat America - Houston
7280 Wynnwood
Houston, TX 77008
Tel (713) 880-2160

VIRGINIA

Boat America
880S Pickett St.
Alexandria, VA 22304
Tel (703) 370-4202 Fax (703) 461-2847

Boat America - Norfolk
6600 Virginia Beach Blvd.
Norfolk, VA 23502
Tel (757) 461-3601

2 YEAR LIMITED WARRANTY

We warrant to the original retail purchaser that Teleflex Canada Limited Partnership products have been manufactured free from defects in materials and workmanship. This warranty is effective for two years from the date of original retail purchase, excepting that where Teleflex Canada Limited Partnership products are used commercially or in any rental or other income producing activity, then this warranty is limited to 1 year from the date of original purchase.

We will provide replacement product without charge, for any Teleflex Canada Limited Partnership product not meeting this warranty, which is returned (freight prepaid) within the warranty period to the dealer from whom such products were purchased, or to us at the appropriate address. In any such case Teleflex Canada Limited Partnership products found to be defective and covered by this warranty, will be replaced or repaired at Teleflex Canada Limited Partnership's option, and returned to the customer.

Teleflex Canada Limited Partnership's sole responsibility under this warranty is limited to the repair or replacement of product which is, in Teleflex Canada Limited Partnership's opinion, defective. Teleflex Canada Limited Partnership is not responsible for charges connected with the removal of such product or re-installation of replacement or repaired parts.

We will have no obligations under this warranty for any product:

- Which has been improperly installed.
- which has been used in an installation other than as recommended in our installation or operation instructions or specifications.
- Which has failed or has been damaged due to an accident or abnormal operation including racing, misuse or alterations outside our factory.
- Which has been repaired or modified by other than Teleflex Canada Limited Partnership.
- Which has been used on an engine/boat combination where the engine horsepower exceeds the boat horsepower rating established by the boat manufacturer.
- Which has been used with other products which, in Teleflex Canada Limited Partnership's opinion, are incompatible with the Teleflex Canada Limited Partnership product.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, OBLIGATIONS OR LIABILITIES ON THE PART OF TELEFLEX CANADA LIMITED PARTNERSHIP AND WILL BE THE CUSTOMER'S EXCLUSIVE REMEDY EXCEPT FOR ANY APPLICABLE IMPLIED WARRANTIES UNDER STATE LAW WHICH ARE HEREBY LIMITED IN DURATION TO TWO YEARS FROM THE DATE OF ORIGINAL PURCHASE. IN NO EVENT WILL TELEFLEX CANADA LIMITED PARTNERSHIP BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY RELATING TO THE PRODUCTS. Some states do not allow limitations on an implied warranty, or the exclusion of incidental or consequential damages, so the above exclusions may not apply to you. You may have other rights which vary from state to state.

If Teleflex Canada Limited Partnership products are to be returned to Teleflex Canada Limited Partnership under warranty, you must obtain a Return Goods authorization number (claim number) prior to shipping. Be sure to label the goods with:

- a) the name and address of the sender, and
- b) the return goods authorization number (claim number).

Please address the returned goods as follows:

From U.S.A.

RGA # ?
Teleflex Canada Limited Partnership
c/o Panalpina
#8 – 14th Street
Blaine, WA 98230

From CANADA and Overseas:

RGA # ?
Teleflex Canada Limited Partnership
3831 No. 6 Road
Richmond, B.C.
Canada V6V 1P6



TELEFLEX CANADA
3831 NO.6 ROAD
RICHMOND, B.C.
CANADA V6V 1P6

FAX 604-270-7172

www.seastarsteering.com

ISO 10592



© 1998 Teleflex Canada Limited Partnership

Printed in Canada

Part Number: SL6001

2000/09/04