

# HYDRAULIC STEERING SELECTION GUIDE 2008



# 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.

 <b>DANGER</b>	 <b>WARNING</b>	 <b>CAUTION</b>	<b>NOTICE</b>
Immediate hazards which <b>WILL</b> result in severe personal injury or death.	Hazards or unsafe practices which <b>COULD</b> result in severe personal injury or death.	Hazards or unsafe practices which <b>COULD</b> 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

<b>The BayStar &amp; SeaStar Hydraulic Steering Systems.</b>		ii
<b>1</b>	<b>BayStar Outboard Steering System.</b>	1-1
	BayStar Compact Application Guide	1-5
<b>2</b>	<b>SeaStar Power Assist</b>	2-1
<b>3</b>	<b>SeaStar Outboard Steering Systems.</b>	3-1
	Front Mount Steering System	3-2
	SeaStar Pro Steering	3-9
	Outboard—Catamaran	3-12
	Side Mount Steering System	3-13
	Splashwell Mount Steering System	3-16
<b>4</b>	<b>SeaStar Sterndrive Systems.</b>	4-1
<b>5</b>	<b>SeaStar Inboard Steering Systems (Power &amp; Sail)</b>	5-1
<b>6</b>	<b>Hynautic 3-Line Inboard Steering</b>	6-1
	Application Guide	6-3
	Hynautic Seal Kits	6-6
	Crossover Hynautic to SeaStar Steering	6-7
<b>7</b>	<b>SeaStar Power Steering</b>	7-1
<b>8</b>	<b>Hynautic Trim Tabs</b>	8-1
<b>9</b>	<b>SeaStar/Hynautic Helms – General</b>	9-1
	SeaStar Standard/Rear Mount Helms	9-4
	SeaStar Tilt/Sport Tilt Helms	9-5
	Hynautic Helms	9-7
<b>10</b>	<b>SeaStar Hose, Tubing, Fittings, Accessories &amp; Tools</b>	10-1
	Outboard Hose	10-2
	Inboard/Sterndrive Tubing	10-6
	Additional SeaStar Steering Station or Autopilot Kit	10-8
	Fittings & Fitting Kits	10-9
	Liquid Tie Bar alignment Valve	10-17
	Tools	10-19
	Torque Data Sheets	10-21
<b>11</b>	<b>Hydraulic Fluid</b>	11-1
<b>12</b>	<b>SeaStar and Hynautic Volumes and Capacities.</b>	12-1
<b>13</b>	<b>Authorized Distributors</b>	13-1
	USA Retailers	13-10
	Teleflex Canada Limited Partnership Warranty	13-11

# 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)

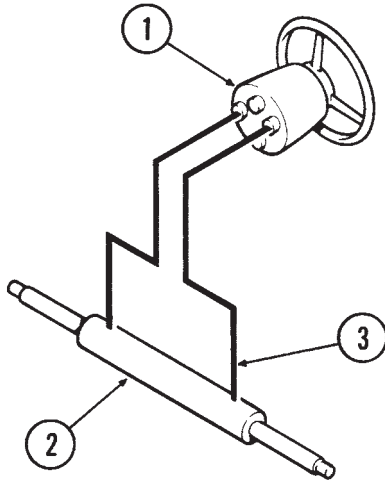
**BayStar and SeaStar! Simply the best!**

# 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.

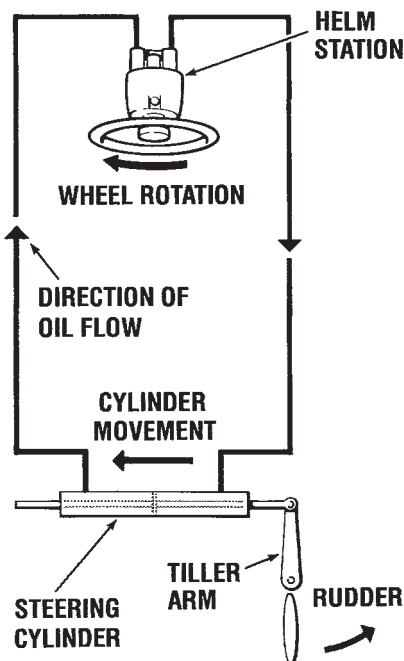
## 2. The Cylinder.

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.

# System Selection Worksheet

## How can we help?

We have provided the following check list to assist you in choosing your Hydraulic Steering System. We invite you to make notes on this page as required.

as appropriate.

- OUTBOARD–Single up to 150HP UNDER 55mph**
  - Most economical system to meet my steering needs .....Page 1-1
  - Economical to meet my needs, PLUS less effort at the steering wheel than above.....Page 3-1, 3-9
  - Power Assist – 'Automotive' Style, Feel and Comfort .....Page 2-1, 3-1, 3-9

---

- OUTBOARD–Multiple up to 150HP combined total**
  - Most economical system to meet my steering needs .....Page 1-1
  - Economical to meet my needs, PLUS less effort at the steering wheel than above.....Page 3-1, 3-9
  - Power Assist – 'Automotive' Style, Feel and Comfort .....Page 2-1, 3-1, 3-9

---

- OUTBOARD–Single 150HP – 350HP UNDER 65mph**
  - Most economical system to meet my steering needs .....Page 3-1, 3-2
  - Power Assist – 'Automotive' Style, Feel and Comfort .....Page 2-1, 3-1, 3-2

---

- OUTBOARD–Single 150HP – 350HP OVER 65mph**
  - Most economical system to meet basic steering needs .....Page 3-1, 3-9
  - Recommended for Steering Comfort and 'Automotive' Style and Feel .....Page 2-1, 3-1, 3-9

---

- OUTBOARD–Multiple over 150HP  
(including Catamaran and Liquid Tiebars)**
  - Most economical system to meet basic steering needs .....Page 3-1, 3-2
  - Recommended for Steering Comfort and 'Automotive' Style and Feel .....Page 2-1, 3-1, 3-2

---

- STERNDRIVE–Single and Twin**
  - Most economical system to meet my steering needs .....Page 4-1
  - Power Assist – 'Automotive' Style, Feel and Comfort .....Page 2-1, 4-1

---

- INBOARD–Single and Twin**
  - Most economical system to meet my steering needs .....Page 5-1
  - Power Assist – 'Automotive' Style, Feel and Comfort .....Page 2-1, 5-1
  - Power Steering System .....Page 7-1

## My Steering Components

Helm Model #..... Cylinder Model #.....

Hose/Tube ..... Other .....

Autopilot Equipped  Yes  No Date Purchased.....

**Boat:** Make..... Model ..... Length .....

**Engine:** Make..... H.P..... Quantity.....







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.

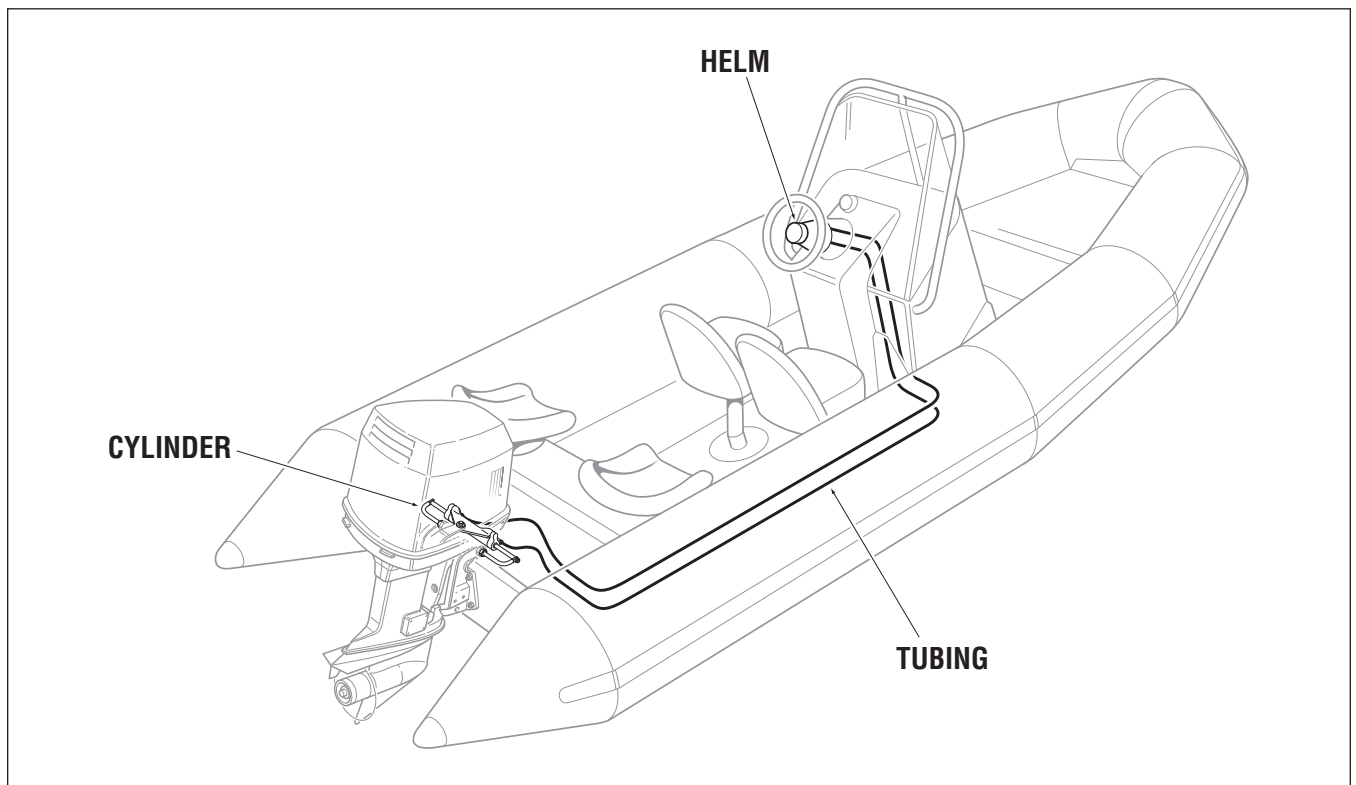
## ⚠ CAUTION

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 HH4315 is available separately. Currently not available in kit form.*

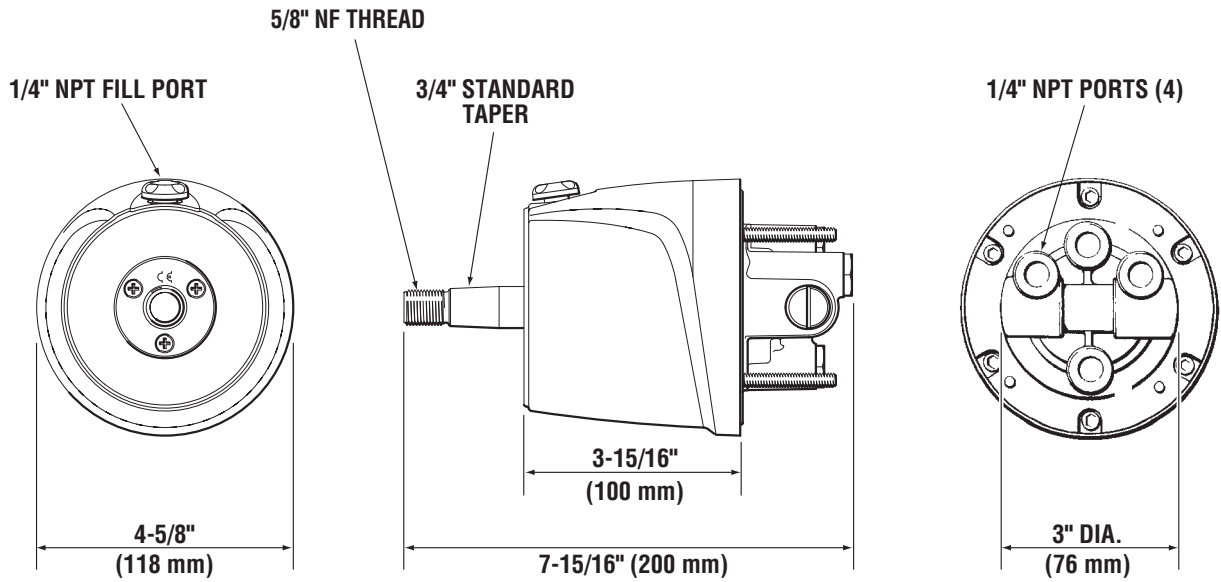


*Typical BayStar Installation*

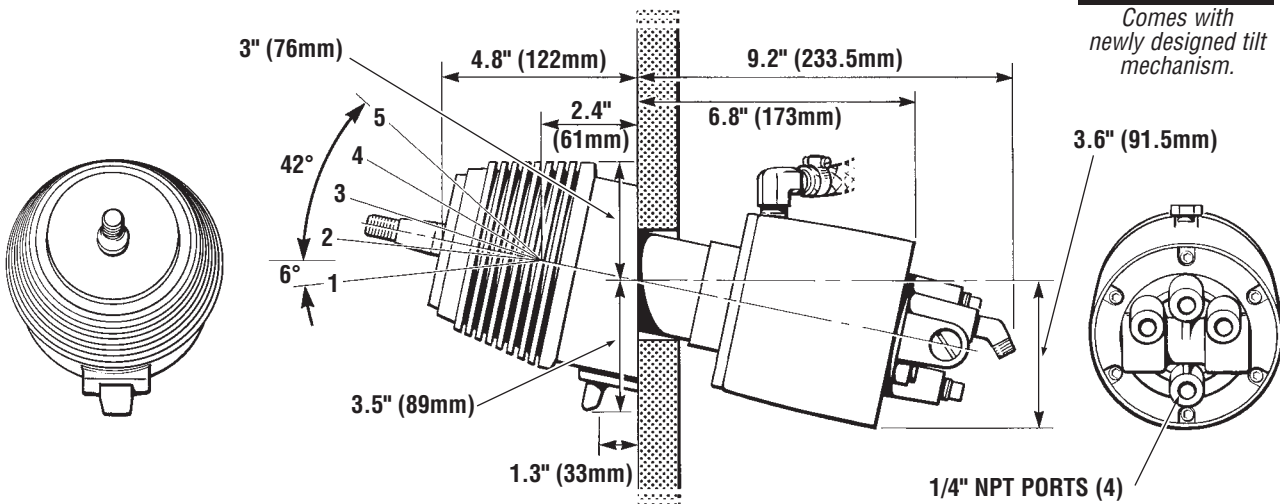
**Three easy steps to select your BayStar System:**

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

**STANDARD HELM PART# HH4314**



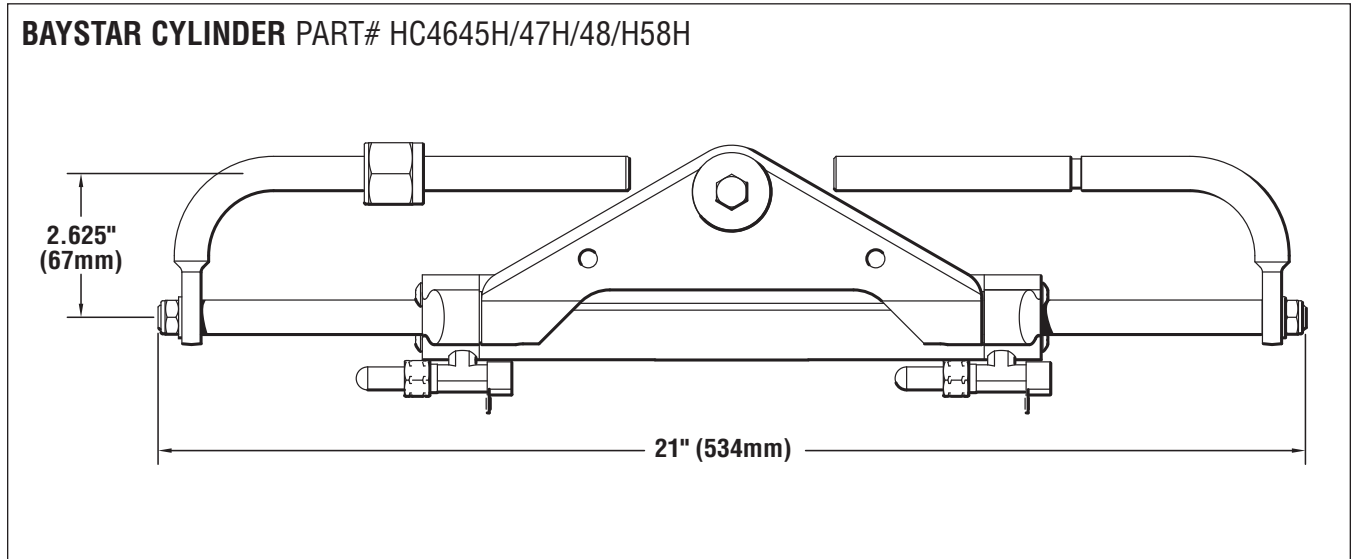
**TILT HELM PART# HH4315**



- 2) Check the BayStar cylinder dimensions through the full trim/tilt range of the engine.**

**IS THE SPLASHWELL WIDE ENOUGH?**

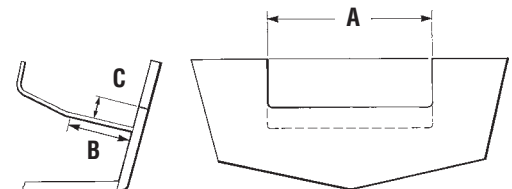
The HC4645H/47H/48H /58H require a 21" (534mm) Splashwell width.



- 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
HC4645H/47H/48H/58H	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# HK4200A, HK4230A**



**NOTICE**

*HC4645H compact cylinder is included in both BayStar Steering Kits. If your engine requires the use of a cylinder other than HC4645H or HC4658H (refer to application guide on page 1-5) then purchase of a replacement Pivot Plate (noted on page 1-5) will be required.*

BayStar Steering kits come complete with everything needed for an install, (some engines require spacer kits and/or cylinder plate change, see application chart on *page 1-5*) the compact cylinder does not require the engine manufacturer drag link for connection. For your convenience two lengths of 20' cut to fit tubing are supplied with the HK4200A and two lengths of 30' cut to fit tubing are supplied with the HK4230A kit.

**BayStar Steering Kit (HK4200A)**

Includes:

- 1 x BayStar helm pump (HH4314)
- 1 x BayStar Cylinder (HC4645H)
- 1 x BayStar Tubing kit (HT4420H, comes with two 20' hoses)
- 2 x Hydraulic Steering Fluid (HA5430)
- 1 x Filler Kit (HA5438)

**BayStar Steering Kit (HK4230A)**

includes:

- 1 x BayStar helm pump (HH4314)
- 1 x BayStar Cylinder (HC4645H)
- 1 x BayStar Tubing kit (HT4430H, comes with two 30' hoses)
- 2 x Hydraulic Steering Fluid (HA5430)
- 1 x Filler Kit (HA5438)

**NOTICE**

*HC4600 and HC4600H are no longer being made by Teleflex Canada, all seal kits and spare parts will be made available. If purchase of a new HC4600 or HC4600H is required, please purchase BayStar Compact Cylinder part# HC4645H/47H/48H/58H as per the application chart on page 1-5. If the cylinder that you are replacing does not include the letter H after the part number, you will need to reuse the fittings out of your old cylinder and/or purchase fitting kit # HF4201 (includes 2 of the old style bleed fittings).*

# BayStar Outboard Compact Application Guide

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



MFG	YEAR	MODEL	CYLINDER	NOTES
<b>FORCE</b>	1985-DATE	90-150 HP	HC4645H	
<b>HONDA</b>	1992-DATE	30-90 HP	HC4645H	
	1998-DATE	115-130 HP	HC4647H	
	2001-DATE	150 HP	HC4645H	
	2003-DATE	BF135 HP	HC4645H	
<b>JOHNSON/ EVINRUDE</b>	1977-1989	65-150 HP	HC4648H	
	1991-DATE	40-150 HP	HC4645H	
	1997-DATE	115 HP FICHT	HC4658H	4
	1997-DATE	75-150 HP FICHT	HC4645H	
	1998-DATE	40-140 HP 4-Stroke	HC4658H	1, 4
<b>MERCURY/ MARINER</b>	1984-DATE	75-150 HP	HC4645H	
<b>NISSAN</b>	1990-DATE	120-140 HP	HC4645H	
<b>SUZUKI</b>	1986-DATE	150 HP	HC4645H	
	1996 ONLY	115-140 HP	N/A	
	1987-2002	115-140 HP	HC4645H	1
	1990-2000	90-100 HP	HC4645H	
	1998-DATE	40-70 4-Stroke	HC4645H	1
	2001-DATE	115-140 HP 4-Stroke	HC4658H	1, 4
<b>TOHATSU</b>	1990-DATE	140-140 HP	HC4645H	
<b>YAMAHA</b>	1998-DATE	40-50 HP	HC4645H	2
	1998-DATE	60 HP	HC4645H	3
	1986-DATE	70-90 HP	HC4645H	1
	1997-DATE	80-150 HP 4-Stroke	HC4645H	
	2000-DATE	25-60 HP 4-Stroke	HC4648H	1
<b>YANMAR</b>	1990-DATE	27-36 HP	HC4645H	

1. Requires Spacer kit part # HO5090

2. 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.

3. Steering hook Yamaha Part # 63D-48511-00-4D must be installed

4. Cylinder HC4645 may be used in these applications. The pivot plate will need to be flipped before installation. Instructions provided with Owner's Manual.

The above engine applications are current through the revision date shown. For up-to-date engine applications go to: [www.seastarsteering.com](http://www.seastarsteering.com)

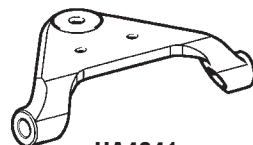
REVISION DATE: MAR. 10<sup>TH</sup> 2006

## NOTICE

HC4645H compact cylinder is included in the BayStar Steering kits. If your engine requires the use of a cylinder other than HC4645H or HC4658H then please refer to the figure below for additional replacement pivot plate.



**HA4640**  
Use with cylinder HC4645H



**HA4641**  
Use with cylinder HC4647H



**HA4642**  
Use with cylinder HC4648H



**HA4643**  
Use with cylinder HC4658H



# SeaStar<sup>PA</sup><sup>TM</sup>

## POWER ASSIST



*SeaStar Power Assist Pilot shown, available Summer, 2008.*

The Marine Industry is continually introducing heavier outboard engines, higher horse power engines, more aggressive propellers, bigger/faster boats...

Boat operators are asking for increased comfort and lighter steering loads... These were the driving forces behind the design of SeaStar and SeaStar PRO Power Assist.

This new and innovative product is highly recommended on any 200HP and above outboard application to give your boat the same, easy steering you are accustomed to in your car. Power Assist is also recommended for the following;

- Twin and Triple engine applications
- Bass Boats
- Power Catamarans
- Inboard powered cruisers without engine driven power assist.

## How the System Works

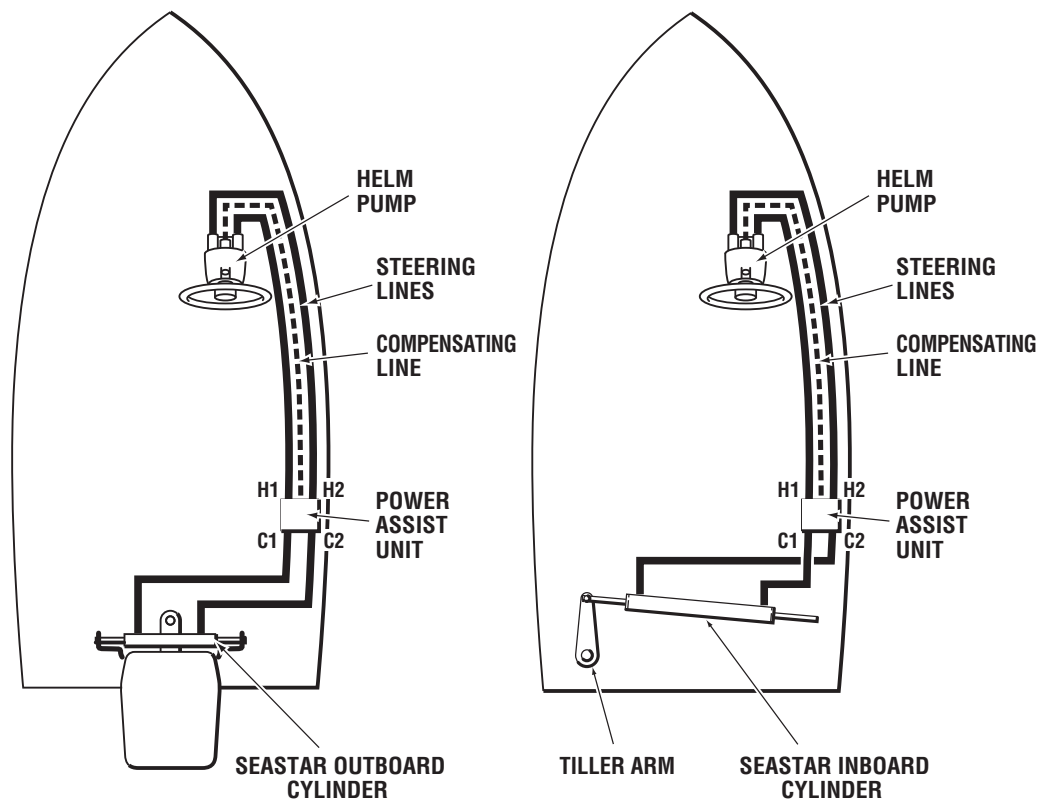
SeaStar P/A (Power Assist) steering uses an electronically controlled hydraulic pump to provide "Power" for your SeaStar Hydraulic Steering system.

The SeaStar P/A system is comprised of two circuits: a hand operated manual system, which is the control element, and a hydraulic power pump, which is the working element.

The manual system consists of a helm pump with internal relief and check valves, as well as a built in reservoir. Two steering lines and a compensating line which provide a routing for fluid to transmit through the system, and a steering cylinder which moves the steering device on the boat from side to side.

The power system, is an electronically controlled hydraulic pump that boosts the fluid being sent from the helm pump to the steering cylinder (this will result in much easier effort at the wheel—even when under heavy loads). A compensating line connects the P/A unit to the helm pump, allowing the P/A unit to share fluid with the helm reservoir.

The SeaStar P/A is compatible with multiple steering stations, and with the use of an autopilot. In the event of a P/A power loss or failure the hydraulic system will automatically revert to a manual hydraulic system.



Typical installations shown (please refer to your cylinder installation manual for proper hose installation diagrams).



## SeaStar P/A Compatibility Chart

The P/A is designed for use in recreational marine applications in conjunction with SeaStar Hydraulic Steering. Optimal performance will be obtained when used with SeaStar 1.4, 1.7 and 2.0 cu in (1000psi) helm pumps, or, 2.0 cu in (1500 psi) SeaStar P/A PRO Hydraulic Steering.

### NOTICE

*SeaStar nylon tube may ONLY be used for the compensating line. DO NOT use SeaStar Nylon tube to plumb any other portion of the steering system.*

### NOTICE

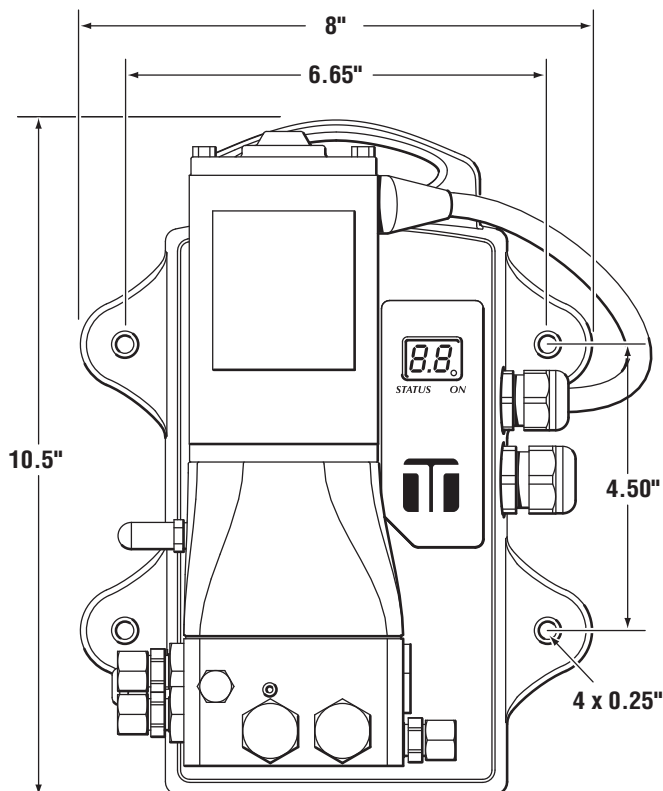
**Plan ahead. There MUST be at least 4' (feet) of hose between the helm pump and power assist, or the power assist and the steering cylinder.**

### NOTICE

*Use ONLY Teleflex products with the P/A unit as with ALL Teleflex systems. Failure to do so may void your warranty.*

*SeaStar P/A PRO is NOT to be used with SeaStar Hydraulic Steering, performance will be compromised. ONLY use P/A PRO with a SeaStar PRO Hydraulic steering system and ensure that SeaStar PRO (1500 psi) hose is used to plumb the entire system. (Nylon tubing may be used for the compensating/return line ONLY.)*

## Specifications



### SEASTAR P/A 12VOLT, SEASTAR PRO P/A, 12 VOLT

- 12 Volts
- 1000 psi MAX System peak pressure (500 psi working load) SeaStar Standard
- 1500 psi MAX System peak pressure (500 psi working load) SeaStar Pro
- MAX Current Draw (at 1000psi) 55 amps
- Purple ignition wire MAX. current draw = 1 amp
- Typical current draw:  
Single outboard ~ 3 amps, average  
Twin Rudder inboard ~ 8 amps, average

### SEASTAR P/A 24 VOLT. (SEASTAR PRO P/A IS NOT AVAILABLE IN 24 VOLT POWER).

- 24 Volts
- 1000 psi MAX., System peak pressure (500psi working load)
- MAX Current Draw (at 1000psi) 25 amps
- Purple ignition wire MAX. current draw = 1 amp
- Typical current draw:  
Single outboard ~ 1.5 amps, average  
Twin Rudder inboard ~ 4 amps, average

### ⚠ WARNING

**DO NOT exceed peak operating pressure.**  
**1000psi – Standard,**  
**1500psi – Pro.**



# OUTBOARD STEERING

SeaStar Outboard Hydraulic Steering offers three models of steering cylinders to suit most applications. The standard and most commonly used model is the Front Mount Steering Cylinder HC5345/47/48/58. The Side Mount Cylinder HC5370 and the Splashwell Mount Cylinder HC5380. Before ordering it is necessary to determine the best possible application for your boat, taking into account the hull design, speed and usage of the boat. Keep in mind that engines today have become larger, more powerful and heavier than in the past. Teleflex encourages you to use the tables noted below and select your system accordingly.

## Selecting the outboard steering system best suited for your boat:

- 1) Using the table below, select your design of boat as per speed, hull design and horsepower.
- 2) Using the Application chart on page 3-5 choose the proper cylinder and tiebar equipment as per your outboard engine. If your engine is not noted, contact Teleflex or your Distributor for details.
- 3) Proceed to page 10-1 for details on fitting kits and particular equipment that will be needed to add a second station and/or and autopilot.

## TYPICAL BOAT DESIGNS

- 1 INFLATABLE:** Boats manufacture from waterproofed fabric which are inflated with air in order to achieve their shape. The bottom of the hull may be made of fabric and/or fiberglass. They typically have narrow transoms. Boats may be single and/or dual engine, and is generally slower than 40 mp/h
- 2 CRUISER:** Cuddy/express/bridge cruiser primarily designed for cruising. It has overnight accommodations. Typically rigged with two steering stations. Boats may be single and/or dual engine, and is generally slower than 45 mp/h
- 3 RUNABOUT:** Intended for day boating. Typically a single engine, but, can be a dual engine boat. This includes tournament Ski boats and performance outboards. Boat speeds are generally slower than 60 mp/h
- 4 FISH "N" SKI:** Single engine boat designed for day fishing or skiing in protected waters. Boats speeds are generally slower than 40 mp/h
- 5 FISH BOAT:** Boat primarily designed and equipped for offshore fishing. May be rigged with a second station and may have single and/or dual outboards. Speeds are generally slower than 50 mp/h
- 6 CENTER CONSOLE:** Boats with the control station located on the center line of the boat. Designed specifically for fishing, may be single and/or dual engine(s). Boat speeds are generally slower than 65 mp/h.
- 7 BASS BOAT:** Single engine designed specifically for fishing in protected waters and has a flat bottomed hull. Generally performance orientated and speeds in excess of 60 mp/h.
- 8 PONTOON:** Twin or triple hull boats. Single and dual engine capable. Generally speeds to not exceed 60 mp/h. Note: High steering loads when equipped with engines over 115 HP.
- 9 CATAMARAN:** Twin hull vessels. Typically twin engine boats where the use of a mechanical tiebar is not possible. Speeds to not exceed 60 mp/h
- 10 COMMERCIAL/WORK/RESCUE/RACE/:** Any of the above noted boats but used in a more severe environment. Take special care when selecting a system for these boats to ensure that you have both comfortable and safe steering.

# 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 700 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 3-3 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 3-5 to page 3-7, 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.

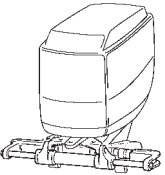
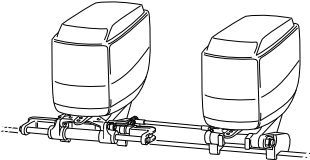
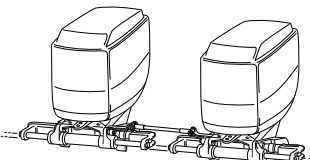
HC5345



# Order Guide

## NOTICE

Front Mount Cylinder part# HC5345 is included in the SeaStar Outboard Steering Kits HK6400/63XX and HK7400/73XX. If your engine requires the use of a cylinder other than the HC5345 (see application guides on pages 3-5 through 3-6) you will need to purchase the individual components (helm, cylinder, hoses, etc.) separately.

ENGINE/ CYLINDER CONFIGURATION	DESCRIPTION	QTY REQ	MODEL	PART NUMBER	REF. PAGE #	
<b>SINGLE ENGINE (SINGLE CYLINDER)</b> APPLICATIONS UP TO 350 HP MAX NUMBER OF TURNS 5 	CYLINDER	1	FRONT MOUNT	† HC5345		
	HELM	1	* SEASTAR I- STANDARD	HH5271	9-6	
	HOSE KIT	1	OUTBOARD HOSE	‡ H051__	10-2	
	OIL	3	SEASTAR OIL	HA5430	11-1	
	FOR EXTRA STEERING STATION ADD:					
	HELM	1	* SEASTAR I- STANDARD	HH5271	9-6	
	FITTING KIT	1	ADD A STATION	HF5501	10-10	
	HOSE KIT	1	OUTBOARD HOSE	‡ H051__	10-2	
	OIL	1	SEASTAR OIL	HA5430	11-1	
	† Refer to Application Guides on page 3-5 to page 3-7 for correct cylinder ‡ Refer to on page 10-2 for measuring hose distance					
<b>DUAL ENGINE (SINGLE CYLINDER)</b> 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	9-6	
	HOSE KIT	1	OUTBOARD HOSE	‡ H051__	10-2	
	OIL	3	SEASTAR OIL	HA5430	11-1	
	FOR EXTRA STEERING STATION ADD:					
	HELM	1	* SEASTAR I- STANDARD	HH5271	9-6	
	FITTING KIT	1	ADD A STATION	HF5501	10-10	
	HOSE KIT	1	OUTBOARD HOSE	‡ H051__	10-2	
	OIL	1	SEASTAR OIL	HA5430	11-1	
† Refer to Application Guides on page 3-5 to page 3-7 for correct cylinder ‡ Refer to on page 10-2 for measuring hose distance						
<b>DUAL ENGINE (DUAL CYLINDERS)</b> NON-COUNTER ROTATING APPLICATIONS UP TO 600 HP MAX ALL COUNTER ROTATING ENGINE APPLICATIONS UP TO 700 HP MAX NUMBER OF TURNS 6.5 	CYLINDER	2	FRONT MOUNT	† HC5345		
	TIE BAR KIT	1		HO60__		
	HELM	1	** SEASTAR II- STANDARD	HH5272	9-6	
	HOSE KIT	1	OUTBOARD HOSE	‡ H051__	10-2	
	HOSE KIT	1	OUTBOARD HOSE	‡ H051__	10-2	
	HOSE KIT	1	OUTBOARD HOSE	‡ H051__	10-2	
	FITTING KIT	1	TEE FITTINGS	HF5530	10-1	
	OIL	3	SEASTAR OIL	HA5430	11-1	
	FOR EXTRA STEERING STATION ADD:					
	HELM	1	** SEASTAR II- STANDARD	HH5272	9-6	
FITTING KIT	1	ADD A STATION	HF5501	10-10		
HOSE KIT	1	OUTBOARD HOSE	‡ H051__	10-2		
OIL	1	SEASTAR OIL	HA5430	11-1		
† Refer to Application Guides on page 3-5 to page 3-7 for correct cylinder ‡ Refer to on page 10-2 for measuring hose distance						
<b>OPTIONAL EQUIPMENT</b>	BACK PLATE KIT		(FOR STANDARD HELMS)	HA5418	9-3	
	20 DEGREE WEDGE		(FOR STANDARD HELMS)	HA5419	9-3	
	AUTOPILOT FITTING KIT		(FOR ALL HELMS)	HF5501	10-10	
	* TILT HELM- SEASTAR I			HH5741	9-7	
	REAR MOUNT HELM- SEASTAR I			HH5261	9-7	
	** TILT HELM- SEASTAR II			HH5742	9-7	
	REAR MOUNT HELM- SEASTAR II			HH5262	9-7	
	POWER ASSIST STEERING			PA1200	2-1	

# 300HP + Outboard Installation Recommendations

With the introduction of heavier, higher horsepower engines producing more torque, Teleflex Marine has updated its recommendations across various applications (single and multiple engines, different hull types, etc.) Please read carefully to ensure that your current steering system provides the best comfort versus performance available.

ENGINE	SEASTAR FRONT MOUNT <i>(Normal Use)</i>	SEASTAR FRONT MOUNT <i>(Aggressive Use - See Note 1)</i>	HYNAUTIC K-6 <i>(Normal Use ONLY)</i>
<b>SINGLE ENGINE</b>	<b>SINGLE CYLINDER</b> 350 HP Max 75 MPH Max HC53xx Cylinder <i>(See Note 2)</i>	<b>SINGLE CYLINDER</b> 350 HP Max HC63xx Pro Cylinder <i>(See Notes 2 &amp; 3)</i>	<b>SINGLE CYLINDER</b> 300 HP Max 55 MPH Max
<b>DUAL ENGINE NON COUNTER ROTATING</b>	<b>SINGLE CYLINDER</b> 450 HP Max 55 MPH Max HC53xx Cylinder HO60xx Tie Bar	<b>SINGLE CYLINDER</b> Not Recommended	<b>SINGLE CYLINDER</b> 400 HP Max 55 MPH Max
	<b>DUAL CYLINDER</b> 600 HP Max 55 MPH Max HC53xx Cylinders HO60xx Tie Bar	<b>DUAL CYLINDER</b> 700 HP Max HC67xx Cylinders <i>(See Notes 2 &amp; 4)</i> HO67xx Tie Bar	<b>DUAL CYLINDER</b> 500 HP Max 55 MPH Max
<b>DUAL ENGINE COUNTER ROTATING</b>	<b>SINGLE CYLINDER</b> 600 HP Max 55 MPH Max HC53xx Cylinder HO60xx Tie Bar	<b>SINGLE CYLINDER</b> Not Recommended	<b>SINGLE CYLINDER</b> 500 HP Max 55 MPH Max
	<b>DUAL CYLINDER</b> 600 HP Max 55 MPH Max HC53xx Cylinders HO60XX Tie Bar	<b>DUAL CYLINDER</b> 700 HP Max HC67xx Cylinders <i>(See Notes 2 &amp; 4)</i> HO67xx Tie Bar	<b>DUAL CYLINDER</b> 500 HP Max 55 MPH Max
<b>TRIPLE ENGINE ONE WITH COUNTER ROTATING</b>	<b>DUAL CYLINDER</b> 900 HP Max 55 MPH Max HC53xx Cylinders HO60xx Tie Bar	<b>DUAL CYLINDER</b> 1050 HP Max HC67xx Cylinders <i>(See Notes 2 &amp; 4)</i> HO67xx Tie Bars HA67xx Center Engine <i>(See Note 2)</i> Bracket Kit	<b>NOT RECOMMENDED</b>
	<b>TRIPLE CYLINDER</b> 900 HP Max 55 MPH Max HC53xx Cylinders HO60xx Tie Bar	<b>TRIPLE CYLINDER</b> 1050 HP Max HC67xx Cylinders <i>(See Notes 2 &amp; 4)</i> HO67xx Tie Bars	<b>NOT RECOMMENDED</b>

1 Teleflex has specific steering equipment for boats that are driven aggressively, used in severe conditions or with more than 300 HP per engine.  
 2 **ALL ENGINES** over 300 HP and all boats that are driven aggressively must use a high strength tiller bolt, kit part # HA5822. All front mount cylinders built after June 15, 2007 will have this high strength bolt included in the box. High strength tiller bolts can be identified by the marking "TFX -ARP" on the head of the bolt (refer to NOTICE page 3-5).

3 HC63xx PRO Cylinders are designed for all those critical high speed, single outboard engine boats, such as Bass, Flats combo Race/Ski and other performance orientated boats capable of speeds in excess of 65 mph. For optimal performance, the use of SeaStar PRO Kevlar Steering Hoses is recommended.

4 HC67xx Tournament cylinders are designed for use with high powered fishing/sport boats. If your application calls for dual or triple outboard engines, is capable of speeds exceeding 55 mp/h and runs in open water, Tournament Cylinders should be used.

# Single Engine Application Guide

Prior to selecting a cylinder from this application guide, please refer to page 3-4 to ensure that you are selecting the correct cylinder for your engine/boat.

**NOTICE**

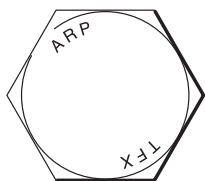
*Is your Splashwell wide enough? Check page 3-11 for space requirements.*

**NOTICE**

Front Mount Cylinder part# HC5345 is included in the SeaStar Outboard Steering Kits HK6400/63XX and HK7400/73XX. If your engine requires the use of a cylinder other than the HC5345 (see application guides on this page through 3-6) you will need to purchase the individual components (helm, cylinder, hoses, etc.) separately.

**NOTICE**

High Strength Tiller bolt, part# HA5822. ALL cylinders shipped after June 15th, 2007 will have this bolt included in the cylinder package.



**CAUTION**

**SeaStar PRO Helms require the use of SeaStar PRO (1500 psi) Kevlar steering hoses.**

MFG	YEAR	MODEL	CYL	NOTES
<b>FORCE</b>	1985-DATE	90-150 HP	HC5345	
<b>HONDA</b>	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	
<b>JOHNSON/ EVINRUDE</b>	1977-1990	65-300HP	HC5348	Inc. ETech 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	
	2005-DATE	E250 DPX Vindicator	HC5348	
<b>MERCURY</b>	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	
<b>NISSAN</b>	1990-DATE	90-140HP	HC5345	
<b>SUZUKI</b>	1986-DATE	100HP	HC5345	<b>NOT 1996</b> See Note 1 See Note 1
	1986-2002	115-140HP	HC5345	
	1986-DATE	150-300HP 2 & 4-Stroke	HC5345	
	1996 ONLY	115-140HP	HC5348	
	1998-DATE	40-140HP 4-Stroke	HC5358	
	2003-DATE	90HP 4-Stroke	HC5358	
<b>US MARINE</b>	1996-DATE	90-120HP	HC5345	
<b>YAMAHA</b>	1990-2003	40-90HP	HC5345	See Note 5 See Note 5 See Note 1 See Note 4
	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	25-60 HP 4-Stroke	HC5348	
	2007-DATE	350 HP	HC5345	
<b>YANMAR</b>	1994-DATE	90-120HP	HC5345	

- Requires Spacer Kit# HO5090.
  - May Require Extensive Cowling Modifications.
  - MUST** use High Strength Tiller bolt, part # HA5822. Refer to the NOTICE on this page identifying the high strength bolt.
  - Optional cylinder part # HC5358. Slight interference may occur when using the HC5358, with the engine in the full tilt position.
  - Cylinder part # HC5358 may also be used in these single engine applications.
- The above engine applications are current through the revision date shown. For up-to-date engine applications go to: [www.seastarsteerng.com](http://www.seastarsteerng.com)

REVISION DATE: MAR. 24th 2008

# Twin Engine Application Guide

Prior to selecting a cylinder from this application guide, please refer to page 3-4 to ensure that you are selecting the correct cylinder for your engine/boat.

**NOTICE**

*Is your Splashwell wide enough? Check page 3-11 for space requirements.*

MFG	YEAR	MODEL	CYL	TIE BAR KITS		NOTES
				TWIN x 1	TWIN x 2	
<b>FORCE</b>	1985-DATE	90-150 HP	HC5345	HO5008A	HO5008A	
<b>HONDA</b>	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	N/A	HO6002	See Note 7
	2001-DATE	225HP 4-Stroke	HC5345	HO6001	HO6002	
	2003-DATE	BF135HP	HC5345	HO6003	HO6002	
<b>JOHNSON/ EVINRUDE</b>	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	<i>Inc. ETech Engines.</i>
	1996-DATE	75-250HP Ficht	HC5345	HO6003	HO6002	
	1998-DATE	40-140HP 4-Stroke	HC5358	HO6003	HO6002	See Note 2
	2000-DATE	115HP FICHT	HC5358	HO6003	HO6002	See Note 2
	2002-DATE	200-225HP 4-Stroke	HC5345	HO6003	HO6002	
	2005-DATE	E250 DPX Vindicator	HC5348	HO6003	HO6002	
<b>MERCURY</b>	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	250-300HP XS	HC5345	N/A	HO6002	See Note 6
<b>NISSAN</b>	1990-DATE	90-140HP	HC5345	HO6001	HO6002	
<b>SUZUKI</b>	1986-DATE	100HP	HC5345	HO6003	HO6002	
	1986-2002	115-140HP	HC5345	HO6001	HO6002	<b>NOT 1996</b>
	1986-DATE	150-300HP 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
<b>US MARINE</b>	1996-DATE	90-120HP	HC5345	HO6001	HO6002	
<b>YAMAHA</b>	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	25-60HP 4-Stroke	HC5348	HO6003	HO6002	See Note 2
	2006-DATE	350HP	<i>MUST Use Tournament Cylinders. Refer to Page 3-8</i>			
<b>YANMAR</b>	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.

7. Interference will occur when using a single HC5345 cylinder and HO6003 tiebar when installed in the aft hole on the steering arm. Options include, a) install tiebar into most forward hole (this will limit steering articulation), b) purchase K-6 Cylinder, and tiebar kit part # HO5009. There will be no interference when using twin HC5345 cylinders.

The above engine applications are current through the revision date shown. For up-to-date engine applications go to: [www.seastarsteerng.com](http://www.seastarsteerng.com)

**REVISION DATE:** NOV. 23rd 2007



# Triple Engine Application Guide

Prior to selecting a cylinder from this application guide, please refer to page 3-4 to ensure that you are selecting the correct cylinder for your engine/boat.

**⚠ WARNING**

***Use of incorrect components on a high speed/performance boat, may lead to bending and breaking of components resulting in steering failure causing property damage and/or personal injury.***

**NOTICE**

*Tournament Tiebar Cylinder should be used on ALL Tournament/High Speed (60 Mph and above) multi-engine boats. Please refer to page 3-8.*

MFG	YEAR	MODEL	CYL	PORT TO DRIVE CYL	STARBOARD TO DRIVE CYL	NOTES
<b>FORCE</b>	1995-DATE	90-120HP	HC5345	HO6001	HO6002	See Note 4
<b>HONDA</b>	1996-DATE 2001-DATE	75-90HP 135-225HP 4-Stroke	HC5345 HC5345	HO6001 HO6003	HO6002 HO6002	See Note 2, 4 See Note 4
<b>MERCURY</b>	1989-DATE 2003-DATE	75-275HP 250-300HP XS	HC5345 HC5345	HO5081 HO6002 HO6002		See Note 4 See Note 3, 4
<b>JOHNSON/ EVINRUDE</b>	1991-DATE 1991-DATE 1991-DATE 1991-DATE 1998-DATE 2005-DATE	90-175HP 250-300HP 200-225HP 90-225HP Ficht 65-70HP 4-Stroke E250 DPX Vindicator	HC5345 HC5345 HC5345 HC5345 HC5345 HC5348	HO5080 HO6001 HO6002 HO6003 HO6002 HO5080 HO6003 HO6002 HO6003 HO6002		See Note 4 See Note 4 See Note 4 See Note 2, 4 See Note 1, 4 See Note 4
<b>SUZUKI</b>	1986-DATE 1986-DATE 1998-DATE 2001-DATE	150-200HP 2 & 4-Stroke 115-140HP 65-70HP 4-Stroke 250-300HP	HC5345 HC5345 HC5345 HC5345	HO6003 HO6003 HO6001 HO6001	HO6002 HO6002 HO6002 HO6002	See Note 4 See Note 4 See Note 1, 4 See Note 4
<b>YAMAHA</b>	1990-DATE 1990-DATE 1998-DATE 2001-DATE 2006-DATE	100-200HP 225-250HP 4-Stroke 80-100HP 4-Stroke 150-300HP HPDI 350HP	HC5345 HC5358 HC5358 HC5358	HO6001 colspan="2">HO5080 HO6001 HO6002 HO6001 HO6002	See Note 4 See Note 4 See Note 4 See Note 4 See Note 3	
				<i>MUST Use Tournament Cylinders. Refer to Page 3-8</i>		
1. Requires Kit HO5090		3. One cylinder required per engine. MUST use high strength tiller bolt part # HA5822.		4. For high performance/speed applications, please refer to the Caution noted at the bottom of this page.		
2. Minimum Engine Center = 29"						
The above engine applications are current through the revision date shown. For up-to-date engine applications go to: <a href="http://www.seastarsteerng.com">www.seastarsteerng.com</a>						

**REVISION DATE:** SEPT. 4th 2007

**NOTICE**

*A minimum of two cylinders will be required to operate a triple engine installation with the exception of Mercury XS engines which MUST use one cylinder per engine.*

**NOTICE**

*Is your Splashwell wide enough? Check page 3-11 for space requirements.*

# Tournament Series Tiebar Cylinders

## NOTICE

Maximum engine centers for:  
 Single cylinder = 41"  
 Twin cylinders = 32-1/8"

With the power and speed increasing for performance orientated fishing boats, Teleflex Marine 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 Tournament Tiebar Cylinders to achieve performance, durability and safety.



MAKE	YEAR	TWIN ENGINE CYLINDERS	TRIPLE ENGINE CYLINDERS *Note
<b>HONDA</b> All models	200-250HP	HC6750 (s) x 1 HC6751 (p) x 1 Tiebar HO6700 x 1	HC6750 (s) x 1 HC6751 (p) x 1 HC6752 (c) x 1 2 x HO6700 tiebar kits required for triples.
<b>EVINRUDE</b> Salt/Fresh/DI engines	200-300HP	HC6753 (s) x 1 HC6754 (p) x 1 Tiebar HO6700 x 1	HC6753 (s) x 1 HC6754 (p) x 1 HC6755 (c) x 1 2 x HO6700 tiebar kits required for triples.
<b>MERCURY</b> Verado N/A	200-300HP	HC6750 (s) x 1 HC6751 (p) x 1 Tiebar HO6700 x 1	HC6750 (s) x 1 HC6751 (p) x 1 HC6752 (c) x 1 2 x HO6700 tie bar kits required for triples.
	250-300HP XS (One cylinder per engine required.)	HC6750 (s) x 1 HC6751 (p) x 1 Tiebar HO6700 x 1	HC6750 (s) x 1 HC6751 (p) x 1 HC6752 (c) x 1 2 x HO6700 tiebar kits required for triples.
<b>SUZUKI</b> All models	200-300HP 2 and 4 stroke	HC6750 (s) x 1 HC6751 (p) x 1 Tiebar HO6700 x 1	HC6750 (s) x 1 HC6751 (p) x 1 HC6752 (c) x 1 2 x HO6700 tiebar kits required for triples.
<b>YAMAHA</b> All models	200-300HP	HC6753 (s) x 1 HC6754 (p) x 1 Tiebar HO6700 x 1	HC6753 (s) x 1 HC6754 (p) x 1 HC6755 (c) x 1 2 x HO6700 tiebar kits required for triples.
	350HP	HC6750 (s) x 1 HC6751 (p) x 1 Tiebar HO6700 x 1	HC6750 (s) x 1 HC6751 (p) x 1 HC6752 (c) x 1 2 x HO6700 tiebar kits required for triples.

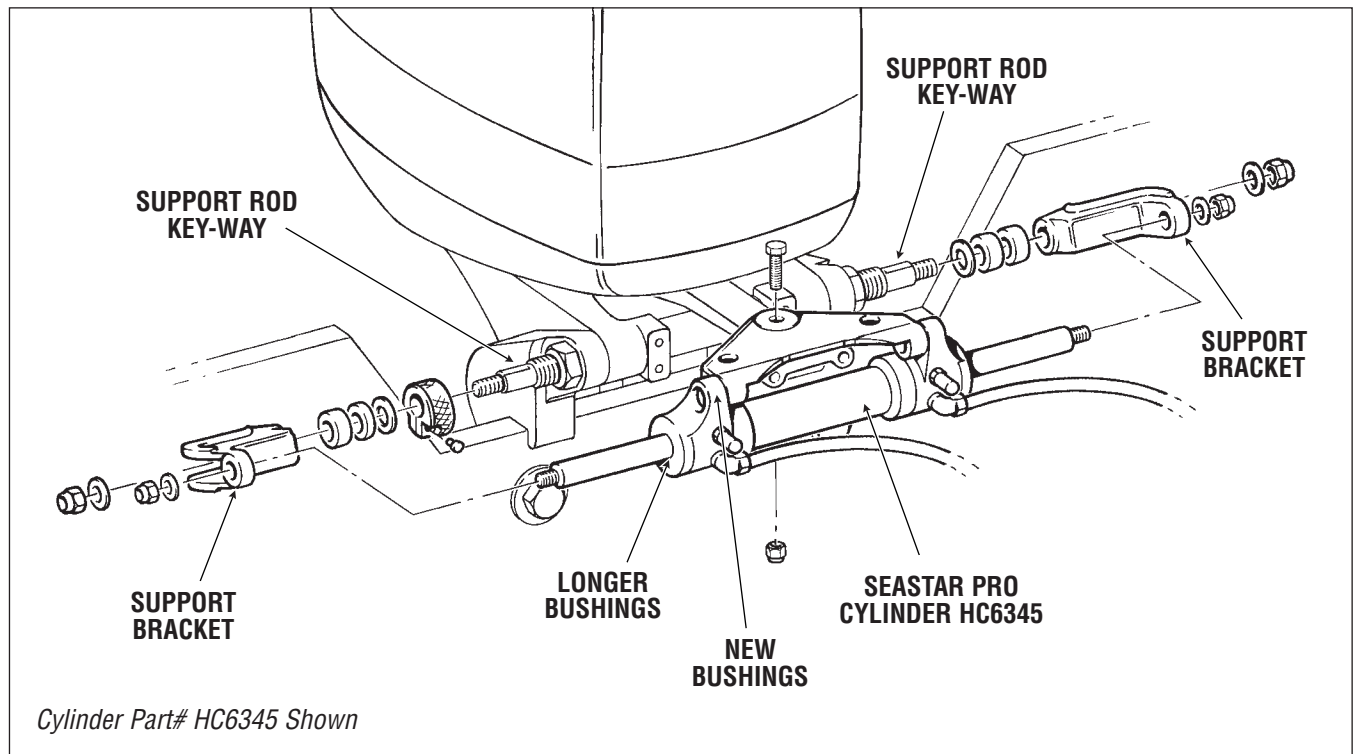
REVISION DATE: NOV. 22nd 2007

## NOTICE

\* All triple engine applications, excluding the Mercury XS line, may use a twin cylinder set up with the additional purchase of a "center engine bracket kit, part # HA6701.

# SeaStar Pro Steering Systems

SeaStar PRO Outboard Steering systems are suited for all those critical high speed, single powered outboard boats, like Bass, Flats, combo Race/Ski and other performance orientated boats capable of speeds in excess of 65mph. Before ordering it is necessary to determine the proper cylinder and helm pump for your application. Using the table on page 3-10, choose the correct cylinder as per your outboard engine. All SeaStar PRO systems require the use of a SeaStar PRO helm and SeaStar PRO (1500psi) reinforced Kevlar hoses ONLY!



## ⚠ WARNING

**SeaStar PRO Helm systems require the use of SeaStar PRO (1500 psi) reinforced Kevlar Hoses ONLY.**

## Helm Pumps

SeaStar PRO Steering systems have the option to install a standard front mounting helm, both traditional and sport tilt as well as rear mount helm pumps. Please refer to page 9-1 for style and page 9-5 for PRO Helm part numbers.

## ⚠ CAUTION

**SeaStar PRO Helms require the use of SeaStar PRO (1500 psi) Kevlar steering hoses**

# SeaStar Pro Application Guide

**NOTICE**

*Is your Splashwell wide enough? Check page 3-11 for space requirements.*

MFG	YEAR	MODEL	CYL	NOTES
<b>FORCE</b>	1985-DATE	90-150HP	HC6345	
<b>HONDA</b>	1996-DATE	150-300HP	HC6345	
<b>JOHNSON/ EVINRUDE</b>	1977-1990	150-300HP	N/A	Contact Teleflex
	2002-DATE	150-250HP 4-Stroke	HC6345	
	2003-DATE 2005-DATE	150-300HP ETech E250HP Vindicator	HC6345 N/A	Contact Teleflex
<b>MERCURY</b>	1989-DATE	150-300 2-Stroke, 4-Stroke and XS Engines	HC6345	XS engine requires mercury supplied tiller bolt on install
<b>SUZUKI</b>	1986-DATE	150-250 HP 2 and 4-Stroke	HC6345	
<b>YAMAHA</b>	1986-DATE	150-250HP 2 and 4-Stroke	HC6345	
	2002-DATE	300 HPDI	HC6358	

REVISION DATE: FEB. 10<sup>TH</sup> 2006

**NOTICE**

*SeaStar PRO Steering Systems can not be used with an unbalanced steering cylinder.*

# Cylinder Installation and General Dimensions

## ⚠ WARNING

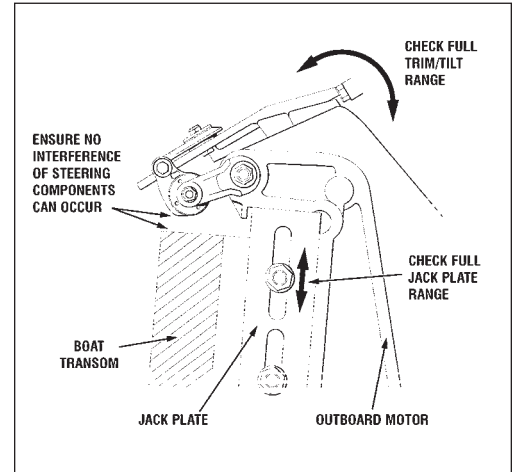
Operational interference of the steering cylinder/cylinder fittings and jackplates/transom/splashwell can occur under certain conditions. Check installation thoroughly throughout the full range of Motor Tilt, Jack Height and Trim before making final installation.

If interference does occur, contact:

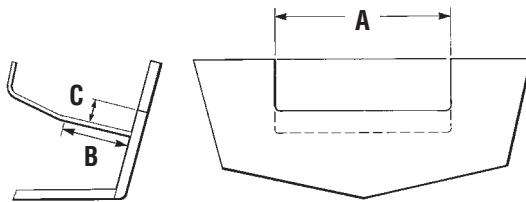
**Teleflex Canada Limited Partnership** for additional information/options.

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

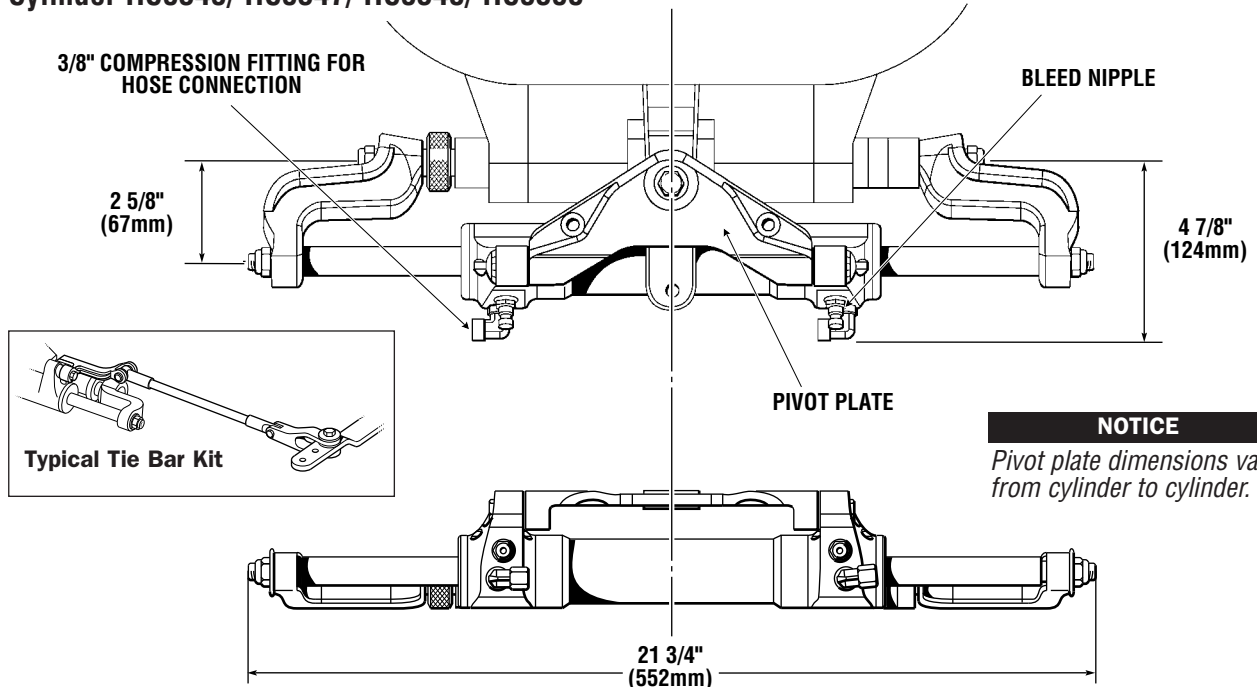


# OF ENGINES	A	B	C	MIN. ENGINE CENTER DISTANCE
1	22" (559mm)	6" (152mm)	5" (127mm)	N/A
2	49" (1244mm)	6" (152mm)	5" (127mm)	26" (660mm)

#### NOTES

- Dimensional restrictions also apply to external motor mount brackets.
- 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.
- Minimum engine center distance is 26" unless engine manufacturer recommendation is greater.

### Cylinder HC5345/ HC5347/ HC5348/ HC5358



Typical Tie Bar Kit

#### NOTICE

Pivot plate dimensions vary from cylinder to cylinder.

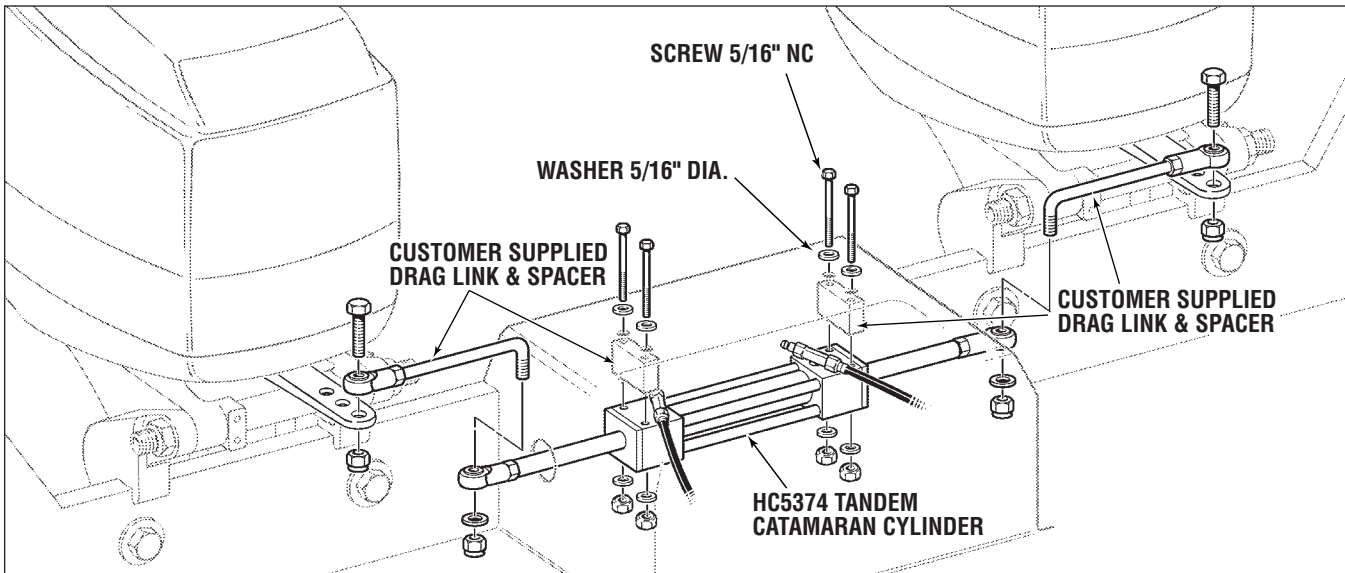
# Outboard-Catamaran

## Horsepower Limitations

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

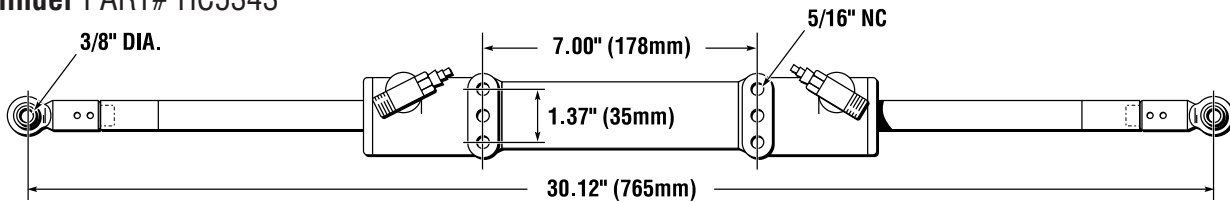
To establish whether or not this cylinder is suitable for your application, the following points should be considered:

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.

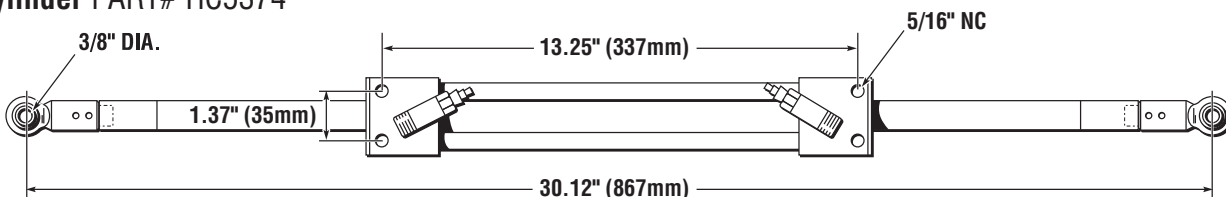


Cylinder Part# HC5374 Shown

### 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 3-14 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.

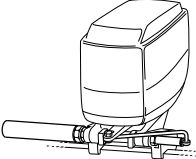
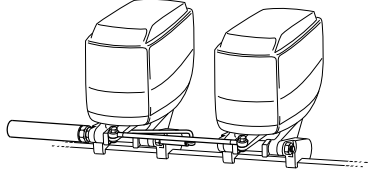
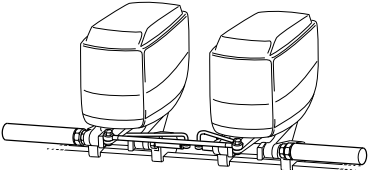
### **NOTICE**

*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.*



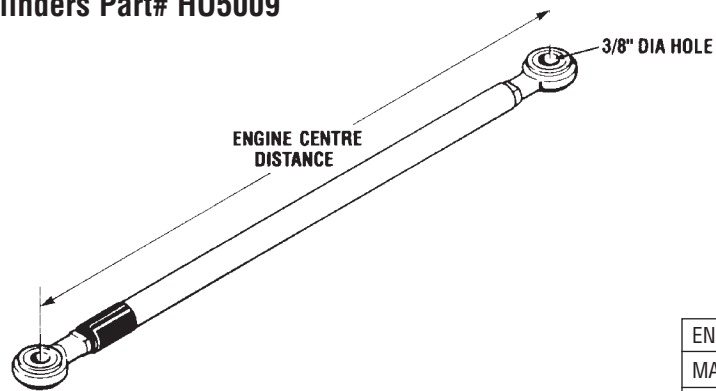
# Order Guide

ENGINE/ CYLINDER CONFIGURATION	DESCRIPTION	QTY REQ	MODEL	PART NUMBER	REF. PAGE #	
<b>SINGLE ENGINE</b> (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	9-6	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	10-2	
	OIL	3	SEASTAR OIL	HA5430	11-1	
	FOR EXTRA STEERING STATIONS ADD:					
	HELM	1	* SEASTAR I- STANDARD	HH5271	9-6	
	FITTING KIT	1	ADD A STATION	HF5501	10-10	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	10-2	
	OIL	1	SEASTAR OIL	HA5430	11-1	
	<b>DUAL ENGINE</b> (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	9-6	
HOSE KIT		1	OUTBOARD HOSE	HO51__	10-2	
OIL		3	SEASTAR OIL	HA5430	11-1	
FOR EXTRA STEERING STATIONS ADD:						
HELM		1	* SEASTAR I- STANDARD	HH5271	9-6	
FITTING KIT		1	ADD A STATION	HF5501	10-10	
HOSE KIT		1	OUTBOARD HOSE	HO51__	10-2	
OIL		1	SEASTAR OIL	HA5430	11-1	
<b>DUAL ENGINE</b> (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	9-6	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	10-2	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	10-2	
	HOSE KIT	1	OUTBOARD HOSE	HO51__	10-2	
	FITTING KIT	1	TEE FITTINGS	HF5530	10-1	
	OIL	3	SEASTAR OIL	HA5430	11-1	
	FOR EXTRA STEERING STATIONS ADD:					
	HELM	1	** SEASTAR II- STANDARD	HH5272	9-6	
FITTING KIT	1	ADD A STATION	HF5501	10-10		
HOSE KIT	1	OUTBOARD HOSE	HO51__	10-2		
OIL	1	SEASTAR OIL	HA5430	11-1		
<b>OPTIONAL EQUIPMENT</b>	BACK PLATE KIT		(FOR STANDARD HELMS)	HA5418	9-3	
	20 DEGREE WEDGE		(FOR STANDARD HELMS)	HA5419	9-3	
	AUTOPILOT FITTING KIT		(FOR ALL HELMS)	HF5501	10-10	
	* TILT HELM- SEASTAR I			HH5741	9-7	
	REAR MOUNT HELM- SEASTAR I			HH5261	9-7	
	** TILT HELM- SEASTAR II			HH5742	9-7	
	REAR MOUNT HELM- SEASTAR II			HH5262	9-7	
POWER ASSIST STEERING			PA1200	2-1		



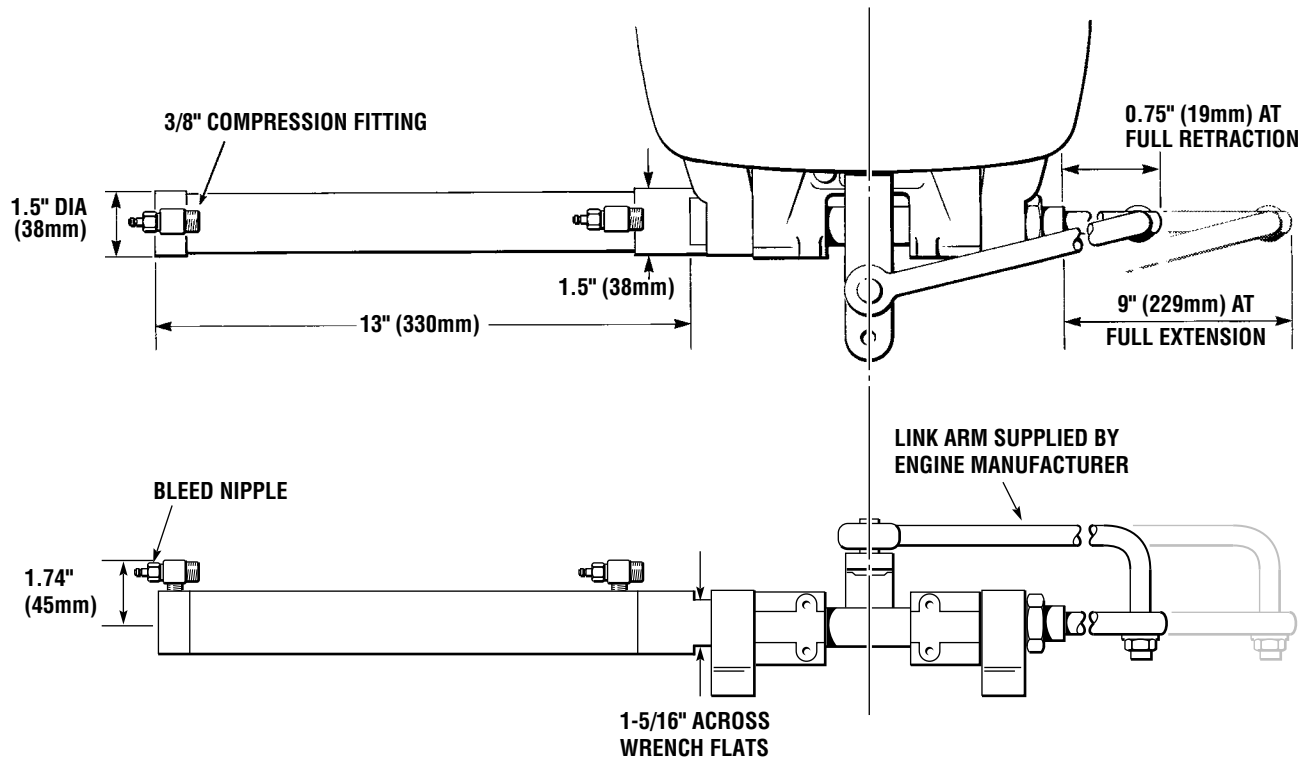
# General Dimensions

## 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).

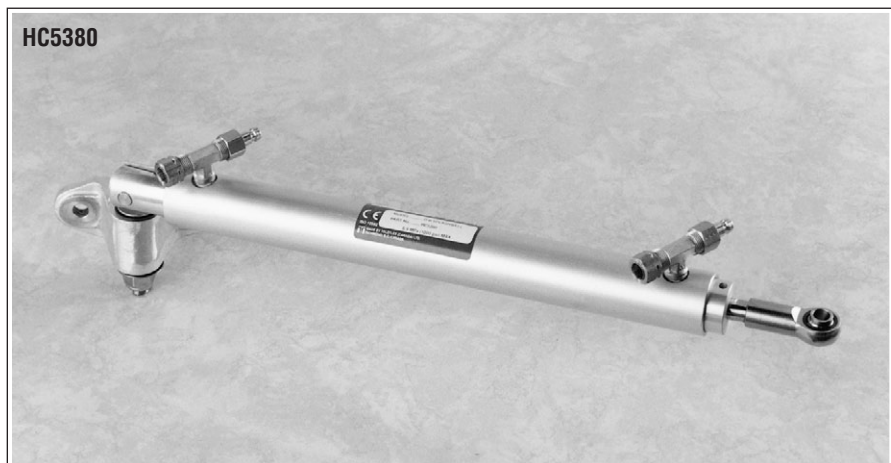
## How to select a splashwell mount outboard steering system

- 1) From the order guide on page 3-17 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 10-2).
- 5) Confirm that there is sufficient space available in the splashwell and dash areas for the steering components.

## NOTICE

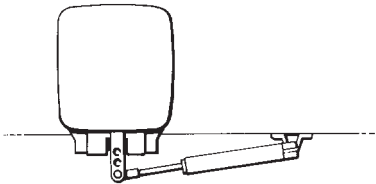
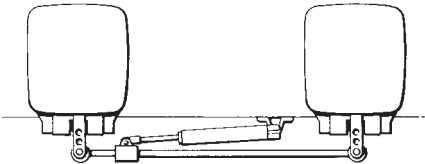
*Not recommended for use in installations where;*

- 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 60mph (97km/h), or*
- e) the power exceeds maximum Coast Guard or M.O.T. recommendations for the boat.*



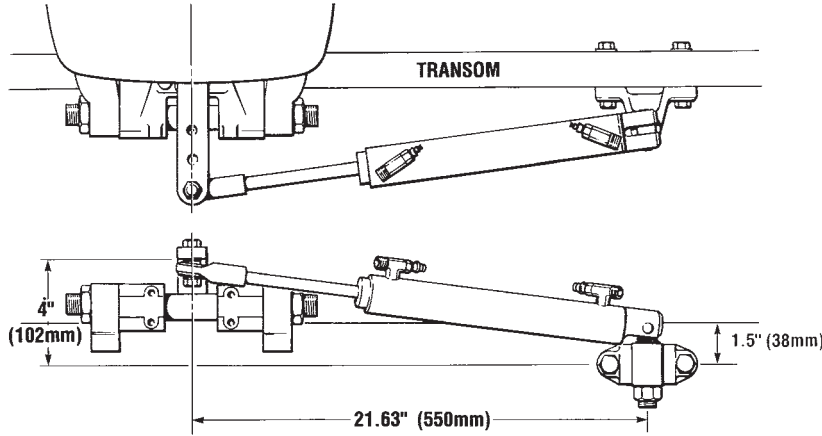
# Order Guide

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.

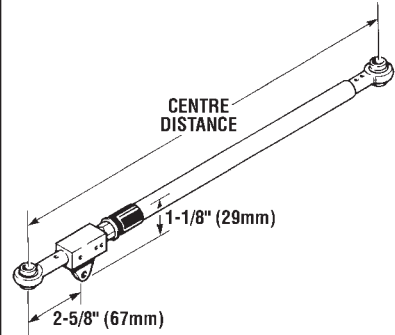
ENGINE/ CYLINDER CONFIGURATION	DESCRIPTION	QTY REQ	MODEL	PART NUMBER	REF. PAGE #	
<b>SINGLE ENGINE</b> (SINGLE CYLINDER) APPLICATIONS UP TO 300 HP MAX NUMBER OF TURNS 5.5/6.5  	CYLINDER	1	SPLASHWELL	HC5380		
	HELM	1	* SEASTAR I- STANDARD	HH5271	9-6	
	HOSE KIT	1	OUTBOARD HOSE	H051_ _	10-2	
	OIL	3	SEASTAR OIL	HA5430	11-1	
	FOR EXTRA STEERING STATIONS ADD:					
	HELM	1	* SEASTAR I- STANDARD	HH5271	9-6	
	FITTING KIT	1	ADD A STATION	HF5501	10-10	
	HOSE KIT	1	OUTBOARD HOSE	H051_ _	10-2	
	OIL	1	SEASTAR OIL	HA5430	11-1	
	<b>DUAL ENGINE</b> (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	HO5010	
HELM		1	* SEASTAR I- STANDARD	HH5271	9-6	
HOSE KIT		1	OUTBOARD HOSE	H051_ _	10-2	
OIL		3	SEASTAR OIL	HA5430	11-1	
FOR EXTRA STEERING STATIONS ADD:						
HELM		1	* SEASTAR I- STANDARD	HH5271	9-6	
FITTING KIT		1	ADD A STATION	HF5501	10-10	
HOSE KIT		1	OUTBOARD HOSE	H051_ _	10-2	
OIL	1	SEASTAR OIL	HA5430	11-1		
<b>OPTIONAL EQUIPMENT</b>	BACK PLATE KIT		(FOR STANDARD HELMS)	HA5418	9-3	
	20 DEGREE WEDGE		(FOR STANDARD HELMS)	HA5419	9-3	
	AUTOPILOT FITTING KIT		(FOR ALL HELMS)	HF5501	10-10	
	* TILT HELM- SEASTAR I			HH5741	9-7	
	REAR MOUNT HELM- SEASTAR I			HH5261	9-7	
	POWER ASSIST STEERING			PA1200	2-1	

# General Dimensions

## Mounting Configuration



## Tie Bar Kit# H05010

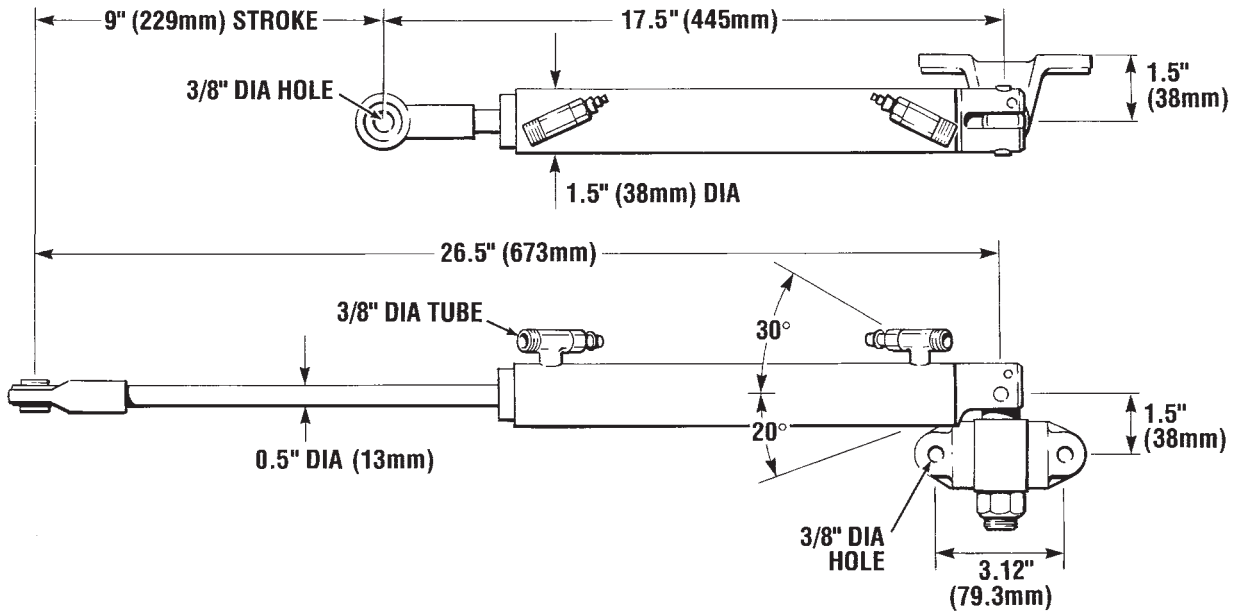


36" (914mm)	MAXIMUM ENGINE CENTRE DISTANCE
26" (660mm)	MINIMUM ENGINE CENTRE DISTANCE

## PART# HC5380

### NOTICE

*DO NOT use a PRO Helm pump with this, or any other unbalanced steering cylinder.*



# 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.

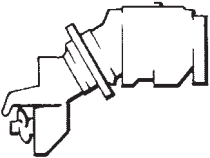
---

## How to select a steering system for a stern drive

- 1) From the order guide on page 4-2 select the drive configuration based on the number of drives.
- 2) From the application guide on page 4-3 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 #	
<b>SINGLE &amp; DUAL STERNDRIVE</b> (For dual sterndrive applications use engine manufactures supplied tie bar.)  	CYLINDER	1	SEE APPLICATION GUIDE			
	HELM	1	* SEASTAR I STANDARD (SEE NOTE 1)	HH5271	9-6	
			** SEASTAR II-STANDARD (SEE NOTE 2)	HH5272	9-6	
	OIL	3	SEASTAR OIL	HA5430	11-1	
	TUBE/HOSE		SEE NOTE 3		10-6	
	FOR EXTRA STEERING STATION ADD:					
	HELM	1	* SEASTAR I STANDARD (SEE NOTE 1)	HH5271	9-6	
			** SEASTAR II-STANDARD (SEE NOTE 2)	HH5272	9-6	
	FITTING KIT	1	ADD A STATION			
			- FOR SEASTAR I HELMS	HF5502	10-11	
		- FOR SEASTAR II HELMS	HF5501	10-10		
OIL	1	SEASTAR OIL		11-1		
EXTRA TUBE/HOSE		SEE NOTE 3		10-6		
<b>OPTIONAL EQUIPMENT</b>						
	BACK PLATE KIT		(FOR STANDARD HELMS)	HA5418	9-3	
	20 DEGREE WEDGE KIT		(FOR STANDARD HELMS)	HA5419	9-3	
	AUTOPILOT FITTING KIT		(FOR ALL HELMS)	HF5502	10-11	
	* TILT HELM-SEASTAR I			HH5741	9-7	
	REAR MOUNT HELM-SEASTAR I			HH5261	9-7	
	** TILT HELM-SEASTAR II			HH5742	9-7	
	REAR MOUNT HELM-SEASTAR I			HH5262	9-7	
	POWER ASSIST STEERING			PA1200	2-1	

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 4-3 for recommendations.
3. \* **For Seastar I systems:** use 3/8" dia nylon tubing ref part No. HT5\_ \_ (Refer to page 10-6)

- \* **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 10-2)
- B)** Copper tube:  
3/8" diameter copper tube and hose kit part No. HF5508 (Refer to page 10-6)
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



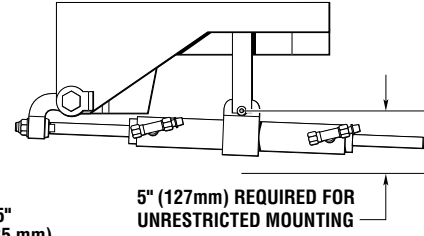
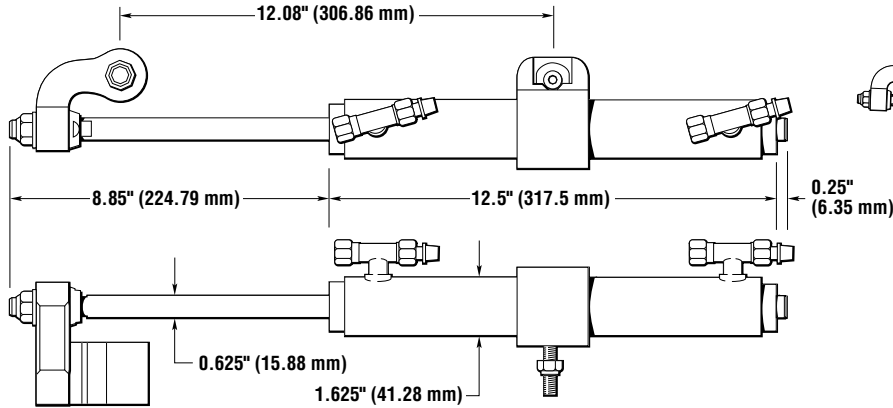
ENGINE MANUFACTURER	STEERING CONFIGURATION	ENGINE/DRIVE DESCRIPTION	YEAR	CYLINDER DESCRIPTION		NUMBER TURNS LOCK TO LOCK		NOTES
				MODEL No.	PART No.	SEASTAR I HELM	SEASTAR II HELM	
<b>BMW</b>	NON POWER ASSIST	ALL	TO DATE	BA125-8EMV	HC5330	4.9	N/A	1
	POWER ASSIST	ALL	TO DATE	125-8EM	HC5328	4.9/5.8	3.4/4.1	2
<b>MERCUISER</b>	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	
<b>OMC</b>	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		
<b>VOLVO</b>	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		
<b>YAMAHA</b>	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 4-4.
- Requires cylinder rod end adapter HA5424 supplied by Teleflex Canada Limited Partnership. Refer to diagram on page 4-4.
- 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 12<sup>TH</sup> 2004

# General Dimensions

## HC5332 135-7EM

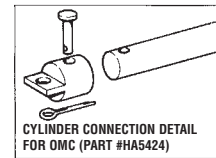
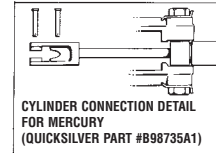
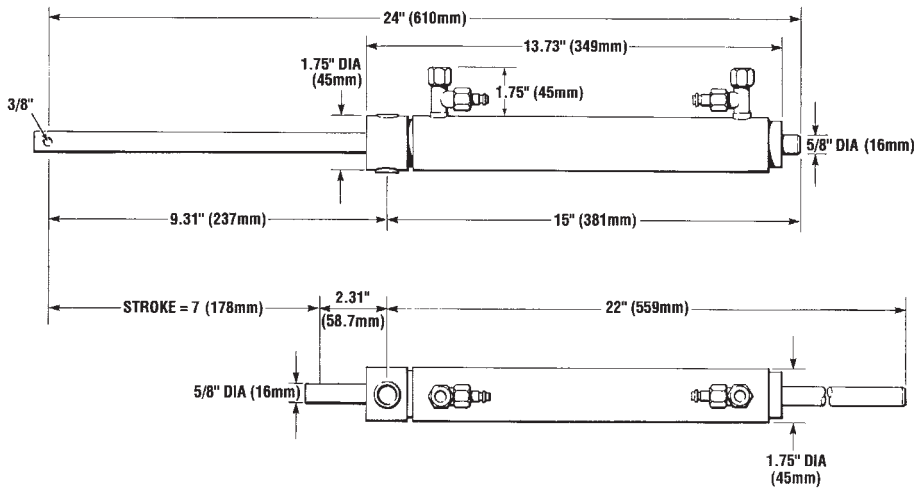


5" (127mm) REQUIRED FOR UNRESTRICTED MOUNTING

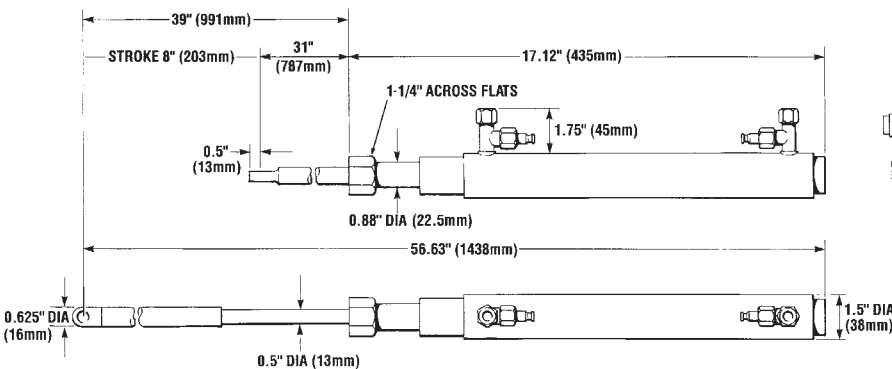
**NOTICE**

*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

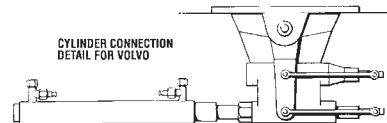
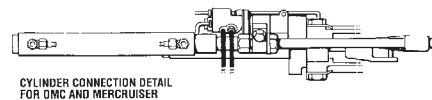


## HC5328 125-8EM



**NOTICE**

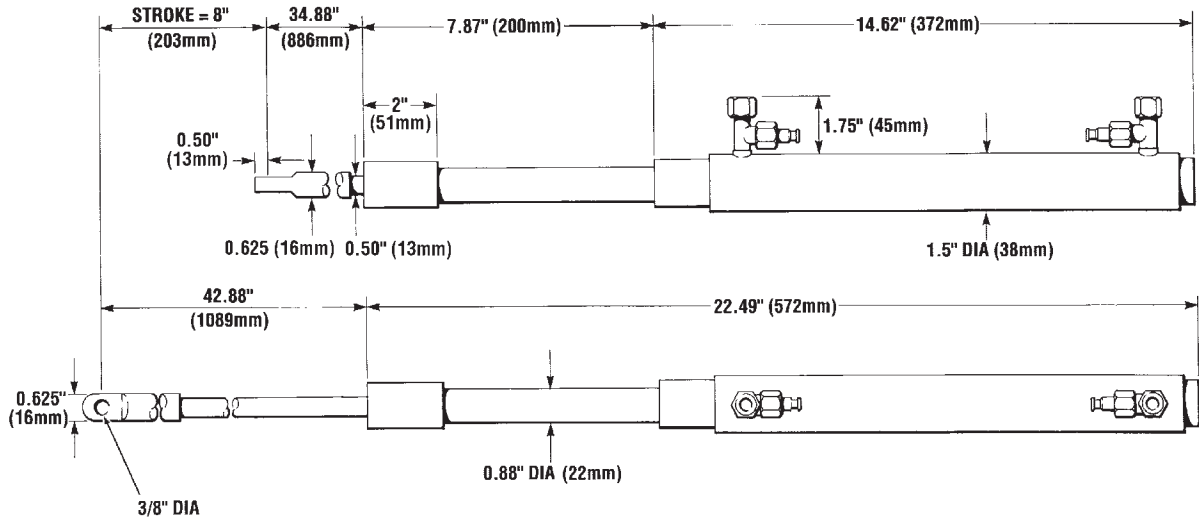
*DO NOT use a PRO Helm pump with this, or any other unbalanced steering cylinder.*



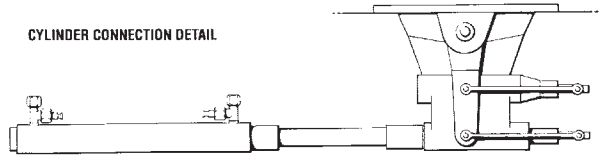


# General Dimensions

## HC5329 125-8VEM



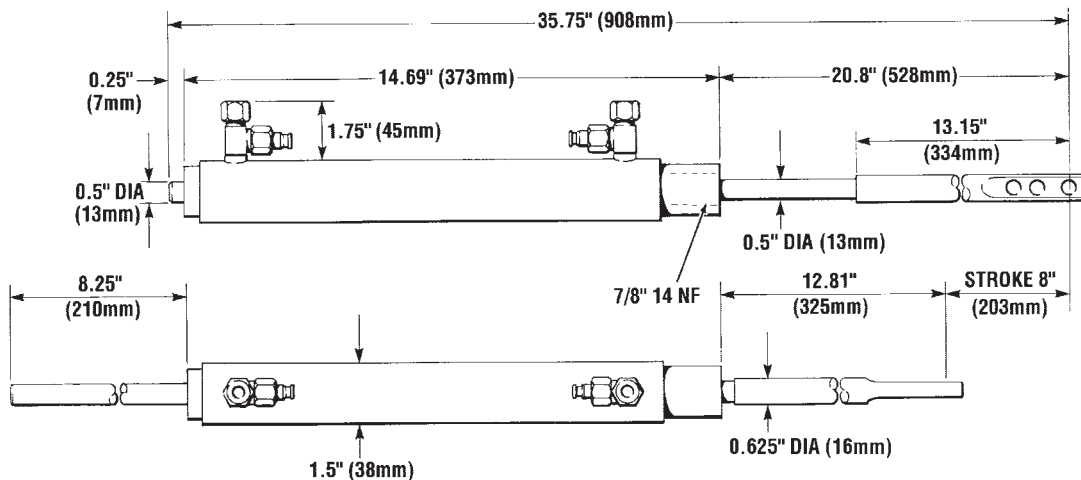
CYLINDER CONNECTION DETAIL



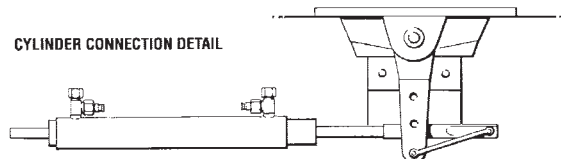
**NOTICE**

*DO NOT use a PRO Helm pump with this, or any other unbalanced steering cylinder.*

## HC5330 BA125-8EMV

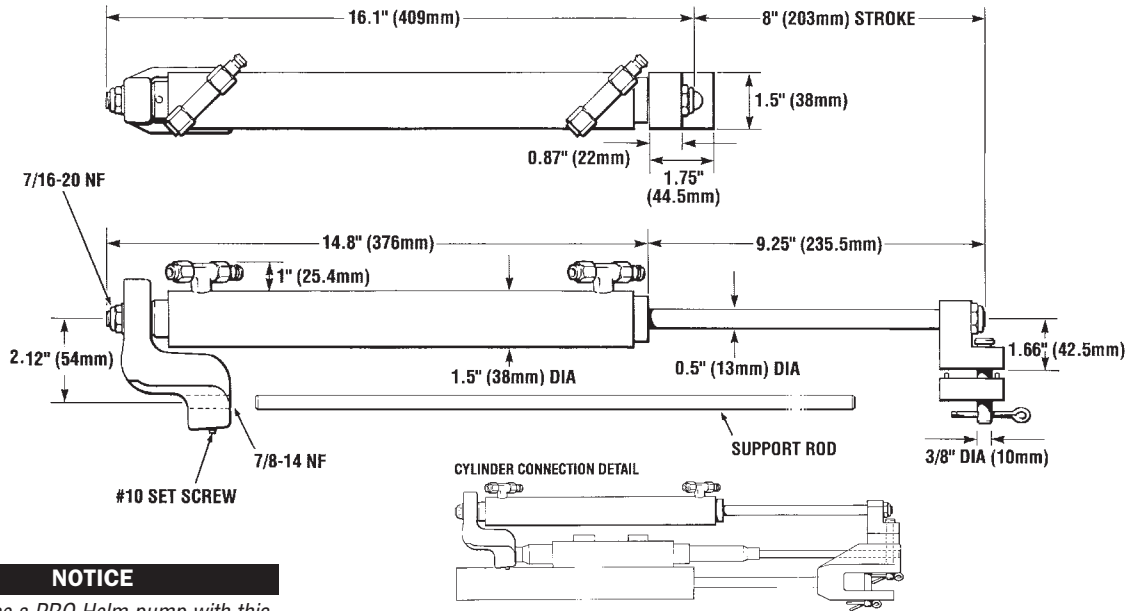


CYLINDER CONNECTION DETAIL



# General Dimensions

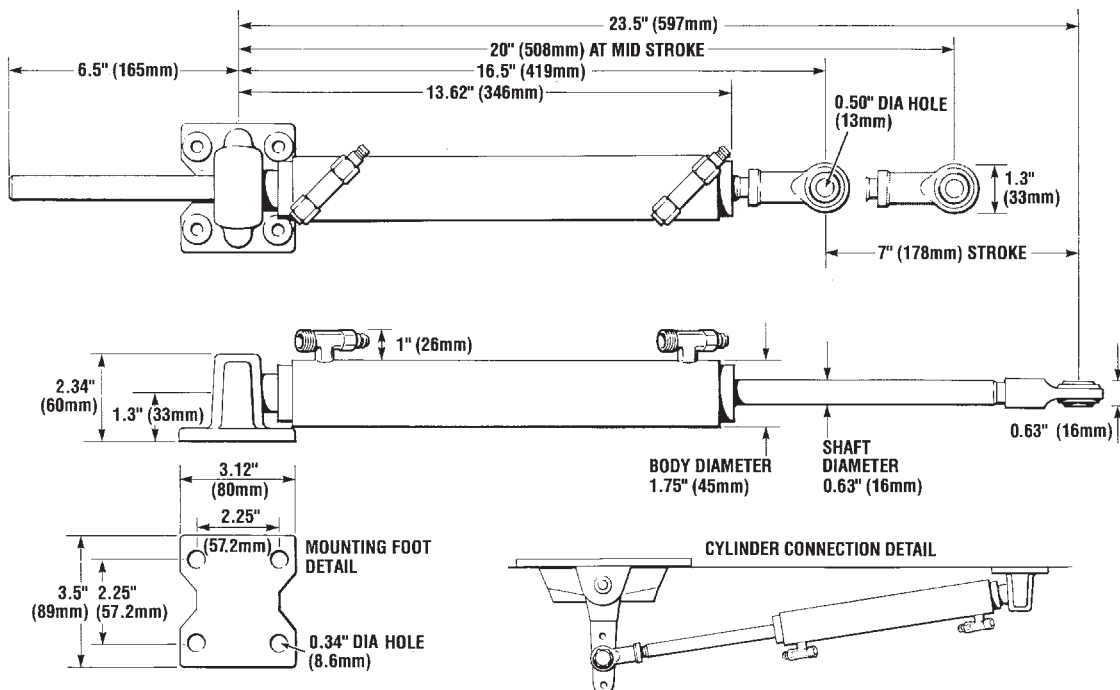
## HC5331 92-VPS



**NOTICE**

DO NOT use a PRO Helm pump with this, or any other unbalanced steering cylinder.

## HC5314 BA150-7ATM



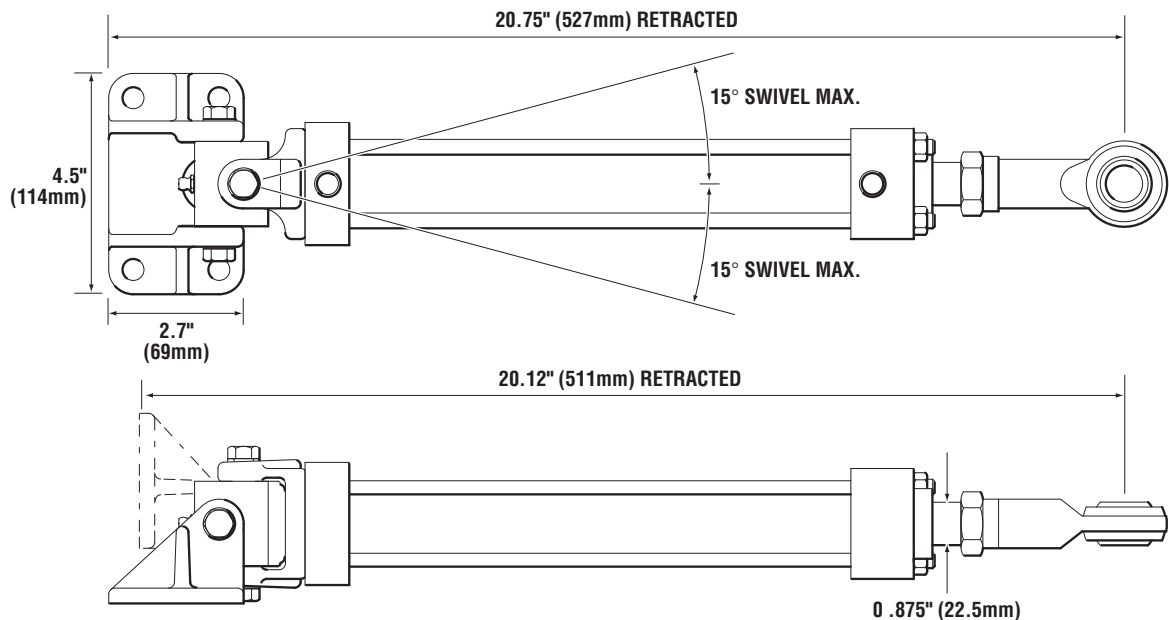
**Performance I/O and Outboard Cylinders**

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.

**NOTICE**

*Due to the large volume of the K-5-B Cylinders, it is suggested that only Capilano and/or Hynautic H-40 series helms be used to retain a comfortable yet reasonable amount of wheel turns from hard over to hard over.*

**K-5-B**



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

**NOTICE**

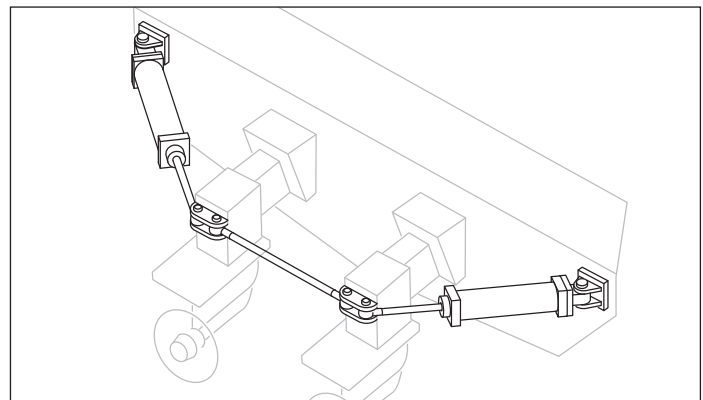
*K-5 Cylinders are UN-balanced Cylinders, unequal amount of fluid on either side of the piston.*

**NOTICE**

*DO NOT use a PRO Helm pump with this, or any other unbalanced steering cylinder.*

**NOTICE**

*Teleflex does NOT make connecting hardware to attach this cylinder to the out drive.*





# INBOARD STEERING

---

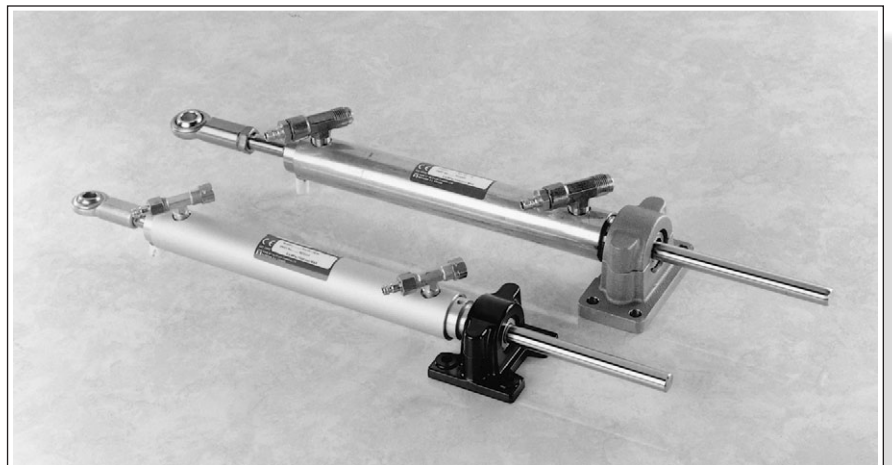
## Features

- 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 5-2 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 5-2 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

**NOTICE**

*Want automotive type steering? Refer to page 2-1 for Power Assist Details.*

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)	<b>1</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>4</b>
32FT (10m)	<b>2</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>4</b>
38FT (11.5m)	<b>3</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>4</b>	<b>5</b>
44FT (13.5m)	<b>5</b>	-	<b>3</b>	<b>5</b>	-	-	<b>5</b>	-	<b>5</b>	-
50FT (15m)	-	-	<b>5</b>	-	-	-	-	-	-	-

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
<b>1</b> <b>4 TURNS LOCK TO LOCK</b>				
HELM	1	* SEASTAR I- STANDARD	HH5271	9-6
CYLINDER	1	BA125 - 7ATM	HC5312-2	
OIL	3	SEASTAR OIL	HA5430	11-1
TUBE	1	3/8" DIA NYLON (NOTE 1 & 3)	HT5_ _	10-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	* SEASTAR I- STANDARD	HH5271	9-6
FITTING KIT	1	ADD A STATION	HF5502	10-11
OIL	1	SEASTAR	HA5430	11-1
EXTRA TUBE		3/8" DIA NYLON (NOTE 1 & 3)		10-6

COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF
<b>4</b> <b>4-1/4 TURNS LOCK TO LOCK</b>				
HELM	1	** SEASTAR II- STANDARD	HH5272	9-6
CYLINDER	1	BA150 - 7TM	HC5318	
OIL	3	SEASTAR OIL	HA5430	11-1
HOSE KIT	1	HOSE KIT	HF5508	10-12
COPPER TUBE		3/8" DIA.(NOTE 2 & 3)		10-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	** SEASTAR II- STANDARD	HH5272	9-6
FITTING KIT	1	ADD A STATION	HF5502	10-11
OIL	1	SEASTAR	HA5430	11-1
EXTRA TUBE		AS ABOVE (NOTE 2 & 3)		10-6

COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF
<b>2</b> <b>5 TURNS LOCK TO LOCK</b>				
HELM	1	* SEASTAR I- STANDARD	HH5271	9-6
CYLINDER	1	BA135 - 7ATM	HC5313	
OIL	3	SEASTAR OIL	HA5430	11-1
TUBE	1	3/8" DIA NYLON (NOTE 1 & 3)	HT5_ _	10-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	* SEASTAR I- STANDARD	HH5271	9-6
FITTING KIT	1	ADD A STATION	HF5502	10-11
OIL	1	SEASTAR	HA5430	11-1
EXTRA TUBE		3/8" DIA NYLON (NOTE 1 & 3)		10-6

COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF
<b>5</b> <b>5-1/2 TURNS LOCK TO LOCK</b>				
HELM	1	** SEASTAR II- STANDARD	HH5272	9-6
CYLINDER	1	BA175 - 7TM	HC5319	
OIL	3	SEASTAR OIL	HA5430	11-1
HOSE KIT	1	HOSE KIT	HF5508	10-12
COPPER TUBE		3/8" DIA.(NOTE 2 & 3)		10-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	** SEASTAR II- STANDARD	HH5272	9-6
10-11 OIL	1	SEASTAR	HA5430	11-1
EXTRA TUBE		AS ABOVE (NOTE 2 & 3)		10-6

COMPONENT DESCRIPTION	QTY REQ	MODEL	PART #	PAGE REF
<b>3</b> <b>6 TURNS LOCK TO LOCK</b>				
HELM	1	* SEASTAR I- STANDARD	HH5271	9-6
CYLINDER	1	BA150 - 7ATM	HC5314	
OIL	3	SEASTAR OIL	HA5430	11-1
TUBE	1	3/8" DIA NYLON (NOTE 1 & 3)	HT5_ _	10-6
FOR EXTRA STEERING STATION ADD:				
HELM	1	* SEASTAR I- STANDARD	HH5271	9-6
FITTING KIT	1	ADD A STATION	HF5502	10-11
OIL	1	SEASTAR	HA5430	11-1
EXTRA TUBE		3/8" DIA NYLON (NOTE 1 & 3)		10-6

OPTIONAL EQUIPMENT		
<b>BACK PLATE KIT (FOR STANDARD HELMS)</b>	<b>HA5418</b>	<b>9-3</b>
<b>20 DEGREE WEDGE KIT (FOR STANDARD HELMS)</b>	<b>HA5419</b>	<b>9-3</b>
<b>AUTOPILOT FITTING KIT (FOR ALL HELMS)</b>	<b>HF5502</b>	<b>10-11</b>
* <b>TILT HELM-SEASTAR I</b>	<b>HH5741</b>	<b>9-7</b>
<b>REAR MOUNT HELM-SEASTAR I</b>	<b>HH5261</b>	<b>9-7</b>
** <b>TILT HELM-SEASTAR II</b>	<b>HH5742</b>	<b>9-7</b>
<b>REAR MOUNT HELM-SEASTAR II</b>	<b>HH5262</b>	<b>9-7</b>
<b>POWER ASSIST STEERING</b>	<b>PA1200</b>	<b>2-1</b>

1. For systems 1, 2 & 3 - nylon tubing (3/8" dia.) is the standard requirement for plumbing the system. Copper tubing (3/8" dia.) can be substituted but Fitting Kit HF5507 is required. (Refer to page 10-12).

2. For systems 4 & 5 - copper tubing (3/8" dia.) is the standard requirement for plumbing the system. Fitting Kit HF5508 is required. (Refer to page 10-12).

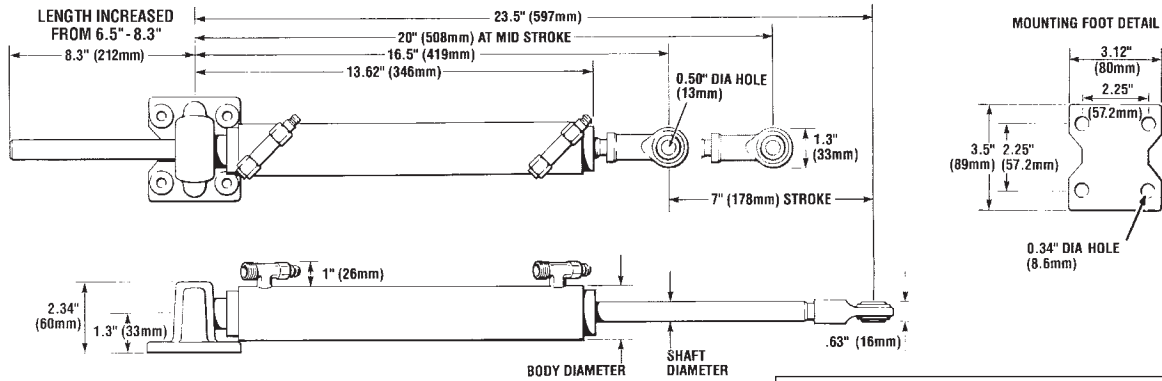
3. For systems 1, 2, 3, 4, & 5 Seastar outboard hose can be substituted for nylon or copper tube. These hoses must be ordered in standard lengths. They cannot be cut to length. (Refer to page 10-2).

**NOTICE**

*If your vessel is beyond system 1 to 5, please go to page 7-1 for SeaStar Power Steering Systems.*

# General Dimensions—SeaStar

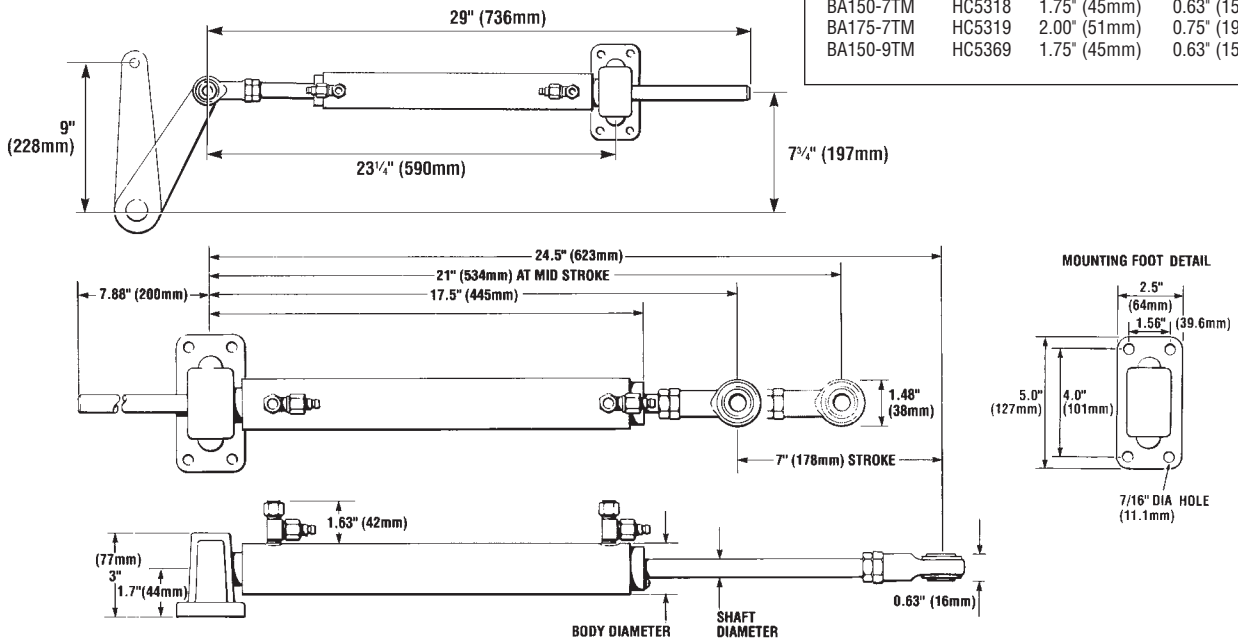
## ATM CYLINDERS (ALUMINUM): HC5312-2/ HC5313/ HC5314



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

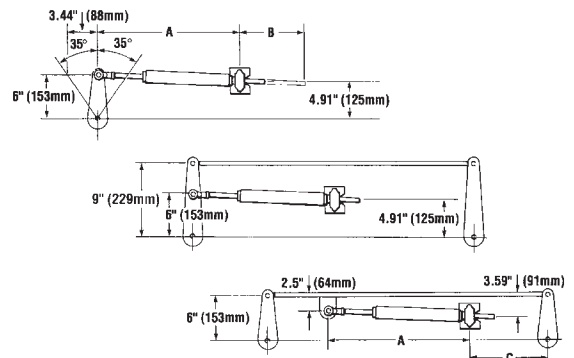


## CYLINDER MOUNTING CONFIGURATIONS

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

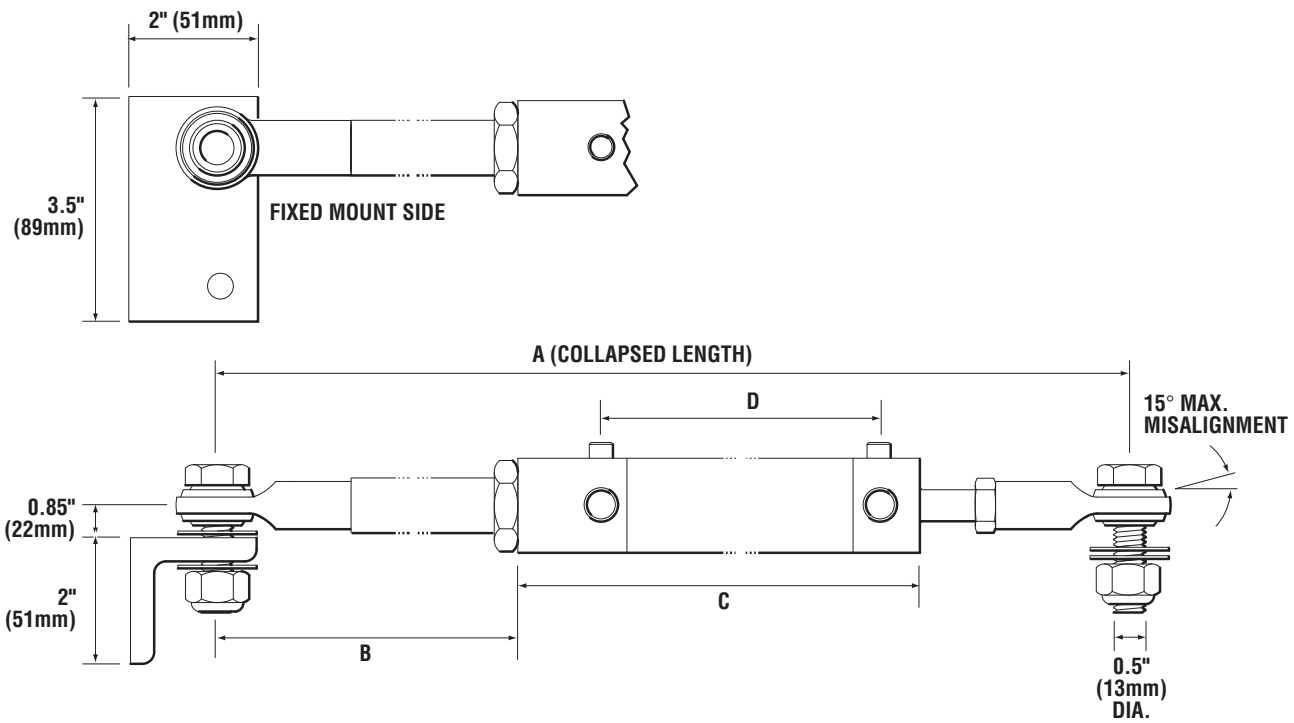


# General Dimensions—Hynautic

### 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

Above cylinders can be used on the following boats:

K-18 = ALL System #1 as noted on page 5-2.

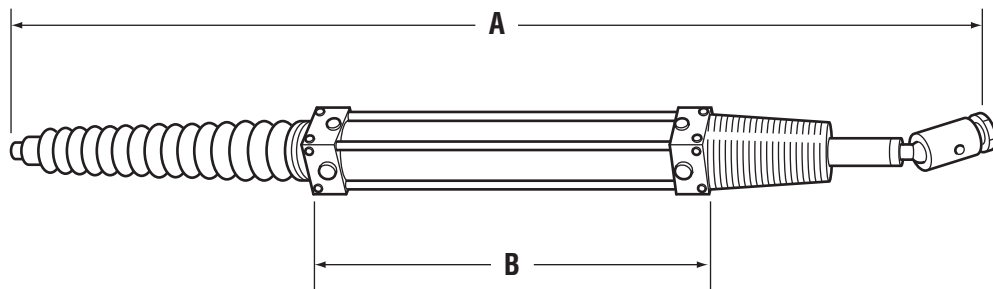
K-19 = ALL Systems #1 through #3 as noted on page 5-2.



**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**

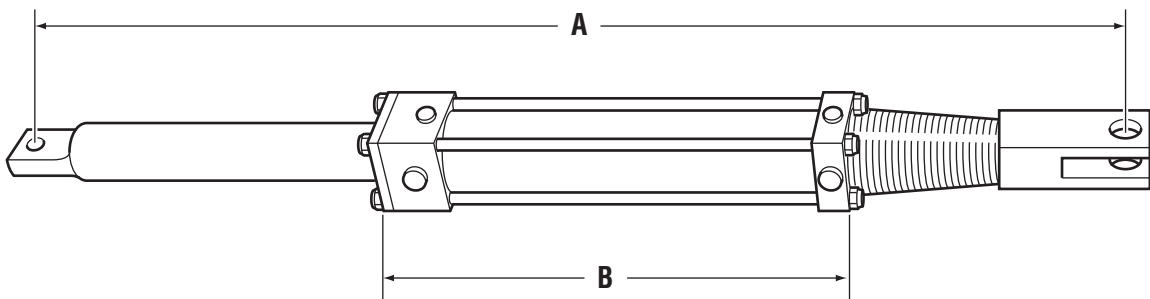


CYL MODEL	DIMENSIONS		BORE	STROKE	DISP
	A	B			
K-22	*34.12" (867mm)	13.25" (337mm)	1.5" (38mm)	10" (254mm)	13.20cu in
K-27	*36.75" (934mm)	13.25" (337mm)	1.5" (38mm)	10" (254mm)	13.20cu in

*\*Dimensions are with the cylinder rod centered.*

For use in Systems #3 through #4 as noted on page page 5-2.

**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

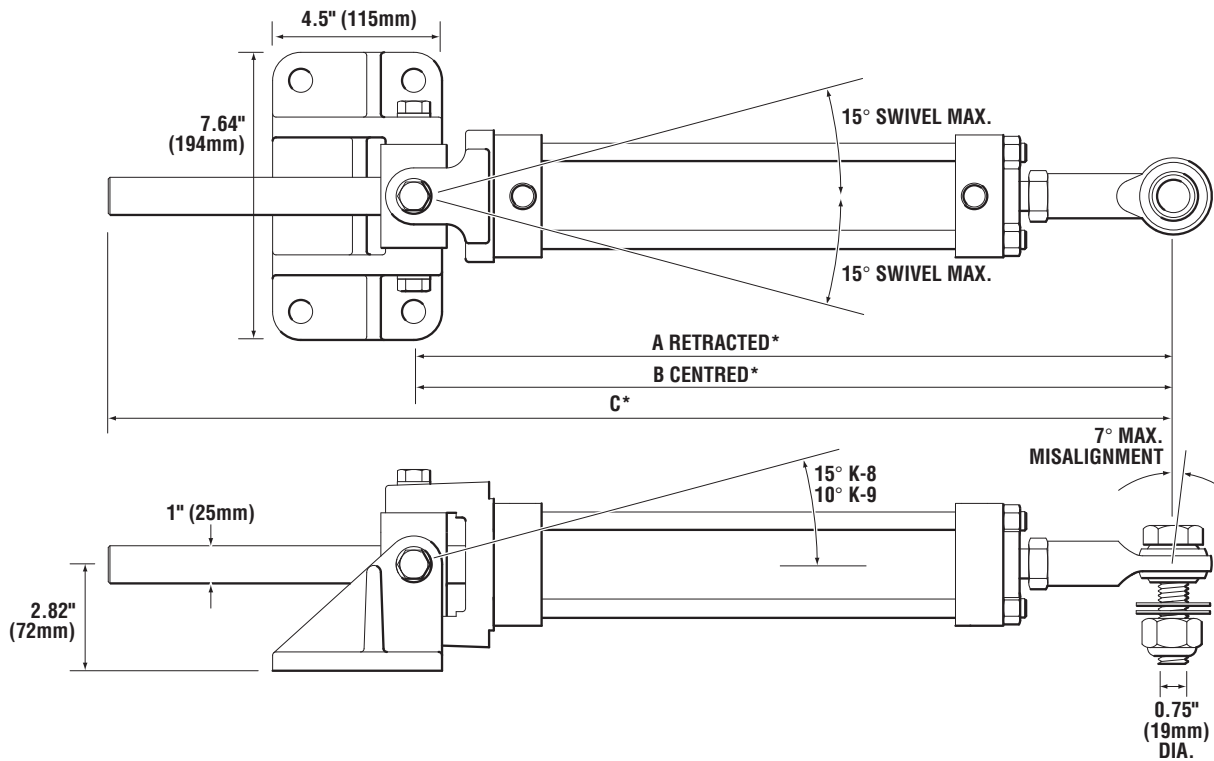
*\*Dimensions are with the cylinder rod centered.*

For use in System #5 as noted on page 5-2.

### 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" 813(mm)	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 9-8 and page 5-4.

**Components**

<b>H-21</b> .....	Hynautic 2.75 cu. in. helm (1" straight shaft) or
<b>H-25</b> .....	Hynautic 2.75 cu. in. helm (3/4" tapered shaft) or
<b>H-42</b> .....	Hynautic 4.0 cu. in. helm (1" straight shaft) or
<b>H-42-02</b> .....	Hynautic 4.0 cu. in. helm (3/4" tapered shaft) or
<b>H-41</b> .....	Hynautic 5.5 cu. in. helm (1" straight shaft) or
<b>H-41-02</b> .....	Hynautic 5.5 cu. in. helm (3/4" tapered shaft) or <i>(See application guide page 6-3.)</i>
<b>HF-10</b> .....	H-20 Fittings Kit for Main Station
<b>HF-21</b> .....	H-40 Fittings Kit for Main Station
<b>HC53__ or K-__</b> .....	Inboard Cylinder <i>(See application guide page 6-3. 1 or 2 required.)</i>
<b>R06</b> .....	Reservoir - Standard (2 quart)
<b>MSV-21</b> .....	Relief Valve (950 PSI)
<b>MSVF-07</b> .....	Relief Fittings (1150 & 1175-21-1)
<b>MSVF-13</b> .....	Relief Fittings (1175-42-1 & up)
<b>1/2" or 5/8" OD Copper Tubing</b> .....	<i>(See application guide page 6-3.)</i>
<b>HF5590</b> .....	Fitting Kit (for 1/2" Copper Tubing) or
<b>HF5592</b> .....	Fitting Kit (for 5/8" Copper Tubing) <i>(See application guide page 6-3. These fitting kits are for one steering station, purchase add-a-station kit for 2nd station.)</i>
<b>HA5731</b> .....	Hose Kit for Copper Tubing (2 hoses) <i>Contains two 18" (.45m) hoses for single-cylinder installations.</i>
<b>HA5440</b> .....	SeaStar Oil (1 Gallon) <i>(Other fittings may be required. Contact Teleflex Canada.)</i>

**Options**

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

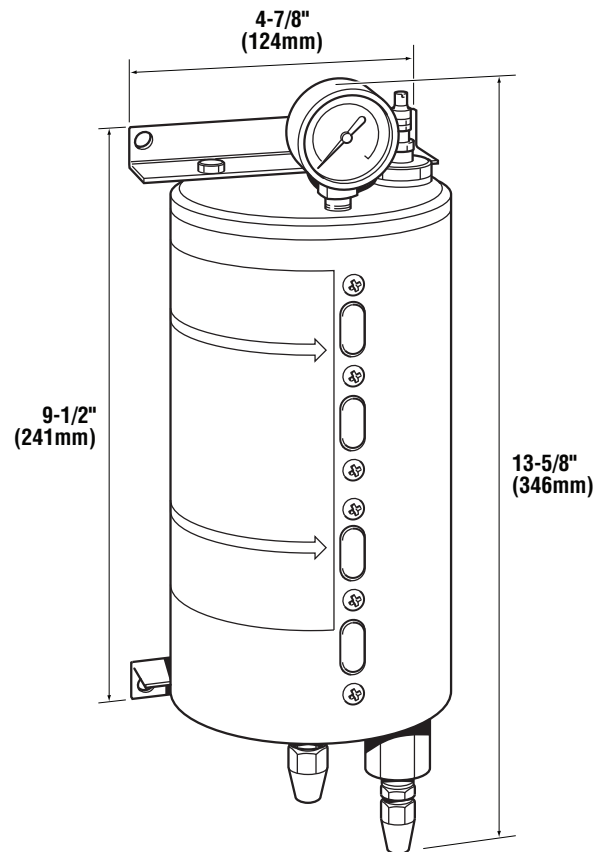
MODEL	PART#	DESCRIPTION / MODEL / ROD END CONFIG
<b>7" Stroke:</b>	HC5350	Cylinder BA175-7TMB (Rod End Ball Joint)
	HC5356	Cylinder BA175-7TMC (Rod End Clevis)
	HC5351	Cylinder BA200-7TMB (Rod End Ball Joint)
	HC5357	Cylinder BA200-7TMC (Rod End Clevis)
<b>9.5" Stroke:</b>	K-8	Hynautic Cylinder, 2.5"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

### NOTICE

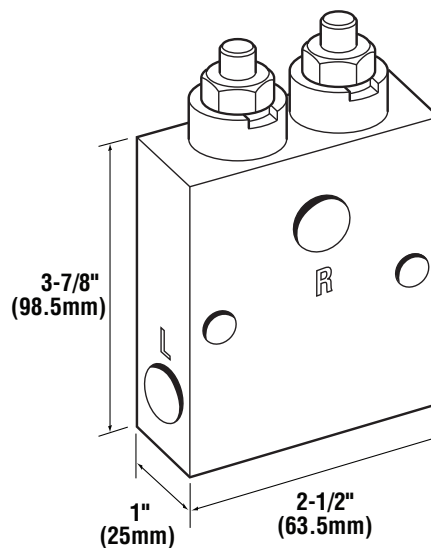
*The application guide on page 6-3 should be used with discretion. The chart is only a guide to selecting a steering system. A steering system manufacturer cannot anticipate all the variables in boat-rudder design that affect the steering loads. It is the final responsibility of the boat builder/designer to specify maximum expected steering loads. If the required information is not available, please see the Displacement and Planning Hull data sheets on page 10-21 and page 10-22. These sheets after being completely filled out can be faxed to Teleflex Technical Support at 604-279-2202.*

**Reservoir** Part# R-06

Capacity = 2 quarts.

**Relief Valve** Part# MSV-21

Relief Pressure factory set to 950psi.



# Hynautic Seal Kits

## Helms

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

## Cylinders

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

## Reservoirs

SEAL KIT#	DESCRIPTION
<b>RS-01</b>	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](http://www.seastarsteering.com) or contact Teleflex Canada Limited Partnership directly at 604-270-6899.

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

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

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

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

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

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

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

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

---

## 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.*

### NOTICE

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.

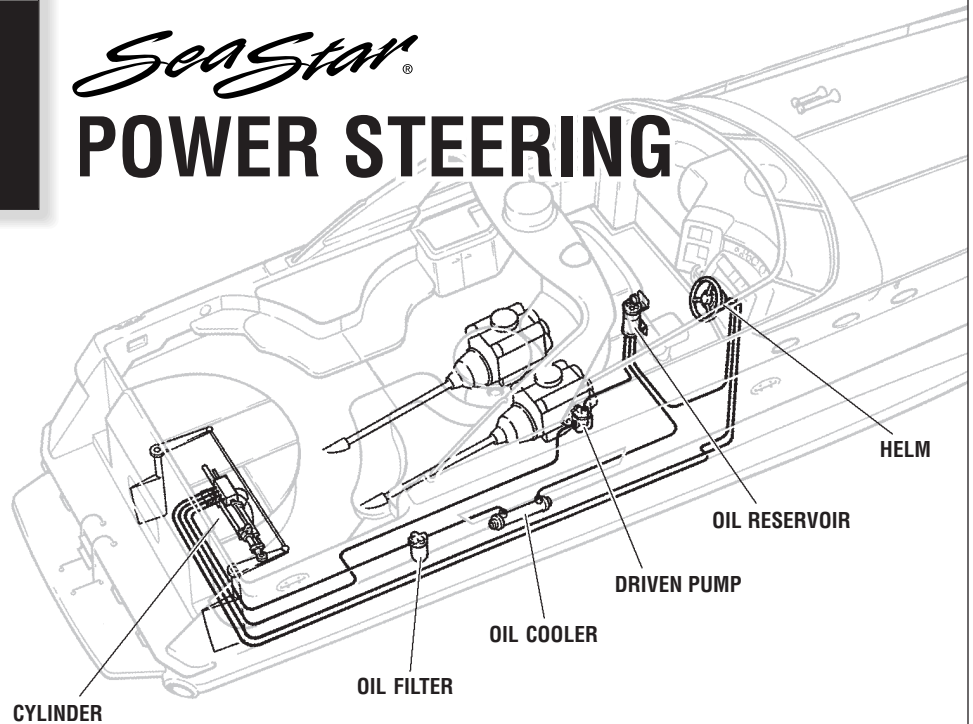
**Tube:** The 5/16 nylon tube and fittings are obsolete and must be replaced with SeaStar 3/8" nylon extruded tube for all inboard applications.

**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.

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

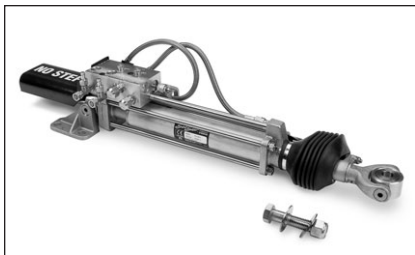
# SeaStar® POWER STEERING



## 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 TO .....50' (15m)	UP TO .....40' (12m)	UP TO .....65' (20m)
TWIN 9" x 2 CYLINDER (HC5802)	UP TO .....75' (22m)	UP TO .....55' (17m)	UP TO .....85' (26m)
SINGLE 11" x 1 CYLINDER (HC5803-2)	UP TO .....60' (18m)	UP TO .....50' (15m)	UP TO .....75' (23m)
TWIN 11" x 2 CYLINDER (HC5804)	UP TO .....85' (26m)	UP TO .....60' (18m)	UP TO .....100' (31m)
*SINGLE 9" x 2.5 CYLINDER (HC5805)	UP TO .....100' (31m)	UP TO .....70' (22m)	UP TO .....110' (34m)
*TWIN 9" x 2.5 CYLINDER (HC5806)	UP TO .....110' (34m)	UP TO .....80' (25m)	UP TO .....120' (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 <sup>3</sup> (348cc)	2.0" (51mm)	9" (229mm)	2946 lbs <sub>f</sub> (13,090 N)	18,900 in-lbs (2130 Nm)
SINGLE 11" CYLINDER (HC5803-2)	26.00 in <sup>3</sup> (426cc)	2.0" (51mm)	11" (280mm)	2946 lbs <sub>f</sub> (13,090 N)	23,140 in-lbs (2610 Nm)
TWIN 9" CYLINDER (HC5802)	42.50 in <sup>3</sup> (697cc)	2.0" (51mm)	9" (229mm)	5892 lbs <sub>f</sub> (26,190 N)	37,800 in-lbs (4260 Nm)
TWIN 11" CYLINDER (HC5804)	52.00 in <sup>3</sup> (853cc)	2.0" (51mm)	11" (280mm)	5892 lbs <sub>f</sub> (26,190 N)	46,280 in-lbs (5220 Nm)
SINGLE 9" CYLINDER (HC5805)	37.11 in <sup>3</sup> (608cc)	2.5" (64mm)	9" (229mm)	5154 lbs <sub>f</sub> (22,926 N)	33,065 in-lbs (3736 Nm)
TWIN 9" CYLINDER (HC5806)	74.33 in <sup>3</sup> (1216cc)	2.5" (64mm)	9" (229mm)	10,308 lbs <sub>f</sub> (45,852 N)	66,130 in-lbs (7472 Nm)

**Basic System Selection Guide:**

**Power Steering Cylinders**

Part #  
9" (228mm) stroke .....HC5801-2

See table above for correct cylinder selection

11" (279mm) stroke .....HC5803-2

See table above for correct cylinder selection

9" (228mm) stroke .....HC5805

See table above for correct cylinder selection

**Add-On Cylinders**

9" (228mm) stroke .....HC5802

See table above for correct cylinder selection

11" (279mm) stroke .....HC5804

See table above for correct cylinder selection

9" (228mm) stroke .....HC5806

See table above for correct cylinder selection

**Steering Helms (For 3-1/2 Turn System)**

Part #  
SSI Helm, Standard Mount.....HH5271

SSI Helm, Rear Mount .....HH5261

SSI Helm, Tilt .....HH5741

SSI Helm, Rear Mount, 1" Shaft .....HH5281

**Power Steering Pumps**

Outlet Check Power Pump.....HP5820

Press Relief Twin Pump.....HP5822

R.H. Rotation, Belt Drive.....HP5830

L.H. Rotation, Belt Drive .....HP5831

R.H. Rotation, Keyed Shaft, Direct Drive .....HP5832

R.H. Rotation, Keyed Shaft, Direct Drive .....HP5833

R.H. Rotation, Direct Drive, Heavy Duty.....HP5835

R.H. Rotation, 9 Tooth

Splined Shaft, Direct Drive .....HP5837

R.H. Rotation, 11 Tooth

Splined Shaft, Direct Drive .....HP5838

R.H. Rotation, Direct Drive,

No Flow Control.....HP5836

R.H. Rotation, 9 Tooth

Splined Shaft, Direct Drive .....HP5839

L.H. Rotation, 11 Tooth

Splined Shaft, Direct Drive .....HP5840

L.H. Rotation, Direct Drive.....HP5841

L.H. Rotation, 11 Tooth

Splined Shaft, Direct Drive .....HP5842

L.H. Rotation, 9 Tooth

Splined Shaft, Direct Drive .....HP5843

R.H. Rotation, 6 Tooth

B Flange, Direct Drive .....HP5844

L.H. Direct Drive, 9 Tooth

Splined Shaft .....HP5845

R.H. Direct Drive, 9 Tooth

Splined Shaft .....HP5846

R.H. Direct Drive, 11 Tooth

Splined Shaft .....HP5847

R.H. Keyed Shaft .....HP5848

L.H. Direct Drive, 11 Tooth

Splined Shaft .....HP5849

L.H. Keyed Shaft .....HP5850

L.H. direct drive, 13 Tooth

Splined Shaft .....HP5852

**Oil Reservoir, Cooler & Filter**

Part #

Oil Reservoir .....HP5810

Oil Cooler, 2.25 Kw, 1" water lines.....HP5825

Oil Cooler, 6.25 Kw, 2" water lines.....HP5826

Oil Filter .....HP5815

**Miscellaneous**

Outlet Check Valve (Power Pump).....HP5820

Auto Flow Control (Twin Pump) .....HP5821

Crossover Pressure Relief .....HP5822

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

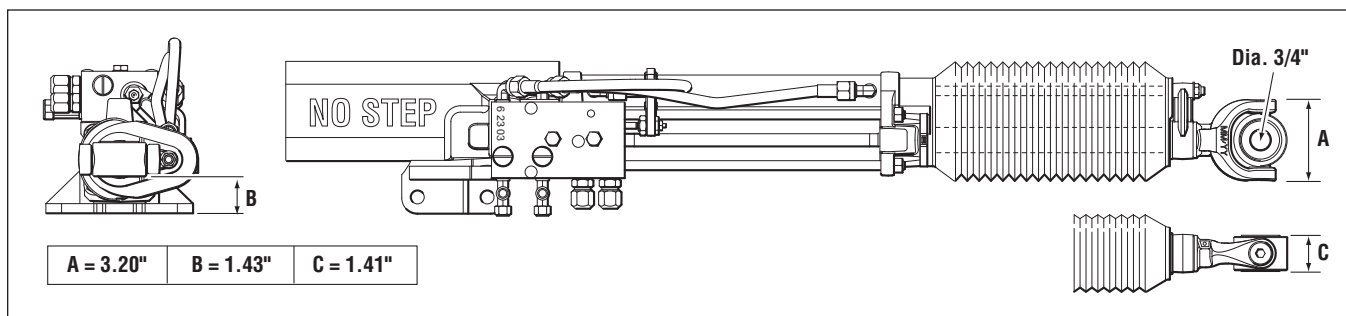
SeaStar Oil, 4 liter.....HA5440

Pressure Relief Valve, (1250psi setting).....\*HP5818

\* Required in a system where the Power pump does NOT

have a built in pressure relief valve. ALL SeaStar Power

Pumps have built in Pressure Relief Valves.



# 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

#### NOTICE

Pressure and plate dimensional requirements are to be calculated by your Naval Architect.

#### 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
---------------------------------	------------

### Cylinder Specification

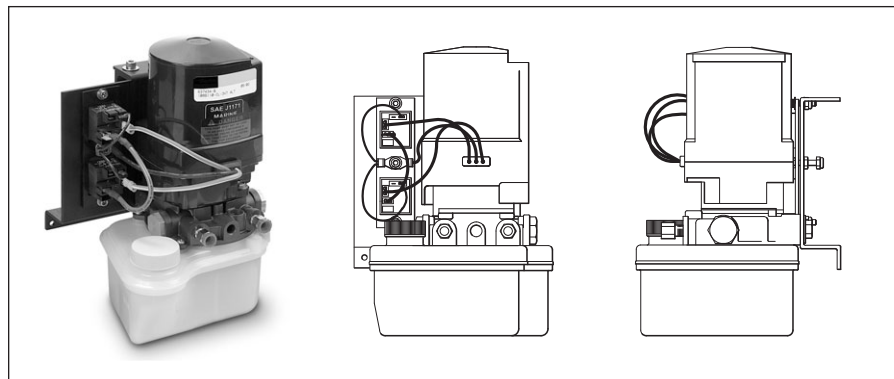
Stroke = 4"

Displacement = 5.94 cu in.

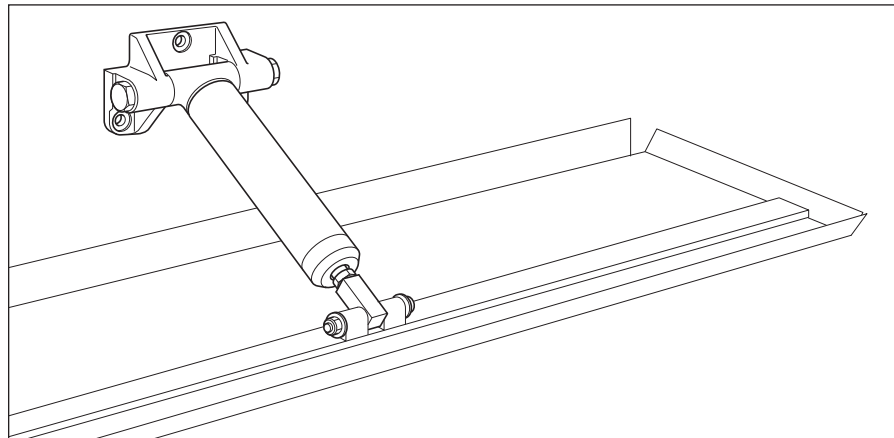
Force = 2230 ft lb @ rated pressure

Model	Displacement (in. 3/min)	Motor
TP-02	57	12V
TP-01	80	24V
TP-03	110	24V

### Optional Pump Part# TP-03



### Tab Cylinder Part# TK-01



# 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.
- Comes with newly designed tilt mechanism.



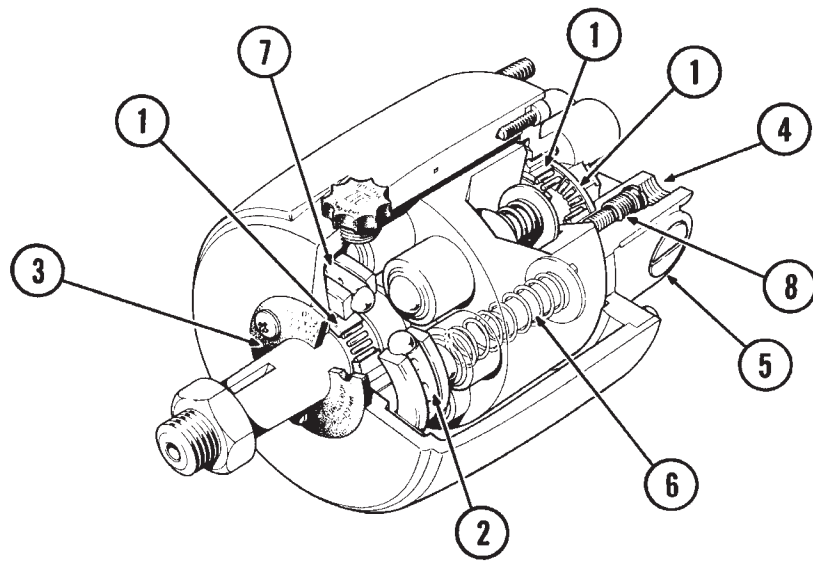
## Traditional Tilt helm features

- 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

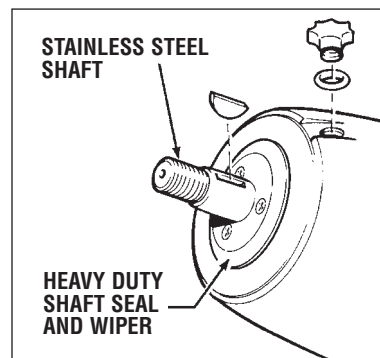
## Features

- 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.

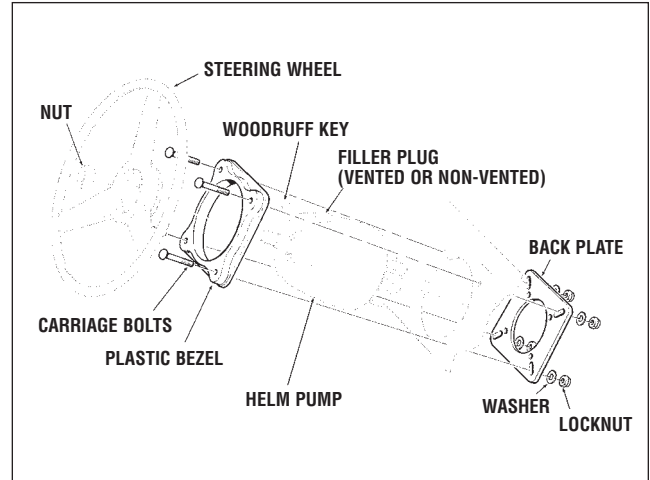


# Accessories

## Backplate Kit (part # HA5418)

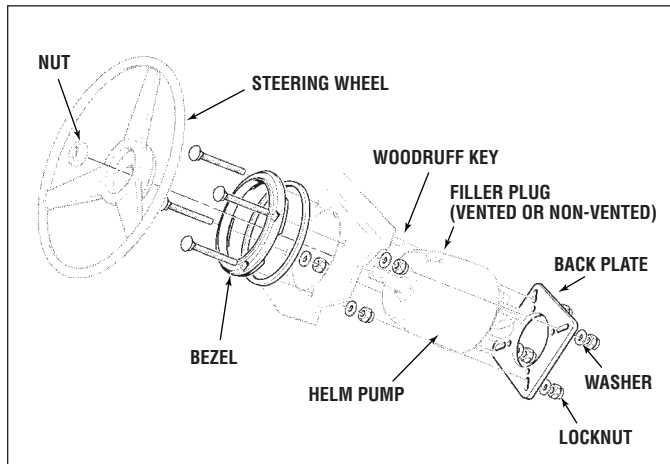
- a) Used to retrofit a new SeaStar standard helm in the old 4.5" (115mm) diameter hole, or
- b) reduce the helm protrusion from the dash by the thickness of the dash, or
- c) retrofit new SEASTAR standard helm into hole cutouts for mechanical and hydraulic steering as per chart.

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).

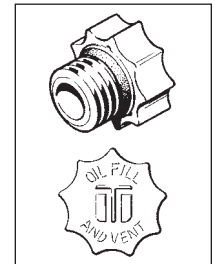


## Vent Plug (part # HA5431)

**Supplied with SeaStar Helm Pump**

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

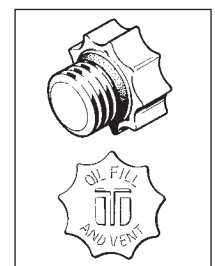
Must be used on uppermost Helm Pump on multi steering station systems.



## Non-Vent Plug (part # HA5432)

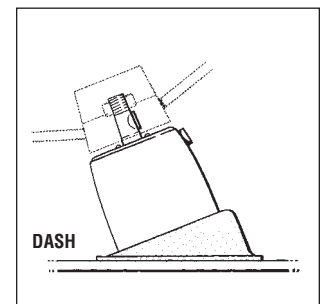
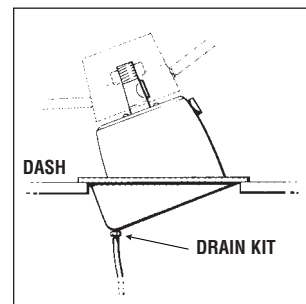
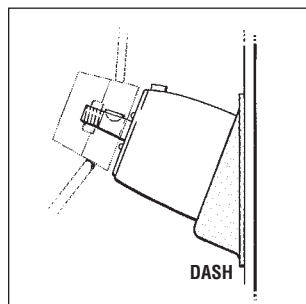
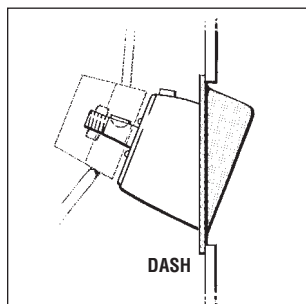
Must be used on all Helm Pumps other than uppermost Helm Pump on multi steering station systems.

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



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

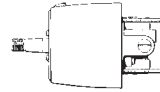
This kit is designed to mount the helm at a 20° angle to the mounting surface. 4 possible mounting configurations are available.



▲ For this configuration use **HA5408**

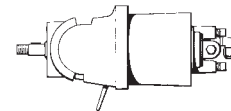
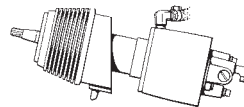
# SeaStar Helm – Order Guide

## SeaStar Standard Mount



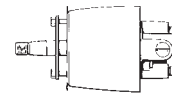
PART NUMBER	HELM DESCRIPTION	DISPLACEMENT		RELIEF VALVE SETTING		NOTES
		CU. IN./REV	(CC/REV)	PSI (BAR)		
HH5269	STANDARD MOUNT	1.4	(23.0)	1000	(70)	
HH5271	STANDARD MOUNT	1.7	(27.8)	1000	(70)	
HH5761	STANDARD MOUNT FULL FEEDBACK	1.7	(27.8)	1000	(70)	2
HH5217	STD. MOUNT, COMMERCIAL	1.7	(27.8)	1000	(70)	3
HH5273	STANDARD MOUNT	2.0	(33.0)	1000	(70)	
HH5760	STANDARD MOUNT FULL FEEDBACK	2.0	(33.0)	1000	(70)	2
HH5272	STANDARD MOUNT	2.4	(39.3)	1000	(70)	
HH5762	STANDARD MOUNT FULL FEEDBACK	2.4	(39.3)	1000	(70)	2
HH5224	STD. MOUNT, COMMERCIAL	2.4	(39.3)	1000	(70)	3

## SeaStar Tilt Mount



HH5744	TRADITIONAL TILT	1.4	(23.0)	1000	(70)	
HH6193	SPORT TILT	1.4	(23.0)	1000	(70)	
HH5741	TRADITIONAL TILT	1.7	(27.8)	1000	(70)	
HH6191	SPORT TILT	1.7	(27.8)	1000	(70)	
HH6291	SPORT TILT (Spline Shaft)	1.7	(27.8)	1000	(70)	
HH5743	TRADITIONAL TILT	2.0	(33.0)	1000	(70)	
HH6145	SPORT TILT	2.0	(33.0)	1000	(70)	
HH5742	TRADITIONAL TILT	2.4	(39.3)	1000	(70)	
HH6192	SPORT TILT	2.4	(39.3)	1000	(70)	
HH6292	SPORT TILT (Spline Shaft)	2.4	(39.3)	1000	(70)	

## SeaStar Rear Mount



HH5260	REAR MOUNT	1.4	(23.0)	1000	(70)	
HH5279	REAR MOUNT 1" STRAIGHT SHAFT	1.4	(23.0)	1000	(70)	
HH5280	REAR MOUNT 1" TAPERED SHAFT	1.4	(23.0)	1000	(70)	
HH5231	REAR MOUNT FULL FEEDBACK	1.4	(23.0)	1000	(70)	
HH5261	REAR MOUNT	1.7	(27.8)	1000	(70)	
HH5281	REAR MOUNT 1" TAPERED SHAFT	1.7	(27.8)	1000	(70)	
HH5262	REAR MOUNT	2.4	(39.3)	1000	(70)	
HH5282	REAR MOUNT 1" TAPERED SHAFT	2.4	(39.3)	1000	(70)	

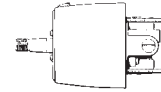
### NOTES

1. SeaStar PRO helms cannot be used with an unbalanced cylinder. SeaStar reinforced Kevlar Outboard style hoses MUST be used with ALL SeaStar PRO helms.
2. No "Check Valves" are installed into these helm pumps. These are intended for use in a single steering station application ONLY. Not for use in multiple steering stations and/or in conjunction with autopilot.
3. Commercial helms use a stainless steel shaft and a better sealing top plate for use in extreme conditions and or commercial type applications.

# SeaStar PRO Helm – Order Guide

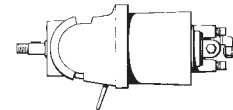
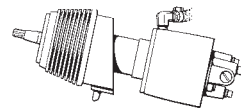


## SeaStar PRO Standard Mount



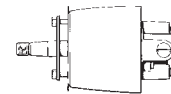
PART NUMBER	HELM DESCRIPTION	DISPLACEMENT		RELIEF VALVE SETTING		NOTES
		CU. IN./REV	(CC/REV)	PSI	(BAR)	
HH5779	STANDARD MOUNT	1.7	(27.8)	1500	(103)	1
HH5218	STD. MOUNT, COMMERCIAL	1.7	(27.8)	1500	(103)	1, 3
HH5770	STANDARD MOUNT	2.0	(33.0)	1500	(103)	1
HH5772	STANDARD MOUNT	2.4	(39.3)	1500	(103)	1

## SeaStar PRO Traditional and Sport Tilt Mount



HH5775	TRADITIONAL TILT	1.4	(23.0)	1500	(103)	1
HH5773	TRADITIONAL TILT	1.7	(27.8)	1500	(103)	1
HH6189	SPORT TILT	1.7	(27.8)	1500	(103)	1
HH5774	TRADITIONAL TILT	2.0	(33.0)	1500	(103)	1
HH6190	SPORT TILT	2.0	(33.0)	1500	(103)	1
HH6188	SPORT TILT	2.4	(39.3)	1500	(103)	1

## SeaStar PRO Rear Mount



HH5778	REAR MOUNT	1.7	(27.8)	1500	(103)	1
HH5771	REAR MOUNT	2.0	(33.0)	1500	(103)	1

### NOTES

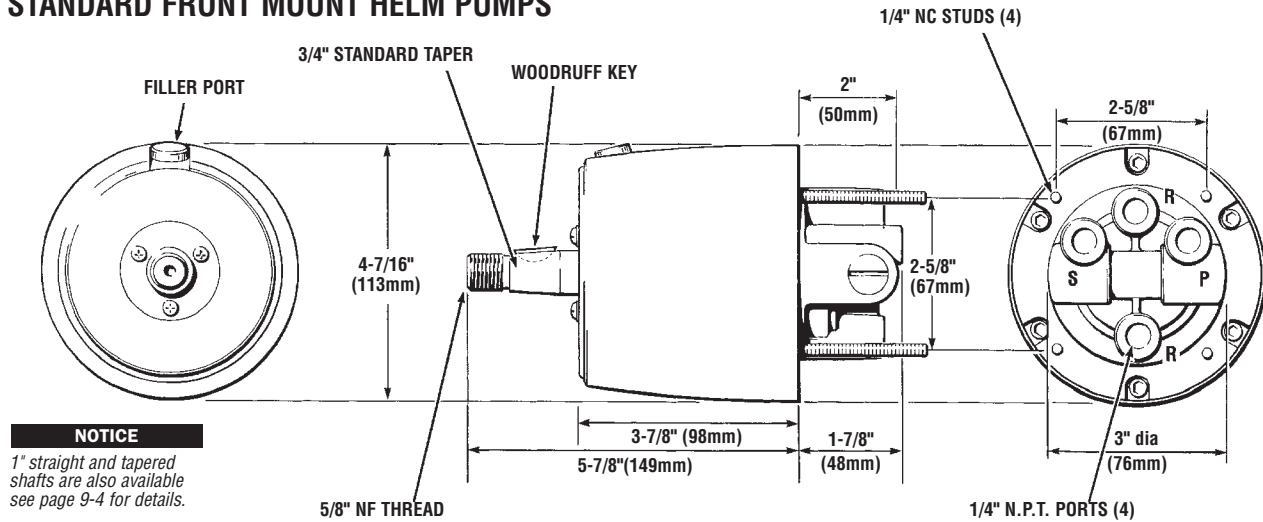
1. SeaStar PRO helms cannot be used with an unbalanced cylinder. SeaStar reinforced Kevlar Outboard style hoses MUST be used with ALL SeaStar PRO helms.
2. No "Check Valves" are installed into these helm pumps. These are intended for use in a single steering station application ONLY. Not for use in multiple steering stations and/or in conjunction with autopilot.
3. Commercial helms use a stainless steel shaft and a better sealing top plate for use in extreme conditions and or commercial type applications.

# Standard/Rear Mount Helm Dimensions

**NOTICE**

ALL SeaStar helm pumps can be mounted horizontally to vertically and anywhere in between. In ALL cases the filler port must be in the uppermost position.

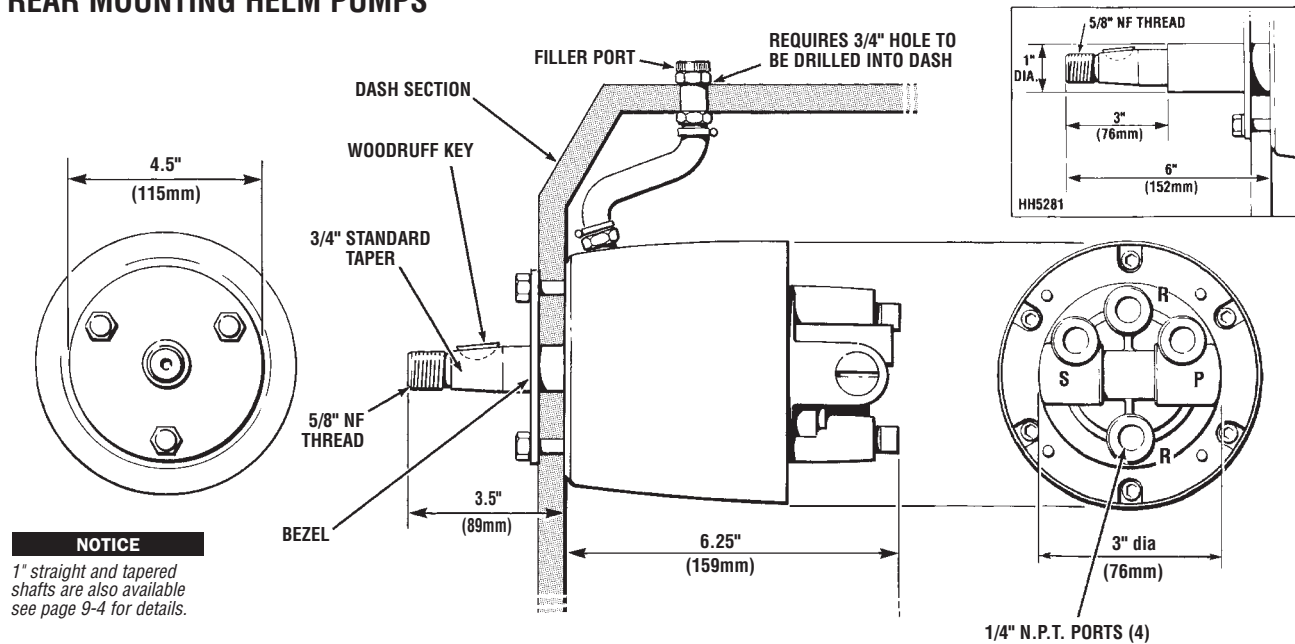
**STANDARD FRONT MOUNT HELM PUMPS**



**NOTICE**  
1" straight and tapered shafts are also available see page 9-4 for details.

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

**REAR MOUNTING HELM PUMPS**

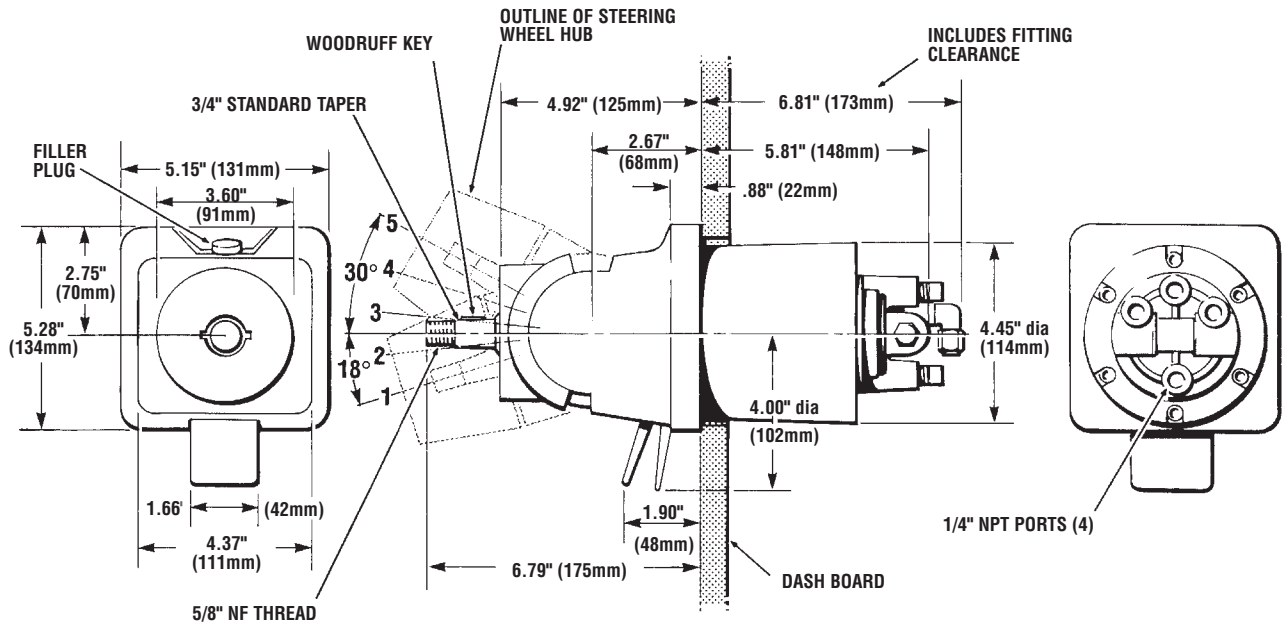


**NOTICE**  
1" straight and tapered shafts are also available see page 9-4 for details.

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

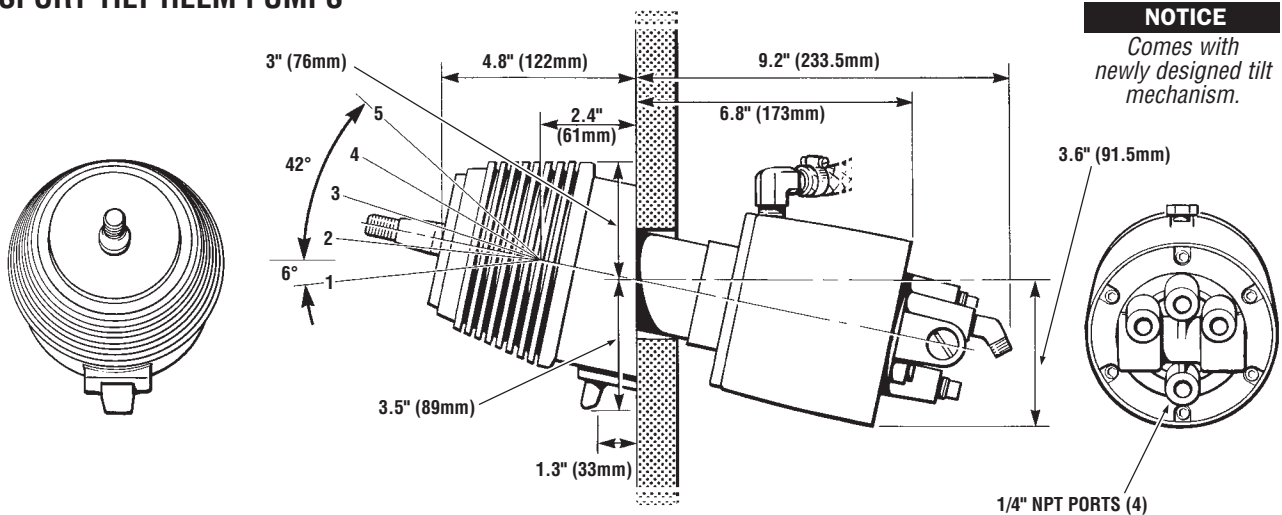
# Tilt/Sport Tilt Helm Dimensions

## TRADITIONAL STYLE TILT HELM PUMPS



**NOTICE** Max. steering wheel diameter 20" (508mm)

## SPORT TILT HELM PUMPS



**NOTICE**

*Comes with newly designed tilt mechanism.*

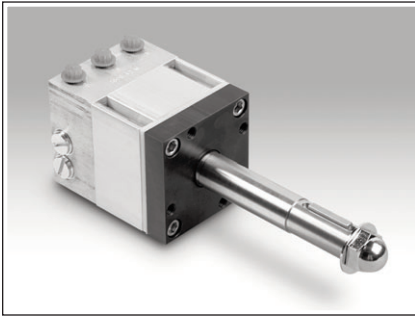
**NOTICE** Max. steering wheel diameter 20" (508mm)

**NOTICE**

*Remote fill and vent kit (included with helm pump) requires a 3/4" hole to be drilled into the dash board and above the helm pump. Please refer to page 10-19, HA5450 for details.*

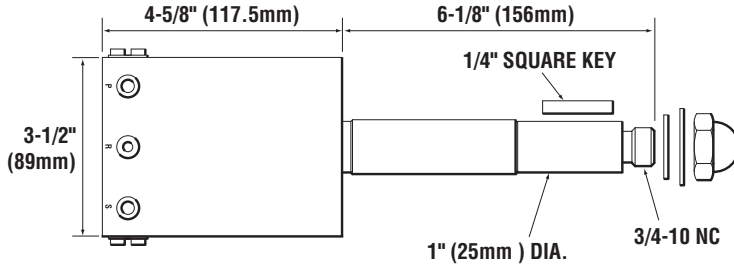
# Hynautic Helm Pumps

## Heavy Duty Helm Pump H-20 Series

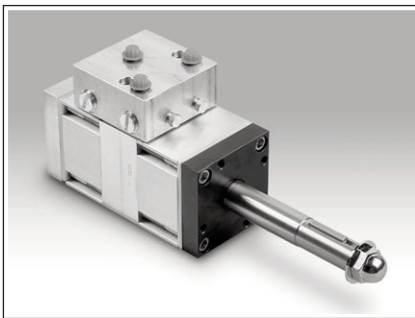


HELM	DISPL	SHAFT STYLE DIA. & TYPE	KEYWAY	INTEGRAL VALVING	
20 Series	H-21	2.75cu in	1 Straight	1/4" Square	Yes
	H-25	2.75cu in	3/4", 1"/ft Tapered	#9 Woodruff	Yes
	H-26	2.00cu in	3/4", 1"/ft Tapered	#9 Woodruff	Yes

### H-21

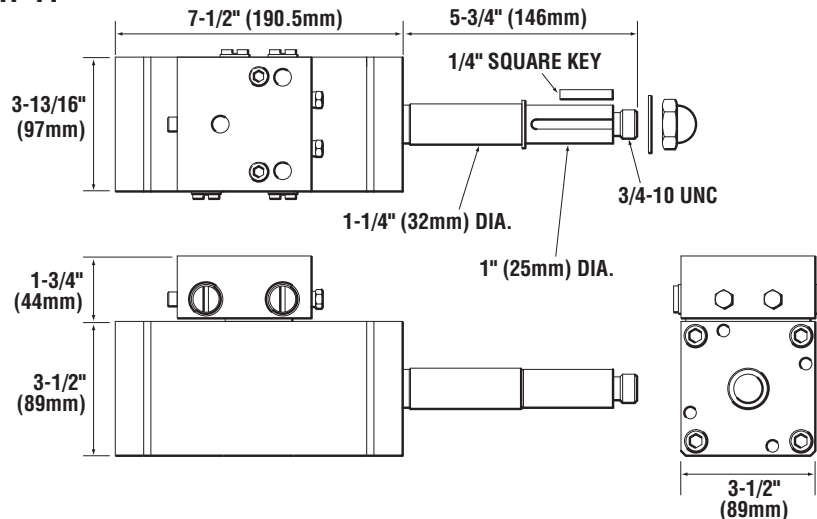


## Heavy Duty Helm Pump H-40 Series



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



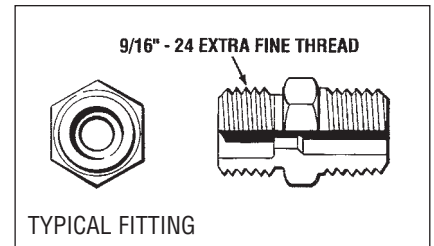
## NOTICE

*If using a Hynautic H-20 or H-40 series helm pump, use of a Hynautic Reservoir and Relief Valve, see page 6-4 for details. Fitting kits sold separately for both H-20 and H-40 series, please see page 6-2 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, SEASTAR POWER ASSIST, or STERNDRIVE CYLINDER# HC5332	OUTBOARD HOSE	10-2- 10-4
STERNDRIVES, SEADRIVES, INBOARDS, SSI	3/8" DIA. NYLON or COPPER TUBE	10-6- 10-8
<b>CAUTION: DO NOT USE NYLON TUBING IN OUTBOARD AND/OR POWER ASSIST STEERING APPLICATIONS.</b>		

## General Considerations

### ⚠ WARNING

**DO NOT use extruded nylon tubing with SeaStar Outboard cylinder, HC5332 stern drive cylinders and/or SeaStar Power Assist Applications.**

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

## **! WARNING**

**SeaStar PRO Helm systems require the use of SeaStar PRO (1500 psi) reinforced Kevlar Hoses ONLY.**

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

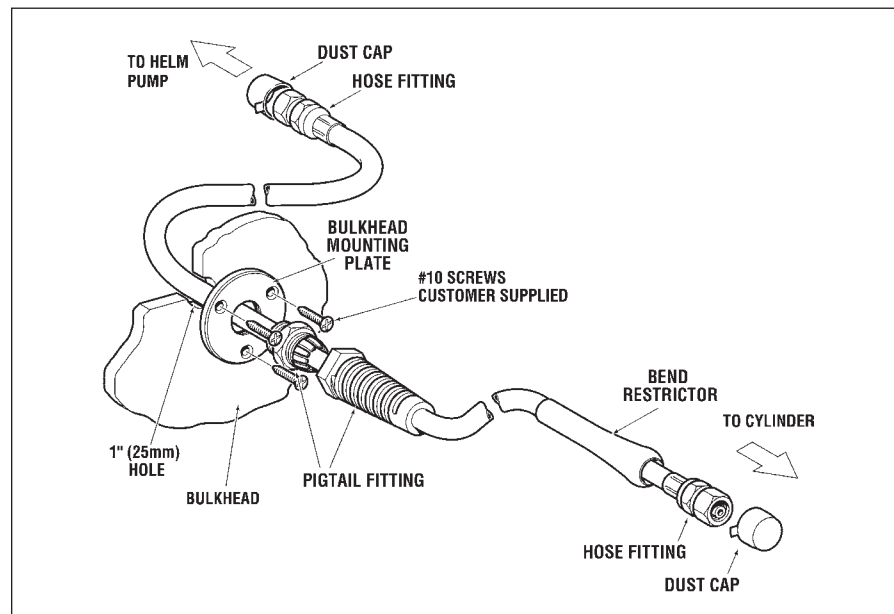
### NOTICE

*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

For the cleanest installation.





## Available SeaStar Hose Kits: How to order

Each part number contains two hoses of equal length.

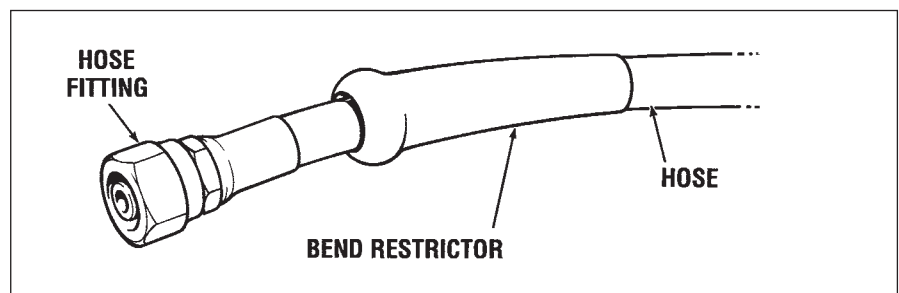
PART NUMBER	KIT DESCRIPTION
* H051XX	SeaStar Standard Outboard Hose Kit (2 hoses)
* H057XX	SeaStar Pro Hose Kit (2 hoses)
** H081XX	SeaStar Bulkhead Hose Kit, Standard (2 hoses)
** H082XX	SeaStar Bulkhead Hose Kit, Pro (2 hoses)

### 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

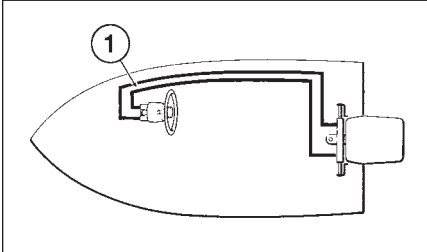
- a) Measure from center of the cylinder(s) and helm(s)
- b) Some installations require more than 1 hose kit and additional fitting kits (see parts list for each figure).
- c) Minimum bend radius for outboard hose is 2-1/2" (6 cm).
- d) Outboard cylinders move. They are subject to engine trim & tilt.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

### ⚠ CAUTION

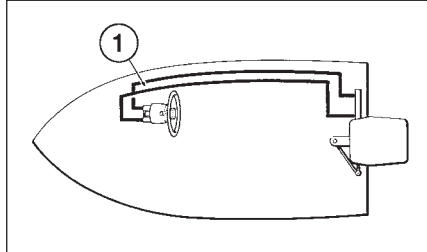
**DO NOT cut the hose. This will destroy the hose. Once cut there is no means to field swage fittings to the ends of the hose.**

# Single Station

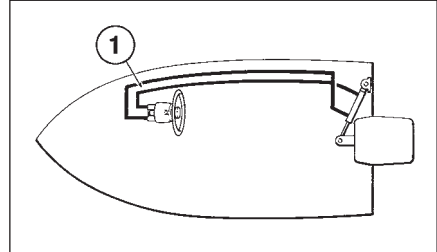
**Figure A:** HC5345  
Single Front Mount Cylinder  
**Note:** cylinder body moves



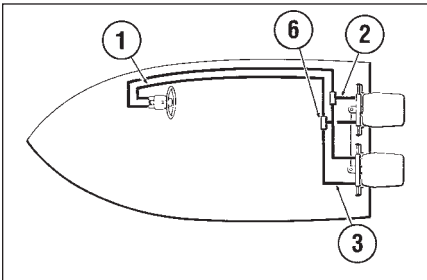
**Figure B:** HC5370  
Single Side Mount Cylinder  
**Note:** cylinder body stationary



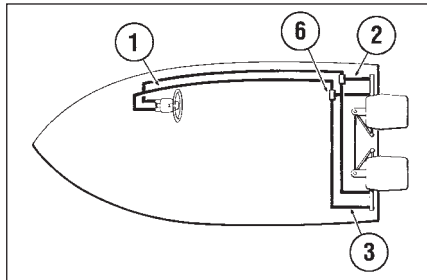
**Figure C:** HC5380  
Single Splashwell Mount Cylinder  
**Note:** cylinder body stationary



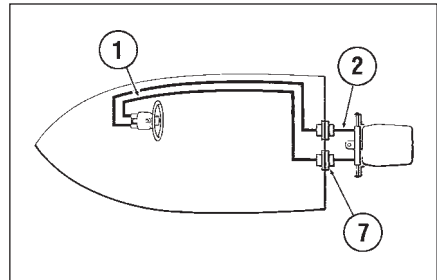
**Figure D:** HC5345  
Dual Front Mount Cylinders  
**Note:** cylinder body moves



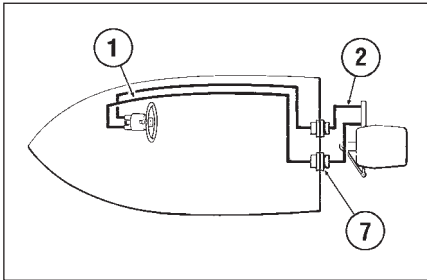
**Figure E:** HC5370  
Dual Side Mount Cylinders  
**Note:** cylinder body stationary



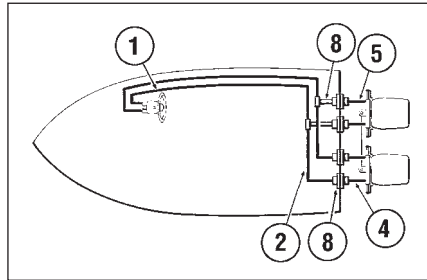
**Figure F:** HC535  
Single Front Mount Cylinder  
c/w bulkhead fittings  
**Note:** cylinder body moves



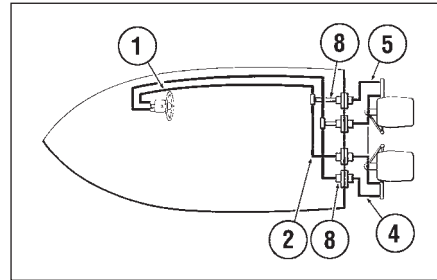
**Figure G:** HC5370  
Single Side Mount Cylinder  
c/w bulkhead fittings  
**Note:** cylinder body stationary



**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) 3/4" Thick Bulkhead
	HF5513	1	
8	HF5514	1	Bulkhead Fitting Kit (4 fittings per Kit) 3/4" Thick Bulkhead
	HF5515	1	

# 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.

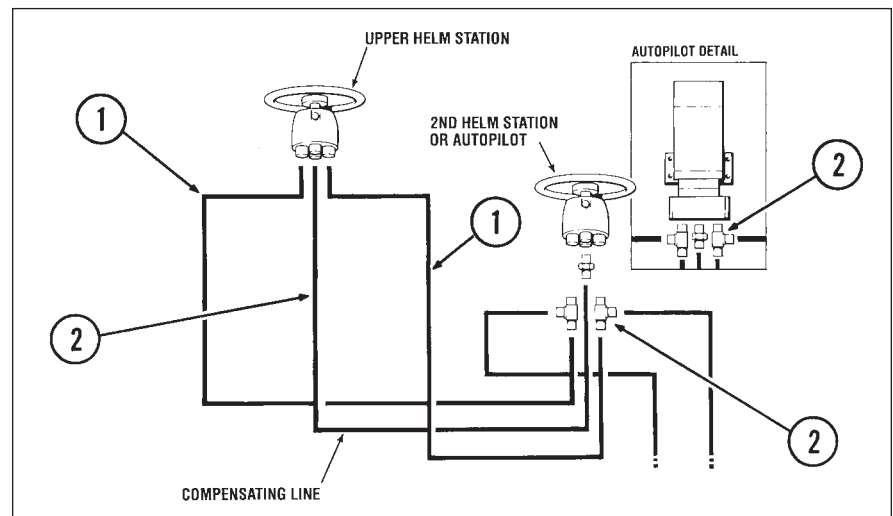
### Note:

- 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	10-10

\* Includes 25' of 3/8" dia. Nylon tubing to be used for the compensating line ONLY.

# 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" extruded nylon is NOT recommended for use in systems with SeaStar 2.4 or SeaStar PRO helm pumps. It is also not to be used in systems where total tubing runs exceed 100', in these cases SeaStar Outboard hoses and/or 3/8" copper tubing must be used.

## ⚠ WARNING

**SeaStar PRO Helm systems require the use of SeaStar PRO (1500 psi) reinforced Kevlar Hoses ONLY.**

## 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:

Soft annealed copper tubing, Type 'L' produced under ASTM D-280.

## 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.

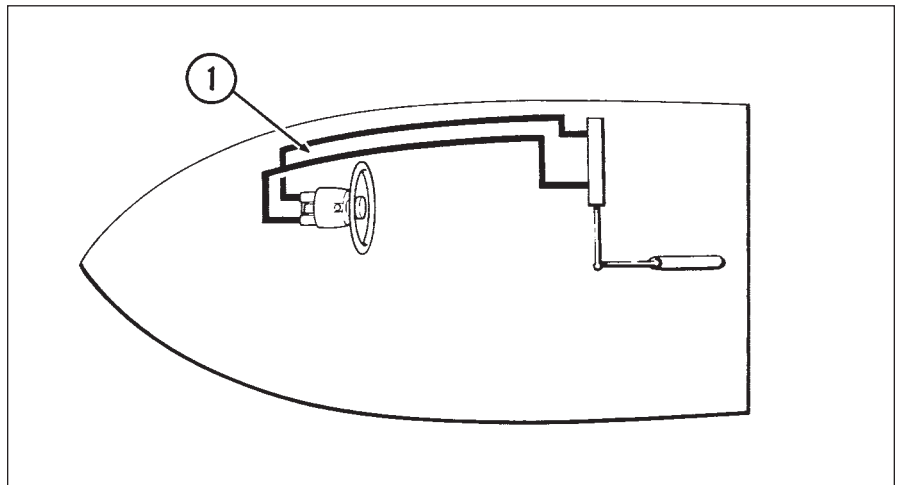
# Single Station

- 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

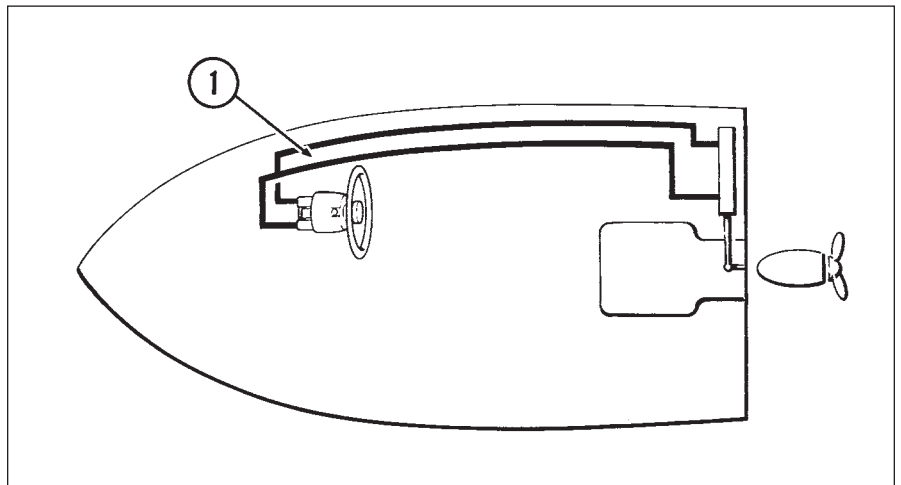
- fittings required supplied with helm and cylinder



## 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

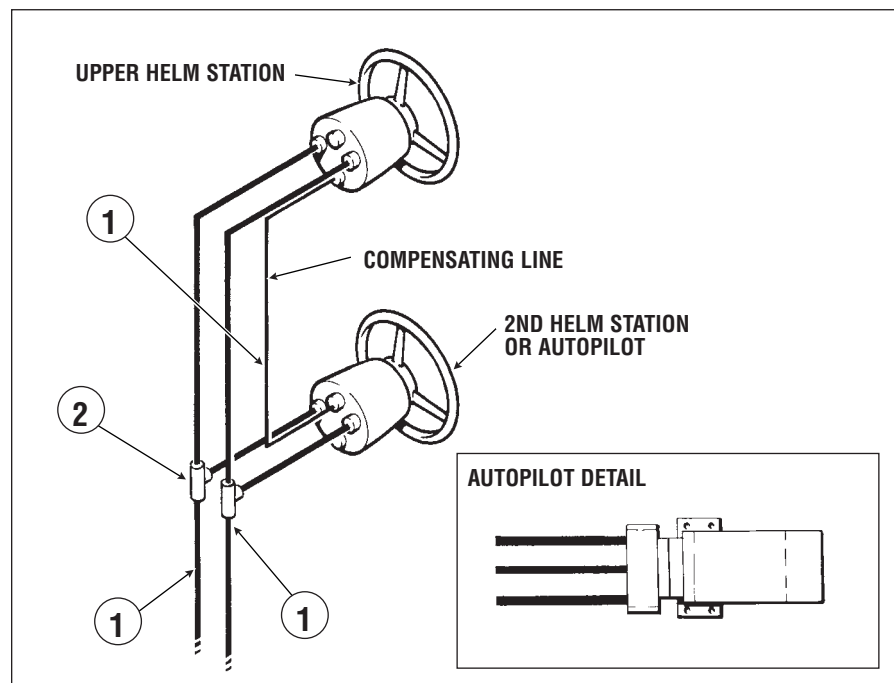
- 1) Refer to illustration Figure E.
- 2) Determine the location of the second station or autopilot power pack.
- 3) Measure along the path of the tube routing from the upper helm pump to the second station or autopilot power pack. Multiply this length by three for the amount of tubing required.
- 4)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



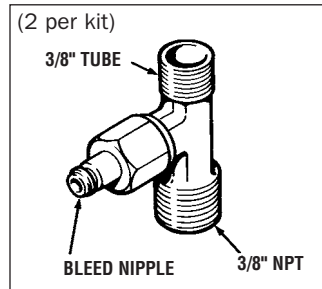
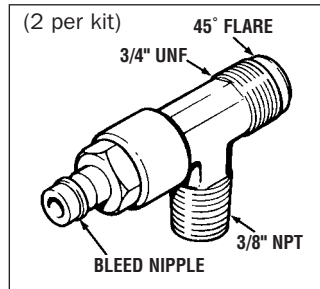
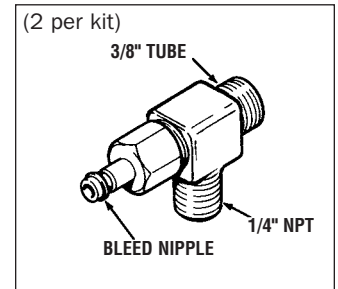
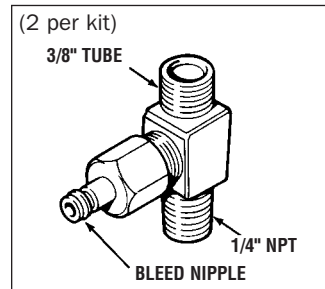
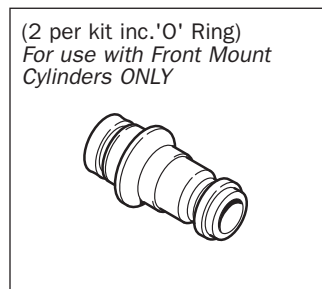
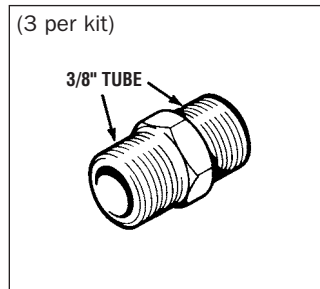
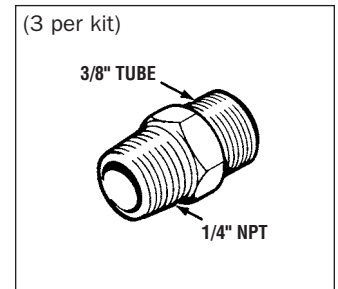
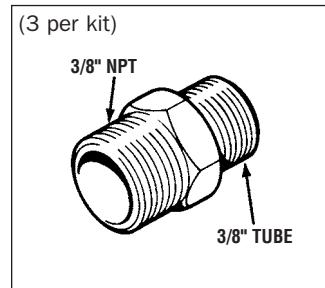
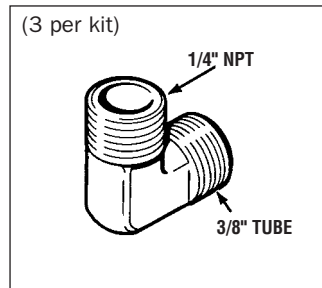
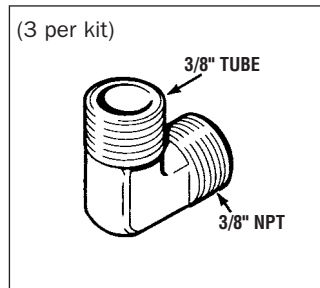
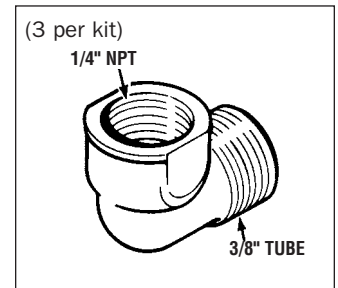
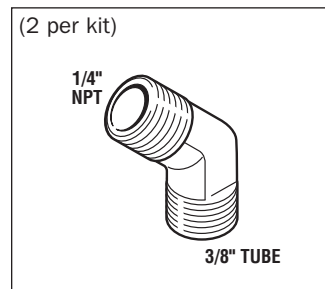
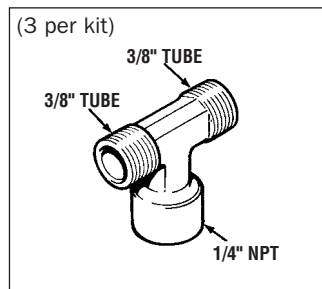
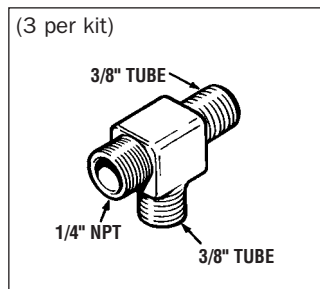
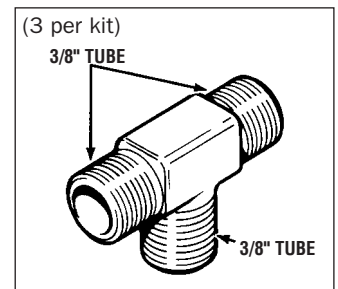
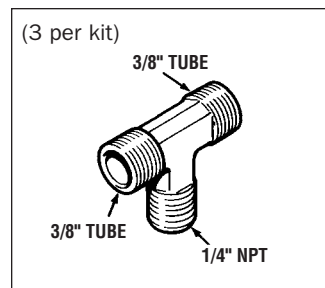
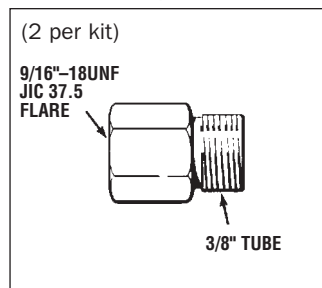
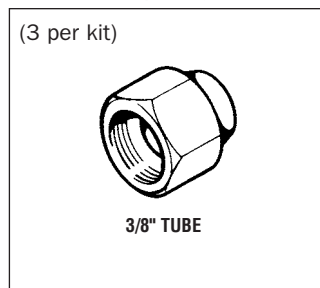
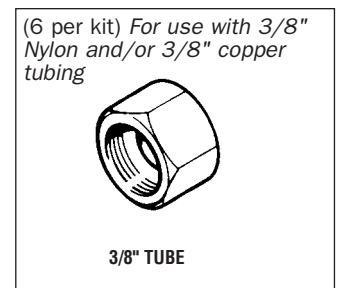
ITEM #	DESCRIPTION	PART NUMBER	QUANTITY REQUIRED	REF PAGE #
1	3/8" DIA NYLON OR COPPER TUBE	HT5_ _ _	AS MEASURED	
2	FITTING KIT	HF5502	1	10-11

**Required details for the addition of an autopilot.**

- 1) Most SeaStar Helm pumps have a built in check valve. Full feedback helm pumps do not have a built in check valve and one will be required for the installation of an autopilot, refer to page 9-4 of this guide to determine whether your helm pump has check valves built in.
- 2) Autopilot mfg. requires the volume of your steering cylinder(s) to provide an adequate autopilot pump, refer to page 12-2 for volumes of your cylinder requirement.

# 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 10-1.

**HF5518 Vertical Bleeder Tee**

**HF5519 Bleed Tee (TM Cylinders)**

**HF5520 Horiz. Bleeder Tee**

**HF5521 Vertical Bleeder Tee**

**HF5548 Bleed Nipple**

**HF5527 Union Coupling Fitting**

**HF5528 Straight Fitting**

**HF5532 Connector Fitting**

**HF5529 Elbow Fitting**

**HF5534 Elbow Fitting**

**HF5538 Street Elbow**

**HF5540 45° Fitting**

**HF5533 Tee Fitting**

**HF5531 Tee Fitting**

**HF5530 Tee Fitting**

**HF5536 Tee Fitting**

**HF5566 Adapter Fitting**

**HF5524 Cap Plug Nut**

**HF5526 Tube Nut**


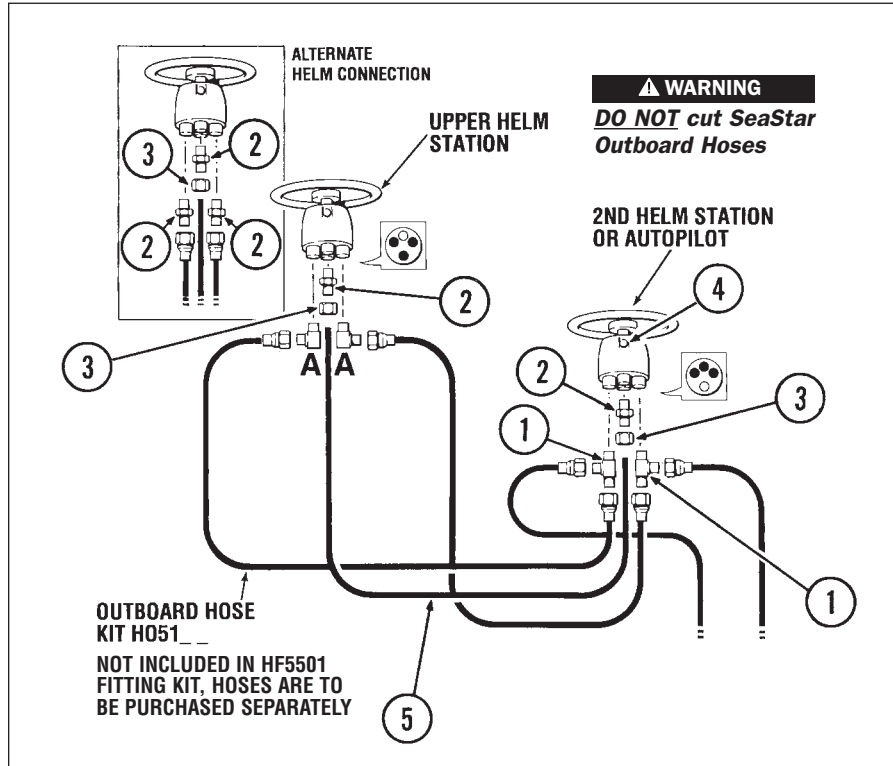
### HF5501

Application

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

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

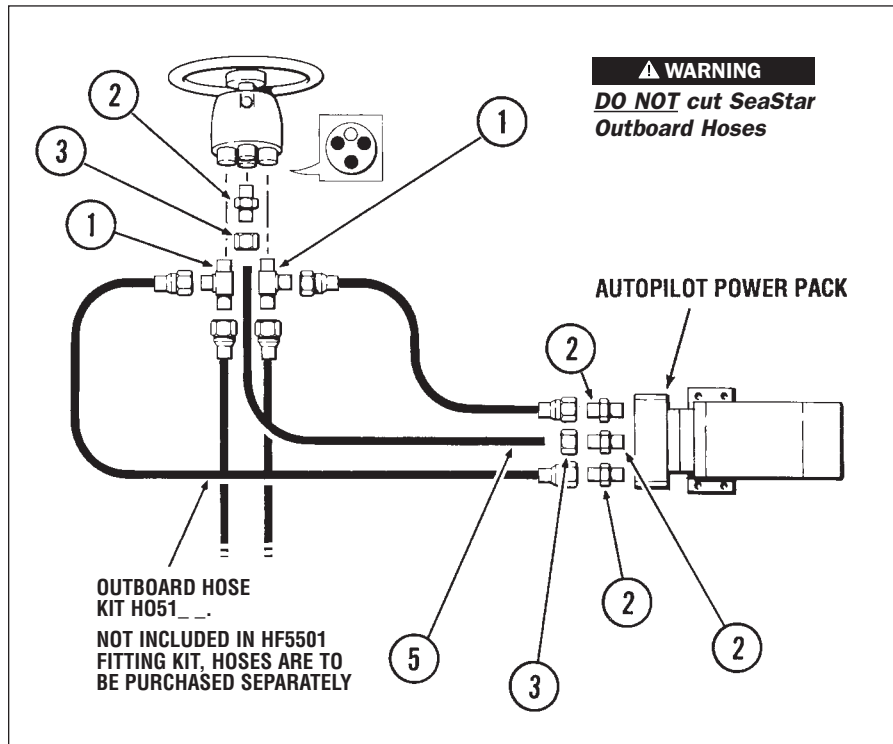
\* SUPPLIED WITH HELM PUMP.  
NOTE: HF5501 FITTING KIT IS TO BE USED WHEN THE SYSTEM HAS BEEN PLUMBED WITH SEASTAR OUTBOARD STEERING HOSE ONLY.



### Autopilot powerpack connection

**CAUTION**

DO NOT cut SeaStar Outboard Steering hose. Once cut there is no means to field swage fittings to the ends of the hoses.





## HF5502

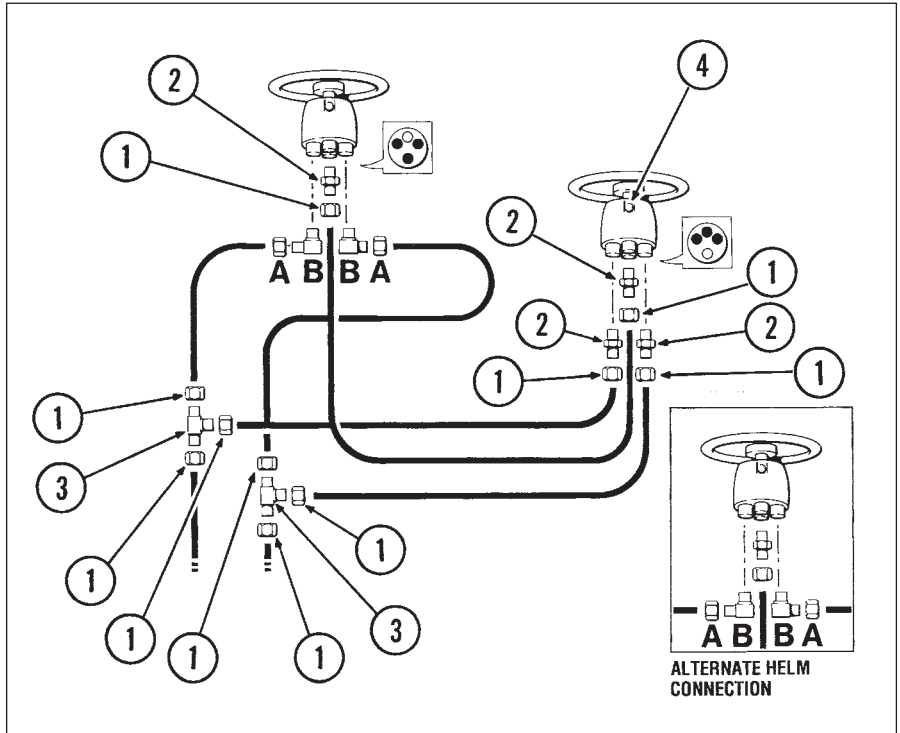
### Application

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

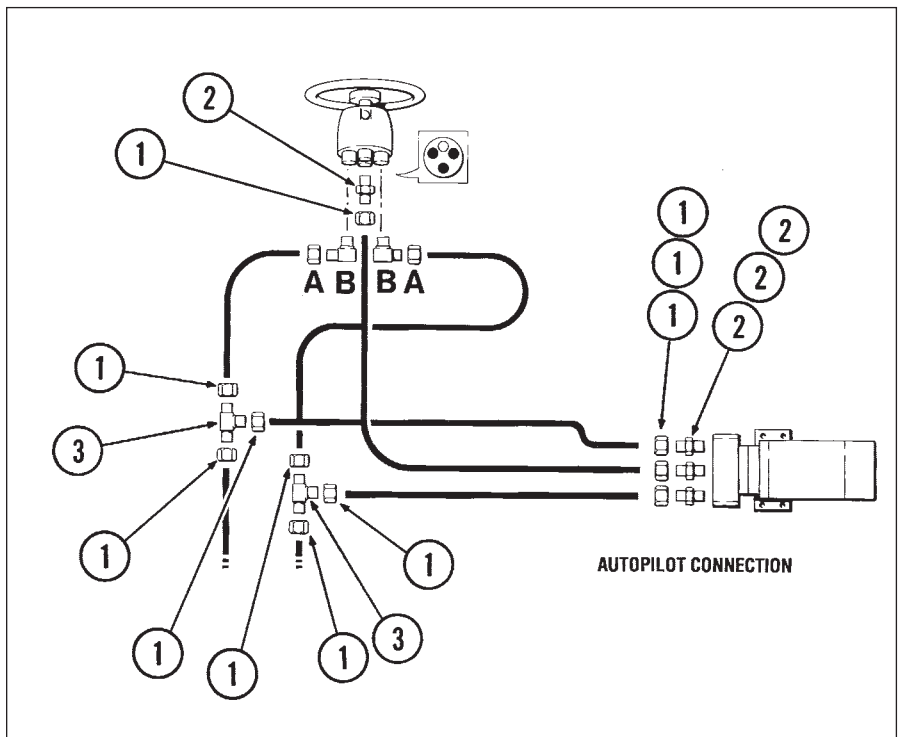
ITEM NO.	DESCRIPTION	QUANTITY PER KIT	PART NO.
1	Tube Nut – 3/8" Dia.	10	280327
2	Connector Fitting 3/8" Tube (M) – 1/4" NPT (M)	4	600602
3	Tee Fitting 3 Ends – 3/8" Tube	2	600605
4	Non-Vented Filler Plug	1	HA5432
A*	Tube Nut – 3/8" +Dia.	2	
B*	3/8" Elbow 1/4" NPT (M)	2	

\* SUPPLIED WITH HELM

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



## Autopilot powerpack connection



### HF5507

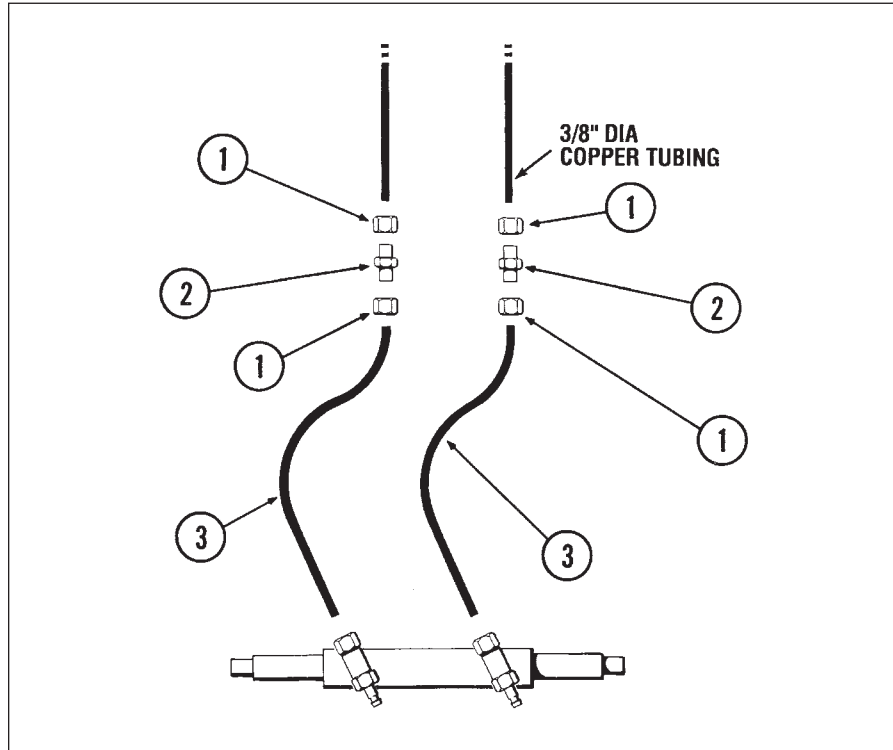
**Application**

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.	4	280327
2	Connector Fitting 3/8" Tube (M) – 3/8" Tube (M)	2	280929
3	Nylon Tubing 3/8" Dia.	6ft	795628

**NOTICE**

DO NOT use with SeaStar Outboard Cylinders and/or SeaStar Sterndrive cylinder # HC5332.



### HF5508

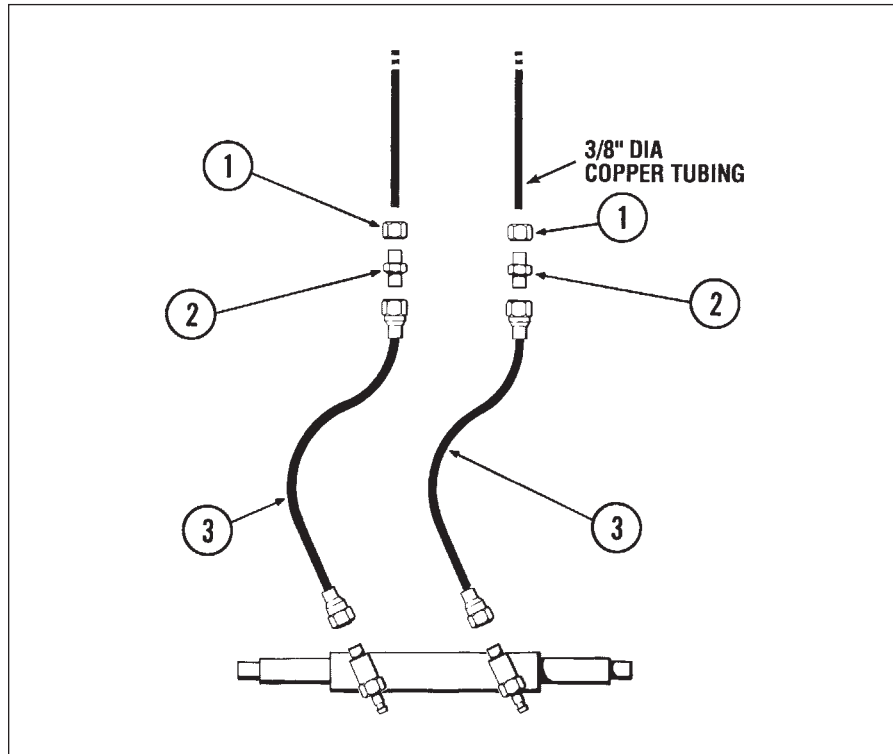
**Application**

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.	2	280327
2	Connector Fitting 3/8" Tube (M) – 3/8" Tube (M)	2	280929
3	18" Hose c/w Fittings	2	338621

**CAUTION**

DO NOT cut SeaStar Outboard Steering hose. Once cut there is no means to field swage fittings to the ends of the hoses.



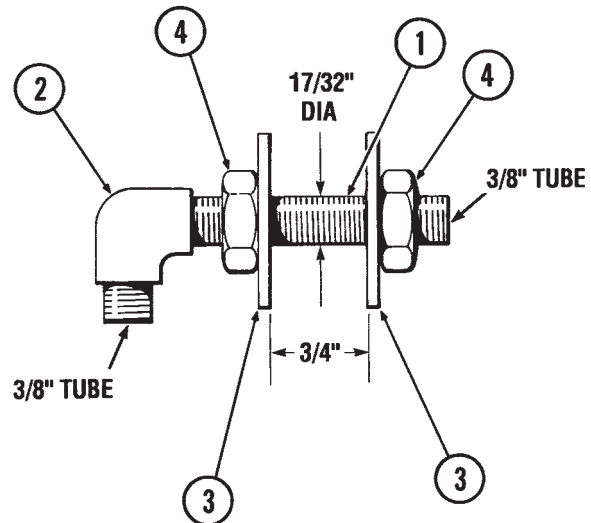
## HF5512

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

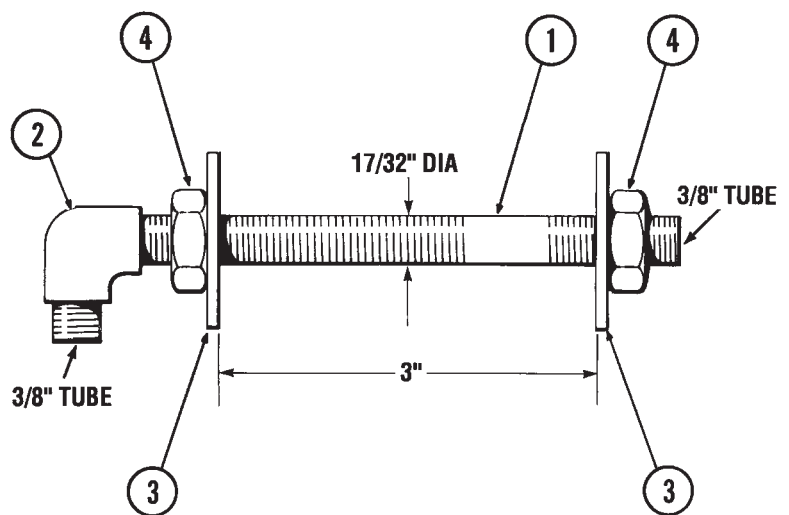
## HF5513

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



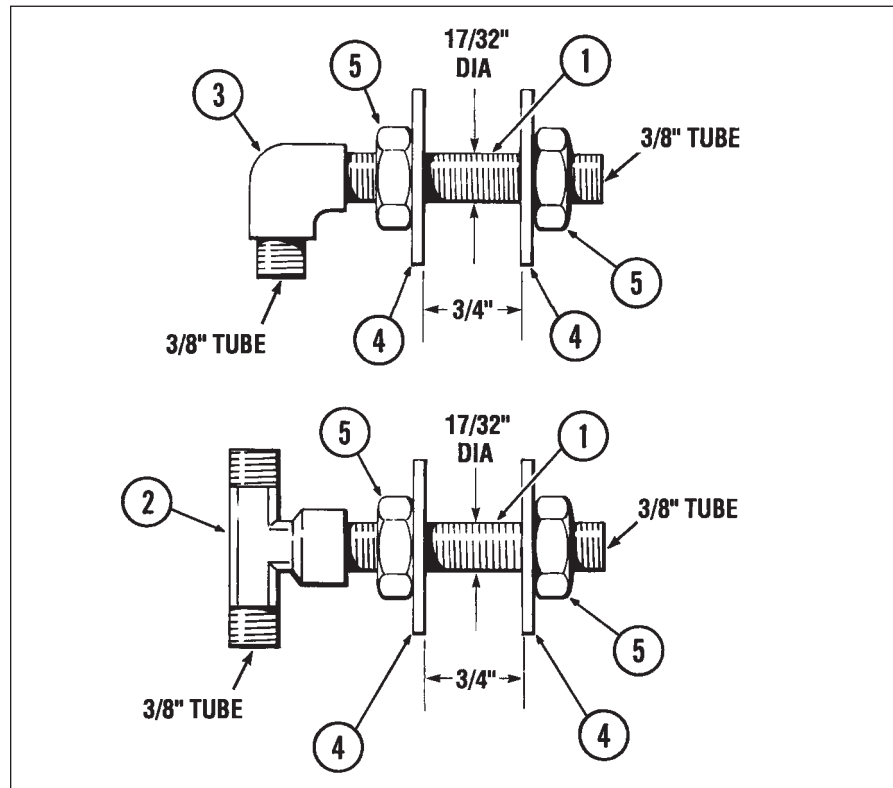
2 OF EACH ILLUSTRATED INCLUDED IN KIT

### 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

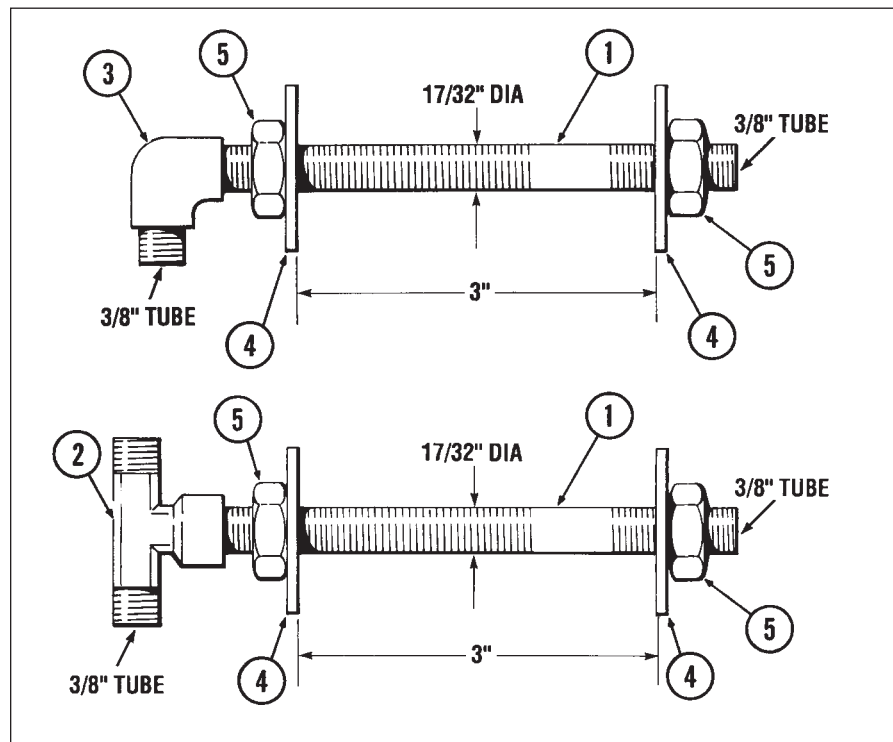


### HF5515

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

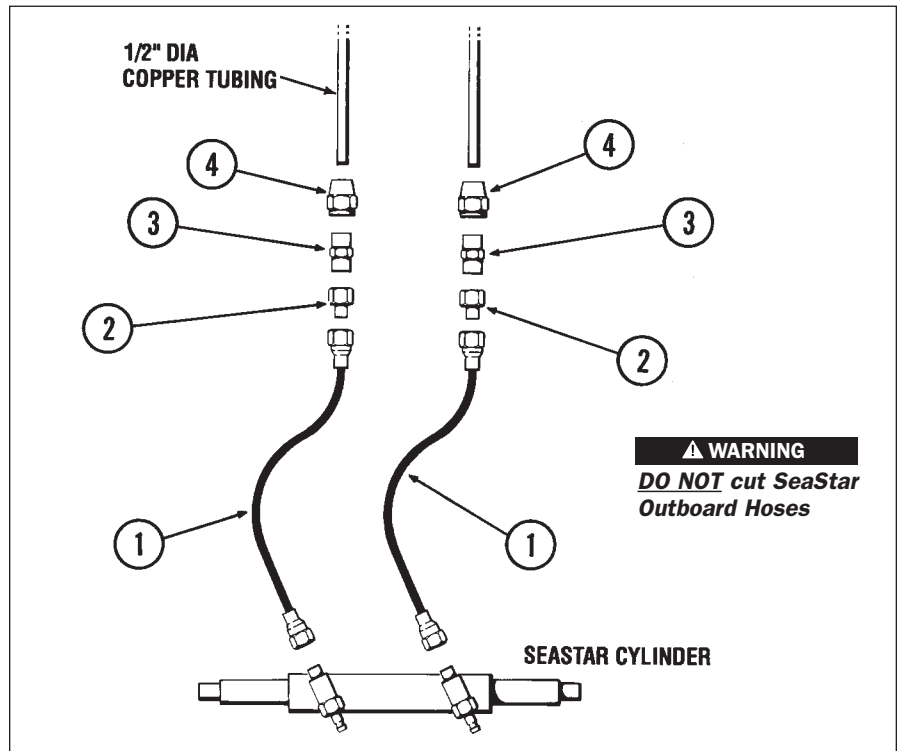


## HF5568

### 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

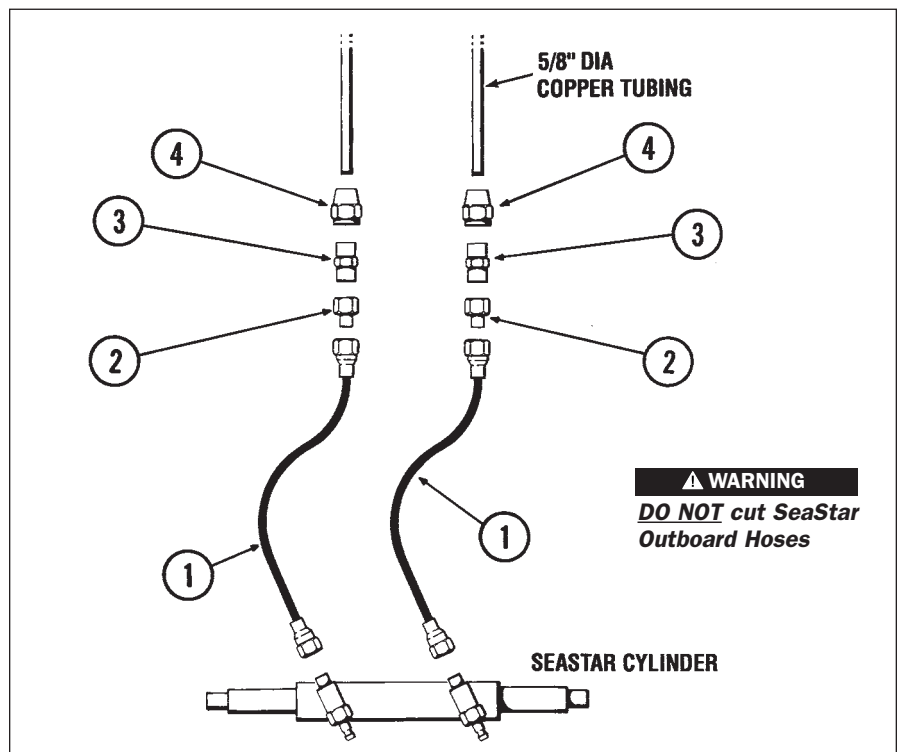


## HF5569

### 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



### CAUTION

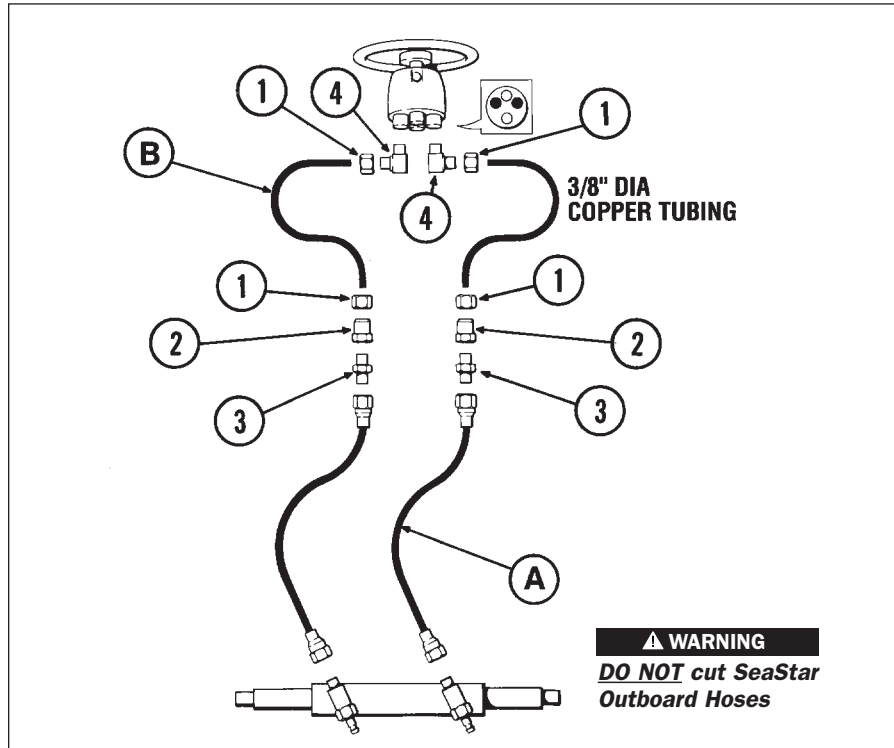
**DO NOT cut SeaStar Outboard Steering hose. Once cut there is no means to field swage fittings to the ends of the hoses.**

## HF5581

Application  
45° flare fitting connection kit  
for SeaStar systems

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

\* NOT SUPPLIED WITH FITTING KIT



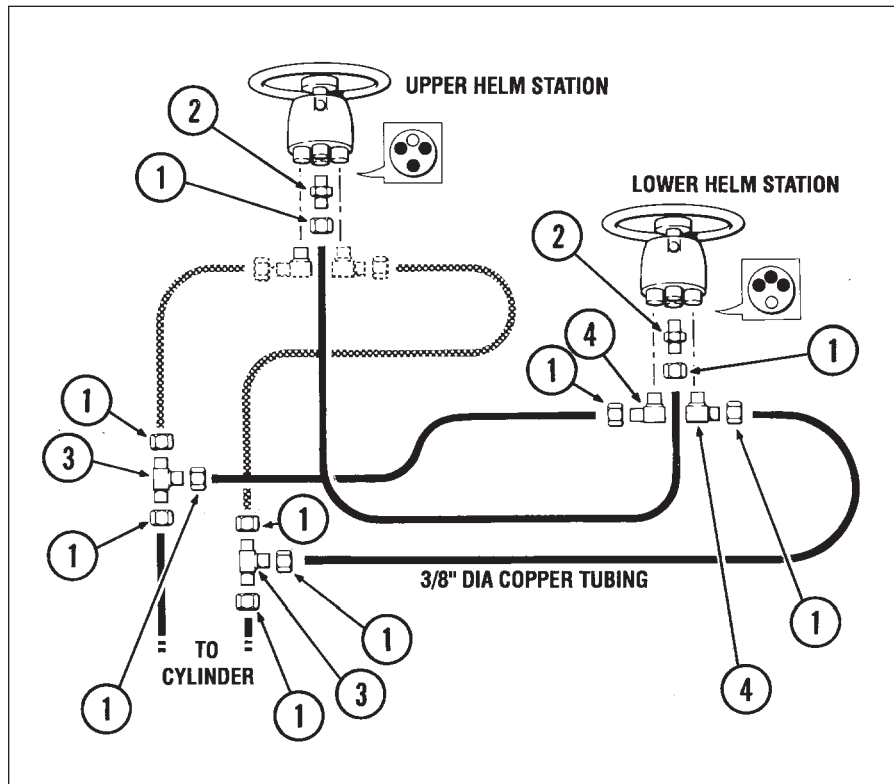
## HF5582

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

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

## NOTICE

If a mechanical tiebar can be used, it is advisable that one is fitted. There is no substitute for a mechanical tiebar

## CAUTION

**Side Mount or Unbalanced 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 at high speed (55 mph +) or a high load, eg: 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 not occur if a SeaStar Pro Helm Pump (part # HH5770) is used.

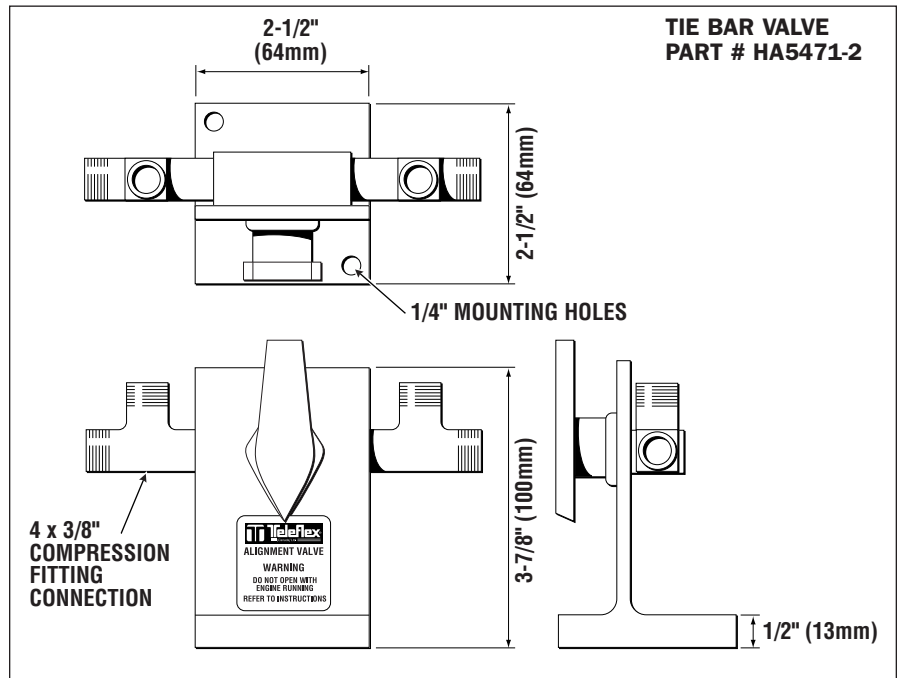
## CAUTION

**DO NOT allow cylinder body to move (HC5345), or shaft to move back into cylinder (HC5370). DO NOT use a wrench to hold cylinder.**

The Cylinder Alignment Valve (part # HA5471-2) will allow for the periodic required realignment of two outboard motors or rudders that are linked together with a Hydraulic Tie Bar as opposed to a solid link or a Mechanical Tie Bar.

Boats exceeding 55 mph must use the SeaStar Pro Helm Pump (part# HH5770) and SeaStar Pro Kevlar Hoses.

Due to the potential for leakage across the piston seals, it is possible for the engines to get out of synchronization. We are unable to predict, due to circumstances beyond our control, the frequency that misalignment may occur, therefore Engine alignment should be checked and corrected as required before leaving the dock.



## Cylinder Alignment Valve Bleeding Instructions

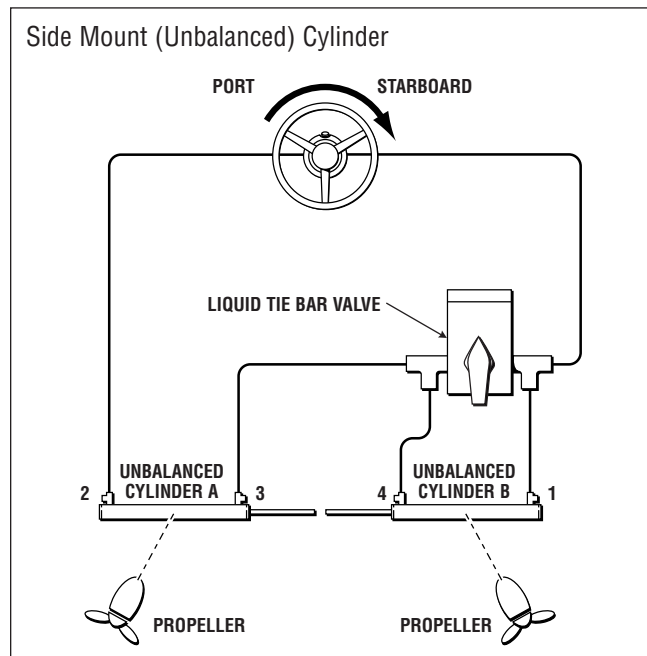
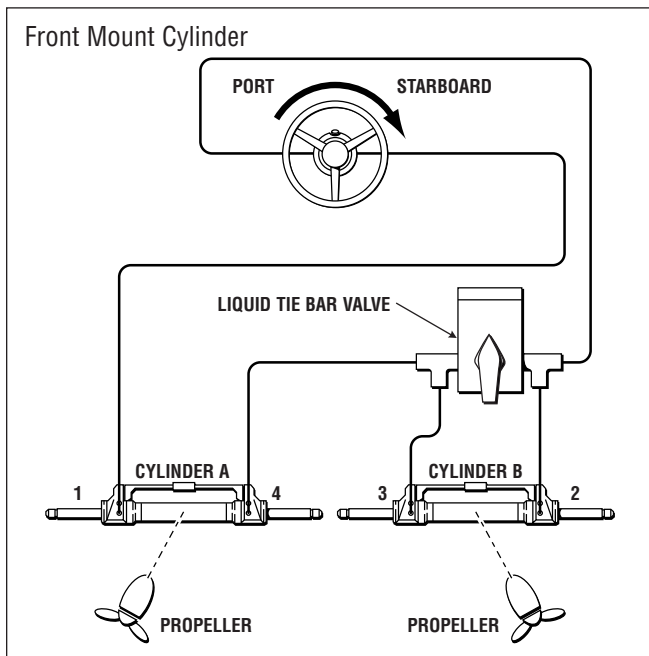
Referencing the cylinder alignment valve installation schematic.

- 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 forth from bleed fitting no. 1
- 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 forth 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 forth 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 forth from bleed fitting no. 4, then close bleed fitting no. 4
- Turn steering wheel back and forth from 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

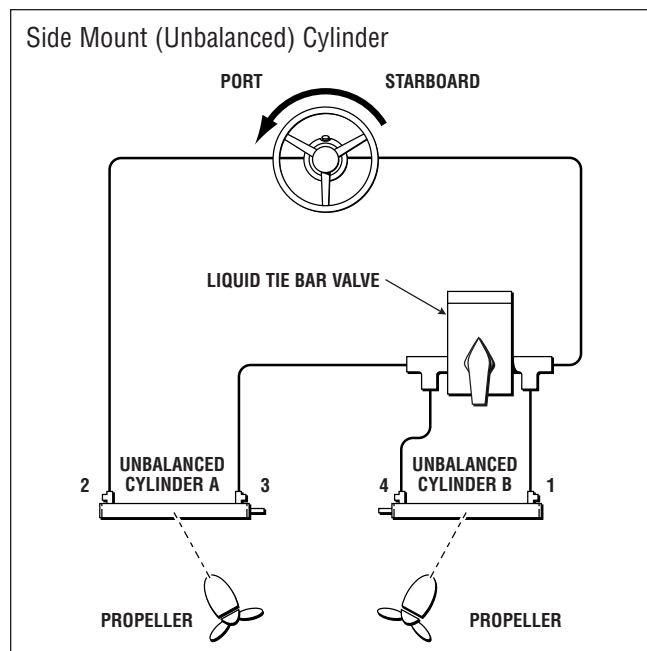
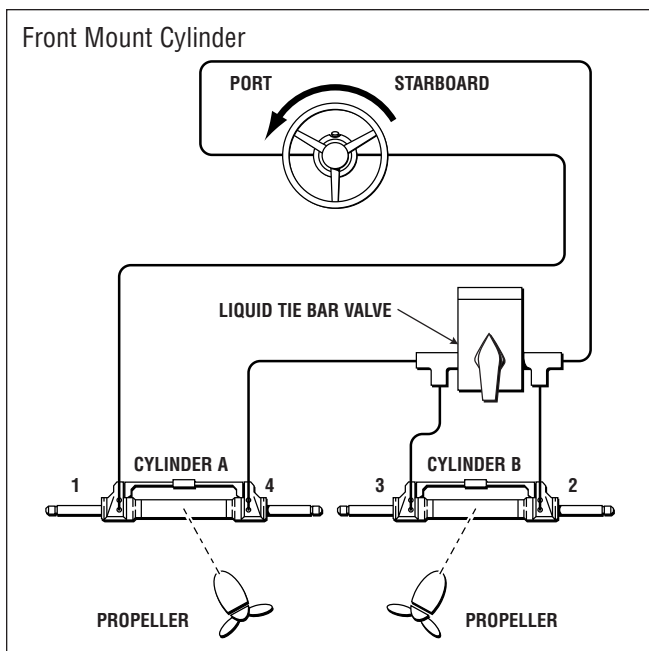
## Engines Toe'd Outwards; Props too far apart

- 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



## Engines Toe'd Inwards; Props too close together

- 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# HA5445-2



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!

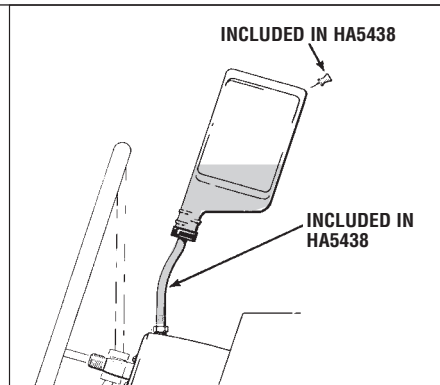
The Power Purge Jr. reduces installation and warranty costs while enhancing the quality of the boat to the end user. A typical manual fill and purge takes the average experienced installer or service technician about 30 minutes per boat — by using the Power Purge Jr. this can be reduced to 10 minutes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



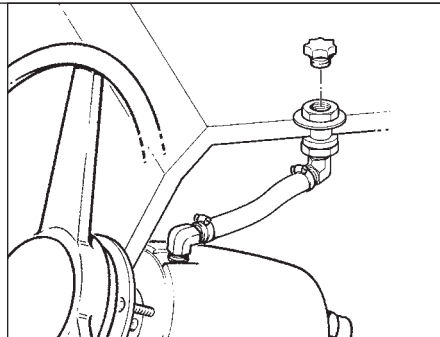
- This kit is needed to properly bleed the SeaStar Outboard steering kit
- Screws onto the SeaStar and equivalent fluid to bleed the SeaStar system
- Makes for a clean bleed when used properly

## SeaStar Remote Fill

Part# HA6450

### NOTICE

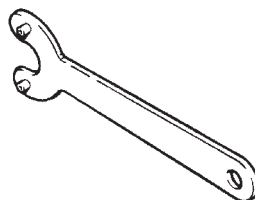
*requires 3/4" hole to be drilled onto dash above helm pump.*



- 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

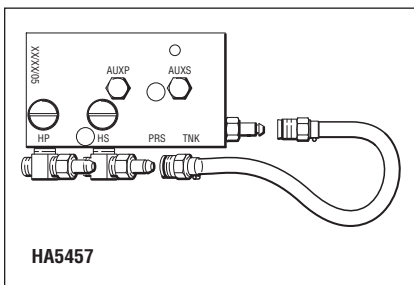
Part# 745225



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

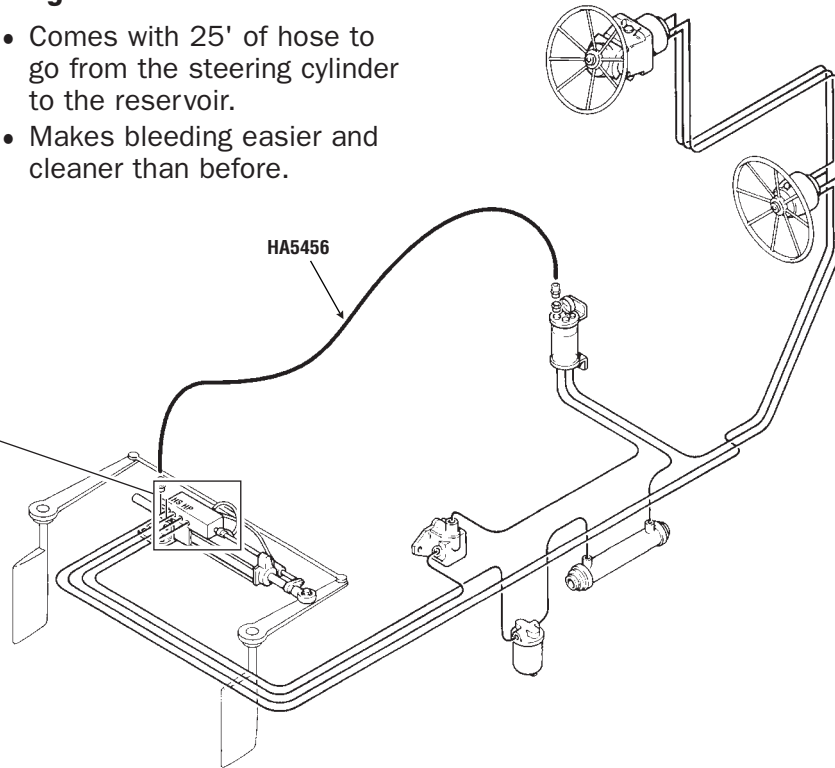
### SeaStar Power Steering Purge Kit Part# HA5457

- Makes bleeding even easier than before.
- Central bleeding location—no need to run hoses to reservoir.
- Can only be used with Power Steering Cylinders made after October 2005.



### 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

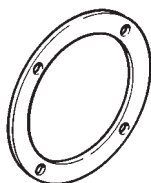
**HA5405** Mounting washer for SeaStar helm studs for applications where the dashboard hole is 3-1/4 inches in diameter.

**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.

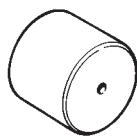
**HA5466** Drill Jig for drilling mounting holes for standard SeaStar and SeaStar Pro helms. A 3 inch dashboard hole is required.

**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.

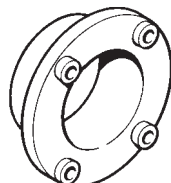
**HA5468** Drill Jig for drilling mounting holes for SeaStar and SeaStar Pro traditional tilt helms (HH5741, HH5742, HH5743). Also back Mount Kit (HA5418). A 4-1/2 inch dashboard hole is required.



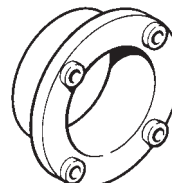
HA5405



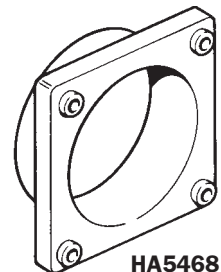
HA5465



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 \_\_\_\_\_

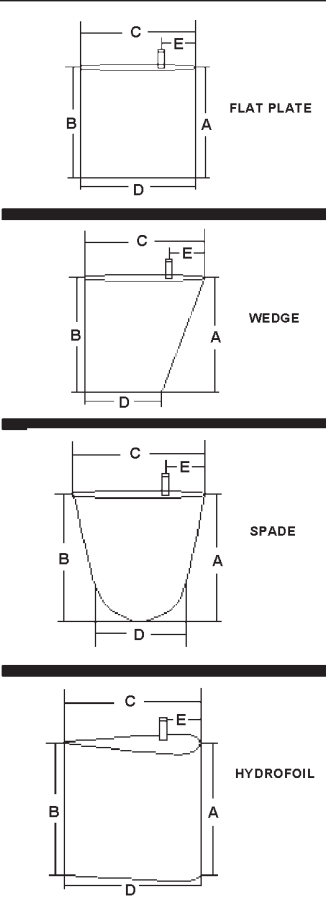
PROP DIAMETER: \_\_\_\_\_

SINGLE ENGINE

TWIN ENGINE

RUDDER DATA
-------------

(CIRCLE TYPE OF RUDDER)



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.

NOTICE
--------

*Please include a detailed drawing of your rudder to assist with rudder load calculations.*

# 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: \_\_\_\_\_

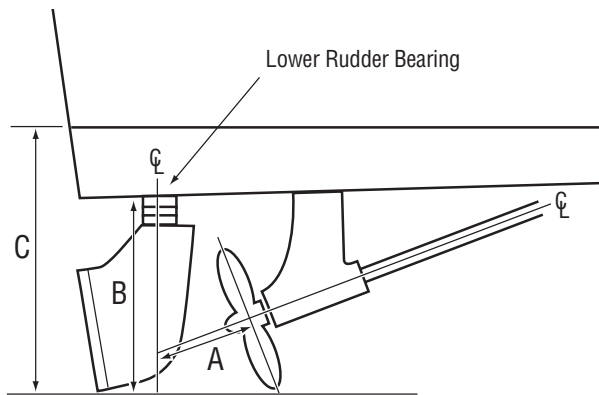
### POWER DATA

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

#### NOTICE

Please include a detailed drawing of your rudder to assist with rudder load calculations.

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

# 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**

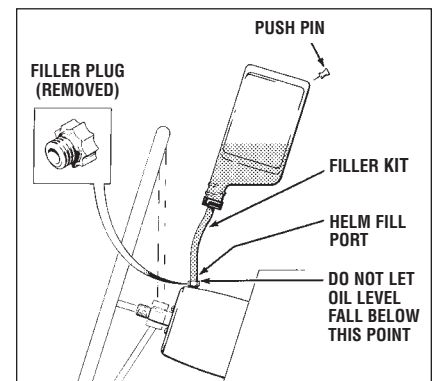


Alternate recommended hydraulic fluids for SeaStar steering systems.

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<sup>®</sup> Hynautic<sup>™</sup>

## 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)
BAYSTAR COMPACT	HC4645H	1.25 (31.7)	0.63 (16.0)	8 (203)	N/A	7.24 (118.6)	N/A
BAYSTAR COMPACT	HC4658H	1.25 (31.7)	0.63 (16.0)	8 (203)	N/A	7.24 (118.6)	N/A
BAYSTAR COMPACT	HC4647H	1.25 (31.7)	0.63 (16.0)	8 (203)	N/A	7.24 (118.6)	N/A
BAYSTAR COMPACT	HC4648H	1.25 (31.7)	0.63 (16.0)	8 (203)	N/A	7.24 (118.6)	N/A
BA125-3ATM	HC5303	1.25 (31.7)	0.63 (16.0)	3 (76)	HS5154	2.72 (44.5)	N/A
BA125-6.25ATM	HC5311	1.25 (31.7)	0.63 (16.0)	6.25 (159)	N/A	5.66 (92.7)	N/A
BA135-7	HC5332	1.37 (34.9)	0.625 (15.9)	7 (178)	HS5155	8.3 (135.2)	5741 (66.1)
BA125-7ATM	HC5312	1.25 (31.7)	0.50 (12.7)	7 (178)	HS5154	7.2 (118.2)	5025 (57.9)
BA135-7ATM	HC5313	1.375 (34.9)	0.625 (15.9)	7 (178)	HS5155	8.3 (135.2)	5741 (66.1)
BA135-8EM	HC5327	1.35 (34.2)	0.63 (16.0)	8 (203)	HS5155	9.5 (155.4)	6557 (75.5)
BA150-7ATM	HC5314	1.50 (38.1)	0.625 (15.9)	7 (178)	HS5156	10.2 (167.5)	7117 (82.0)
BA150-7TM	HC5318	1.50 (38.1)	0.625 (15.9)	7 (178)	HS5182	10.2 (167.5)	7117 (82.0)
BA175-7TM	HC5319	1.75 (44.4)	0.75 (19.0)	7 (178)	HS5183	13.7 (225.4)	9569 (110.2)
BA135-7EM	HC5332	1.375 (34.9)	0.625 (15.9)	7 (178)	HS5155	8.3 (135.2)	5741 (66.1)
BA150-7EM	HC5326	1.50 (38.1)	0.625 (15.9)	7 (178)	HS5156	10.2 (167.5)	8853 (102.0)
BA150-9TM	HC5369	1.50 (38.1)	0.625 (15.9)	9 (229)	HS5182	13.1 (214.7)	9375 (107.7)
BA175-9TM	HC5373	1.75 (44.4)	0.75 (19.0)	9 (229)	HS5183	17.7 (290.0)	12600 (145.5)
BA200-11TM	HC5378	2.00 (50.8)	0.75 (19.0)	11 (279)	HS5185	26.0 (426)	23140 (267.2)
BA200-11TMC	HC5379	2.00 (50.8)	0.75 (19.0)	11 (279)	HS5185	26.0 (426)	23140 (267.2)
BA200-9	HC5802	2.00 (50.8)	0.75 (19.0)	9 (229)	HS5198	21.25 (348.2)	18900 (218.3)
BA200-11	HC5804	2.00 (50.8)	0.75 (19.0)	11 (279)	HS5198	26.0 (426)	23140 (267.2)
125-8EM	HC5328	1.25 (31.7)	0.50 (12.7)	8 (203)	HS5154	8.3 (135.2)	7142 (82.3)
92VPS	HC5331	1.25 (31.7)	0.50 (12.7)	8 (203)	HS5153	8.3 (135.2)	N/A
BA125-8EMV	HC5330	1.25 (31.7)	0.50 (12.7)	8 (203)	HS5154	8.3 (135.2)	7142 (82.3)
PIVOT MOUNT	HC5345	1.375 (35)	0.75 (19.0)	8 (203)	HS5157	8.34 (136.6)	N/A
PIVOT MOUNT	HC5347	1.375 (35)	0.75 (19.0)	8 (203)	HS5157	8.34 (136.6)	N/A
PIVOT MOUNT	HC5348	1.375 (35)	0.75 (19.0)	8 (203)	HS5157	8.34 (136.6)	N/A
PIVOT MOUNT	HC5358	1.375 (35)	0.75 (19.0)	8 (203)	HS5157	8.34 (136.6)	N/A
FRONT MOUNT	HC5342	1.262 (32.56)	0.75 (19.0)	10 (254)	HS5157	8.13 (133.2)	N/A
SIDE MOUNT	HC5370	1.25 (31.7)	0.50 (12.7)	8 (203)	HS5153	8.3 (135.2)	N/A
SPLASHWELL MOUNT	HC5380	1.25 (31.7)	0.50 (12.7)	9 (228)	HS5155	9.3 (152.1)	N/A
CATAMARAN O/B	HC5343	1.262 (32.0)	0.75 (19.0)	10 (254)	HS5157	8.13 (133.2)	N/A
CATAMARAN O/B	HC5374	1.50 (38.1)	0.75 (19.0)	10 (254)	KS-06	13.3 (217.95)	8990 (103.8)
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)
TOURNAMENT SERIES	HC6750	1.375	0.75 (19.0)	8 (203)	HS5157	8.3 (135.2)	N/A
TOURNAMENT SERIES	HC6751	1.375	0.75 (19.0)	8 (203)	HS5157	8.3 (135.2)	N/A
TOURNAMENT SERIES	HC6752	1.375	0.75 (19.0)	8 (203)	HS5157	8.3 (135.2)	N/A
TOURNAMENT SERIES	HC6753	1.375	0.75 (19.0)	8 (203)	HS5157	8.3 (135.2)	N/A
TOURNAMENT SERIES	HC6754	1.375	0.75 (19.0)	8 (203)	HS5157	8.3 (135.2)	N/A
TOURNAMENT SERIES	HC6755	1.375	0.75 (19.0)	8 (203)	HS5157	8.3 (135.2)	N/A

**NOTICE**

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



## DISTRIBUTOR LIST

## CANADA

**ALBERTA**

Coast Distribution (Wholesale)  
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**  
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**  
www.paynesmarine.com

Payne's Marine Supply Inc.  
201 - 3765 E. First Avenue  
Burnaby  
British Columbia  
V5C 3V8  
Canada

**Tel: (604) 299-7771 Fax: (604) 299-3471**  
www.paynesmarine.com

Western Marine Company  
1494 Powell Street Vancouver  
British Columbia  
V5L 5B5  
Canada

**Tel: (604) 253-7721 Fax: (604) 253-2656**  
Toll Free: 800-663-0600  
e-mail: sales@westernmarine.com  
www.westernmarine.com

**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**  
e-mail: scott.mercer@nf.sympatico.ca  
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**  
e-mail: info@stright-mackay.com  
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  
1594 Winhara Road  
Gravenhurst  
Ontario  
P1P 1R0  
Canada  
**Tel: 705-684-9709 Fax: 705-684-9325**  
e-mail: hutching@vianet.on.ca  
www.hutchingsmarine.com

Kimpex Action  
311 Soversion Rd.  
London  
Ontario  
N6M 1A6  
Canada

**Tel: 519-659-0508 Fax: 519-659-6428**

Payne's Marine Supply  
2360 Industrial St.  
Burlington  
Ontario  
L7P 1A1  
Canada

**Tel: 905-332-8291 Fax: 905-332-0557**  
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  
e-mail: mail@mermaidmarine.com  
www.mermaidmarine.com

**QUEBEC**

Coast Distribution (Wholesale)  
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  
Alabama  
36610  
USA

**Tel: 504-467-9200 Fax: 251-452-3425**

Toll Free: 800-462-9500  
e-mail: [hsales@beaconsupply.com](mailto:hsales@beaconsupply.com)  
[www.beaconsupply.com](http://www.beaconsupply.com)

### ALASKA

LFS Inc. (Retail)  
2315 Airport Beach  
Dutch Harbor  
Alaska  
99692  
USA

**Tel: 907-581-2178 Fax: 907-581-2188**

e-mail: [dutch@lfsinc.com](mailto:dutch@lfsinc.com)  
[www.lfsinc.com](http://www.lfsinc.com)

LFS Inc. (Retail)  
PO Box 3010  
Dillingham  
Alaska  
99576  
USA

**Tel: 907-842-5376 Fax: 907-842-2350**

e-mail: [bellingham@lfsinc.com](mailto:bellingham@lfsinc.com)  
[www.lfsinc.com](http://www.lfsinc.com)

LFS Inc. (Retail)  
PO Box 215  
Naknek  
Alaska  
99633  
USA

**Tel: 907-246-4490 Fax: 907-246-4446**

e-mail: [bellingham@lfsinc.com](mailto:bellingham@lfsinc.com)  
[www.lfsinc.com](http://www.lfsinc.com)

Redden Marine (Retail)  
PO 2323  
Cordova  
Alaska  
99574  
USA

**Tel: 907-424-3188 Fax: 907-424-3788**

e-mail: [reddeninc@worldnet.att.net](mailto:reddeninc@worldnet.att.net)  
[www.reddenmarine.com](http://www.reddenmarine.com)

Redden-Kachemak Gear  
59385 East Rd.  
Homer  
Alaska  
99603  
USA

**Tel: (907) 235-8617 Fax: (907) 235-2605**

Toll Free: 800-478-8612  
e-mail: [reddeninc@worldnet.att.net](mailto:reddeninc@worldnet.att.net)  
[www.reddenmarine.com](http://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  
e-mail: [vipdist@alaska.net](mailto: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  
[www.benrock.com](http://www.benrock.com)

### CALIFORNIA

Boatech Inc.  
31500 Grape Street 3-208  
Lake Elsinore  
California  
92532  
USA

**Tel: 213-200-0369 Fax: 909-678-6358**

[www.boatech.com](http://www.boatech.com)

Coast Distribution System (Wholesale)  
California  
USA

**Tel: 800-495-5858**

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  
e-mail: [englund@pacifier.com](mailto:englund@pacifier.com)  
[www.englundmarine.com](http://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  
e-mail: [englund@pacifier.com](mailto:englund@pacifier.com)  
[www.englundmarine.com](http://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: (831) 728-4417 Fax: (408) 728-3014**

Toll Free: 800-621-6885  
[www.portsupply.com](http://www.portsupply.com)

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

### FLORIDA

Boat Owner's Warehouse  
33377 SW 2nd Ave  
Ft. Lauderdale  
Florida  
33315  
USA

**Tel: 954-462-7337 Fax: 954-527-4173**

Toll Free: 800-262-8799  
[www.boatownerswarehouse.com](http://www.boatownerswarehouse.com)

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

**Tel: 954-525-3379 Fax: 954-760-9617**

e-mail: [brung@earthlink.net](mailto:brung@earthlink.net)  
[www.brungerexport.com](http://www.brungerexport.com)

# U.S.A.

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 (Wholesale)  
203A Kelsey Lane  
Tampa  
Florida  
33619  
USA

**Tel: 800-538-7973 Fax: (813) 621-5216**  
Toll Free: 800-538-7973

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

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

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

**Tel: (727) 536-1955 Fax: (727) 539-1248**  
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

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  
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  
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  
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  
e-mail: lms@lewismarine.com  
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**  
www.lewismarine.com

## DISTRIBUTOR LIST

### GEORGIA

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

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

Coast Distribution (Wholesale)  
1795 Continental Way  
Atlanta  
Georgia  
30316  
USA

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

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

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

### HAWAII

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

**Tel: (808) 524-6150**

West Marine  
111 Sand Island Access Road  
Honolulu  
Hawaii  
96819  
USA

**Tel: (808) 845-9900 Fax: (808) 842-0454**

### ILLINOIS

Coast Distribution (Wholesale)  
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: 1-765-396-9683 Fax: 1-800-647-8449**  
Toll Free: 1-800-247-6324  
e-mail: charmantent@insightbb.com  
www.charmantent.com

## U.S.A.

**IOWA**

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

**KANSAS**

Medart Inc. KC  
2644 South 96th Street  
Edwardsville  
Kansas  
66111-3483  
USA  
**Tel: 800-888-7181 Fax: 888-510-3101**  
Toll Free: 800-888-7181  
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  
e-mail: sales@beaconsupply.com  
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  
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  
www.donovanmarine.com

**MAINE**

HHamilton Marine Supply  
155 East Main StreetSearsport  
Maine  
4974  
USA  
**Tel: 207-548-6302 Fax: 800-548-6352**  
e-mail: mail@hamiltonmarine.com  
www.hamiltonmarine.com

Lewis Marine Supply of Maine  
50 New County Road  
Rockland  
Maine  
4841  
USA  
**Tel: (207) 596-6464 Fax: (207) 596-5615**

**MARYLAND**

Boater's World  
6711 Ritz Way  
Beltsvillw  
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  
e-mail: mcdurmon1@AOL.com

Midwest Marine Supply Co.  
24300 Jefferson Avenue  
St. Clair Shores  
Michigan  
48080  
USA  
**Tel: (586) 778-8950 Fax: (586) 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  
www.landnsea.net

Bell Industries  
580 Yankee Doodle Rd. Suite 1200  
Eagan  
Minnesota  
55121  
USA  
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  
www.hannaysinc.com

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

**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  
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  
www.medartmarine.com

# U.S.A.

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: 1-888-244-4735**  
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**

Morgan Recreational Supply  
6013 Denny Drive  
Farmington  
New York  
14425  
USA  
**Tel: 800-836-5300 Fax: 888-353-8099**  
Toll Free: 800-836-5300  
e-mail: tima@morganrec.com  
www.morganrec.com

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  
www.paxtonco.com

## OHIO

Barclay Marine  
327 Detroit Ave  
Cleveland  
Ohio  
44113  
USA  
**Tel: 800-959-5907 Fax: 800-959-1697**  
Toll Free:

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  
www.benrock.com

## OREGON

Coast Distribution (Wholesale)  
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  
e-mail: englund@pacifier.com  
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  
e-mail: englund@pacifier.com  
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  
e-mail: englund@pacifier.com  
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

## 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  
e-mail: blackburn@wpia.net

Coast Distribution (Wholesale)  
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  
www.donovanmarine.com

Ellett Brothers  
267 Columbia Avenue  
Chapin  
South Carolina  
29036  
USA  
**Tel: (803) 345-3751 Fax: (803) 345-1820**

## DISTRIBUTOR LIST

## U.S.A.

Jerry's Marine  
3601-B Meeting St. Rd.  
Charleston  
South Carolina  
29405  
USA  
**Tel: 1-800-788-2231**  
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**  
www.donovanmarine.com

**TEXAS**

Coast Distribution (Wholesale)  
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  
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**

V & V Marine Products  
6642 Baker Blvd.  
Fort Worth  
Texas  
76118  
USA  
**Tel: (817) 284-1125 Fax: (817) 284-1219**

**UTAH**

Coast Distribution (Wholesale)  
3800 W. 2100 S.  
Salt Lake City  
Utah  
84120  
USA  
**Tel: (801) 973-4993 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  
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  
www.paxtonco.com

**WASHINGTON**

Coast Distribution Seattle (Wholesale)  
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  
e-mail: englund@pacifier.com  
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  
e-mail: englund@pacifier.com  
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  
e-mail: mail@fisheriessupply.com  
www.fisheriessupply.com

G02Marine  
330 Madison Ave, South  
Bainbridge Island  
Washington  
98110  
USA  
**Tel: 877-780-5670 Fax: 877-780-5673**  
www.go2marine.com

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  
e-mail: kolstrand@msn.com  
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  
e-mail: bellingham@lfsinc.com  
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  
e-mail: kevinp@reddeninc.com  
e-mail: jima@reddeninc.com  
www.reddeninc.com

Seattle Marine  
2121 West Commodore Way  
Seattle  
Washington  
98199  
USA  
**Tel: 1-206-285-5010 Fax: 1-206-285-7925**  
e-mail: seamar@seamar.com  
www.seamar.com

## U.S.A. &amp; INTERNATIONAL

**WISCONSIN**

Bell Industries  
N117 W18456 Fulton Drive  
Germantown  
Wisconsin  
53022  
USA  
**Tel: 262-253-0450 Fax: 262-253-0220**  
Toll Free: 800-766-2355  
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****ARGENTINA**

See Brunger Exports, Florida

**ARUBA**

See Brunger Exports, Florida

**AUSTRALIA**

Bob Littler Agencies (Wholesale)  
45 Aquarium Ave.  
Hemmant  
Queensland  
4174  
Australia  
**Tel: 61 7 3907 5500 Fax: 61 7 3907 5599**  
e-mail: morser@bla.com.au  
www.bla.com.au

**AUSTRIA**

G Ascherl GmbH  
Erlengrund 38  
6971 Hard  
Austria  
**Tel: 00 43 5574 899000**  
**Fax: 00 43 5574 8990010**  
e-mail: 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**  
e-mail: info@allpa.nl  
www.allpamarine.com

**BERMUDA**

See Brunger Exports, Florida

**BRAZIL**

See Brunger Exports, Florida

**COLUMBIA**

See Brunger Exports, Florida

**DENMARK**

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

**EGYPT**

See Brunger Exports, Florida

**ENGLAND**

Hypro Marine  
Mount Pleasant Lane  
Lymington  
Hampshire  
SO41 8LS  
England  
**Tel: 0044 590 681445**  
**Fax: 0044 590 681446**  
e-mail: info.@hypromarine.co.uk  
www.hypromarine.com

**EQUADOR**

See Brunger Exports, Florida

**FINLAND**

US Parts Oy  
Holkkitie 10  
880  
Helsinki  
Finland  
**Tel: 00-358-9-251-31888**  
**Fax: 00-358-9-251-31881**  
e-mail: marine@usparts.fi  
www.usparts.fi

**FRANCE**

Proxam Distribution  
86 Chemin de la Pelouque  
FR13016  
Marseille  
France  
**Tel: 00-33-491-463434**  
**Fax: 00-33-491-460400**  
e-mail: proxam@pieces-marine.com  
www.pieces-marine.com

**FRENCH WEST INDIES**

See Brunger Exports, Florida

**GERMANY**

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**  
e-mail: info@allpa.nl  
www.allpamarine.com

**GIBRALTAR**

See Brunger Exports, Florida

**GREECE**

Motocraft SA  
48 Alimou Ave  
17455  
Athens  
Greece  
**Tel: +3010 98.88.288**  
**Fax: +3010 98.50.102**  
e-mail: alexzeis@motocraft.gr  
www.motocraft.gr

## INTERNATIONAL

**GUATEMALA**

See Brunger Exports, Florida

**HOLLAND**

Allpa Marine Equipment  
P.O. Box 6630 6503 GC Nijmegen- NL  
Kerkenbos 10-15 6546 BB  
Nijmegen  
Holland  
**Tel: +31 (0) 24 3777773**  
**Fax: +31 (0) 24 3777770**  
e-mail: info@allpa.nl  
www.allpa.nl

**HONG KONG**

Holylight (HK) Trading Co.  
Flat C., 11/F. Sing Teck Factory Building  
44 Wong Chuk Hang Road  
Aberdeen  
Hong Kong  
**Tel: 00 852 2543 7048**  
**Fax: 00 852 2543 6156**  
e-mail: coha@holylight.biz.com.hk

To Kee Marine Ltd.  
NO. 8 B On Kui Street  
On Lok Tsuen  
Fanling, NT  
Hong Kong  
**Tel: 00 852 2947 2921**  
**Fax: 00 852 2947 2076**  
e-mail: tokeer@netvigater.com

Teleflex Morse Pte Ltd.  
30 Pioneer Road  
Singapore  
628502

**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.sg

**INDIA**

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.sg

**INDONESIA**

Jasa Marine  
Jl Malaka 2, No. 35  
Jakarta 11230  
Indonesia  
**Tel: 00 62 21 690 3130**  
**Fax: 00 62 21 690 5615**  
e-mail: fred@jasamarine.co.id  
www.jasamarine.co.id

PD Sumber Marine  
Jalan Cengkeh No. 21 B-C  
Jakarta, 11110  
Indonesia  
**Tel: 00 62 21 692 5436**  
**Fax: 00 62 21 692 9234**  
e-mail: smmarine@centrin.net.id

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 00 65 686 13644**  
**Fax: 00 65 686 13662**  
e-mail: lkt.tfxmorse@pacific.net.sg

**IRELAND**

Western Marine  
Bulloch Harbour  
Dalkey  
County Dublin  
Ireland  
**Tel: 00-353-128-00321**  
**Fax: 00-353-128-00327**  
e-mail: 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**  
e-mail: giuseppe.scarpino@yamaha-motor.it  
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**  
e-mail: svama-nautica@svama-nautica.com  
www.svama-nautica.com

**JAMAICA**

See Brunger Exports, Florida

**JAPAN**

See Brunger Exports, Florida

**KOREA**

Saehan Marine  
591-16, Janghang-Dong  
Ilsan-Gu, Goyang-Si  
Gyungki-Do  
Korea  
**Tel: 82-31-907-6363**  
**Fax: 82-31-903-1951**  
e-mail: saehan36@hanmir.com

Saehan Marine Co.  
591-26, Janghang-Dong  
Ilsan-Gu, Goyang-City  
Gyungki-Do  
Korea  
**Tel: 00 82 31 907 6363**  
**Fax: 00 82 31 903 1951**  
e-mail: saehan36@paran.com

Saehan Marine  
P.O. Box 232  
Young Dong  
Seoul  
Korea  
**Tel: 00-822-542-6363**  
**Fax 00-822-546-1951**

Hwa Chang Trading Co.  
# 726-420 Hannam-Dong, Yongsan-Gu  
Seou  
Korea  
**Tel: 00 822 7946-133**  
**Fax: 00 822 7946-155**  
e-mail: hwachang@hwachang.com

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.sg

**KUWAIT**

See Brunger Exports, Florida

**MALAYSIA**

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.sg

**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**  
e-mail: sales@lusty-blundell.co.nz  
www.lusty-blundell.co.nz

**NORWAY**

Telma Control - A/P  
P.O. Box 2906, Toyen  
Rolph, hofmosgatan 18  
Oslo  
NO-0608  
Norway  
**Tel: 47 2318 0810**  
**Fax: 47 2318 0814**

**OMAN**

See Brunger Exports, Florida

**PANAMA**

See Brunger Exports, Florida

**PERU**

See Brunger Exports, Florida

**PHILLIPINES**

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.sg



# INTERNATIONAL

## DISTRIBUTOR LIST

### POLAND

Marco Motors SP. ZOO  
Lady 2  
71-605  
Szczecin  
Poland  
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  
e-mail: j.pires@krautli.pt  
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 Jalan Pemimpin  
05-09 Pemimpin Industrial BLDG  
Singapore  
577219  
**Tel: 00 65 6251 4595**  
**Fax: 00 65 6258 7296**  
e-mail: mengsina@singnet.com.sg

Richmond Supplies & Services Pte. Ltd  
Blk 3019 Ubit Road 1, 03-103  
Singapore  
408715  
**Tel: 00 65 6745 7288**  
**Fax: 00 65 6745 5618**  
e-mail: Rmond@singnet.com.sg

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.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**  
e-mail: craig@boating-distributor.co.za  
www.waterworld.com

### SPAIN

F.J. Blasco S.L.  
C/Bolivia 340, Local 64  
2a PLANTA  
8019  
Barcelona  
Spain  
**Tel: 00-34-93-3034300**  
**Fax: 00-34-93-3033252**  
e-mail: blasco@larapita.com

### SRI LANKA

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.sg

### SWEDEN

Jan Comstedt Ab  
Box 12022  
SE 402  
41  
Gothenburg  
Sweden  
**Tel: 00-46-31-775-6530**  
**Fax: 00-46-31-24-53-17**  
e-mail: info@comstedt.se  
www.comstedt.se

### SWITZERLAND

Marine Parts Heimgartner  
Pfaffikerstr. 6  
CH 8604  
Volketswil  
Zurich  
Switzerland  
**Tel: 00-41-1997-4090**  
**Fax: 00-41-1997-4094**  
e-mail: marineparts@pilatusnet.ch

### TAIWAN

Matsu Shiyon Trading Co.  
No. 19 Lane 100 Ho Pien Street  
San Chung City,  
Taipei  
Taiwan  
**Tel: 00 886 2 2975 4178**  
**Fax: 00 886 2 2975 4238**  
e-mail: ms78.ms4628@msa.hinet.net

Mercury Marine Supply Co., Ltd.  
No. 15 Chongshan Street  
Siaogang District  
81245 Kaohsiung  
Taiwan  
**Fax: 00 886 7 813 32533-5**  
Toll Free: 00 886 7 813 3236  
e-mail: mms46654@ms16.hinet.net

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.sg

### THAILAND

Seat Pattaya Co. Ltd.  
308/4 M. 12 Thappraya Road  
Nongprue  
Banglamung  
Cholburi  
20150  
Thailand  
**Tel: 00 66 38 251637**  
**Fax: 00 66 38 251 782**  
e-mail: seatboat@loxinfo.co.th

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.sg

### TUNISIA

Majimpex  
26 Av  
Chedly  
Zouiten  
1082  
Tunisia  
**Tel: 00-216-1-802617**  
**Fax: 00-216-1-802617**  
e-mail: 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 Chimhn  
Vietnam  
**Tel: 00-84-8844-4297**  
**Fax: 00-84-8843-9666**

Teleflex Morse Pte Ltd. Singapore  
30 Pioneer Road  
Singapore  
628502  
**Tel: 65 6869 6439**  
**Fax: 65 6869 3662**  
e-mail:  
lkt.tfxmorse@pacific.net.sg

### 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 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.**

RG# # ?  
Teleflex Canada  
c/o UPS-SCS Warehouse  
1927 Boblett Street  
Blaine, WA 98230

**From CANADA and Overseas:**

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

**Teleflex®**

**MARINE**

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

FAX 604-270-7172

**[www.seastarsteering.com](http://www.seastarsteering.com)**

**ISO 10592**



© 1998 Teleflex Canada Limited Partnership

Printed in Canada

Part Number: SL6001 Rev. 13\_r04