



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

FAX 604-270-7172

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

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MEMBER  
**ABYC**  
Setting Standards for Safer Boating

14

FOURTEEN  
ISO 9001

*BayStar*<sup>TM</sup>  
*Capilano*<sup>TM</sup>  
and  
*SeaStar*<sup>®</sup>

ARE MANUFACTURED BY

**Teleflex**<sup>®</sup>  
Teleflex Canada

## INSTALLATION INSTRUCTIONS

### SUPPLEMENTAL

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



*BayStar*<sup>TM</sup>


### Tilt Helm for Hydraulic Steering

BayStar is a Single Station steering system for boats rated to a maximum of 150HP\* (Total).

\* BayStar is not recommended for use with the Mercury 150HP Optimax (DFI) engine.




*Before you do it your way,  
please try it our way*

# 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.

## **WARNING**

Cleaning fluids containing ammonia, acids or any other corrosive ingredients **MUST NOT** be used for cleaning any part of this Hydraulic Steering System. Failure to comply will cause serious damage to the steering system, resulting in possible loss of steering, causing property damage, personal injury and/or death.

## **WARNING**

Failure to comply with maintenance checks may result in loss of steering, causing property damage, personal injury or death. Maintenance requirements will vary depending on usage. Bi-annual inspection by a qualified Marine Mechanic is required.

Refer to page 11 for Maintenance instructions.

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## Introduction

The BayStar helms are the smoothest and most efficient hydraulic steering systems available. They have been designed for normal pleasure boat use where standard rigging arrangements are used.

### CAUTION

**BayStar is ONLY applicable for single station steering on boats with a maximum 150 horsepower\* (Total).**

\* BayStar is not recommended for use with the Mercury 150HP Optimax (DFI) engine.

Before proceeding with the installation, read these instructions thoroughly. Teleflex cannot accept responsibility for installations where instructions have not been followed, where substitute parts have been used, or where modifications have been made to our products.

This precision built product may not function properly if dirt or contaminant's are introduced into the system.

### NOTICE

*Due to a small amount of internal hydraulic slip, a "master spoke" or "centered" steering wheel cannot be maintained with a hydraulic steering system. For best results, use an equidistant spoke steering wheel. **Maximum steering wheel diameter = 22" (559mm) and maximum steering wheel dish = 4.5" (115mm).***

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# MOUNTING THE HELM

Determine desired mounting position. Ensure that the steering wheel will not interfere with other functional equipment with steering wheel in all tilt positions. Check for adequate space behind dash or console to accommodate the helm pump, fittings and line connections.

The BayStar helm can be mounted from horizontal to 70°, and anywhere in between.

The filler port must always be in the uppermost position.

## NOTICE

*Before attempting installation please be sure that you read through the installation instructions on page 5 completely, and that you have all the tools necessary for the installation.*

## Dashboard Mounting Templates

Mounting template for: **BayStar Tilt Helm (Refer to page 1)**

1. Tape Template to dash and use center punch for locating holes on dash, or photocopy (**see Caution below**) if required to use as a drilling template.
2. Before drilling holes, check that helm location will allow unrestricted operation of the steering wheel in all tilt positions and will not interfere with other functional equipment.
3. Drill the required diameter center hole and the specified number and size of mounting holes, positioned as shown.

## ⚠ CAUTION

**If a photocopy of the Mounting Template is to be used, ensure the size is 100% by checking all dimensions before use.**

## Tilt Helm Models

	<b>Part Number</b>	<b>Description</b>	<b>Seal Kit</b>
<b>Tilt Helms</b>	HH4015	1.6 BayStar Tilt Helm	HS5147
	<b>Part No.</b>	<b>Description</b>	
<b>Accessories</b>	HA4515	Remote Fill and Vent	

# BayStar Tilt Helm

Part# HH4015

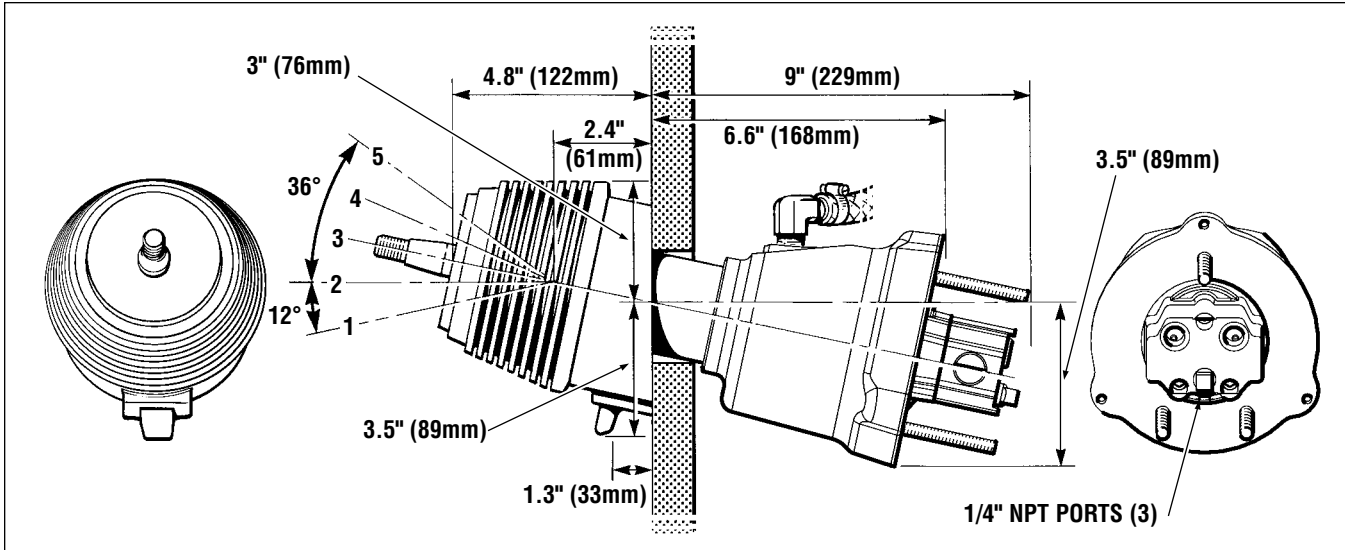


Figure 1

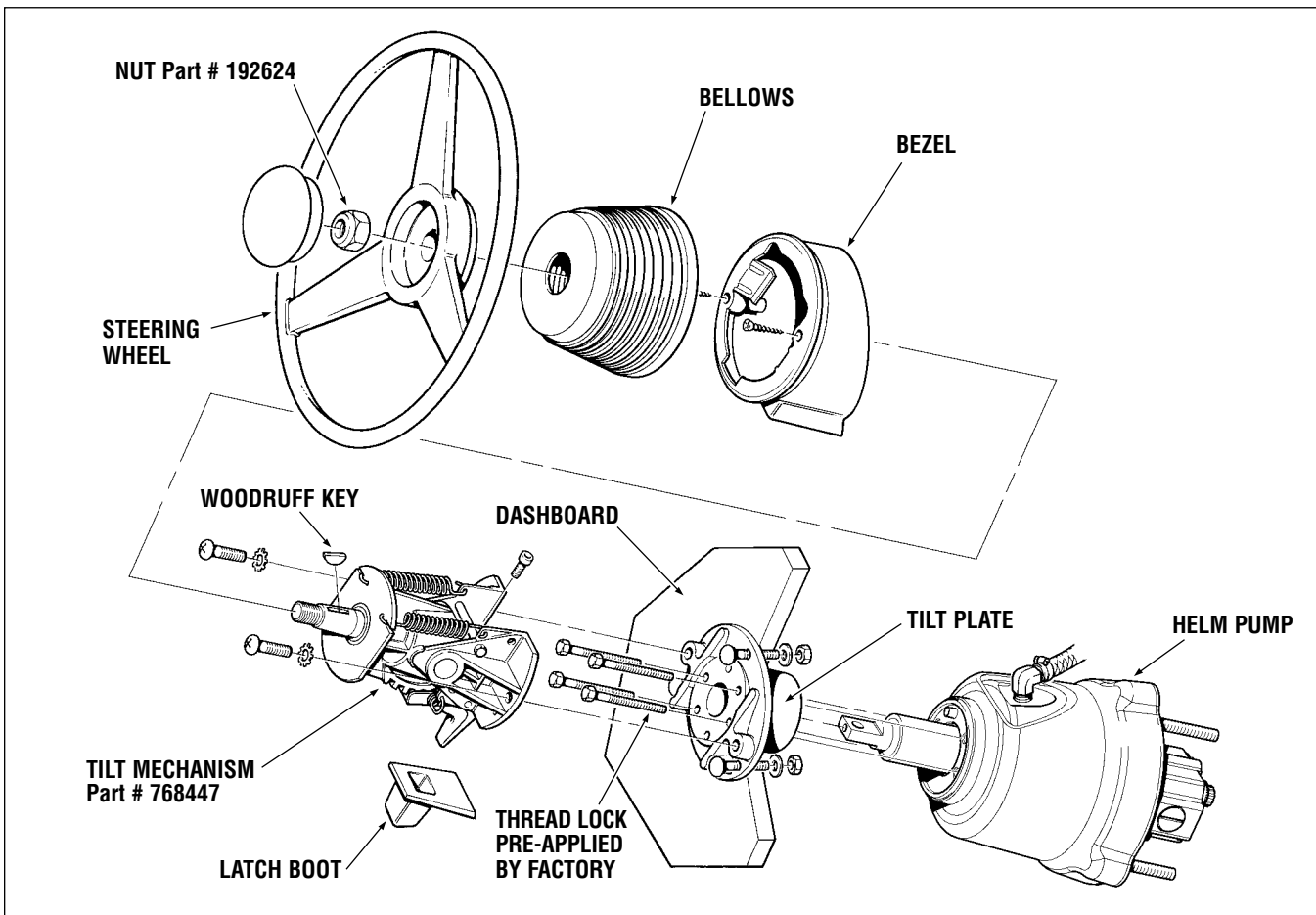


Figure 2

# BayStar Tilt Helm

## Step 1

Determine desired mounting position. Ensure that the steering wheel will not interfere with other functional equipment with steering wheel in all tilt positions. Check for adequate space behind dash or console to accommodate the helm pump, fittings and line connections.

## Step 2

Using the helm mounting template, carefully drill with a hole saw or cut out the 3" (76mm) dia. hole and drill the three 5/16" (8mm) dia. mounting holes.

## Step 3

Mount the tilt plate to the dash using the three (3) 1/4" NC x 2" carriage bolts, washers and self-locking nuts. Torque to 110in.-lbs (12N.m)

### **⚠ WARNING**

**Use fasteners provided only; substituting non-self locking fasteners can result in loosening or separation of equipment and loss of steering control.**

**Do not exceed 110 in.-lbs. (12 Nm) torque on helm nuts and bolts.**

## Step 4

Mount the helm pump from behind the dash to the tilt mounting plate, so that the four (4) helm mounting holes align with the applicable holes in the tilt mounting plate and secure with the four (4) 1/4" x 2-1/2" hex head bolts.

## Step 5

Mount the tilt mechanism to the tilt plate as per drawing on page 4. Secure with the two (2) 5/16" phillips screws and star washers.

### **NOTICE**

*If the fit of the universal joint onto the tilt mechanism shaft is tight or difficult, loosen the top screw in the universal joint by no more than 1/4 of a turn. Ensure this screw is fully tightened before installing the boot and bezel.*

### **⚠ CAUTION Do Not exceed 150 in.-lbs (17 Nm).**

Step 5 also requires the attachment of the helm shaft to the tilt mechanism coupling. Line up the coupling slot with the helm shaft tongue and secure with the No. 10-24 x 7/8" socket head cap screw. The coupling contains a captive self locking nut. Both helm shaft tongue and coupling slot must be in a horizontal plane with captive coupling nut on the bottom.

## Step 6

Position the tilt unit in the middle position and mount the tilt bezel to the tilt mechanism, ensuring the latch boot is held in the slots of the bezel and secure with the two (2) No. 8 x 1" screws.

**Note:** The decal on the bezel cover indicates the top of the bezel.

## Step 7

### **⚠ CAUTION**

**Tighten steering wheel shaft nut before filling and purging the steering system. Tighten nut to 150 in.-lbs. (17 Nm). Do not exceed 200 in.-lbs. (22 Nm).**

Slide the bellows onto the tilt mechanism wheel shaft hub. Stretch the base of the bellows over the lip of the bezel.

Check the tilt mechanism for proper operation. Five (5) tilt positions are available. Ensure that the tilt mechanism locks in each position.

Lightly **grease taper of tilt mechanism shaft.**

Mount steering wheel to tilt mechanism.

To relocate the steering wheel to any one of the other four positions, push the tilt lever forwards. This will unlock the tilt mechanism.

Once the desired steering wheel position is obtained the tilt lever will click back into the locked position.

## Step 8

Fittings inserted in the rear of the helm should be installed until finger tight and then turned an additional 1-1/2 to 2-1/2 turns depending on desired orientation of fitting. **DO NOT exceed 156 in./lbs (17.6 Nm).**

**Use a pipe sealant such as Loctite P.S.T. or equivalent on all pipe threads. DO NOT use "tape" sealers.**

**Remote Fill & Vent Plug Hardware Part# HA4515**

Included with the BayStar Tilt Helm (HH4015) are components that will provide a means to fill and vent the steering system from above each dash or console. Included are: one (1) through dash Fill and Vent fitting, two (2) elbow hose barb fittings, two (2) hose clamps, and one (1) 21" piece of vinyl tubing.

For tilt helm pump mounting install as follows.

1. Remove vent plug that is installed in the BayStar Helm. **DO NOT** discard as this will be required once installation is complete.
2. Screw one end of the elbow barb fitting into the applicable helm fitting port, hand tighten. **Note:** Use liquid pipe sealant, i.e. Loctite P.S.T on the elbow fittings. **DO NOT** use tape sealant.
3. Attach the vinyl tubing to the elbow fitting (installed in helm) and secure with hose clamp. A small amount of oil inside the vinyl tube will help slide it onto the elbow barb fitting.

**⚠ CAUTION**

Vinyl hose must have a slight constant gradual rise from helm fitting to fill fitting, to allow the air to rise.

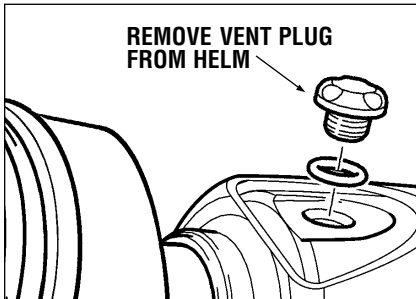


Figure 3

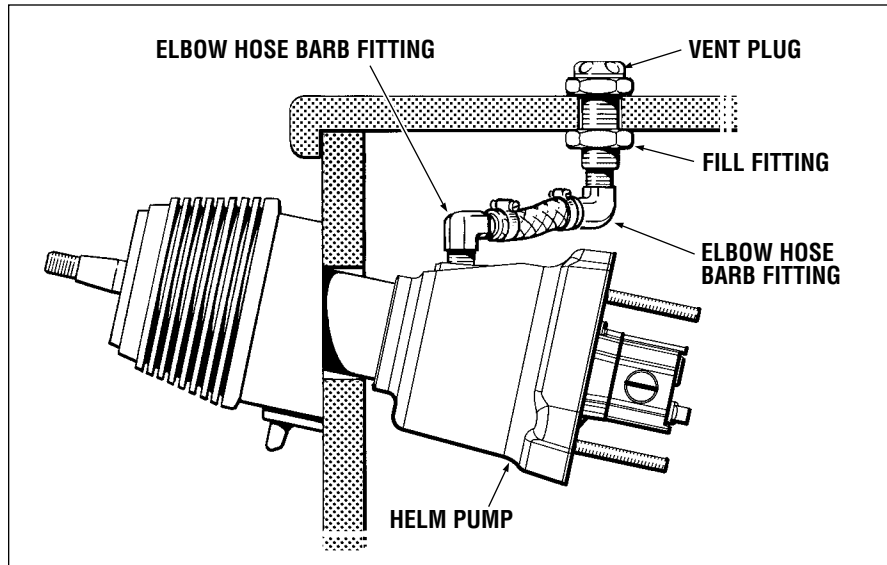


Figure 4

**⚠ WARNING**

Make certain that you **DO NOT** drill into any functional equipment or electric wires.

4. Direct the other end of the vinyl tube to a preferred clear area location under the dash to determine the length of tube required.
5. Drill a 3/4" (19mm) dia. hole from under or above the dash.
6. Insert fill fitting from top of dash/console and secure with jam nut underneath the dash/console. **Note:** A spacer washer is required if mounting surface is less than 3/8" (9mm) thick.
7. Screw elbow hose barb fitting into the base of the fill fitting. **Note:** Stop fill fitting from turning by holding in place with a wrench on top of dash hex. Use liquid pipe sealant, i.e. Loctite P.S.T.
8. Cut vinyl tube to required length and slide onto elbow hose barb fitting and secure with hose clamp.
9. Replace the vent plug removed in step# 1 into the fitting on top of the dash or console (refer to diagram above).

# HYDRAULIC TUBING INSTALLATION

## NOTICE

*BAYSTAR TUBING PREVIOUSLY MARKED "140HP" IS ACCEPTABLE FOR USE WITH BAYSTAR HYDRAULIC SYSTEMS ON BOATS RATED TO 150HP\* (TOTAL).* \*BayStar is not recommended for use with the Mercury 150HP Optimax (DFI) engine.

## ⚠ WARNING

**BayStar Helm & Cylinder fittings are NON-STANDARD — DO NOT substitute with SeaStar or any other tube, Hose, or fittings.**

**Do not remove protective fitting caps until connection of tube fitting to helm and cylinder is made.**

**Use shortest convenient path for routing tubing.**

Attach BayStar tubing to port side of BayStar cylinder and route tubing with a gradual rise through splashwell and along gunwale or through builder installed conduit to the port side of the BayStar helm pump. Repeat for starboard side. Leave approximately 12" (30.5cm) of extra tubing in splashwell to allow for cylinder rotation.

Do not bend BayStar tubing tighter than a 4" (10cm) radius.

## Tube nut installation and connection for BayStar tubing to helm fitting:

Cut BayStar Nylon Tubing to the required length for your installation. Ensure the cut is straight so that the tubing will sit flush inside the fitting. The use of a pipe cutter is recommended.

Slide tube nut over tubing.

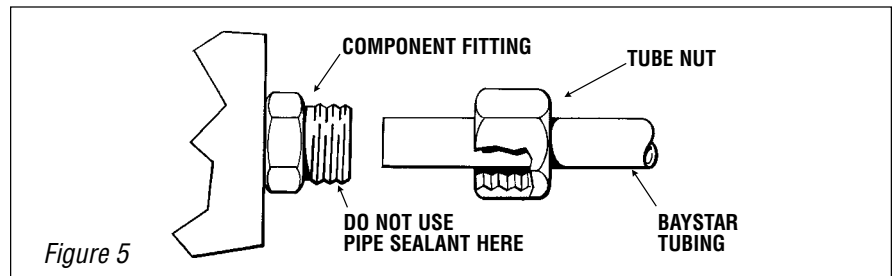
Push tubing into bottom of component fittings.

Hand tighten tube nut, ensuring that tube is bottomed against the fitting while tightening tube nut.

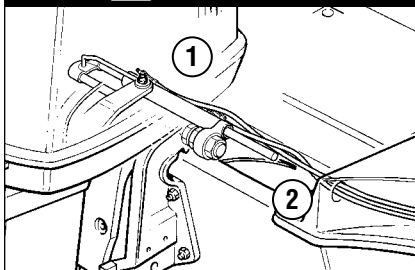
After hand tightening tube nut, tighten nut an additional one and a half turns with a 5/8" wrench.

## NOTICE

**Cut BayStar tube with tube cutter or pipe cutter only.** Thread tube fitting onto appropriate fitting on rear cover of BayStar helm and tighten to 12 ft lbs (16N.m).



## ⚠ WARNING



**1 DO NOT** adjust angle of fittings without first consulting manufacturer.

**2 Tubing** should be secured to the control cable harness as they enter the splashwell through the boot.

**BayStar tubing must be protected from chafing and any possible contact or interference with assembly screws or sharp edges of any type.** The BayStar tubing should be secured wherever possible. Teleflex recommends the use of a rigging tube, PVC piping or conduit for the safe secure installation of BayStar tube.

**Do not allow tubing to hang free in an area where they could become a safety hazard.**

**Do not install tubing in such a way that they will become exposed to high heat areas such as engine manifolds or highly corrosive areas such as battery fumes or electrical connections.**

**Ensure that no stretching, crushing, kinking or restriction of movement, of the hydraulic lines occurs or chaffing or abrading of hoses against bulkheads, splashwell or gunwale entry points.**

**Continuous kinking, chafing, rubbing, scoring or twisting may eventually weaken BayStar Tube(s) to a point where it could rupture from normal steering pressure causing loss of steering resulting in property damage, personal injury or death. Periodically inspect tubing and fittings for wear and/or damage.**

## ⚠ CAUTION

**Provide sufficient tube length to allow full uninterrupted steering motion including trim and tilt.**

# FILLING AND PURGING THE SYSTEM

## DEALER NOTICE

**Reduce purging time to approximately 10 min per system with optional, portable Power Purge Jr. (Part# HA5445). For more information reference our Website at [www.seastarsteering.com](http://www.seastarsteering.com) or contact Teleflex at 604-270-6899.**

## Read First

**This procedure requires two people. One person may not be able to remove all the air from the system which will result in spongy, unresponsive steering.**

During the entire filling procedure, oil **must** be visible in the filler tube. **Do not** allow the oil level to disappear into the helm pump, as this may introduce air into the system and increase your filling time.

## ⚠ WARNING

**DO NOT use SeaStar power purge with the BayStar system unless pressure gauge kit # HA5443 has been installed in the power purge. Failure to do so may result in damage to the system.**

## Hydraulic Fluid Requirements

Recommended oils for your BayStar Steering System are; SeaStar/BayStar Marine Steering Fluid, part# HA5430 (1 quart), HA5440 (1 Gallon.)

## ⚠ WARNING

**NEVER use brake fluid. Any non-approved fluid may cause irreparable damage, loss of steering, and cancellation of warranty.**

Texaco H015

Chevron Aviation Fluid A

Aero Shell Fluid #41

Mobil Aero HFA

Esso Univis N15

Fluids meeting Mil H5606 specifications.

Automatic transmission fluid Dexron II may be used in an emergency.

In case of emergency any non-toxic, non-flammable fluid may provide temporary steering. Steering system should be fully serviced after such usage. Please contact manufacturer.

## NOTICE

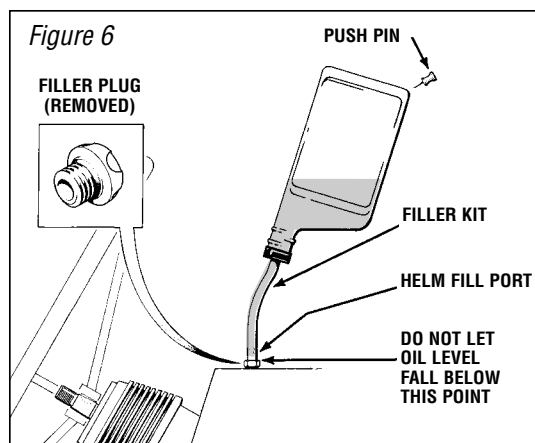
*Oil can be re-used if filtered through a fine mesh screen such as used for gasoline. If unable to filter oil, an additional bottle of oil is required.*

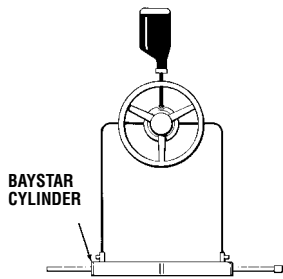
## NOTICE

*"Bleeder" refers to cylinder fitted with bleeder tee fittings. Open bleeder by turning bleed nipple tube nut 2 revolutions counter clockwise.*

## NOTICE

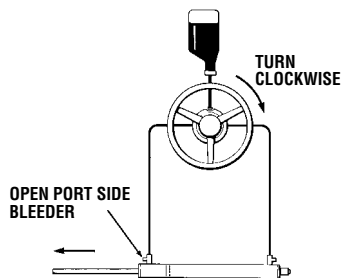
*Filling the helm with oil can be done faster if oil is poured into the helm prior to connecting filler tube and oil bottle to the helm. Part #HA5438.*





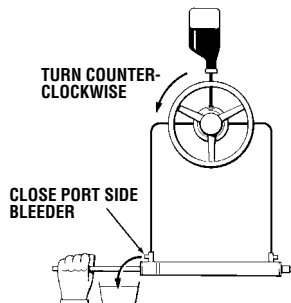
### Step 1

- Screw the threaded end of the filler tube into the helm filler port.
- Remove the cap from the oil bottle and holding upright screw into the filler tube bottle cap. Poke hole in the bottom of the bottle.
- Fill the helm pump with hydraulic oil so that it is visible in the filler tube. Oil should always be visible in the filler tube. Use the next bottle of fluid at any time during the procedure in order to maintain the oil level. Do not proceed with step 2 until helm is full.



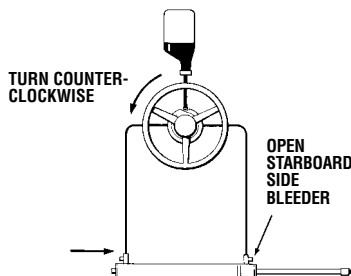
### Step 2

- Turn the steering wheel clockwise until the cylinder rod is fully extended to port.
- Open port side bleeder.



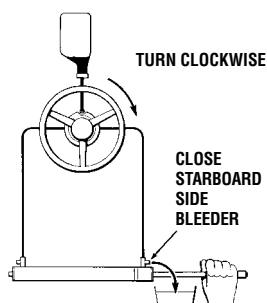
### Step 3

- Hold the rod with your hand (**do not use a wrench or channel locks to restrict movement in shaft**) to prevent the rod from moving and turn the wheel counter-clockwise until a steady stream of air free oil flows from the bleeder nipple.
- While continuing to turn the wheel, close the port side bleeder and let go of the cylinder rod.



### Step 4

- Continue turning the steering wheel counter-clockwise until the cylinder rod is fully extended to starboard. (Steering wheel will come to a stop).
- Open the starboard bleeder.



### Step 5

- Hold the rod with your hand (**do not use a wrench or channel locks to restrict movement in shaft**) to prevent the rod from moving and turn the wheel clockwise until a steady stream of air free oil flows from the bleeder nipple.
- While continuing to turn the wheel, close the starboard side bleeder and let go of the cylinder rod.

## System Air Test

Attach the fill tube (part number HA5438) to the fill port of your BayStar Helm Pump.

Fill the HA5438 tube approximately 1/2 with Steering fluid.

Jog the steering wheel back and forth quickly approximately 1/2 turn in each direction while observing the level of fluid movement in the fill tube.

If the fluid level in the filler tube remains constant, all air has been removed from the system. If the fluid level in the tube jumps more than 2 inches, further bleeding is required.

When BayStar steering system has been properly purged/bled the steering wheel will turn approximately 4.5 times stop to stop.

## OIL LEVEL AND SYSTEM CHECK

### CAUTION

#### **Check oil level prior to leaving dock or turning wheel.**

For helms mounted horizontally, or up to 10° from the horizontal, oil must be filled to the bottom of the fill port. DO NOT allow the oil level to drop more than 1/4" (6.3mm).

### WARNING

**DO NOT USE NON-VENTED FILL PLUG/CAP.**

For helms mounted between 10° and 70° from the horizontal, oil should be maintained at between 1/8" (3.2mm) and 1/2" (12.5mm) from the bottom of the fill port.

Over filling may NOT allow sufficient air volume in the reservoir and may cause weeping from the vent plug.

### CAUTION

**Single and twin outboard engines MUST be tested to ensure no interference occurs between the cylinder, the steerable devices, tiebars, transom, engine lift plates, splashwell or other surfaces with engine(s) at any and all combinations of hard over to hard over, highest and lowest tilt positions and engine lift plates highest and lowest adjustment. This is done by taking the system through 2 full cycles from hard over to hard over.**

Under filling may result in air being drawn into the lines causing poor performance and/or **loss of steering causing property damage, personal injury or death.**

**At this time the steering system must be checked for proper connections of tube and fittings, possible leaks, and air removal. To do so, turn the steering wheel in one direction (port or starboard) to the engine stop position and pressurize the system by forcing the wheel beyond the engine stop position. You will not harm any component of the system by doing this. While maintaining pressure on the steering wheel, check all the fittings and tube connections for a minimum of 60 seconds for leaks. Repeat by turning the steering wheel in the opposite direction. If there is no sign of fluid loss your steering system is ready for use.**

### CAUTION

**Failure to check for interference may result in cylinder, splashwell and/or engine damage.**

If interference occurs during engine tilt or trim between steering cylinder and splashwell or jackplate, contact your engine manufacturer for trim restrictors or a Tilt Stop Switch.

# MAINTENANCE

## ⚠ WARNING

Failure to comply with maintenance checks may result in loss of steering, causing property damage, personal injury or death. Maintenance requirements will vary depending on usage. Bi-annual inspection by a qualified Marine Mechanic is required.

**Maintenance requirements will vary with usage and climate.**

**Inspection by a qualified marine mechanic is required:**

- A minimum of two times a year.
  - At the first sign or indication that the steering system is not operating normally or correctly.
- 1 Check the oil level in the helm pump. This should always be within 1/2" of the bottom of the filler hole.

## NOTICE

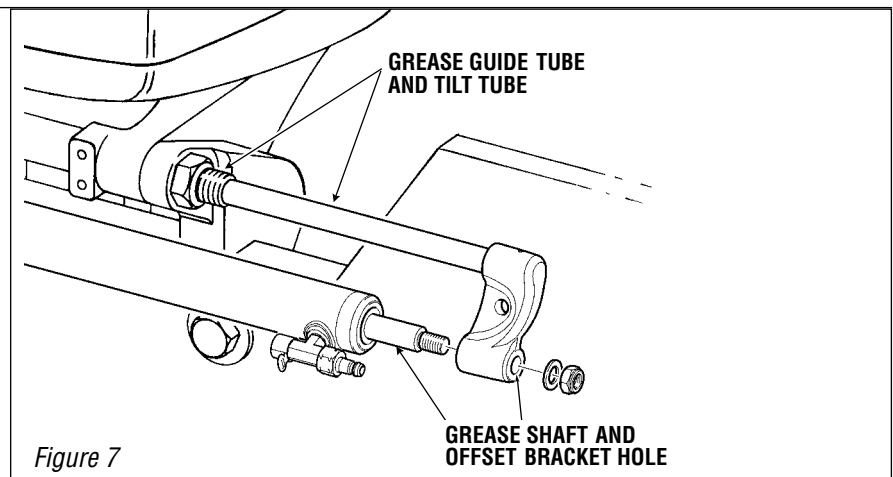
*BayStar hydraulic oil is not available from your local gas station. Order a spare bottle (HA5430) from your Teleflex/BayStar dealer.*

- 2 Check mechanical linkages and connections. Tighten loose parts and replace badly worn parts.
- 3 Check for leaks. See previous page for how to check for leaks.
- 4 Check hoses for chafing/rubbing marks, and replace if required.
- 5 Check cylinder shaft for nicks and scratches. A damaged cylinder shaft can cause seal failure and leaks. Replacing seals to a damaged cylinder shaft will not stop leaks. A damaged cylinder shaft must be replaced immediately.

## LUBRICATING INSTRUCTIONS

### ⚠ CAUTION

Grease tilt tube, guide tube and offset bracket holes once a year or every 100 hours whichever comes first.



**Bolt Torque Specifications**

These are the recommended maximum torque values for reusable dry bolts. Bolts should be torqued to this value +0% -20%. For lubricated bolts, multiply the dry bolt torque values by .75.

Values are stated in: **in/lbs (N.m)**

Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass
2-56	2.5 (.282)	2.0 (.226)	6-32	9.6 (1.08)	4.9 (.554)	5/16"-18	132.0 (14.91)	107.0 (12.10)
2-64	3.0 (.338)	2.5 (.282)	6-40	12.0 (1.35)	9.9 (1.12)	5/16"-24	142.0 (16.04)	116.0 (13.11)
3-48	3.9 (.440)	3.2 (.361)	8-32	20.0 (2.25)	16.0 (1.81)	3/8"-16	236.0 (26.66)	192.0 (21.71)
3-56	4.4 (.497)	3.6 (.407)	8-36	22.0 (2.48)	18.0 (2.03)	3/8"-24	259.0 (29.20)	212.0 (23.97)
4-40	5.2 (.587)	4.3 (.486)	10-24	23.0 (2.59)	19.0 (2.14)			
4-48	6.6 (.740)	5.4 (.610)	10-32	32.0 (3.61)	26.0 (2.94)			
5-40	7.7 (.869)	6.3 (.712)	1/4"-20	75.0 (8.47)	62.0 (7.01)			
5-44	9.4 (1.06)	7.7 (.869)	1/4"-28	94.0 (10.6)	77.0 (8.70)			

Values are stated in: **ft/lbs (N.m)**

Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass
7/16"-14	31.0 (42.00)	26.0 (35.25)	5/8"-11	93.0 (126.09)	76.0 (103.04)	1"-8	287.0 (389.12)	235.0 (318.62)
7/16"-20	33.0 (44.74)	27.0 (36.61)	5/8"-18	104.0 (141.00)	85.0 (115.24)	1"-14	259.0 (351.16)	212.0 (287.43)
1/2"-13	43.0 (58.30)	35.0 (47.45)	3/4"-10	128.0 (173.55)	104.0 (141.00)			
1/2"-20	45.0 (61.01)	37.0 (50.17)	3/4"-16	124.0 (168.12)	102.0 (138.29)			
9/16"-12	57.0 (77.28)	47.0 (63.72)	7/8"-9	194.0 (236.03)	159.0 (215.58)			
9/16"-18	63.0 (85.42)	51.0 (69.15)	7/8"-14	193.0 (261.67)	158.0 (214.22)			

**NOTICE** Torque values for 18-8 stainless steel and brass bolts are taken from a torque guide by ITT Harper. All results correspond well with basic bolt equations, using a bolt factor of 0.2 and a factor of 3/4 for a reusable connection.

# TROUBLE SHOOTING GUIDE

## Maximum 150HP (Total)\*

### WARNING

Whenever in the following text a solution calls for removal from the vessel and/or dismantling of steering system components, the work must be carried out by a qualified marine hydraulic mechanic only.

Teleflex Canada offers the following as a guide only and will not assume any responsibility for problems resulting from incorrect repairs.

BayStar hydraulic steering will provide years of safe reliable performance with a minimum of service if properly installed with correct cylinder.

BayStar steering systems have been designed with protection against over-pressure situations by a pressure relief valve.

Most faults occur when the installation instructions are not followed and usually show up immediately upon filling the system. Below are the most common faults, their likely cause and solution.

Sometimes when returning the wheel from a hardover position, a slight resistance may be felt and a clicking sound heard. This should not be mistaken as a fault, as it is a normal situation caused by the release of the lockspool.

### WARNING

**Warranty will be void if maximum 150HP (Total)\* exceeded or if combined with any other product (including SeaStar steering components). Steering failure may occur causing property damage and/or personal injury or death.**

*\* BayStar is not recommended for use with the Mercury 150HP Optimax (DFI) engine.*

FAULT	CAUSE	SOLUTION
<p><b>1. During Filling, the helm becomes completely jammed.</b></p>	<p>Blockage in the line between the helm and the cylinder.</p>	<p>Make certain that BayStar tube has not collapsed during installation. If so, the collapsed section must be removed and re-fitted with a new piece with the aid of tube connectors. Check fittings for incomplete holes, replace faulty fitting. Fittings with incomplete holes, however, are not common.</p>
<p><b>2. System is very difficult to fill. Air keeps burping out top of helm even after system appears full.</b></p>	<p>Cylinder has been mounted upside down. This causes air to be trapped in the cylinder.</p> <p>Air in system.</p> <p>Bleed fitting leaking.</p> <p>Coiled BayStar tube.</p>	<p>Mount cylinder correctly, according to cylinder installation instructions. Ports should always be kept in uppermost position.</p> <p>Review filling instructions.</p> <p>Tighten bleed fitting.</p> <p>Uncoil or straighten the BayStar tube.</p>
<p><b>3. Steering is stiff and hard to turn, even when the vessel is not moving.</b></p>	<p>Restrictions in tubing or fittings.</p> <p>Air in oil.</p> <p>Wrong oil has been used to fill steering system, like A.T.F. (automatic transmission fluid), or any other oil with a high viscosity factor.</p>	<p>Find restriction and correct.</p> <p><b>WARNING:</b> Kinked BayStar tubing <u>must</u> be replaced. Failure to do so may result in a loss of steering causing personal injury, property damage or death.</p> <p>See filling instructions supplied with helm units.</p> <p>Drain system and fill with BayStar, or any other recommended oil.</p>

<b>FAULT</b>	<b>CAUSE</b>	<b>SOLUTION</b>
<b>4. Helm unit in system is very bumpy and requires too many turns from hardover to hardover.</b>	Dirt in inlet check of helm pump.	Dismantle check valves and remove contaminant.
<b>5. Steering is easy to turn at the dock, but becomes hard to turn when vessel is underway.</b>	Steering wheel is too small.	Fit larger steering wheel if possible, see installation instructions. If this does not correct the problem proceed with next cause and solution or consult factory. Max. wheel dia. 22" (56cm).
	Incorrect setting of trim tab(s) engine. Air pocket in system.	Adjust tab(s). Check oil level, perform air test as instructed on page 12, fill and purge system as instructed on page 10 & 11.
	Total horsepower exceeds 150HP.	Replace BayStar steering system with SeaStar steering system.
<b>6. Engine drifts to port or starboard while vessel is underway, even when wheel is not being turned.</b>	Dirt in check valves.	Remove check valve plugs. These are the larger <u>SLOTTED</u> plugs on either side on rear of helm. Clean ball seats and balls and re-assemble. <b>Note:</b> Be prepared to lose a certain amount of oil during this procedure. Have a small can available. Refill and purge system when check valves have been re-assembled.
<b>7. Turning wheel to starboard causes the boat to turn to port.</b>	Incorrect tube connections.	Switch the port side BayStar tubing to the starboard cylinder fitting and the starboard BayStar tubing to the port side cylinder fitting. Refill and purge system.

# Statement of 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 date of purchase, excepting that where **Teleflex Canada Limited Partnership** products are used commercially or in any rental or income producing activity, then this warranty is limited to one year from the date of purchase.

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

The above quoted statement is an extract from the complete **Teleflex Canada Limited Partnership** products warranty statement. A complete warranty policy is available in our **Teleflex Canada Limited Partnership** products catalogue.

## Return Goods Procedure

Prior to returning product to **Teleflex Canada Limited Partnership** under warranty, please obtain a *Return Goods Authorization number* (claim number).

Be sure to label the goods with:

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

Please address the returned goods as follows:

**From U.S.A.**

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

**From Canada**

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