

**SEASTAR™**

# SEAL REPLACEMENT

## SeaStar ATM, Inboard Steering Cylinders, -3 Models

Throughout this publication, Warnings and Cautions (accompanied by the International Hazard Symbol) are used to alert the user or installer to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. **OBSERVE THESE 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', are major accident prevention measures.

### ⚠ WARNING

**Hazards or unsafe practices which could result in severe personal injury/death. Failure to comply with ANY warning may lead to loss of steering control. Loss of steering control may lead to unpredictable boat behavior causing ejection from vessel, or a collision with an object, resulting in property damage, personal injury and/or death.**

### ⚠ CAUTION

**Hazards or unsafe practices which could result in minor injury, or product/property damage.**

### NOTICE

*Important information to assist with the installation/maintenance of the steering system and is not hazard-related.*

### NOTICE

*Protect yourself and your environment. ALWAYS wear approved safety glasses and protective equipment to avoid injury. ALWAYS dispose of used oil in an environmentally conscientious manner and be sure to adhere to local and Federal environmental laws. Keep your waters clean so that they can be enjoyed by all.*

## Applicable Cylinders

CYLINDER PART#	DESCRIPTION	SEAL KIT & GLAND END
HC1503-3	BA150-3ATM	HP6025
HC4460-3	BA125-6.25ATM	HP6026
HC4461-3	BA100-6ATM	HP6026
HC5303-3	BA125-3ATM	HP6026
HC5312-3	BA125-7ATM	HP6026
HC5313-3	BA135-7ATM	HP6025
HC5314-3	BA150-7ATM	HP6025
HC6324-3	BA150-3.5ATM	HP6025

## Tools Required

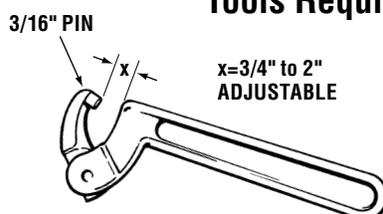


Figure A. Spanner Pin Wrench.

- Spanner Pin Wrench 3/16" C492 Proto Tool 3/4" to 2". Available at Granger or McMaster Carr ([www.mcmaster.com](http://www.mcmaster.com)) Distributors. Part # 5472A2.
- Needle nose pliers.
- 5/16" Wrench, open or box end type.
- 3/4" Wrench, open or box end/crescent type.
- 7/16" Wrench, box end/crescent type.
- 1/2" Socket and socket wrench.
- Loctite® 271 included in kit.

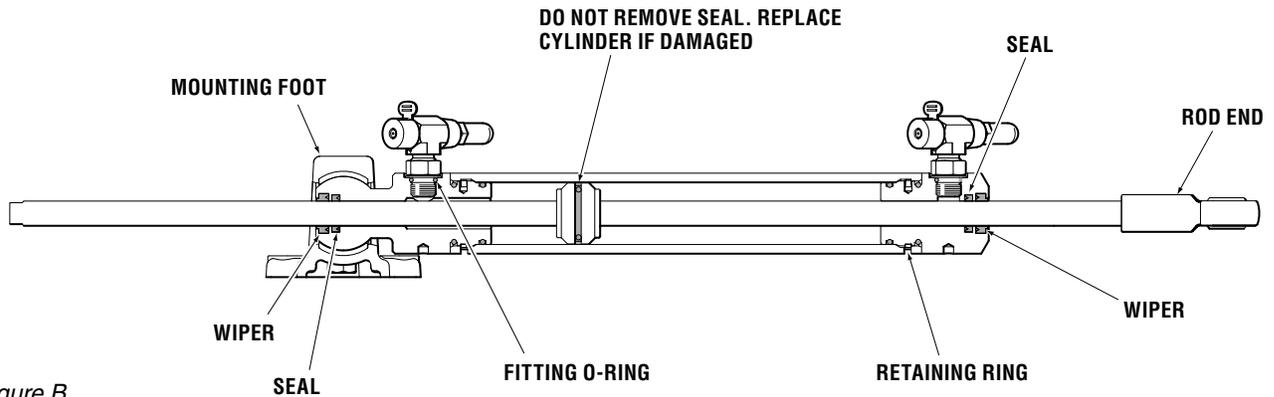


Figure B.

## ⚠ CAUTION

Before attempting to replace these seals check the cylinder shaft surface for any signs of damage, such as; scratches, burrs, dents, dings or pitting. If there is any damage to the shaft the steering cylinder will need to be replaced completely. Installing seals into a cylinder with a damaged cylinder shaft will result in a leak.

## Seal Replacement Procedure

### Step 1

Inspect shaft for nicks, dings, scratches, pitting or any other defects. If defects are present, do not replace seals; cylinder must be replaced.

## NOTICE

*DO NOT attempt this repair with the steering cylinder installed on the boat. ALL work must be completed in a clean, dirt/debris free working area.*

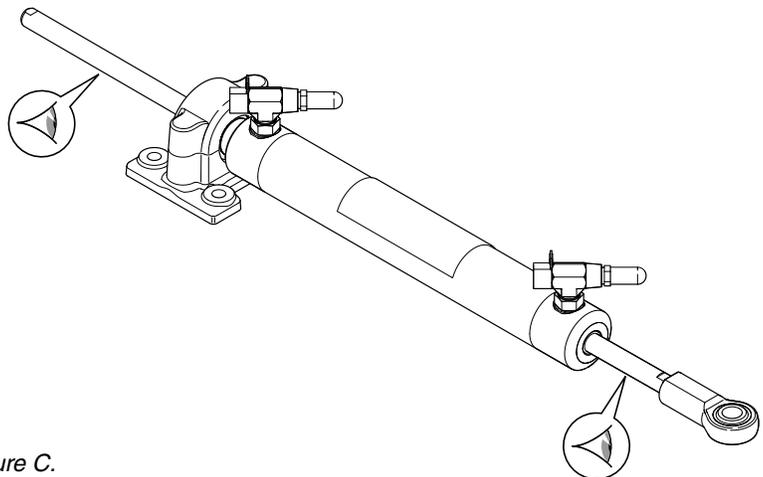


Figure C.

## Step 2

Remove the Rod End Ball Joint from the shaft. Prevent the shaft from rotating by holding a 7/16" open-ended/crescent wrench across the wrench flats on the shaft and turn the rod end ball joint counter-clockwise using a 3/4" open end wrench.

### NOTICE

*DO NOT hold the stainless steel shaft with vice grips or channel locks as permanent damage will occur.*

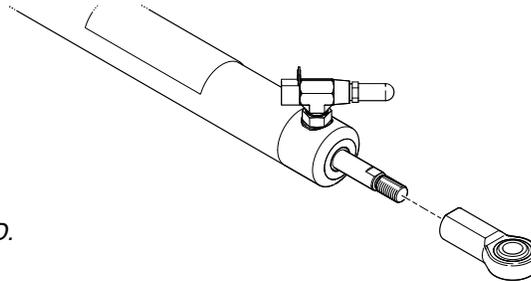


Figure D.

## Step 3

While securing hose fitting with a 5/8" open wrench, loosen the 5/8" hose fitting nut and remove the fitting from the cylinder body.

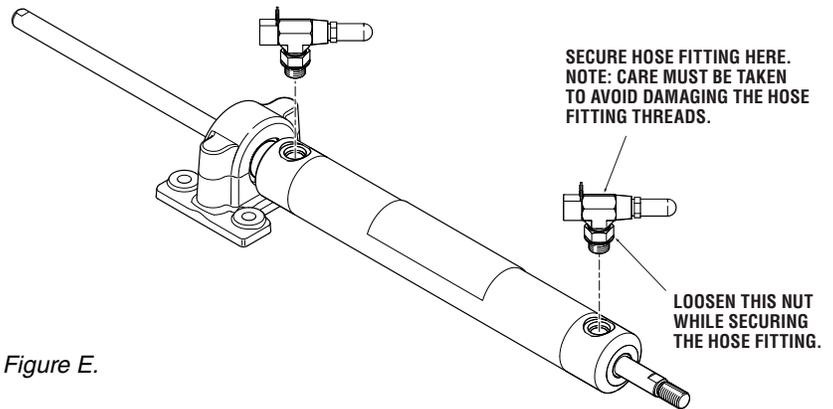


Figure E.

## Step 4

Remove the Trunnion Mounting Foot by clamping the cylinder in a soft jawed vice and using a 1/2" socket.

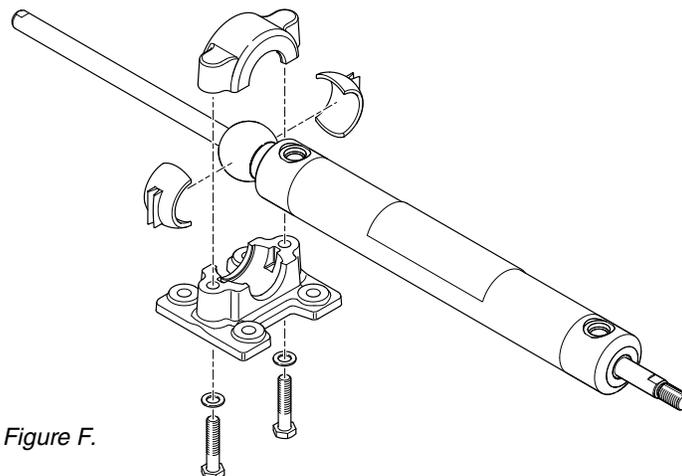


Figure F.

## Step 5

Remove the retaining rings that secure both end glands as outlined below.

1. Using the spanner wrench, turn end gland 'counter-clockwise' until the retaining ring end becomes visible in the retaining ring slot.
2. Using a small, flat head screwdriver, pry up slightly on the end of the retaining wire to provide an area to grab with needle nose pliers.
3. Grab onto retaining wire with needle nose pliers.
4. Using spanner wrench, turn end gland 'counter-clockwise' pulling the retaining wire out with the pliers.
5. Once the retaining wire is removed tap the opposite side of the cylinder shaft using a non-marring hammer. Tap the shaft until the gland releases from the cylinder body.

### NOTICE

*DO NOT* remove cylinder shaft from steering cylinder body.

6. Repeat the above for the opposite end gland.

### NOTICE

*If the retaining ring does not become visible in the fitting port of the cylinder barrel, it may have broken off inside the cylinder. The only way to remove the broken retaining ring at this point is to tap a second retaining ring in behind the first, forcing the broken ring to be ejected.*

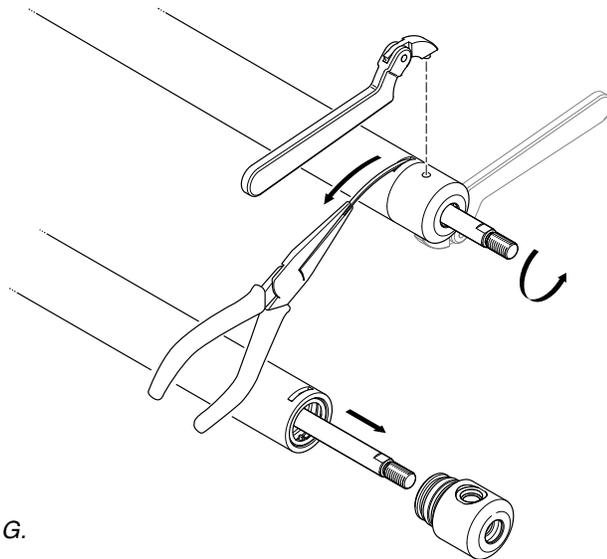


Figure G.

## Step 6

Installing new End Gland.

1. Lubricate seals with steering fluid.
2. Carefully slide gland over shaft.
3. Push gland into place.
4. Using the spanner pin wrench, turn the end gland clockwise, drawing the retaining ring into the end gland. Continue turning the end gland until the retaining ring is drawn into the groove.

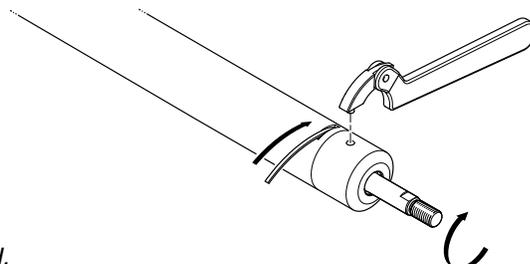


Figure H.

## Step 7

Install and realign the tee fittings.

1. Back off lock nut (item 1, figure J), counter-clockwise, until it stops.
2. Thread fitting into cylinder body until fitting washer (item 2, figure J) contacts the face of the cylinder port. Tighten hand tight, DO NOT TORQUE FITTING INTO GLAND.
3. Position fitting to desired orientation by turning it counter-clockwise to a MAXIMUM of 1 full turn.
4. While holding fitting with a wrench, tighten the locknut (item 1, figure J) and torque to 40–43 ft-lb.
5. Purge system as per your cylinder instruction manual.

### ⚠ WARNING

SeaStar Solutions recommends that the hose and hose fittings are checked on a regular basis to ensure the safe operation of the steering system.

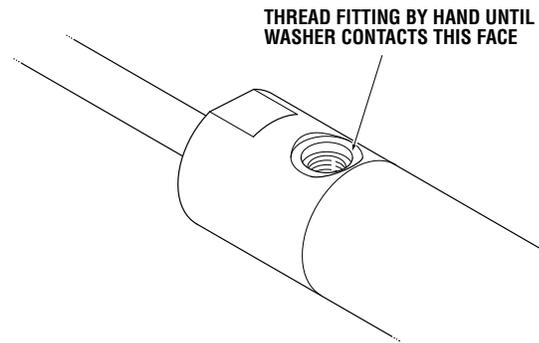


Figure I.

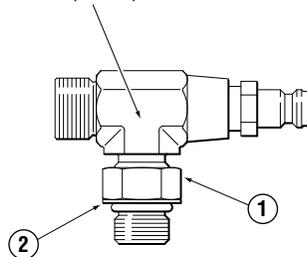
### ⚠ WARNING

Failure to properly tighten the locknut (item 1, figure J) may lead to loss of steering control. Loss of steering control may result in unpredictable boat behavior, collision with an obstacle and/or ejection from vessel, leading to property damage, personal injury and/or death.

### NOTICE

Care **MUST** be taken to avoid any damage to the hose fitting threads.

SECURE WITH 5/8"  
OPEN ENDED WRENCH  
HERE WHILE TIGHTENING  
LOCKNUT (ITEM 1)



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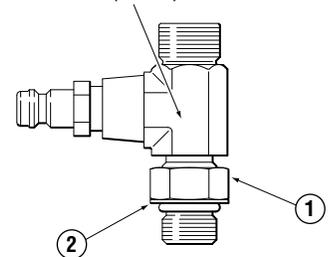


Figure J.

### ⚠ CAUTION

Leaks could cause loss of steering resulting in property damage and/or personal injury.

## Step 8

1. Apply some of the supplied Loctite® to the threads of the Mounting Trunnion Foot bolts. Torque bolts to the torque setting shown in figure K.
2. Apply some of the supplied Loctite® to the threads of the cylinder shaft, then, install rod end ball joint. Torque rod end ball joint to the torque settings shown in figure K.

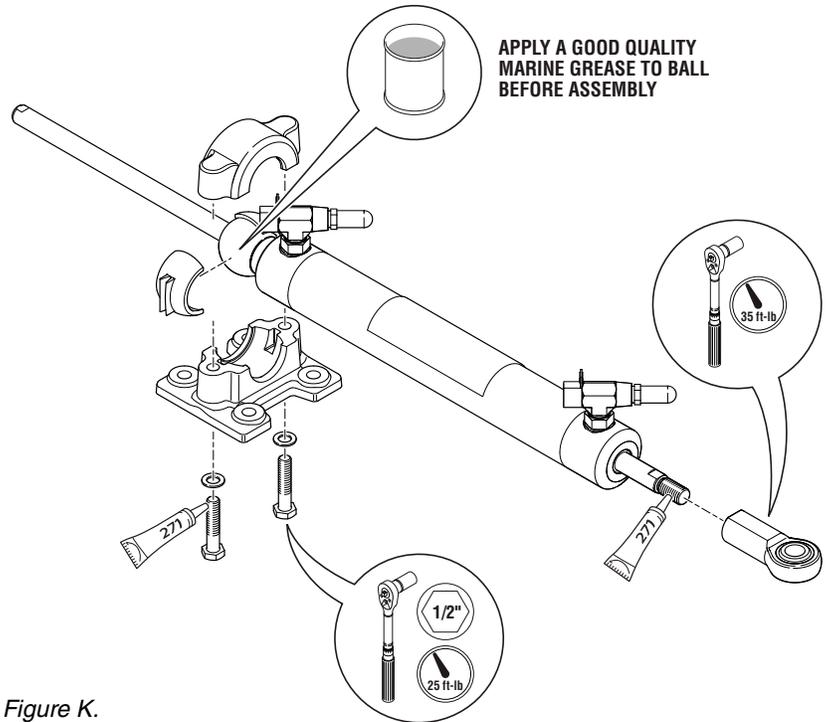


Figure K.

## Step 9

Install steering cylinder as outlined in your Installation and Owner's Manual.

### NOTICE

*If you do not have a manual or installation instructions please contact SeaStar Solutions Technical Support @ 604-248-3858, or, visit [www.seastarsolutions.com](http://www.seastarsolutions.com)*

## Before Operating Your Boat

After the cylinder has been installed and the steering system bled free of air, ensure that the following check list is carried out.

### ⚠ WARNING

**The following checks should be completed prior to every use.**

1. Check fluid level in highest helm pump (consult Owner's Manual).
2. Verify immediate response when turning steering wheel(s).
3. Visually inspect ALL steering hoses and fittings for wear, kinking and/or leaks.
4. Check for binding, loose, worn or leaking steering components.

### ⚠ WARNING

**DO NOT operate boat if ANY component is not in proper working condition.**