**SEASTAR™  
CAPILANO™****REPLACEMENT SEALS**  
For Brass Inboard Steering Cylinders**Applicable Cylinders**

CYLINDER PART #	DESCRIPTION	SEAL KIT
Various	ALL Brass Cylinders BA 150-7, BA150-9 TM and TMB	HS5182
Various	ALL Brass Cylinders BA175 -7, BA175-9 TM, TMB and TMC	HS5183
Various	ALL Brass Cylinders BA200-7 TM, TMB and TMC	HS5184
Various	All Brass Cylinders BA200-11 TM, TMB and TMC	HS5185

**NOTICE**

*Before replacing seals, check the shaft surface carefully for any indication of damage: such as, scratches, burrs, dents, dings or pitting. If there is any indication of damage to the shaft, the cylinder will have to be replaced. **DO NOT** install replacement seals on a hydraulic steering cylinder shaft that has been damaged.*

**⚠ CAUTION**

**Failure to replace a damaged shaft may result in loss of steering causing property damage and/or personal injury.**

**Tools Required**

- Spanner Pin Wrench, (available through your local tool shop), Details: Adjustable from .75"– 3", Pin size = 1/8". (Refer to figure A.)
- Needle Nose Pliers.
- Teflon based pipe sealer, or PST with Teflon.  
**DO NOT USE TEFLON TAPE**
- 5/8" Wrench, open or box end/crescent type.
- 7/8" Wrench, open or box end/crescent type.
- 1/2" Wrench, box end/crescent type.
- 3/4" Wrench, box end/crescent type.
- 3/4" Wrench, socket type.
- Phillips head screwdriver.

ADJUSTABLE  
3/4"– 3"

PIN 1/8"

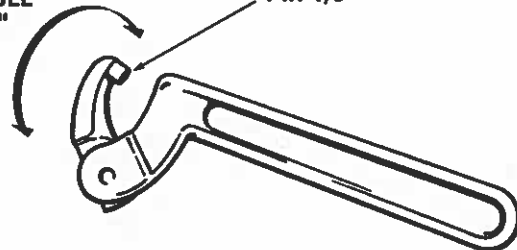
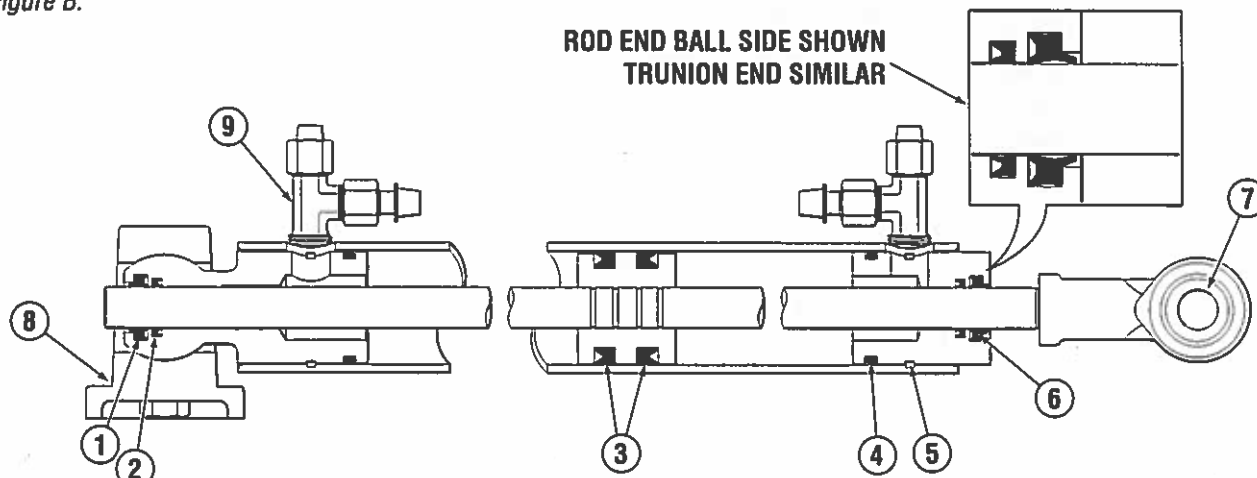
*Figure A. SPANNER, PIN WRENCH*



Figure B.

**HS5182**

ITEM	PART #	QTY	DESCRIPTION
1	061729	1	Wiper Ring
2	007320	2	O-ring, one per gland
3	007527	2	U-Cup
4	007423	2	O-Ring, one per gland
5	020521	2	Retaining Ring, one per gland
6	023520	1	Molded End Cap
*7	560928	1	Rod End Ball
*8	N/A	1	Trunion Assembly
*9	Various	2	T-Bleeder Fitting (Consult Owner's Manual for Part No.)

*\* Items are not included in seal kit***HS5183**

ITEM	PART #	QTY	DESCRIPTION
1	064322	1	Wiper Ring
2	225226	2	Quad Ring
3	025722	2	U-Cup
4	025629	2	O-Ring, one per gland
5	065024	2	Retaining Ring, one per gland
6	025121	1	Molded End Cap
*7	560928	1	Rod End Ball
*8	N/A	1	Trunion Assembly
*9	Various	2	T-Bleeder Fitting (Consult Owner's Manual for Part No.)

*\* Items are not included in seal kit***HS5184**

ITEM	PART #	QTY	DESCRIPTION
1	064322	1	Wiper Ring (Old Style)
	588621	1	Wiper Ring (Nov '05 to Date)
2	225226	2	Quad Ring (Old Style)
	588625	2	U-Cup (Nov '05 to Date)
3	026621	2	U-Cup
4	026528	2	O-Ring, one per gland
5	064229	2	Retaining Ring, one per gland
6	025121	1	Molded End Cap
*7	560928	1	Rod End Ball
*8	N/A	1	Trunion Assembly
*9	Various	2	T-Bleeder Fitting (Consult Owner's Manual for Part No.)

*\* Items are not included in seal kit***HS5185**

ITEM	PART #	QTY	DESCRIPTION
1	081826	1	Wiper Ring (Old Style)
	588321	1	Wiper Ring (Nov '05 to Date)
2	225320	2	Quad Ring (Old Style)
	588325	2	U-Cup (Nov '05 to Date)
3	026621	2	U-Cup
4	026528	2	O-Ring, one per gland
5	064229	2	Retaining Ring, one per gland
6	346223	1	Molded End Cap
*7	N/A	1	Rod End Ball / Clevis
*8	N/A	1	Trunion Assembly
*9	Various	2	T-Bleeder Fitting (Consult Owner's Manual for Part No.)

*\* Items are not included in seal kit*



## Seal Replacement Procedure

- 1 Clamp the cylinder in a soft jawed vice.
- 2 Remove the rod end ball joint (item 7, figure B) from the cylinder shaft. Prevent the shaft from rotating by holding an open end/crescent wrench across the flats of the shaft (refer to figure C) and turn the rod end ball joint counter clockwise using an open end/crescent wrench on the rod-end flats.

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

- 3 Remove the mounting foot (item 8, figure B) using a 3/8" socket.
- 4 Remove the hose fittings (item 9, figure B) from the cylinder body.
- 5 Remove the retaining rings (item 5, figure B) that secure both end glands. This will require the use of needle nose pliers, and a spanner pin wrench. Using the pin wrench, turn the end gland counter clockwise until the retaining ring becomes visible in the fitting port. Remove the retaining ring with the needle nose pliers as you turn the end gland with the spanner pin wrench. Repeat the same procedure for the other side.

**NOTICE** *In some cases the retaining ring will loose its grip to the gland, if this occurs, push down on the retaining wire while turning the end gland. You will feel the ring engage with the wire, and removal can begin.*

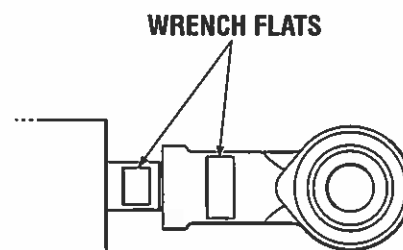
**NOTICE** *If the retaining ring does not become visible in the fitting port of the cylinder body, it may have broken off inside the cylinder. The only way to extract the broken ring is to feed a second retaining wire in behind the first, forcing the broken ring to be ejected.*

- 6 Once the retaining wires are removed the end gland can be pulled out.  
**NOTICE** *To ease removal of the gland, cut the o-ring that you see through the fitting port of the cylinder. The gland is not threaded and will pull right out.*
- 7 Carefully slide cylinder shaft out of cylinder body.

## WARNING

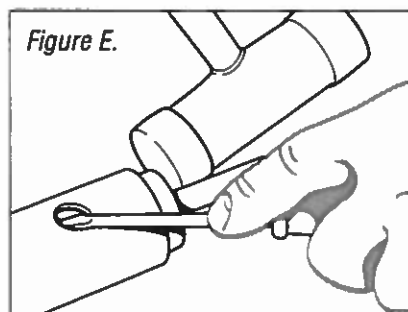
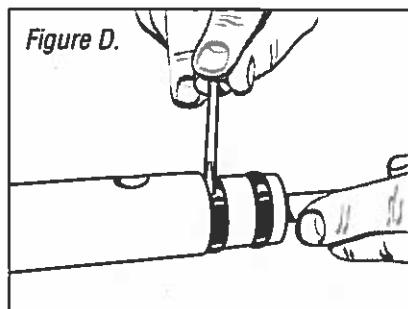
**DO NOT** damage the shaft in any way, a damaged shaft is not serviceable and the cylinder **MUST** be replaced.

Figure C.





## Reassembly



**NOTICE** Tap end gland lightly to reassemble.

### WARNING

Failure to add a thread lock to the rod end ball joint may result in separation of the end ball joint from the cylinder shaft, causing property damage and/or personal injury.

- 1 Lubricate new "u-cup seals" (item 3, figure B) with SeaStar Hydraulic Steering Fluid and stretch them over the piston so that the open side is facing away from the center of the piston.
- 2 Reinstall piston shaft. Be careful not to damage new seals when reinstalling the cylinder shaft.
- 3 Remove and match up the seals (items 1 through 6, figure B) out of the seal kit bag. **NOTICE** Cylinders produced "before Nov. 2005" use a different type of seal than those produced after "Nov. 2005". It is advisable that you match the seals out of the bag with the seals from your cylinder.
- 4 Install new seals into the end glands as per figure D. Note: early models and newer models have different style seals. In both cases installation is the same. Open side of the seal and wiper are to face towards the piston.
- 5 Install end gland into cylinder body. Prevent damage of the O-rings by guiding the ring past the fitting port with a dull instrument, see figures D and E.
- 6 Grease and insert the replacement retaining rings (item 5, figure B) through the fitting port/hole and into the guide hole of the end gland, refer to figure F. Using your spanner wrench, turn the end gland clockwise, drawing the retaining ring into the end gland and continue to turn the end gland until the thread fitting holes line up with the gland hole, as shown in figure G.
- 7 Apply a Teflon based pipe sealant, **DO NOT** use Teflon tape, to the threads of the hose fittings (item 9, figure B), and reinstall the hose fitting into the cylinder port.
- 8 Apply a thread-locking, such as Loctite® Thread locker to the rod end ball (item 7, figure B) joint and reinstall the rod end ball joint.
- 9 Grease Ball end gland (item 8, figure B) with good quality marine grease and reassemble the mounting foot.
- 10 Reinstall the cylinder onto the boat, purge the system as per your owner's manual and complete a "system check" to ensure that there are no leaks and your steering system is operating properly and safely.

