

Chapter 11 Steering System

Manufacturer

The steering is Teleflex Seastar Hydraulic.

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You just have to love any company who state on their owners manual: “Before you do it your way, please try it our way!” They obviously know their customers.

Hydraulics

Check the system by trying to move the tiller arm (in the lazarette, under the fiberglass cover). It should not be moveable by hand.

Check hydraulic oil level by putting a probe or pipe-cleaner down tube next to the gearshift. Full level is one to two inches down.

If the fluid level is decreasing, then there is a leak - and there are only 3 joints:

- Helm pump (accessed through teak cover plate under the wheel).
- Autopilot connections, in the engine room.
- The steering cylinder on the tiller arm, in the lazarette.

Helm Pump

Part# 1.7 ?? – I can’t see or read it...

Overhaul Kit HS5176 Shaft seal 225226

Steering Cylinder

Model BA150-7 TM Part #HC531 8

Overhaul Kit HS5182

Fluid

Teleflex SeaStar – sold at West Marine.

You should have got a filler tube with the boat. It’s a 12in clear tube with a plastic screw fitting on each end. One end screws into the fill by the gearshift, and the other attaches to the SeaStar fluid bottle. You then upend it (kinda like an IV drip) to provide a constant ‘head’ of pressure to fill the system, as you loosen the bleed valves and someone else turns the wheel lock-to-lock. Work from the bow to the stern.

There is a special procedure to bleed dual stations on the flybridge models. Check with Kurt if you need to do this.

Rudder

The AT34 has a rudder blade made of a fiberglass composite material, with a 1 ¼ in stainless steel shaft. It is fully supported by a bottom bearing embedded in a composite skeg, and a Teflon top bearing in the driplless seal.

There should be a donut zinc on the rudder shaft. Our boat did not have this when we got it – Tomco started to add them shortly after our boat was built.

Skeg

The skeg runs from the keel to the base of the rudder, and is glued to the boat with some kind of high-tech adhesive.

Someone at Tomco told me that they thought it was strong enough to lift the entire vessel. They performed the engineering calculations, and it was, so they did just that.... lifted the boat with a big jack under the skeg !

Rudder Shaft Seal

It's a good idea to check the top of the rudder shaft for corrosion. Take a look in the lazarette under the protective fiberglass step. Either hang upside-down like a bat, or remove the step (4 screws).

The upper end of the rudder shaft is fitted into a bearing with the control arm attached. Unfortunately, the bearing and collar make a nice 'ledge' for seawater to sit and corrode. Tides marine recommends inverting the red "hat" to prevent intrusion of any foreign substance from the outside getting into the lip seal area. This is shown in the photo for step 22 in the section below.

You should check the tightness of the two square-headed lock bolts that secure the rudder arm onto the post as long as you're in there standing on your head anyway.

The driplless seal and bearing for the rudder shaft are made by Tides marine. See the *Driplless Shaft Seal* section in the *Transmission and Driveline* chapter for details and contact information.

Several earlier boats have had leaks around the rudder seal, and I know of two ("Mersea" AT34 #39 and "Lone Duck" AT34-unk) that have had new rudders installed.

Donald Gordon, AT34-28 "Annie," recommends that if you have any standing water in the lazarette, look first at the fiberglass housing for the rudder shaft bearing. Look to see if there is a tell-tale brown stain showing that salt water is leaking out of the lip seal and down the vertical surface of the fiberglass housing. If this is the source of the water, the lip seal needs replacement. You can wipe the area clean and dry and place a rag or paper towel down there and observe if and when it gets wet and where the water is coming from.

The problem might be related to the lack of rudder shaft zincs on early boats, or maybe crevice corrosion in the underwater stainless-steel.

Removing and Replacing the Rudder Shaft Seal

Donald Gordon, AT34-28 "Annie", has provided this write-up on how to remove and replace the rudder lip seal.



This job should only be attempted when the boat is out of the water.



Make sure to get the correct replacement lip seal G-1250 (Garellick) from Tides Marine. Part number is GAR-0631 1 1/4" lip seal.

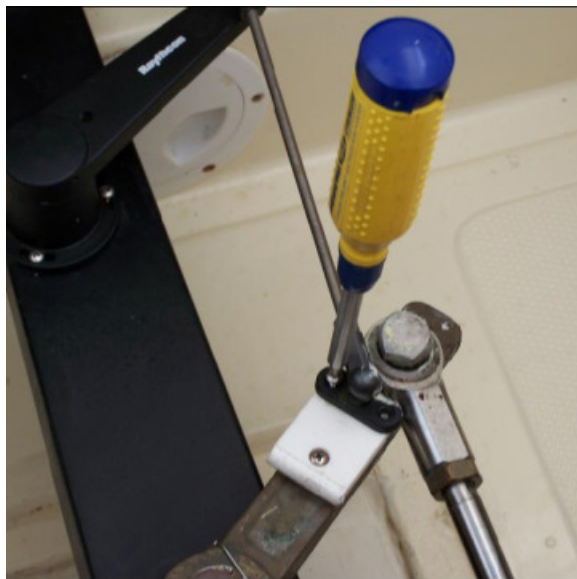


Tomco switched to a bearing assembly with *two* lip seals starting around hull # 130. According to Kurt, Tides Marine discovered that they had better luck with two lip seals in a vertical installation as in the rudder shaft (versus a horizontal installation as in the prop shaft). Basically they just machined out more plastic in the bearing housing to allow for two lip seals to be stacked one on top of the other, so you cannot tell the difference between a single lip seal assembly and a dual lip seal assembly by looking at it. If you are unsure of which you have, give Kurt a call. If you have the dual lip seal assembly, make sure you order two lip seals.

If you have a single lip seal, you can consider ordering a new *bearing* from Tides Marine with two lip seals installed (part number: RPBH-D-1250-03). Kurt has cautioned that if you want to do this upgrade, make sure that the rudder shaft is in pristine condition where both of the lip seals would ride.

Getting at the Lip Seal:

1. Remove Rudder cover – 4 Phillips head screws
2. Turn wheel hard over to starboard exposing both Raymarine attachment screws.
3. Remove Raymarine AP rudder indicator by loosening 2 screws on top of rudder tiller.



4. Remove RAM from tiller arm. 15/16 wrench. Remove nylock nut from bottom. Lift out vertically.



5. Remove tiller wire from set screw bolt.



6. Loosen tiller set screw bolt on rudder post – 8 mm wrench.
7. Remove tiller arm nylock bolt – 9/16 wrench.
8. Gently pry up tiller with crowbar.
9. Remove tiller arm.
10. Open hand holds to access $\frac{3}{4}$ nuts holding black rudder base onto stringer at each end. Remove bolts.



11. Remove shaft key – this was the hardest part. Screwdriver, crow bar, pliers, hammer & prayer.

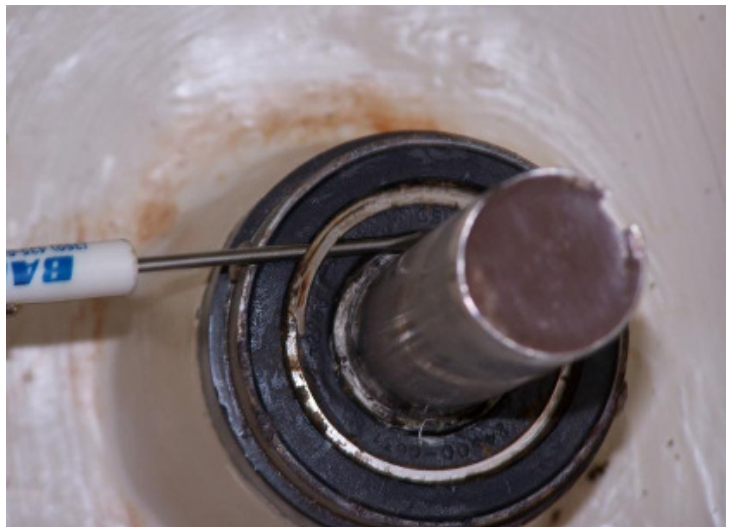


12. Remove the seizing wire from the bolts. Loosen set screw bolts – 3/8 wrench. Slide collar off.



Replacing the Lip Seal(s):

13. Find the spiral retaining ring and its 45 degree angle end. Using a small screwdriver, pry the end of the spiral ring off toward the shaft. Remove ring (it goes around twice) and set aside for re-installation later.



14. Remove the lip seal. Clean area. Use 320 wet/dry sandpaper to radially (not vertically) sand the shaft area where seal rests.
15. Follow Tides Marine instructions that are provided with the new seals for the remainder of the lip seal replacement steps, and you will be done. Re-assemble by following steps 1 through 12 in reverse order.

Replacing the Bearing:

16. If you have purchased a new bearing with two lip seals (as mentioned above at the start of this section), you will need to remove the old bearing. To remove the bearing, use a chain wrench around the metal ring (with two screws in it).



17. Clean shaft to remove any grease – I used brake cleaner.



18. Position chain wrench on new bearing.



19. Install hat inside of bearing top to cover two lip seals.
20. Apply Life Caulk or Silicone Caulk around bearing shoulder inside o-ring. Apply another bead half way down spiral around 2 times.
21. Slide bearing onto shaft with hat installed & use chain wrench around SS ring to screw in and tighten down.
22. Remove hat from seals. Invert. Cut off 1/2" of hat bottom to clear collar. Place on shaft above seal to protect it.



23. Re-assemble. Refer to steps 1-12 in reverse order.