

REPLACE SHAFT BOTTOM BEARING #25

MARCH 2019

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The Bottom Bearing is a friction fit inside the Tube. If it is only the Shaft Bottom Bearing that needs replacement, this can be done without removing the Drive Unit or the Shaft Assembly, especially if the boat is on the hard.

Remove Shaft Bottom Collar

1. Use a hex/Allen key to loosen Bottom Collar Screw #46
2. Remove Bottom Collar #26

Remove old Shaft Bottom Bearing #25

Idea #1 – Clamp and Hammer

1. Tighten a jawed pipe wrench onto the visible lip of the Bottom Bearing – so tight that you pinch it
2. Wack the wrench with a big hammer... might take a few hits

Idea #2 – Destroy and Pull

1. If the above doesn't work, go about destroying the Bottom Bearing
2. Drill little holes into the plastic
3. Once you have enough holes, devise a puller to hook inside and pull the bearing out

Option #3 – If the above 'quick fixes' are not possible, use this longer process...

Remove Drive Unit

1. Remove Vane Assembly
2. With Locking Pin #61 inserted, move the Ratio Knob #21 to the far right.
3. Slacken Fork Bolt #58 and Shaft Bolts #55.
4. Remove the Pin #61 and lift the drive unit off the rudder shaft. Remove the Fork Arm #71 from the top of the rudder shaft as it becomes free. **Helpful Tip:** If the drive unit can not be moved upwards, use the OPENER: Remove one of the Bolts #55 (or any M10 bolt) and screw it into the threaded 'opener' hole between the two bolt #55 locations, until it touches the casting on the other side of the gap. Now tighten this bolt carefully, a quarter turn at a time (so opening the drive unit frame casting around the rudder shaft

tube) until the drive unit can be lifted off. Take care not to overly 'open' the clamp onto the shaft.

5. Place Drive Unit and Tiller somewhere same, on a towel is best to prevent damage

Remove Shaft Assembly from Bracket 'holders'

6. Ensure you have a safety line on the Shaft Assembly and an extra pair of hands to hold it.
Warning: It is heavy and will drop as soon as you sufficiently loosen the bracket clamps.
7. Loosen the appropriate bracket bolts sufficiently to slide the Shaft Assembly out

Disassemble Shaft Assembly – remove Shaft Bearings and Shaft from Outer Tube

8. This is best done on land or down below so that no parts are lost overboard.
9. Punch out Race Collar Pin #28. **WARNING:** Pin #28 in the Shaft Race Collar #27 prevents the rudder shaft from dropping downwards out of the tube. Best have the bottom of the shaft on something solid – terra firma.
10. Remove Shaft Race Collar #27 and Shaft Ball Race #31. **WARNING:** The 19 small nylon balls sit below the collar. Best to carefully pour those 19 into a bucket.
11. Use the shaft inside the tube to knock out the bearings. Lift the tube a fist length or so and bring it down onto the Bottom Bearing. A few such hits and the Bearing will pop out.

Replace Bottom Bearing

3. Line up the new Bottom Bearing – it will be important to tap evenly inside the tube
4. Gently use a hammer directly on the Bearing and tap it inside
5. If you can find a 1.5" OD tube that is at least 8" tall to hold the Bearing in position from below, this allows you to apply more even pressure with the hammer

Replace Bottom Collar

6. Ensure *at least* a business card sized gap between the Bottom Bearing and Bottom Collar
7. Best is to hold the Shaft Bottom Collar on the Shaft as you put the Rudder on and insert the Rudder Locking Pin to hold Rudder on
8. Position the Bottom Collar just a hair above the Rudder (to help you to know where to pull the rudder up to) and tighten down on the Bottom Collar Screw
9. Spin the Shaft to ensure no binding! If there is binding, reposition the Collar slightly further away from the Bottom Bearing.