

REPLACE SHAFT BEARINGS

INSTRUCTION VERSION 1.0 – NOVEMBER 2016

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BOTTOM BEARING AND TOP BEARING

All shafts are machined to 1in outer diameter at the top where the drive unit fits on. The shaft has an increased diameter just below the Top Bearing 24. To change the Bottom Bearing 25, without the use of special tools, the top bearing is first removed, using the rudder shaft to knock it out upwards. The shaft can then also be used to knock out the bottom bearing.

Remove Drive Unit

1. With Locking Pin 61 inserted, move the ratio knob to the least rudder movement position.
2. Slacken Fork Bolt 58 and Shaft Bolts 55.
3. 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, remove one of the bolts 55 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.

Remove Bearings and Shaft

4. Slacken screw 46 and remove the Bottom Collar 26.
5. Punch out Race Collar Pin 28. **Helpful Tip:** The pin 61, removed from its string, can be used for this, since it is fractionally smaller in diameter than 28. **WARNING:** Pin 28 in the Shaft Race Collar 27 prevents the rudder shaft from dropping downwards out of the tube. Before knocking out this pin, if the unit is mounted on the boat, brace a SAFETY LINE upwards from the rudder retaining pin hole to take the weight of the shaft and prevent its loss if it drops through the tube.
6. Remove collar 27 and Ball Race 31. **WARNING:** The 19 small nylon balls sit below the collar.
7. When the shaft is below the top bearing, it can be used to knock out this bearing upwards. Try to keep the shaft in contact with the inside of the tube as it is moved up and down, to avoid any damage to the bottom of the bearing.
8. After the top bearing is removed, the shaft can be lifted above the bottom bearing and used to knock this bearing downwards and out of the tube. To do this, the safety line from the rudder pin hole will be removed. Attach it to one of the two holes at the top of the shaft instead.

Replace Bearings

9. The shaft bearings 24 and 25 can be replaced using a soft-faced hammer, or a steel hammer, using a plastic or timber pad on the bearing flange.

Re-assemble

10. Slide the shaft back in and replace the 19 nylon balls 31, and the top race collar and pin 27 28.
11. Replace the bottom collar 26 so that the shaft has a small vertical clearance – about 0.015 inches (the thickness of a piece of card from a cigarette packet).

Replace Drive Unit

12. Replace the drive unit after reviewing the installation instructions – 'Assembly of Drive Unit onto Shaft'

MID BEARING

Since 2008, all shaft assemblies include Mid Bearing 24M. This is recommended for bigger and faster boats. If your pre-2008 Hydrovane has a 1.25in shaft, you may wish to add a mid bearing.

Hand file ridge inside shaft tube

1. The mid bearing can be inserted in either end of the shaft tube. A cavity has been machined out of each end of the tube for the top and bottom bearings. You can feel a lip or ridge at the end of

the cavity caused by the machining (not noticeable in new assemblies – has a smoother transition) – the edge between the machined section and the unmachined wall of the tube. That ridge must be filed down – otherwise there is not enough space for the Mid Bearing to fit in the tube. This will take a bit of work.

Devise a 'Pusher'

2. A suitable ram must be devised to push the bearing half way up the tube. **Helpful Tip:** 1in (50mm) plumbing PVC pipe – add the related cap – the cap has an OD of 42mm or 1.65 in – about right.

Install Mid Bearing

3. Mix dish soap in water then pour some in the tube and slosh it around so the surface is slippery.
4. Insert the Mid Bearing (has two rubber 'O' rings) so that it is clear of that machined lip.
5. Ram it up to a position of about half way up the tube.
6. Proceed with installing the two other bearings.