



Rebuild Instructions:

FM102

with Standard Propeller and Steel Front Bearing



Enclosed are step by step instructions to tear down and rebuild the following Mainline™ meters:

Model	Kit
FM1020411100	600009
FM1020611100	600013
FM1020811100	600017
FM1021011100	600023
FM1021211100	600029
FM1021411100	600035

Tools:

To rebuild the FM102 meters, the following tools will be required:

- 2 lb brass or rubber hammer
- Snap ring Pliers
- Bearing puller
- Brass Bar stock (1" OD x 5" long)
- 1/2" wrench
- 9/16" wrench
- Medium Flat Head Screwdriver

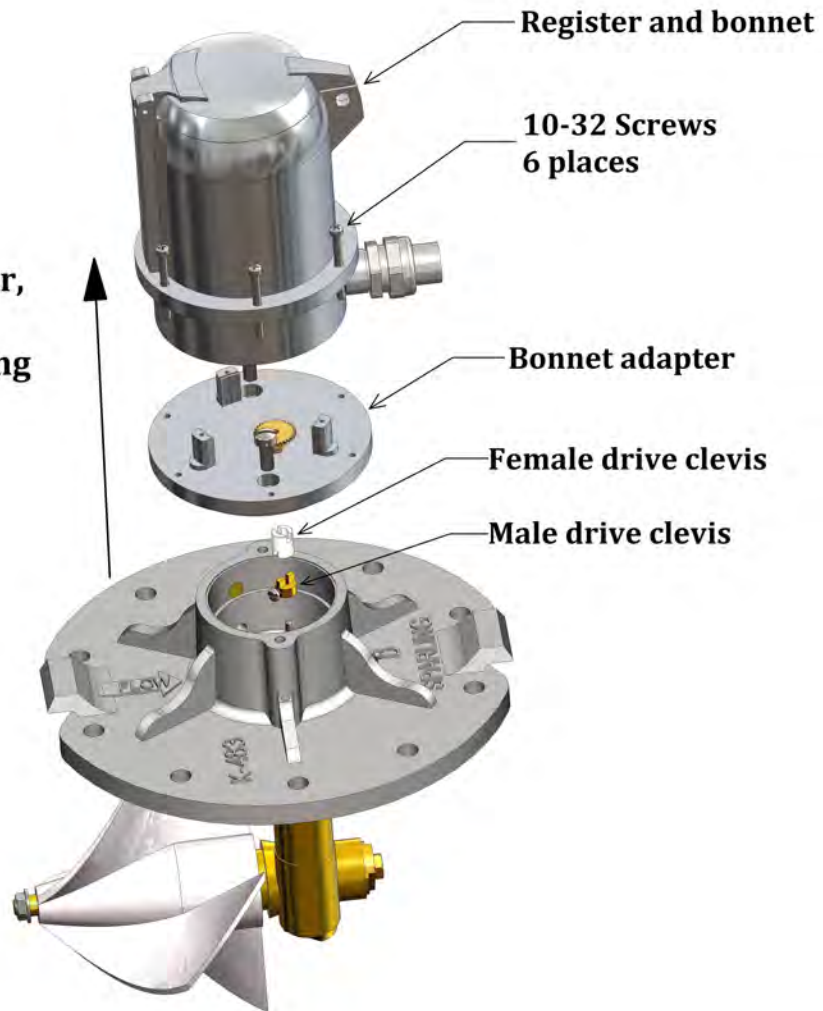


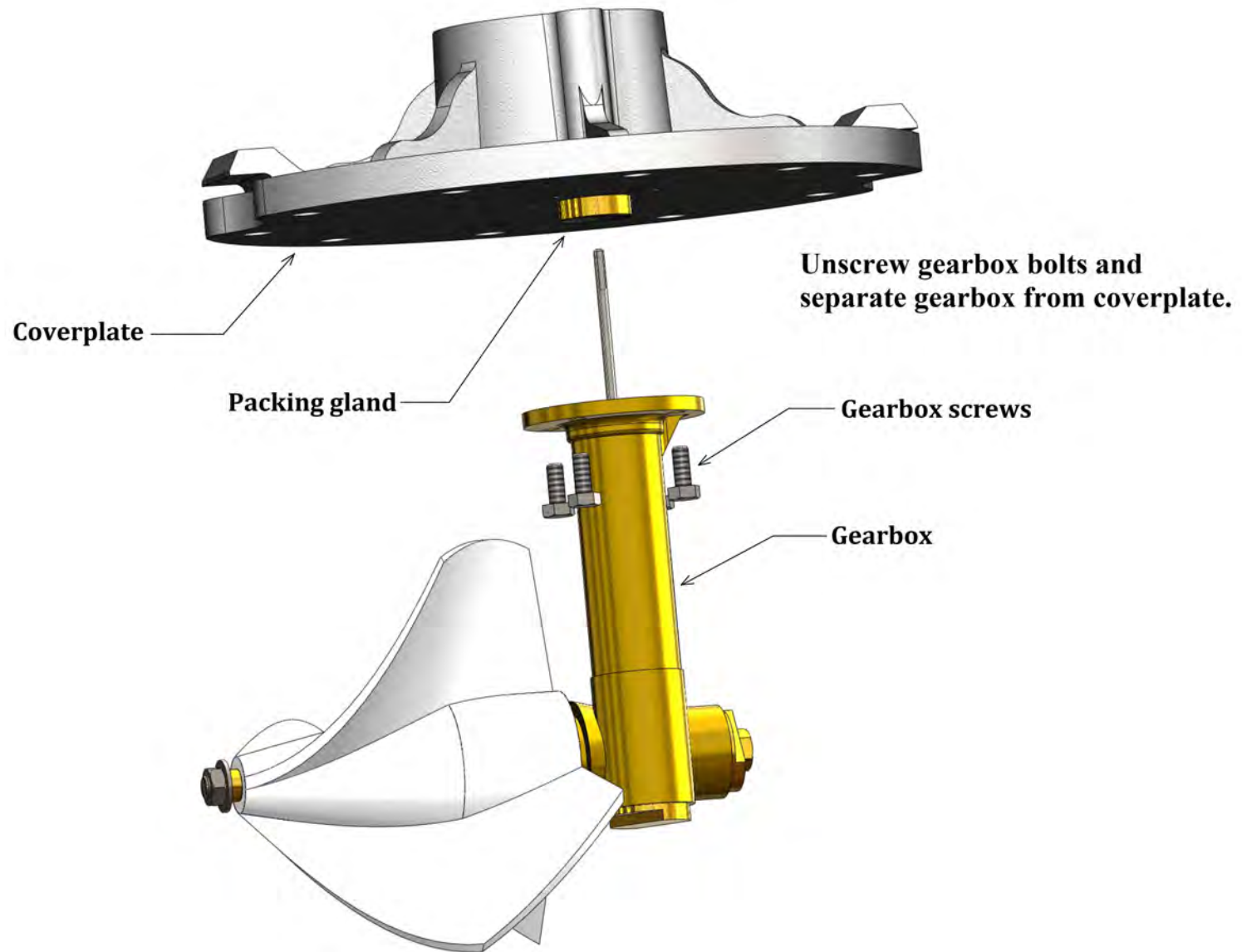
When rebuilding these meters, the Rebuild Kits should be used – all the items in the Rebuild Kit should be replaced when rebuilding the meter. For reference, the list of items in the Rebuild Kit, the quantity of each in the Rebuild Kit, and the page number where that part is used.

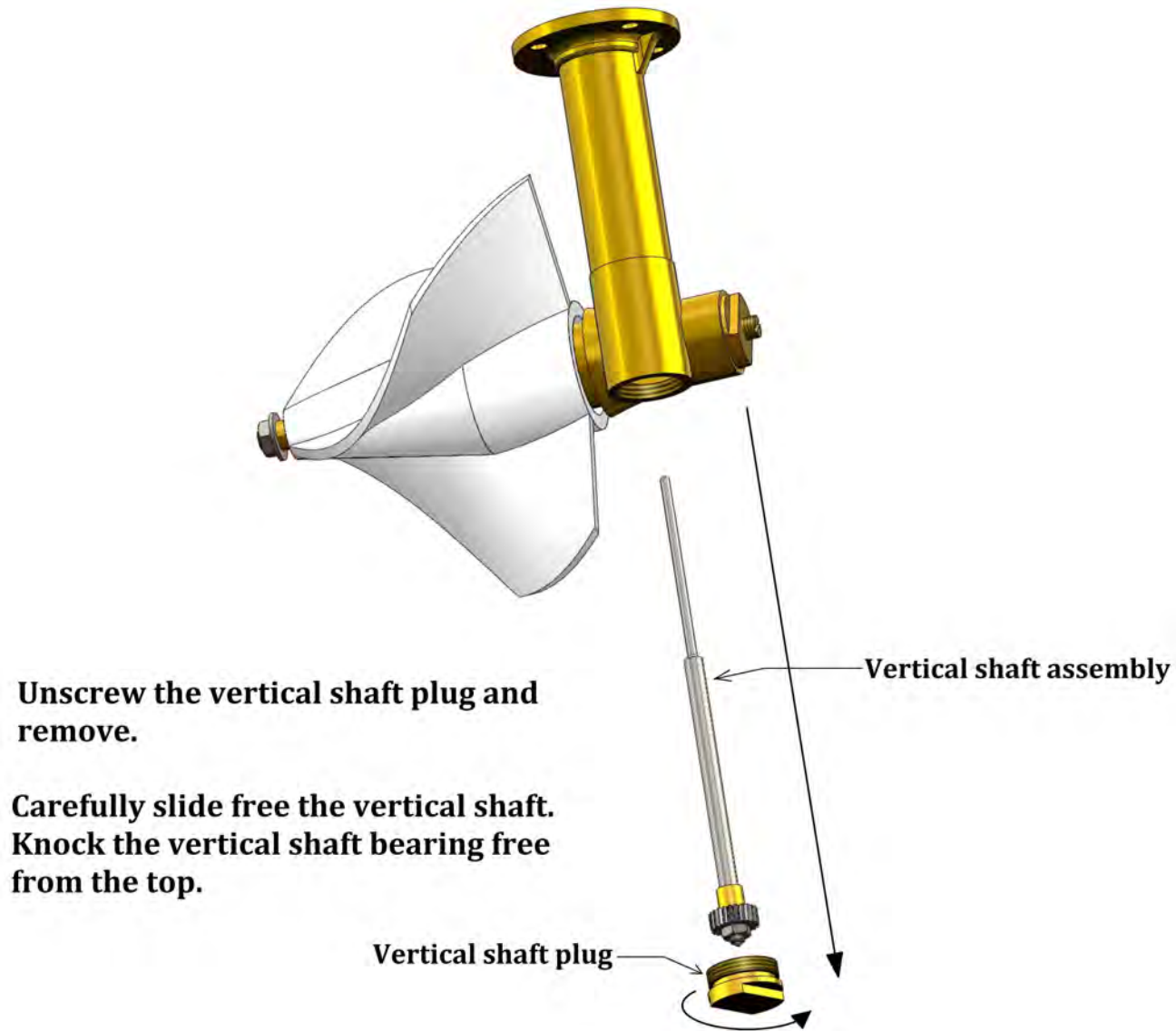
FM102 Rebuild Kit – Part Number 600009, 600013, 600017, 600023, 600029, or 600035

Description	Quantity	Page
O-ring Packing Gland	1	7
Single-row Ball Bearing, Vertical	1	8
Double-row Ball Bearing, Front	1	8
Lubriplate #105	1	8, 12, 13
Cap Screw, 1/4-20 x 5/8" long	4	9
External Retainer	1	10
Propeller Shaft Assembly	1	10
Vertical Shaft Assembly	1	11
Flat Washer, 3/8"	1	12
Hex Stop Nut, 3/8-24	1	12
Key	1	12
Thrust screw	1	13
Hex Jam Nut, 3/8-24	1	13
Coverplate Gasket	1	

Remove register bonnet, register, bonnet adapter, and male and female drive clevises by removing six 10-32 screws.

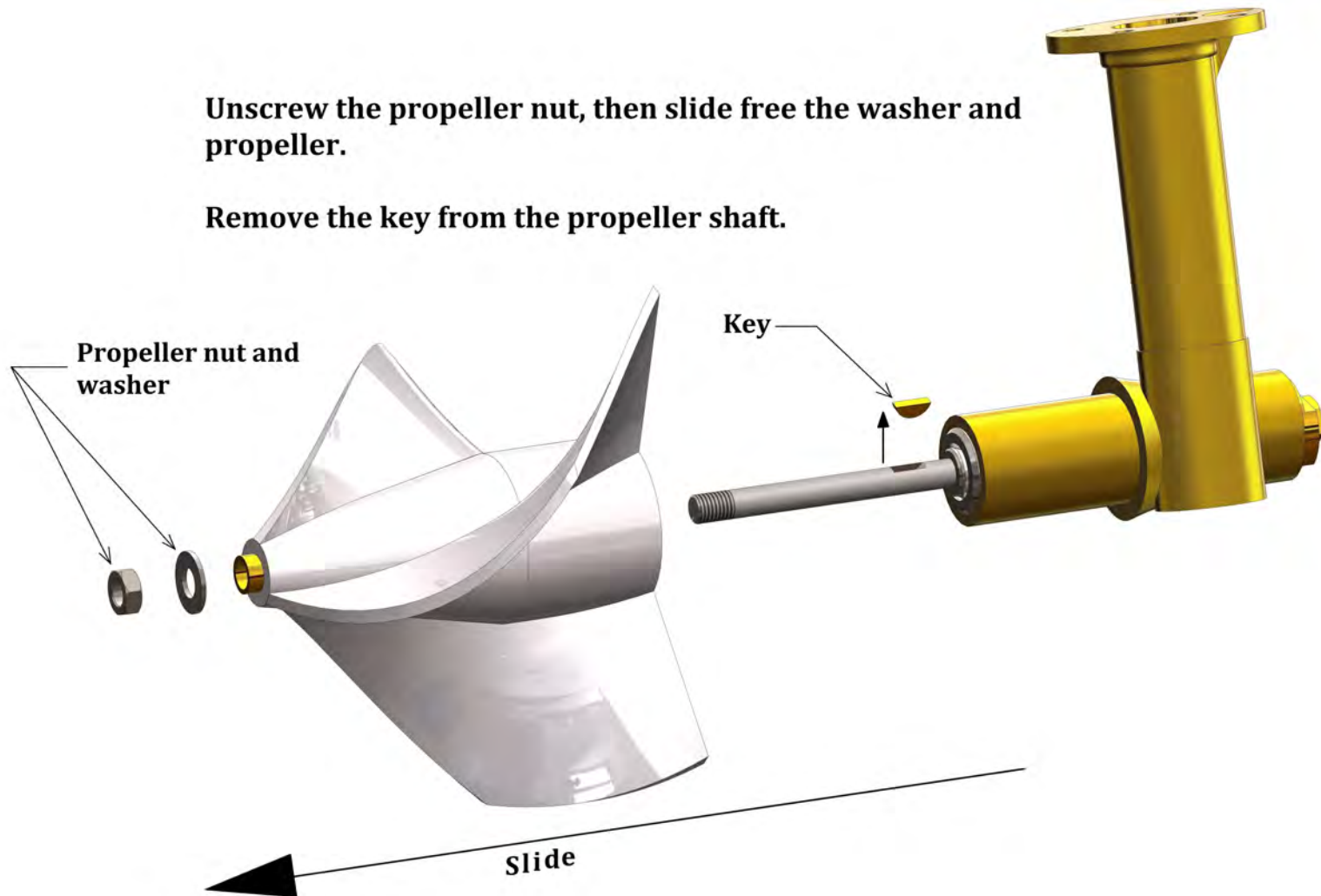


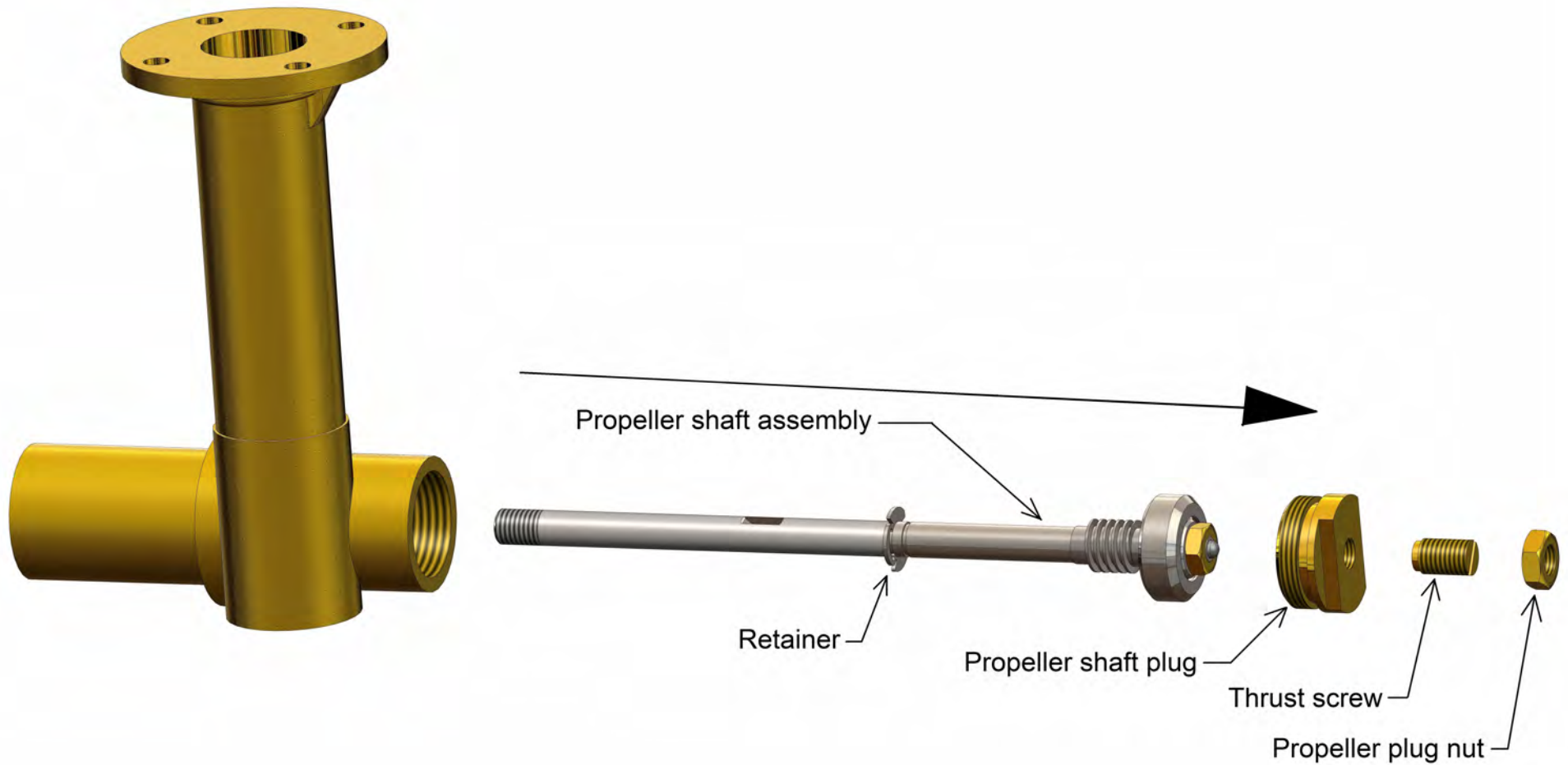




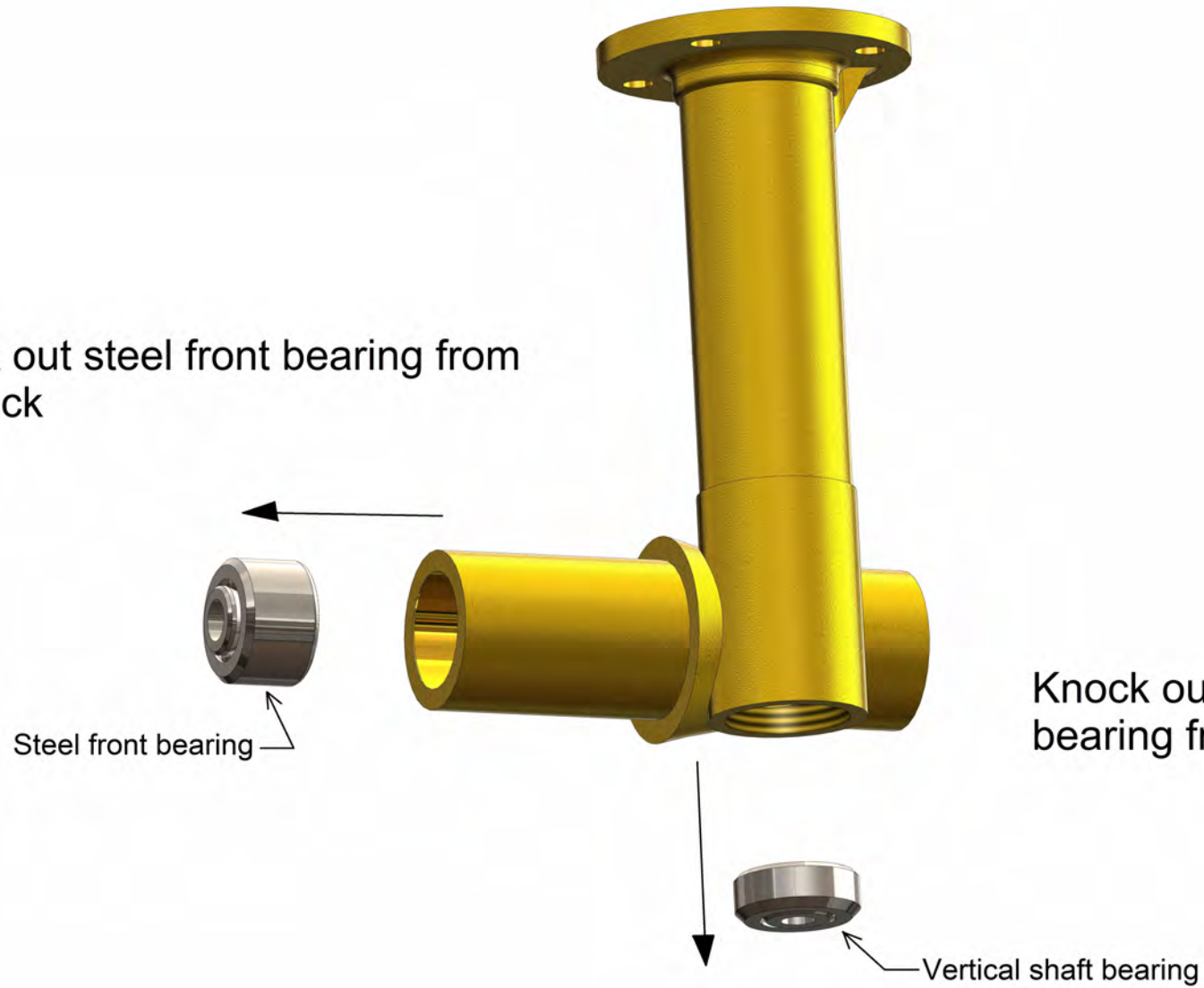
Unscrew the propeller nut, then slide free the washer and propeller.

Remove the key from the propeller shaft.

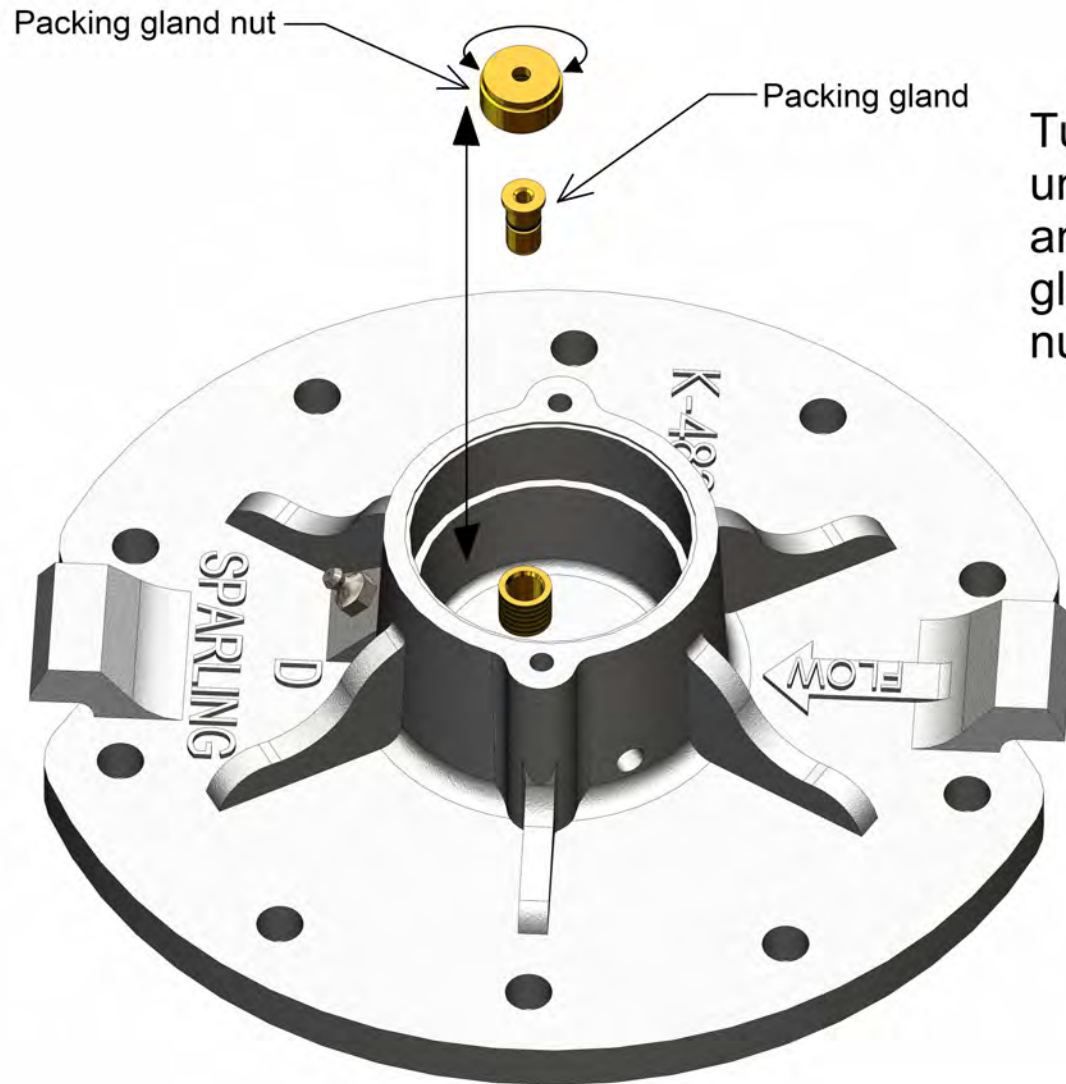




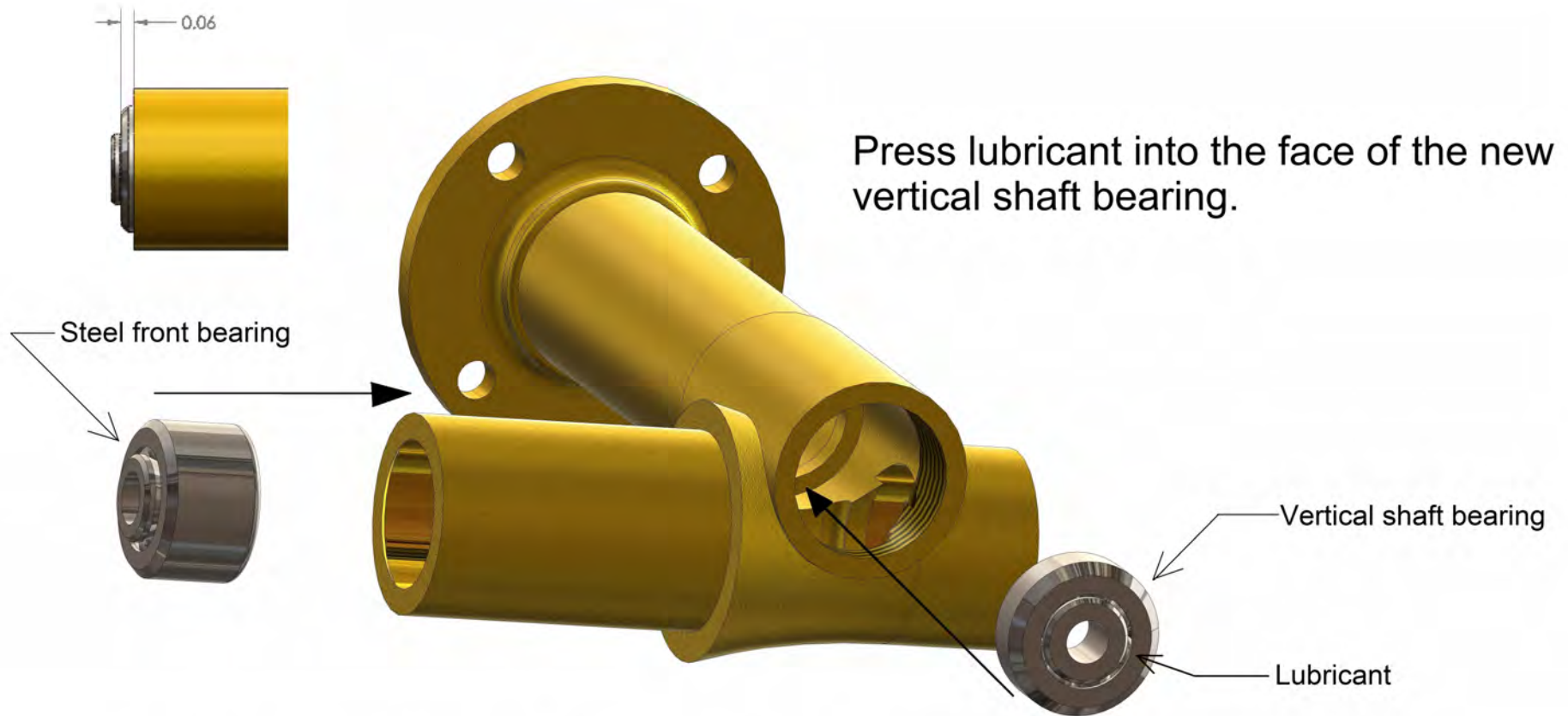
Knock out steel front bearing from the back



Knock out vertical shaft bearing from the top.



Turn packing gland nut clockwise to unscrew. Remove old packing gland and replace with the new packing gland from the kit. Tighten down the nut to secure it.

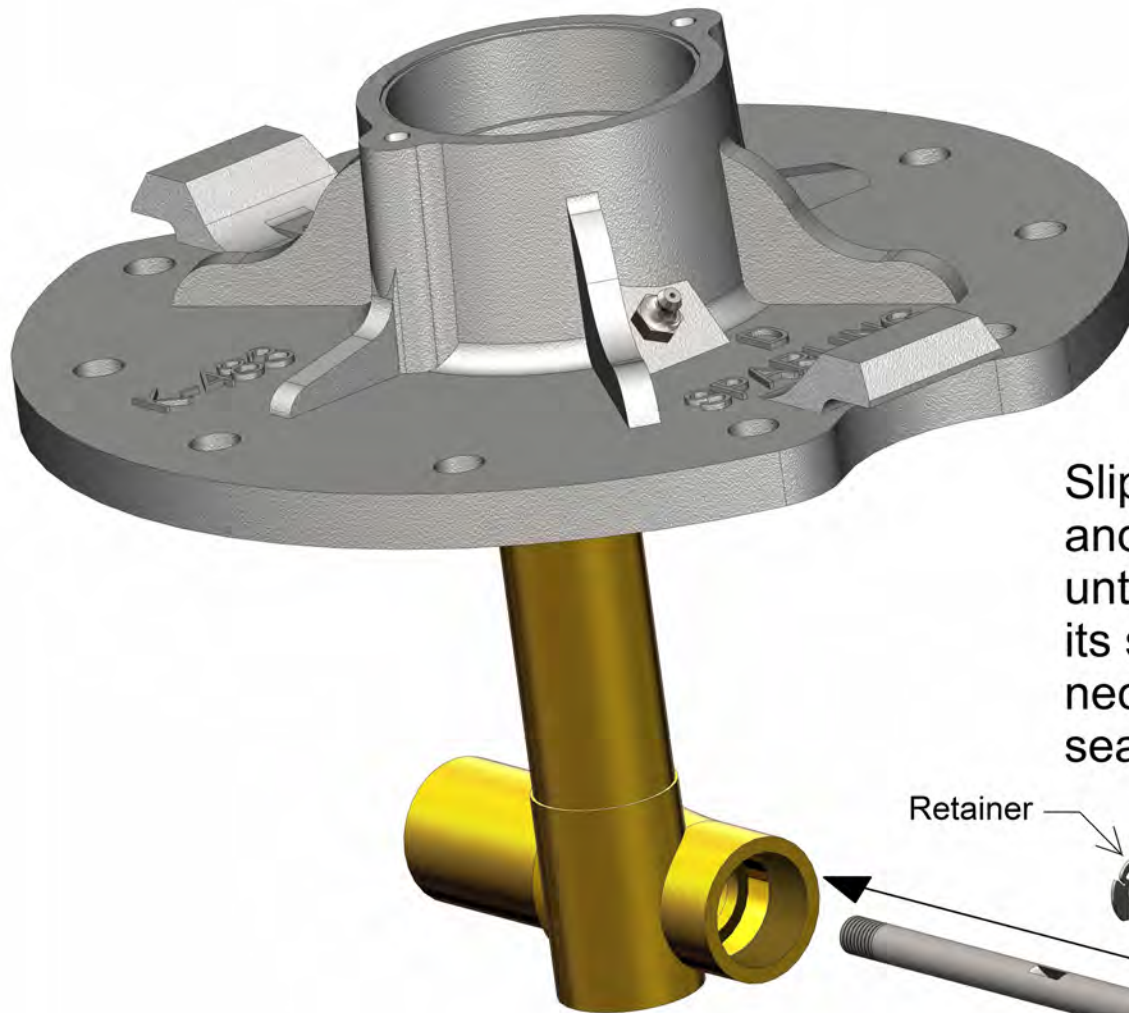


Press the new steel front bearing into the open propeller shaft bore chamfered end out, until 1/16" protrudes from the gearbox.

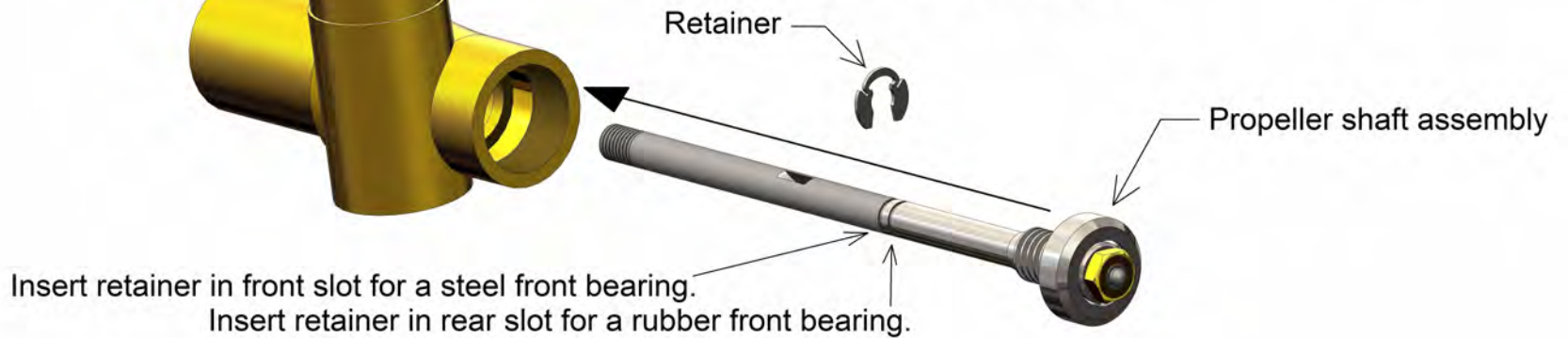
Insert the new vertical shaft bearing into the vertical bore until it rests flat against the seating surface. It may be necessary to tap it into place before it seats correctly.



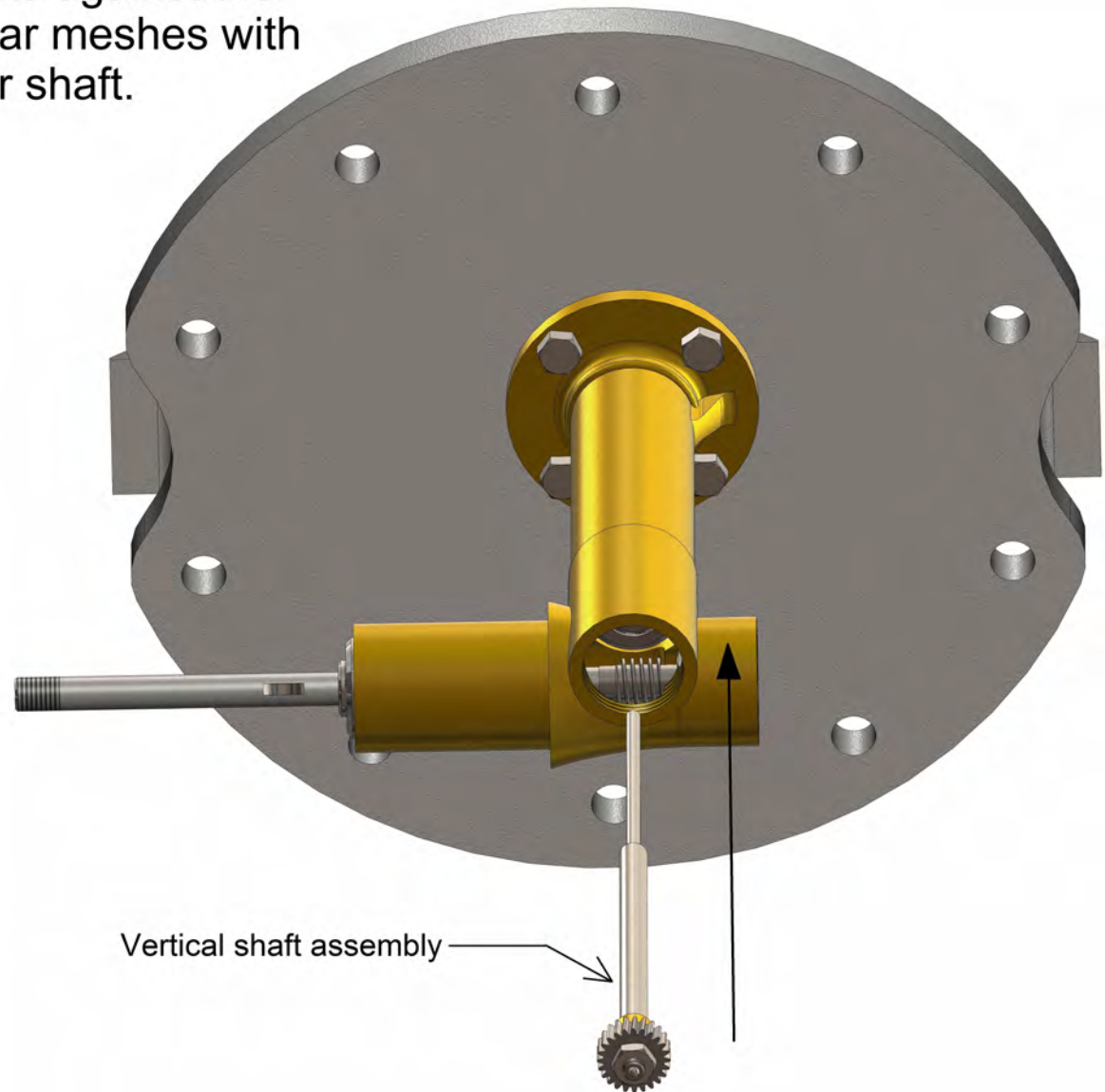
Screw gearbox onto coverplate. Make sure the protruding end of the gearbox faces the opposite direction than the flow arrow.



Slip the retainer onto the propeller shaft and slide the shaft in through the back until the ball bearing rests flat against its seating surface. It may be necessary to tap it into place before it seats correctly.



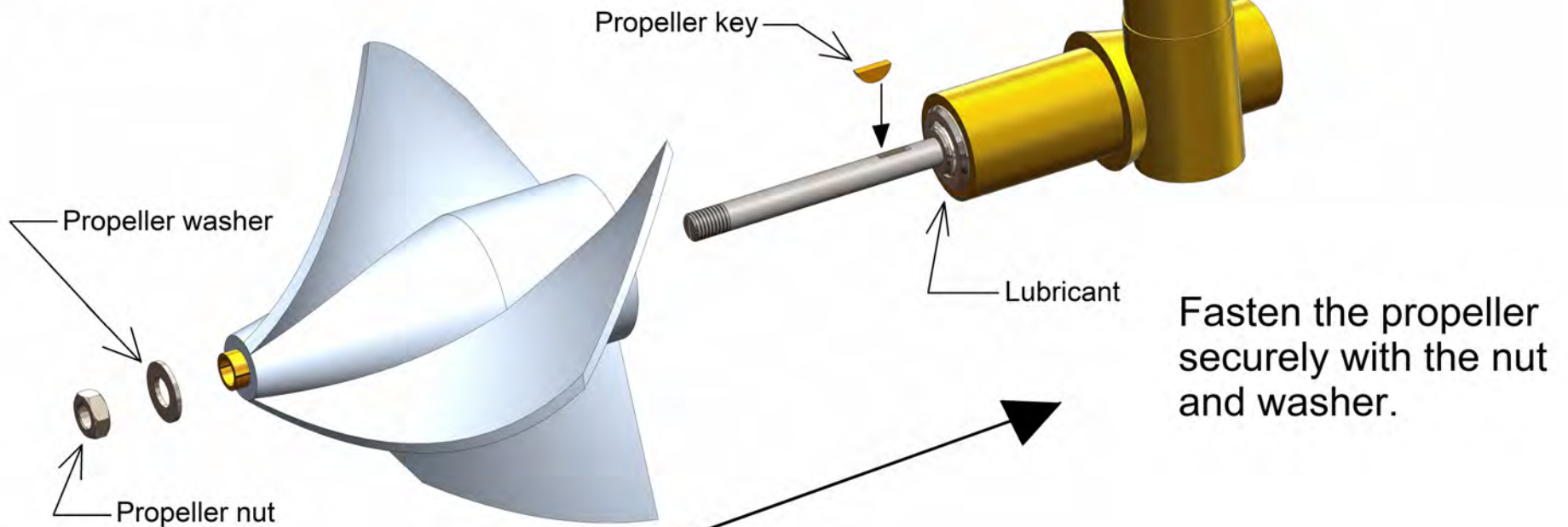
Slide the vertical shaft up the bore, through the vertical shaft bearing and the packing gland until its brass spacer rests against the ball bearing and the helical gear meshes with the worm gear on the propeller shaft.



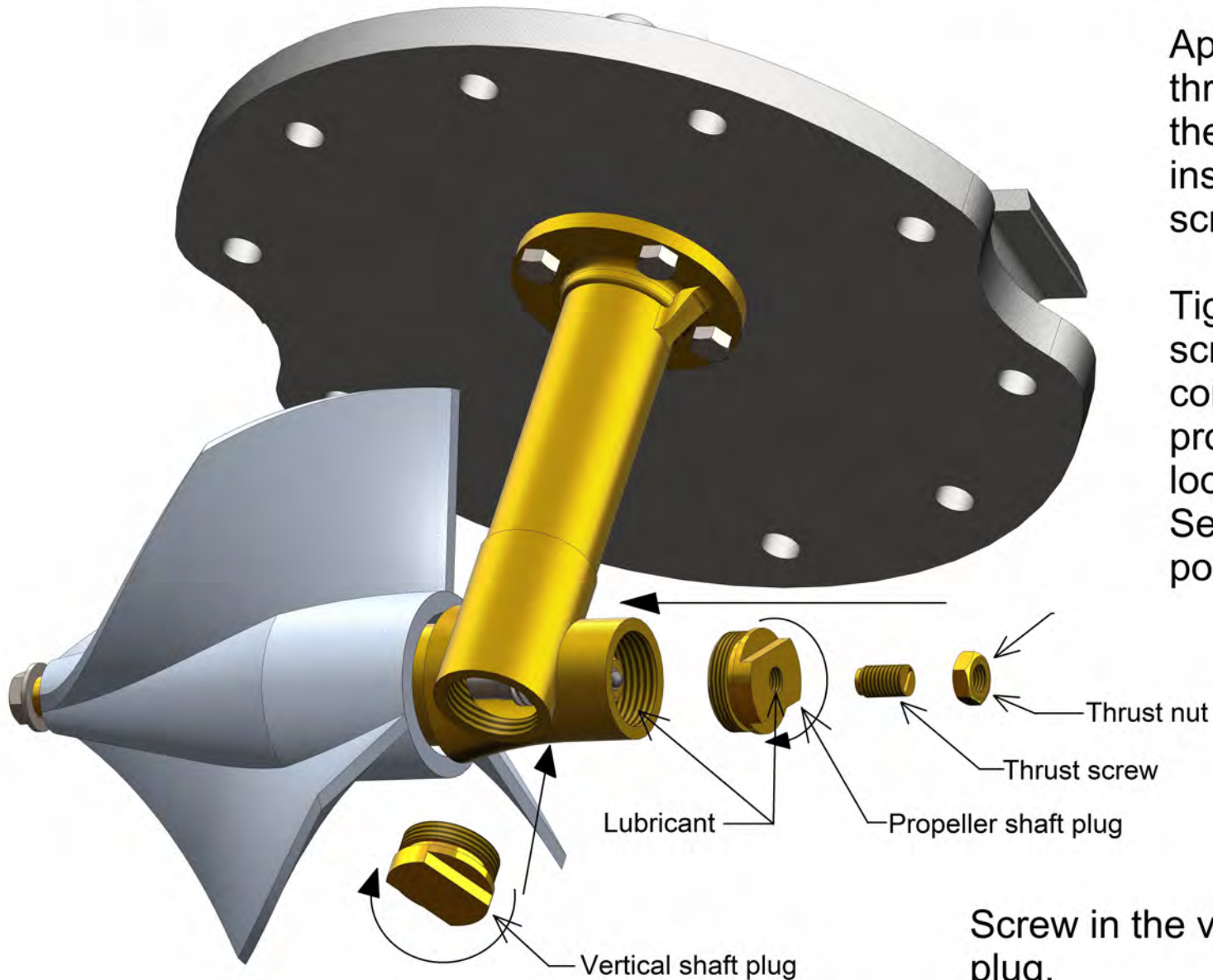
Layer lubricant along exposed front of the steel bearing.

Insert the key into its slot on the shaft.

Slip the propeller onto the shaft and slide it down past the key until the propeller insert contacts the bearing.



Apply lubricant to rear gearbox threading, then screw in the propeller shaft plug.



Apply lubricant to the thrust screw hole in the plug before inserting the thrust screw.

Tighten the thrust screw until it makes contact with the propeller shaft, then loosen by half a turn. Secure it in this position with the nut.

Screw in the vertical shaft plug.

Slide the A Gear onto the vertical shaft sticking up from the coverplate and fix it in place with its screw.

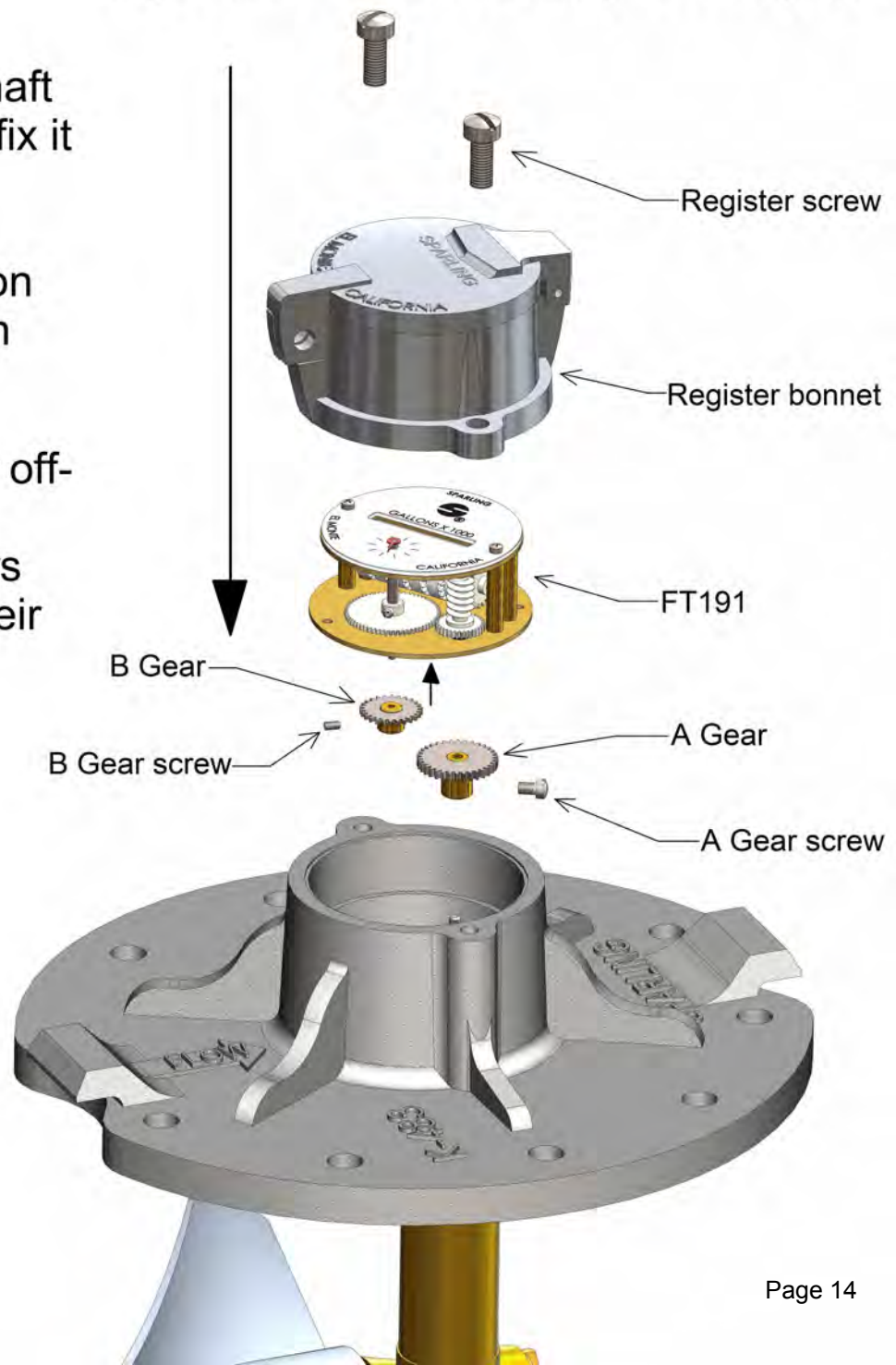
Slide the B Gear up the drive shaft on the bottom of the register and fix it in place with its screw.

Rest the bottom plate of the register off-center on the register base of the coverplate so both the A and B gears are visible. Adjust their height so their top surfaces align.

Set the register in the groove on the coverplate and rotate it until the gears mesh with each other. Spin the propeller and check that the gears spin freely without binding.

Once the gears are properly aligned, cover the register with its bonnet and screw down firmly.

If you have an FT191, follow stop on this page.
If you have an FT193, skip to next page.

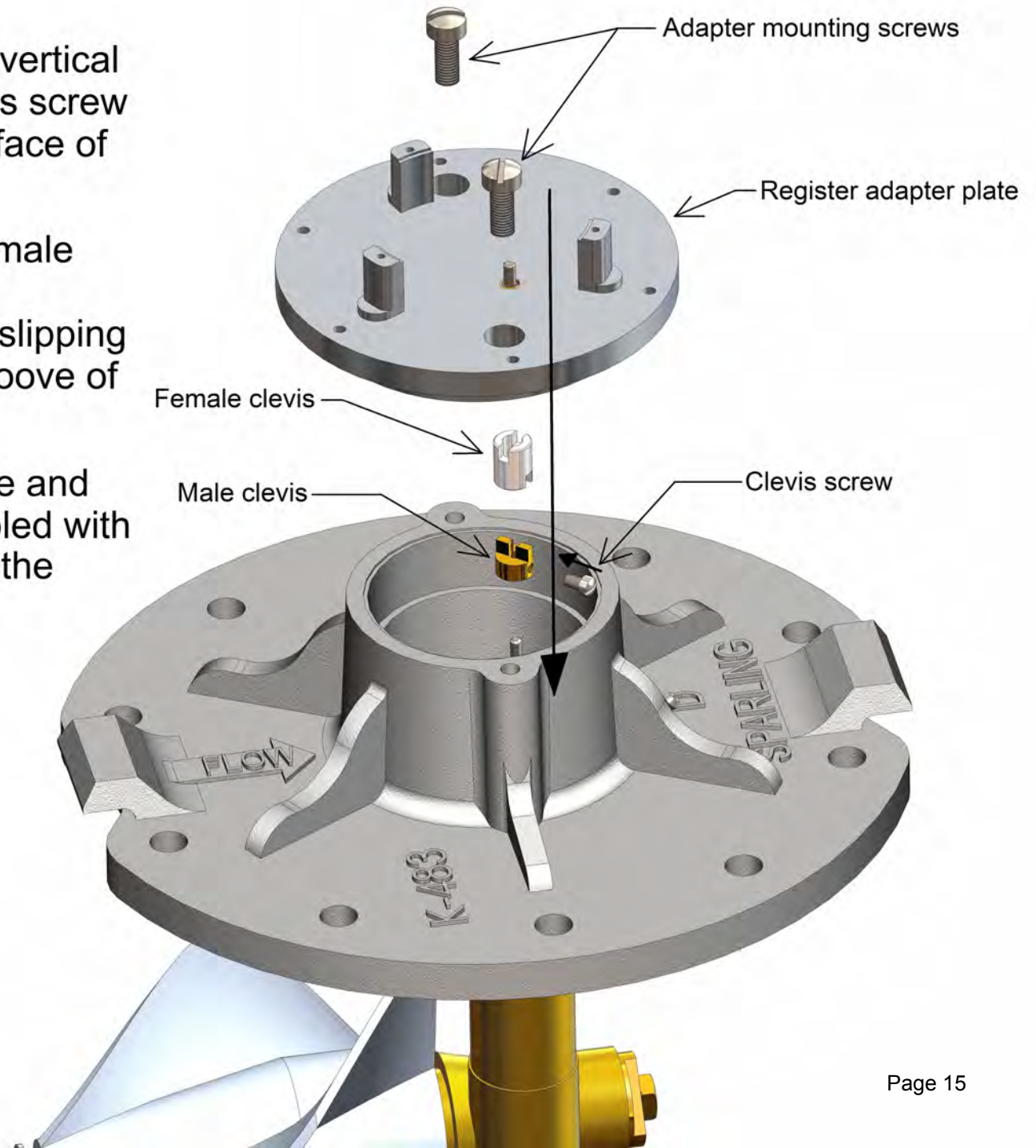


Slip the male clevis onto the vertical shaft and fix it in place with its screw tightened against the flat surface of the shaft.

Set the female clevis on the male clevis and the adapter plate assembly on the coverplate, slipping the drive shaft pin into the groove of the female clevis.

Screw down the adapter plate and confirm its drive shaft is coupled with the vertical shaft by spinning the propeller and watching the shaft rotate.

If not coupled, remove the adapter plate assembly and adjust the height of the male clevis



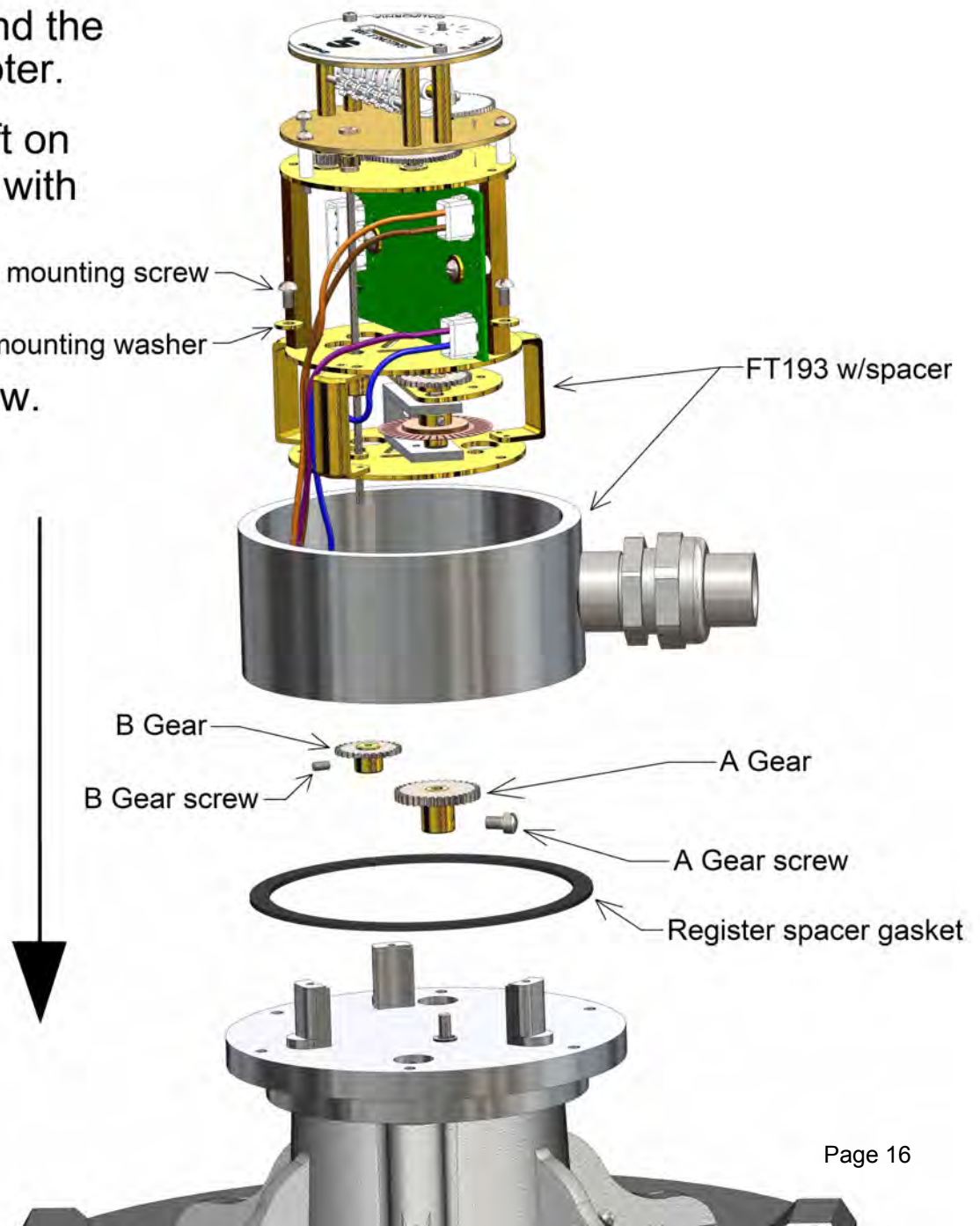
Set the register spacer gasket around the mounting stubs on the register adapter.

Slide the A Gear onto the drive shaft on the register adapter and fix in place with its screw.

Slide the B Gear onto the shaft on the bottom of the register and fix in place with its screw.

Set the register spacer onto its gasket, then set the register's lower plate into the groove on the adapter stubs and rotate until the B Gear couples with the A Gear. Adjust the height of one or both gears if they do not align properly. Spin the propeller and make sure the gears are close enough to turn, but not so close they bind.

When the gears are set, fix the register in place with the register mounting washers and screws.



Stuff the bonnet o-ring into the groove on the bottom of the bonnet, then set the bonnet over the register, onto the spacer, and screw down firmly.

