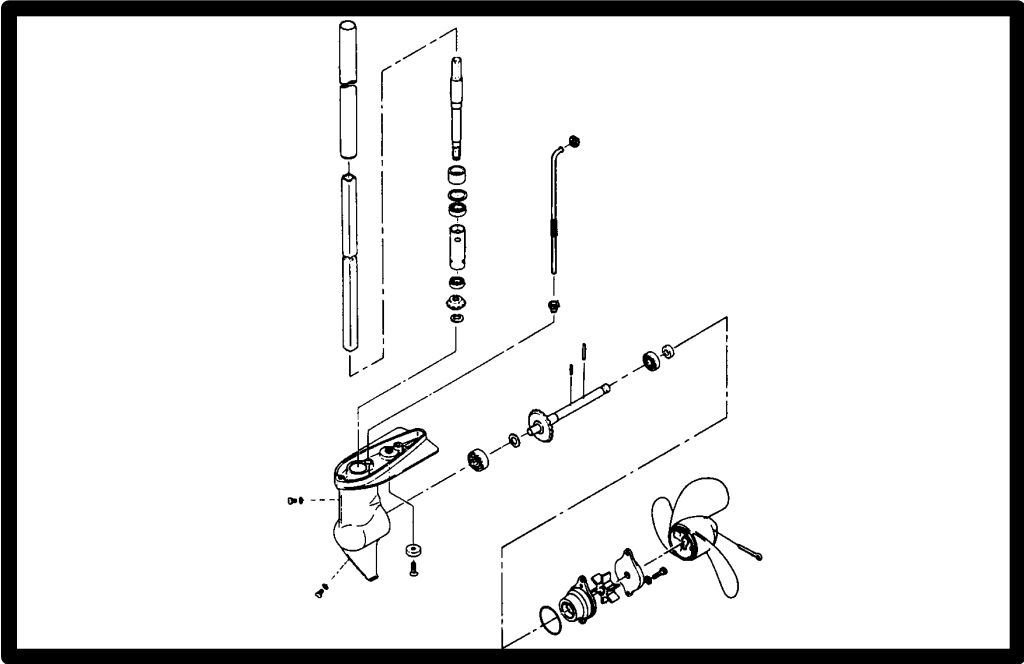




GEAR HOUSING (NON-SHIFTING)



5

A



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Gear Housing (Non-Shifting)

Specifications

Gear Ratio

Model 2.2/2.5 1.85:1

Models 3.0 2.18:1

Gear Type

Gear Type Spiral Bevel

Propeller Drive System

Propeller Drive System Drive (Shear) Pin

Lubricant Capacity

Lubricant Capacity 3 fl. oz. (90ml)

Gear Case Pressure Test

Pressure Test (without lube in case) 10-12 psi

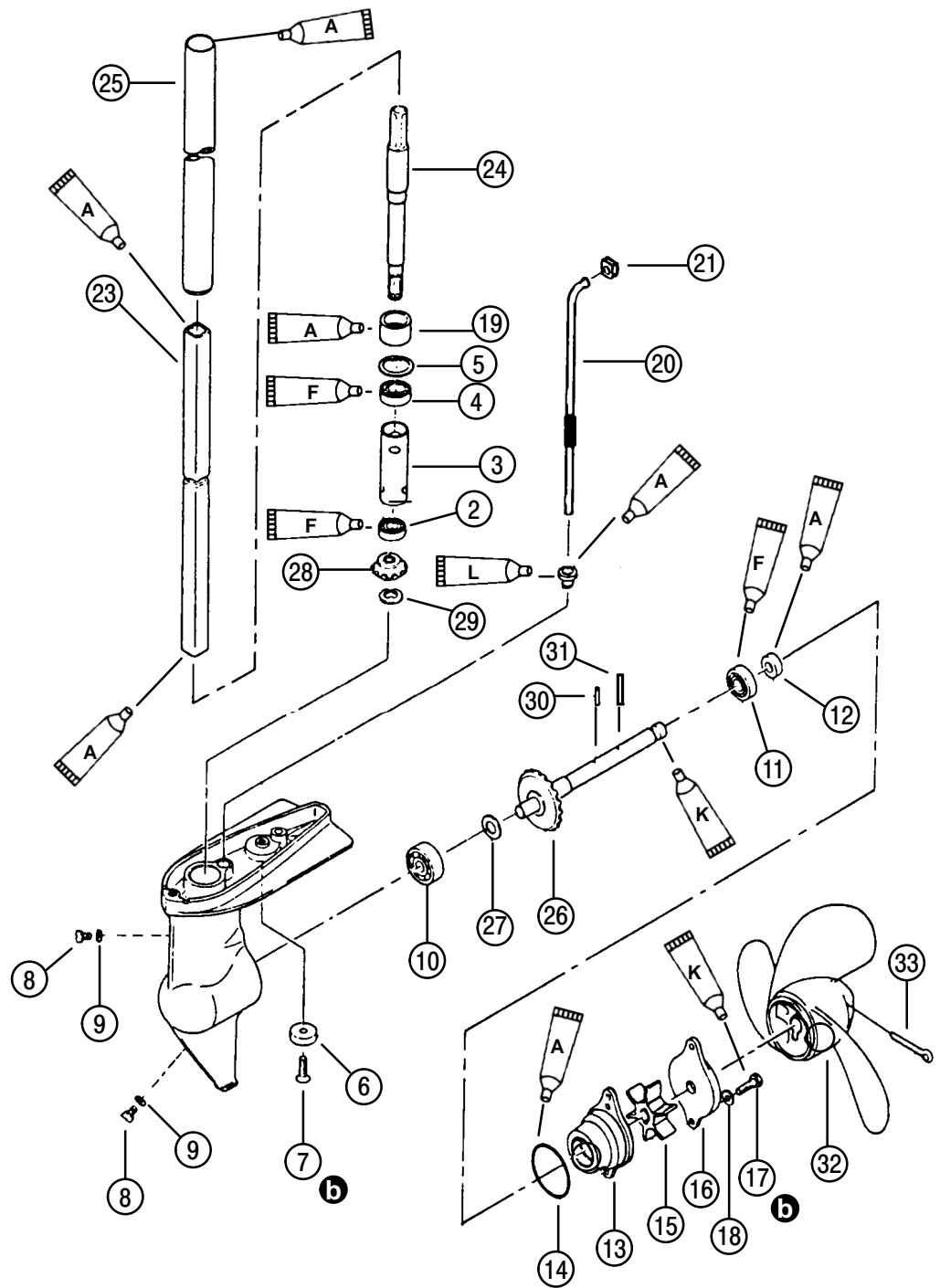
Special Tools

Description	Part No.
Plate	91-29310
SNAP-ON TOOL	
Expander Rod	CG-40-4
Collet 7/16	CG-40-9
Expander Rod	CG-41-11
Collet 3/8	CG-41-13
Washer	12-37429
Slide Hammer	91-34569A1

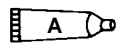

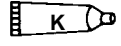
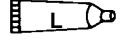


Gear Housing Components (Non-Shiftable)

- 1 - Housing
- 2 - Ball Bearing
- 3 - Sleeve
- 4 - Ball Bearing
- 5 - Snap Ring
- 6 - Anode
- 7 - Screw
- 8 - Plug (2)
- 9 - Gasket (2)
- 10- Ball Bearing
- 11- Ball Bearing
- 12- Seal
- 13- Water Pump Housing
- 14- O-ring
- 15- Impeller
- 16- Cover
- 17- Screw (2)
- 18- Washer (2)
- 19- Seal
- 20- Water Tube
- 21- Grommet
- 22- Seal
- 23- Drive Shaft (Upper)
- 24- Drive Shaft (Lower)
- 25- Tube
- 26- Propeller Shaft
- 27- Shim(S)
- 28- Pinion Gear
- 29- Snap Ring
- 30- Drive Pin, Impeller
- 31- Shear Pin
- 32- Propeller
- 33- Cotter Pin



Quicksilver Lubrication /Sealant Application Points

-  2-4-C Marine Lubricant (92-90018A12)
-  Super Duty Gear Lubricant (92-13783A24)
-  Perfect Seal (92-34227-1)
-  Bellows Adhesive (92-86166)

Torque Specifications

b 50 lb. in. (5.6 N-m)



Gear Housing

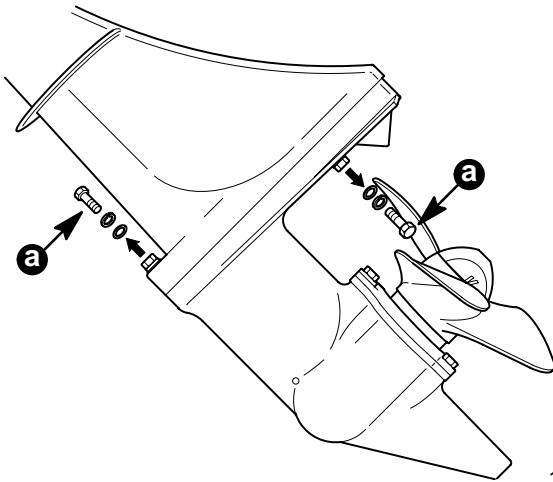
Removal

NOTE: Gear housing does NOT have to be removed from driveshaft housing to repair water pump.

⚠ WARNING

To prevent accidental engine starting, remove (and isolate) spark plug lead from spark plug BEFORE removing gear housing from driveshaft housing.

1. Remove spark plug lead from spark plug.
2. Close fuel shut-off valve.
3. Tilt engine to full "UP" position.
4. Remove 2 bolts and pull gear housing from driveshaft housing.



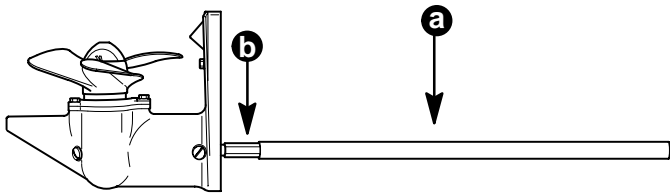
17391

a - Bolts

Disassembly

NOTE: When performing partial repairs, follow the disassembly procedure to the point where desired component(s) can be replaced, then proceed to reassembly of the component.

1. Pull tube and upper driveshaft from gear housing.



17385

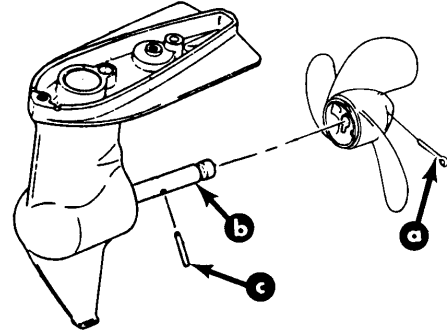
a - Tube
b - Driveshaft

PROPELLER REMOVAL

⚠ WARNING

Before turning propeller or attempting to remove propeller, remove (and isolate) spark plug lead from spark plug to prevent engine from starting accidentally.

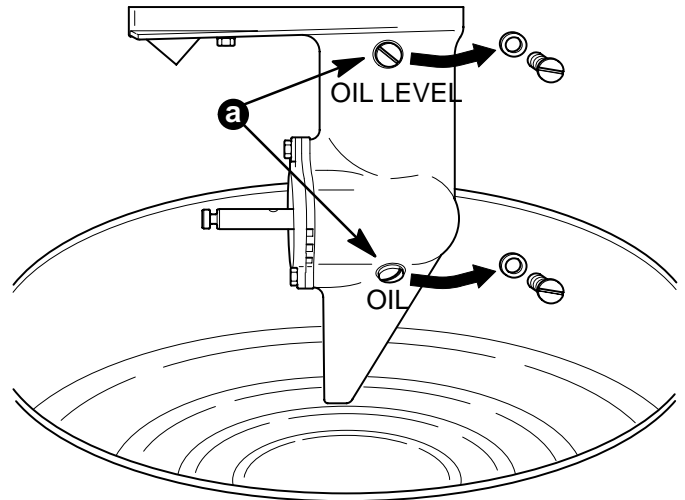
2. Remove cotter pin and pull propeller off from shaft.
3. Remove shear pin.



a - Cotter Pin
b - Shaft
c - Shear Pin

DRAINING AND INSPECTING GEAR HOUSING LUBRICANT

4. Place gear housing over a clean pan and remove screws (with gaskets).



17382

a - Screws with Gaskets

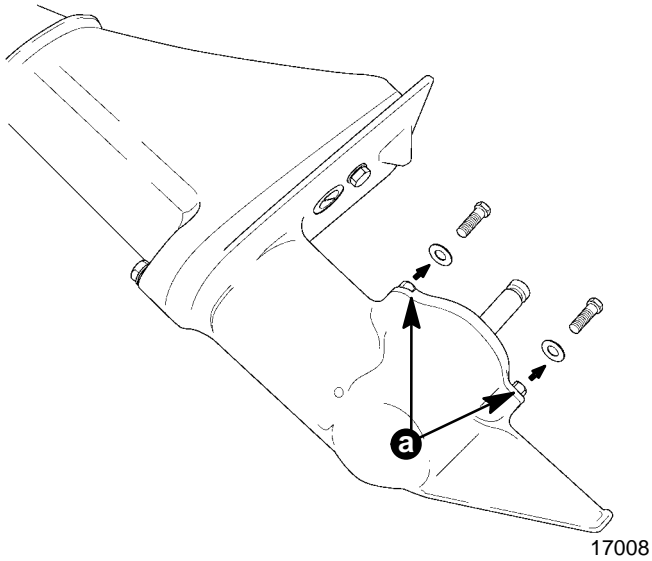
- a. Inspect gear lubricant for metal particles. Presence of a small amount of fine metal particles (resembling powder) indicates normal wear. Presence of larger particles (or a large quantity of fine particles) indicates need for gear housing disassembly and component inspection.



- b. Note the color of gear lubricant. White or cream color indicates presence of water in lubricant.
- c. Check drain pan for water separation from lubricant. Presence of water in gear lubricant indicates the need for disassembly and inspection of oil seals, seal surfaces, O-ring and gear housing components.

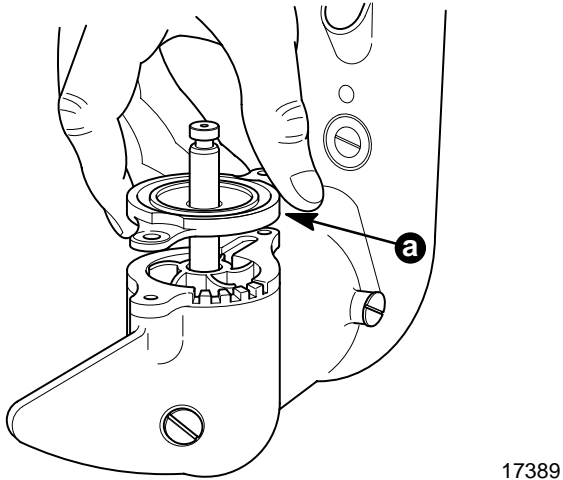
WATER PUMP REMOVAL

- 5. Remove bolts (with washers).



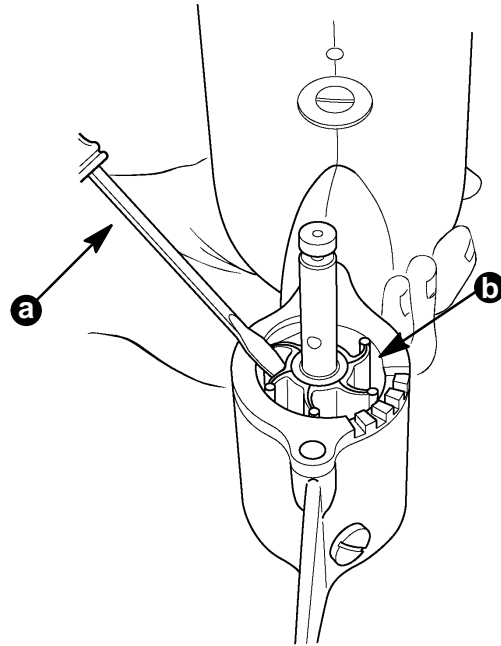
a - Bolts

- 6. Lift cover from shaft.
- 7. Inspect surface of cover that contacts impeller. Replace if worn.



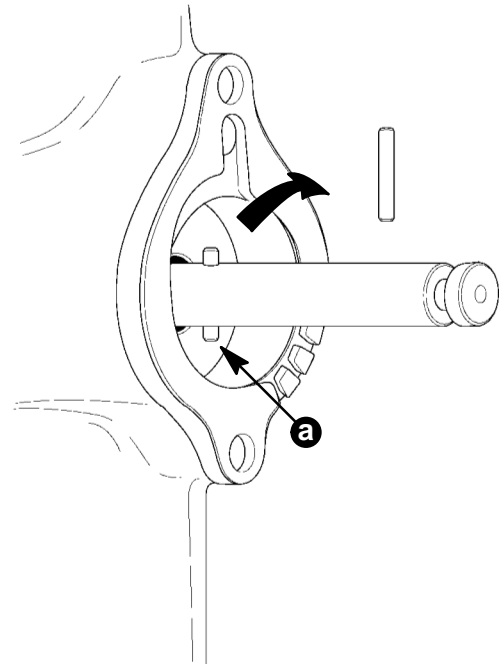
a - Cover

- 8. Using a screwdriver, remove impeller from shaft. Replace impeller if:
 - a. Blades are cracked, worn or glazed.
 - b. Rubber portion of impeller is NOT bonded to inner hub.



a - Screwdriver
b - Impeller

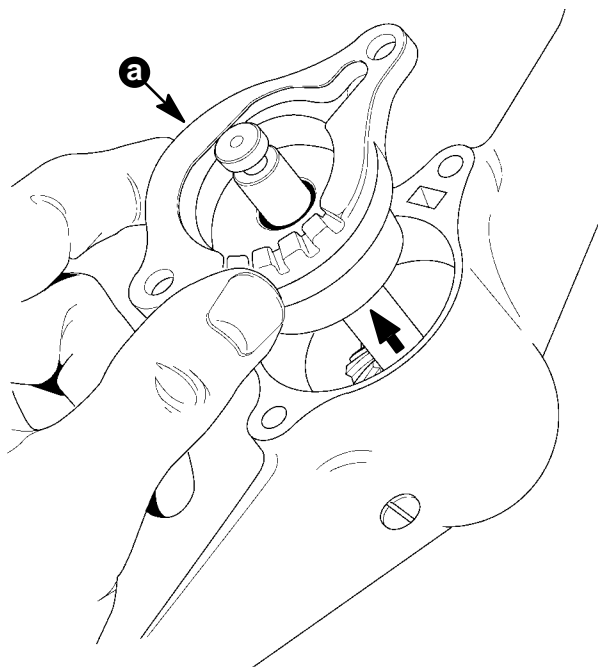
- 9. Remove drive pin from shaft.





a - Drive Pin

10. Inspect surface of water pump housing that contacts impeller. Remove (and replace) if worn. To remove, pull housing from shaft.



17024

a - Water Pump Housing

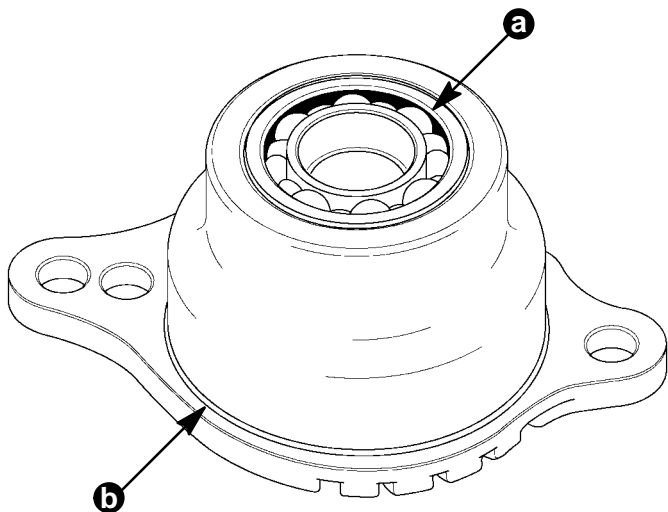
DISASSEMBLY OF WATER PUMP HOUSING

IMPORTANT: DO NOT remove bearing unless necessary as removal process will damage bearing. If bearing must be replaced, replace prop shaft seal also.

11. Inspect bearing. If bearing does NOT roll freely or is rusted, replace bearing.

12. Pull bearing from housing using SNAP-ON TOOL:
Collet 7/16 CG 40-9
Expander Rod CG 40-4
with Slide Hammer 91-34569A1.

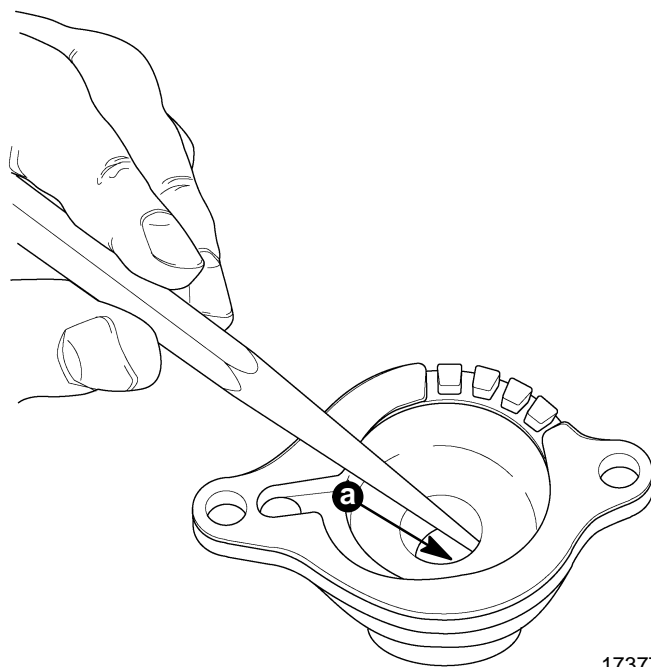
13. Remove and discard O-ring.



17025

a - Bearing
b - O-ring

14. Remove and discard seal from housing using a punch and hammer, as shown.

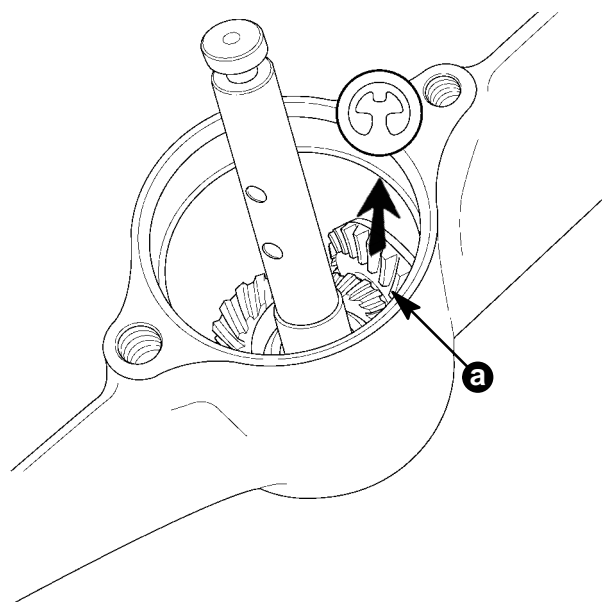


17377

a - Seal

PINION GEAR AND DRIVESHAFT REMOVAL

15. Remove clip from end of driveshaft using a screwdriver.

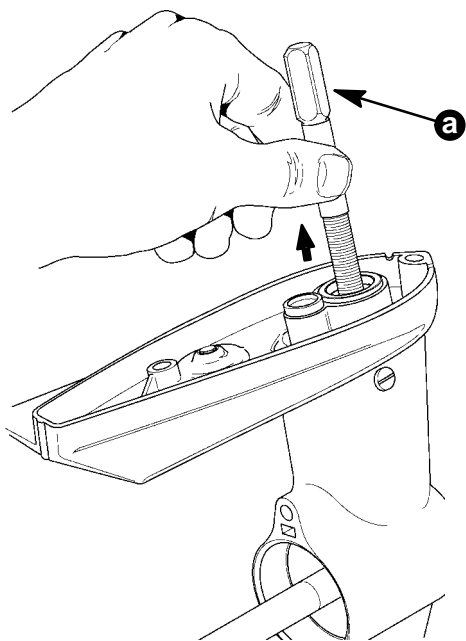


17378

a - Clip

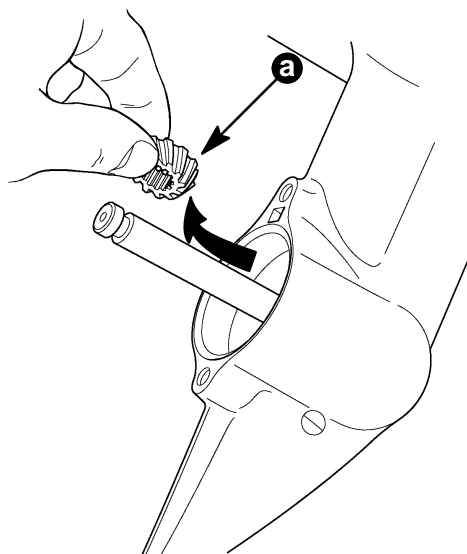


16. Pull driveshaft out of housing being careful not to drop pinion gear.
17. Remove pinion gear from housing.
18. Replace shaft if:
 - a. Shaft seal surface is deeply grooved, allowing water to enter gear housing.
 - b. Shaft splines are twisted or worn.
19. Replace gear if it is chipped or worn.



a - Shaft

17005

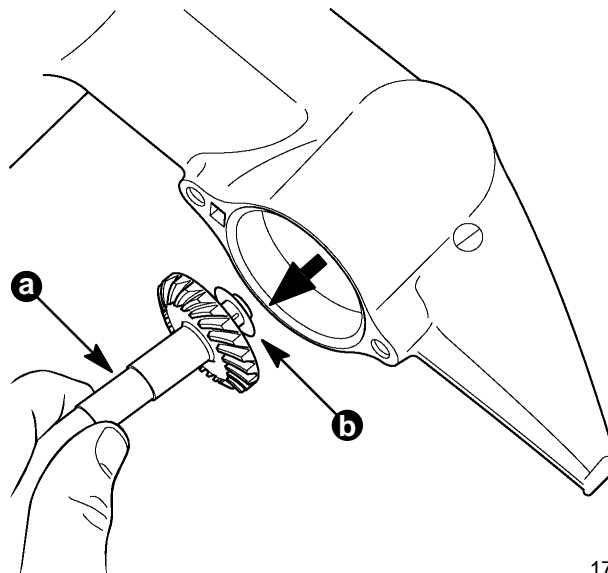


a - Pinion Gear

17026

PROPELLER SHAFT REMOVAL

20. Pull propeller shaft and shims from housing.
21. Replace shaft if:
 - a. Gear is chipped or worn.
 - b. Shaft seal surface is deeply grooved, allowing water to enter gear housing.
 - c. Shear pin hole (or impeller drive pin hole) is worn.



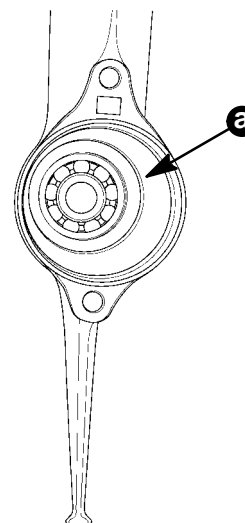
a - Shaft
b - Shims

17006

PROPELLER SHAFT BEARING REMOVAL

IMPORTANT: DO NOT remove bearing unless necessary as removal process will damage bearing.

22. Inspect bearing. If bearing does NOT roll freely or is rusted, replace bearing.
23. Pull bearing using SNAP-ON TOOL:
Expander Rod CG-41-11
Collet 3/8 CG-41-13
with Slide Hammer 91-34569A1./



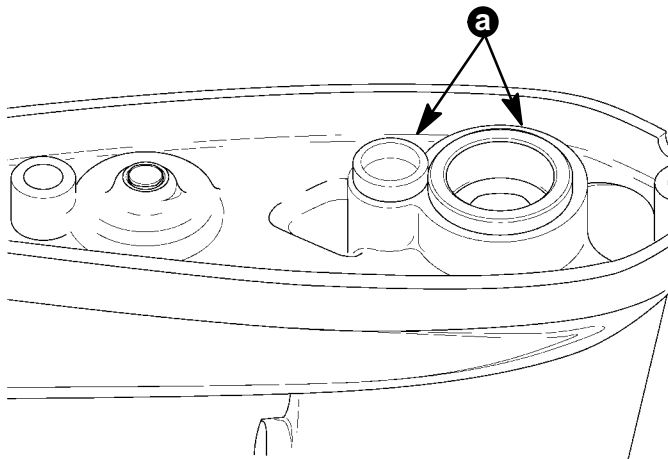
a - Bearing

17315



REMOVAL OF SEALS

24. Remove (and discard) seals using screwdriver.



17010

a - Seals

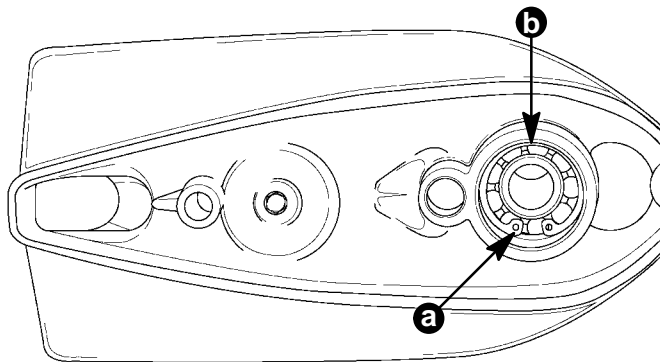
REMOVAL OF DRIVESHAFT BEARINGS

IMPORTANT: DO NOT remove bearings unless necessary as removal process may damage bearings.

25. Remove snap ring.

26. Inspect bearing. If bearing does NOT roll freely or is rusted, replace bearing.

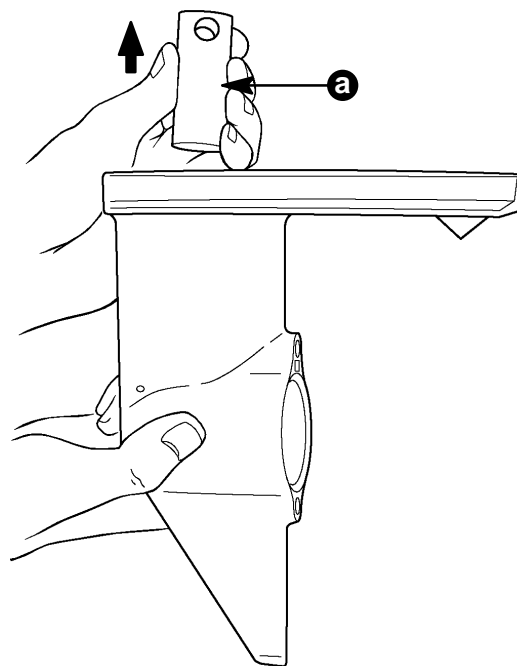
27. Pull bearing using SNAP-ON TOOL:
Expander Rod CG-40-4
Collet 7/16 CG-40-9
with Slide Hammer 91-34569A1.



17375

a - Snap Ring
b - Bearing

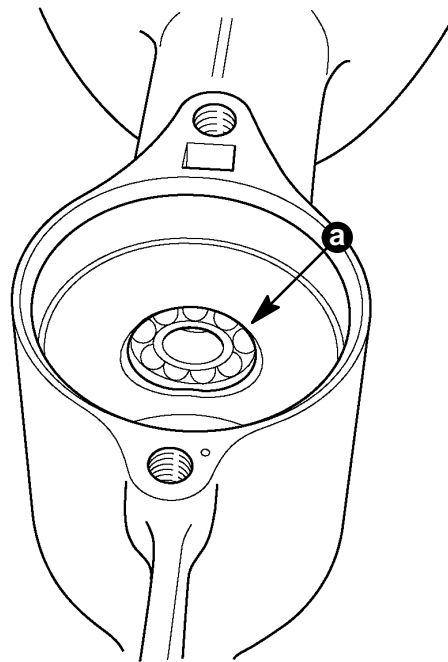
28. Lift sleeve from housing.



17380

a - Sleeve

29. Inspect bearing. If bearing does NOT roll freely or is rusted, replace bearing. Drive bearing out of housing using a 3/4 in. socket and driver rod.



17011

a - Bearing

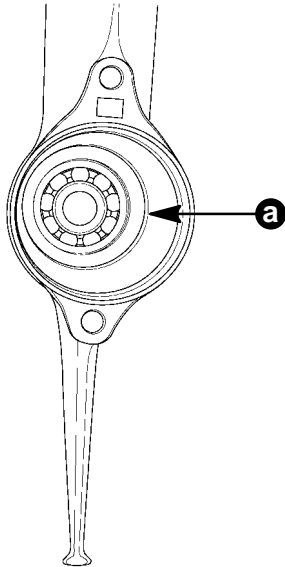


Reassembly

PROPELLER SHAFT BEARING INSTALLATION

NOTE: Drive on numbered side of bearing.

1. Apply oil on O.D. of bearing.
2. Drive bearing into housing using propeller shaft/forward gear assembly, with washer 12-37429 between forward gear and bearing, until bearing bottoms-out. Install bearing carrier in gear housing to maintain alignment of prop shaft while seating bearing.

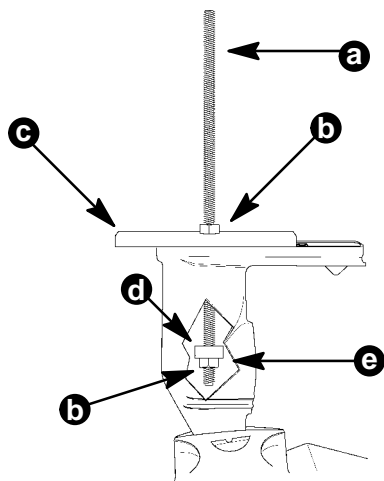


17315

a - Bearing

INSTALLATION OF DRIVESHAFT BEARINGS

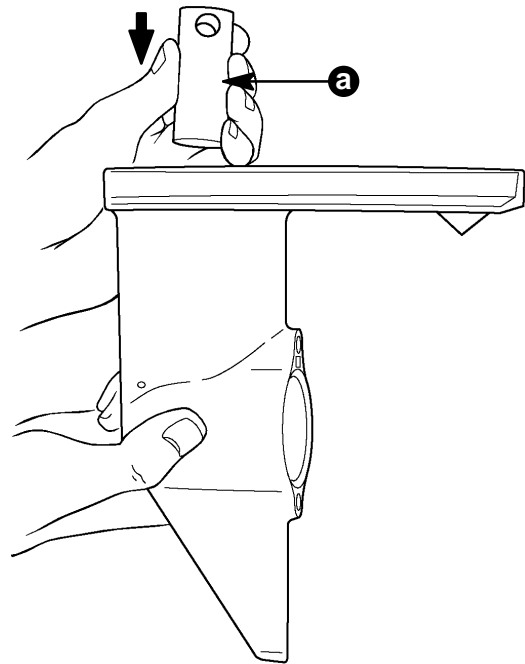
3. Apply oil on O.D. of bearing.
4. Pull bearing into housing by holding rod so that it will not rotate. Tighten upper nut against plate. Pull bearing up into bore until bearing is flush with housing..



17384

- a - 3/8 in. (9.5mm) O.D. Threaded Rod
- b - Nut
- c - Metal Plate (91-29310)
- d - Bearing (Numbered Side "UP")
- e - 1 in. (25.4mm) O.D. x 3/8 IN. (9.5MM) I.D. Mandrel (or Washer)

5. Place sleeve into housing.

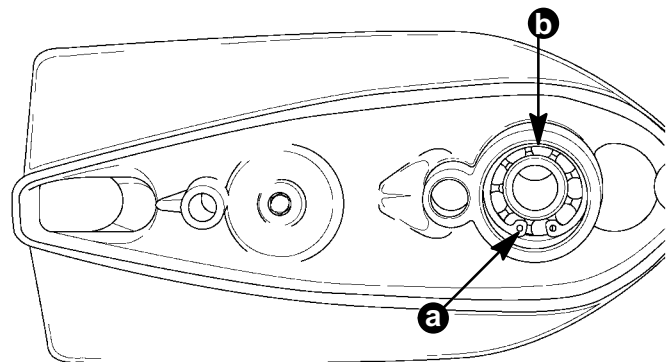


17380

a - Sleeve

NOTE: Drive on numbered side of bearing.

6. Apply oil on O.D. of bearing.
7. Drive bearing into housing until bearing bottoms-out, using a 13/16 in. socket and driver rod.
8. Install snap ring into groove.



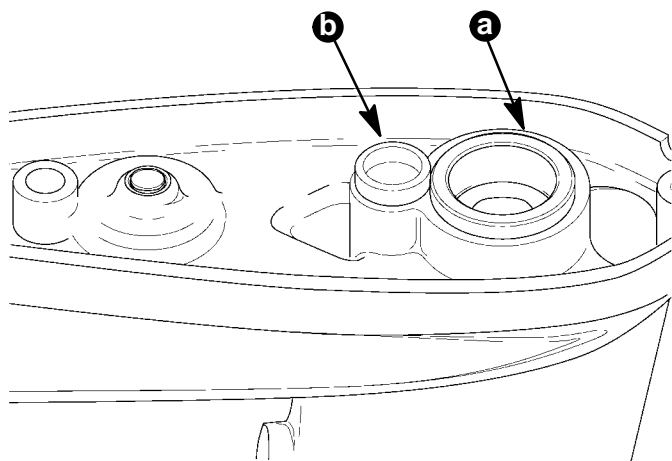
17375

- a - Bearing
- b - Snap Ring



SEAL INSTALLATION

9. Apply Quicksilver Bellows Adhesive to O.D. of seal.
10. Push new seals ("a" and "b") into housing, as shown.
11. Apply Quicksilver 2-4-C Marine Lubricant on I.D. of seals.

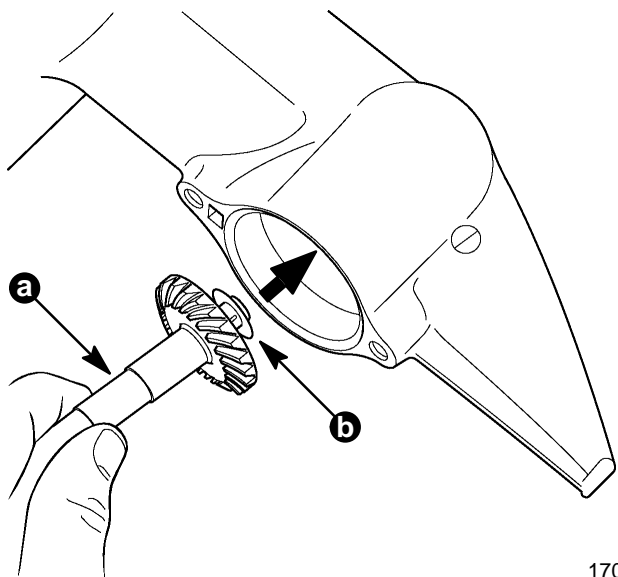


17010

- a - Seal
- b - Seal

PROPELLER SHAFT INSTALLATION

12. Place propeller shaft and shims into housing.

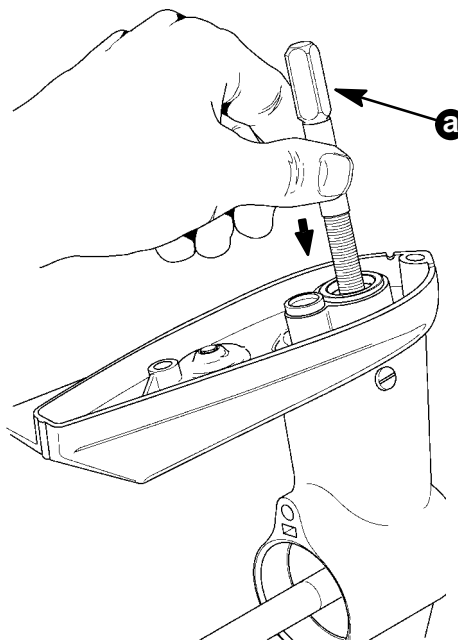


17006

- a - Shaft
- b - Shims

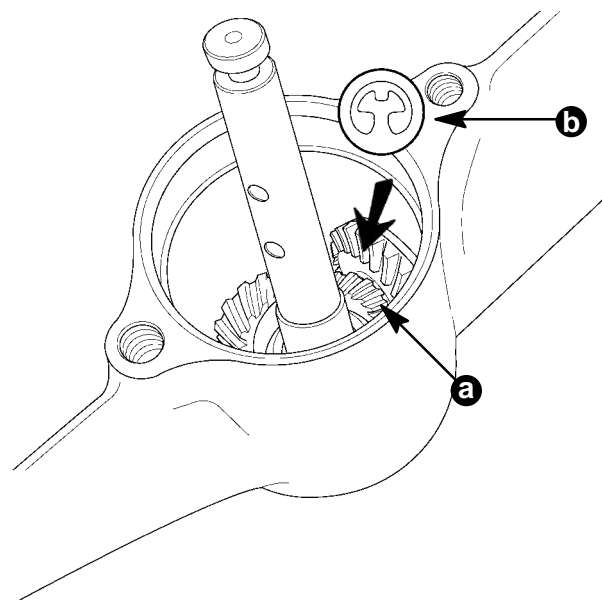
PINION GEAR AND DRIVESHAFT INSTALLATION

13. Insert driveshaft, as shown.
14. Install pinion gear onto driveshaft, as shown.
15. Install clip into groove in driveshaft.



17005

- a - Shaft



17378

- a - Pinion Gear
- b - Clip



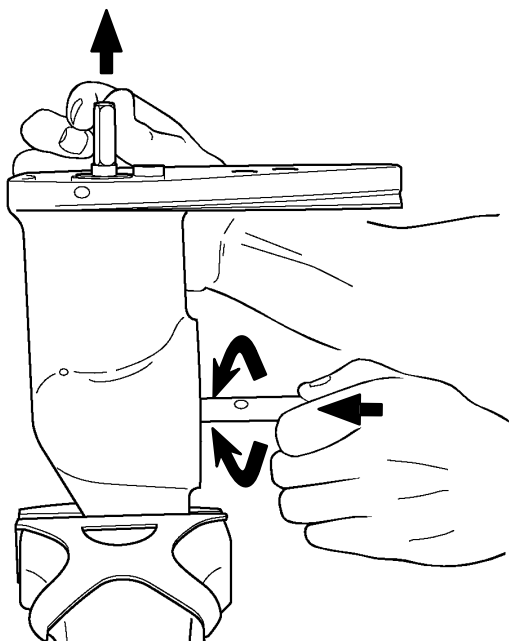
GEAR BACKLASH CHECK

16. Pull up on driveshaft and hold so that it will not rotate. While pushing in on propeller shaft, rotate shaft back and forth. There should be play between gears (a clicking sound should be heard as the shaft is rotated back and forth).

NOTE: The amount of play between the gears is not critical, but no play between the gears is unacceptable.

If there is no play between the gears, check that bearings are completely seated in housing. If bearings are seated properly, remove shim(s)* until play is obtained between gears.

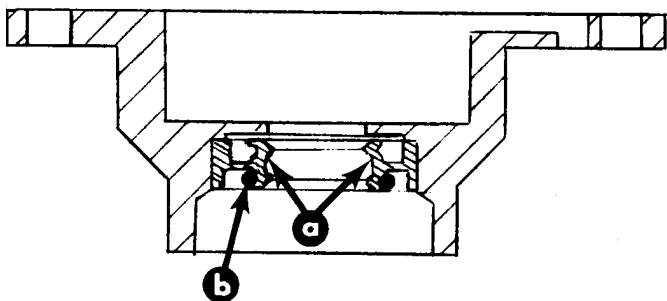
*Shim Kit (15-95292) contains 3 shims (.002 in., .004 in. and .008 in.) [.05mm, .10mm and .20mm]



17381

ASSEMBLING WATER PUMP HOUSING

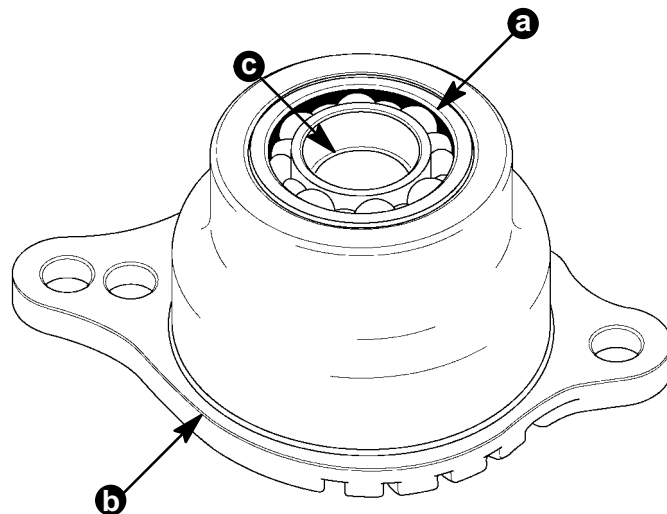
17. Install new seal into housing using a suitable mandrel (or socket) and driver rod.



a - Seal
b - Spring

NOTE: Press on numbered side of bearing.

18. Press bearing into housing using 13/16 in. socket until bearing bottoms-out.
19. Install new O-ring.
20. Apply Quicksilver 2-4-C Marine Lubricant on O-ring and I.D. of seal.

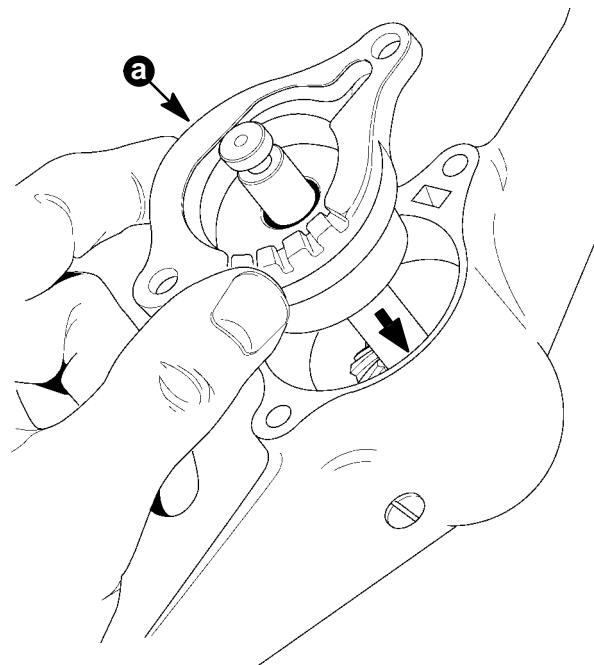


17025

a - Bearing
b - O-ring
c - Seal

WATER PUMP INSTALLATION

21. Install water pump housing, as shown.

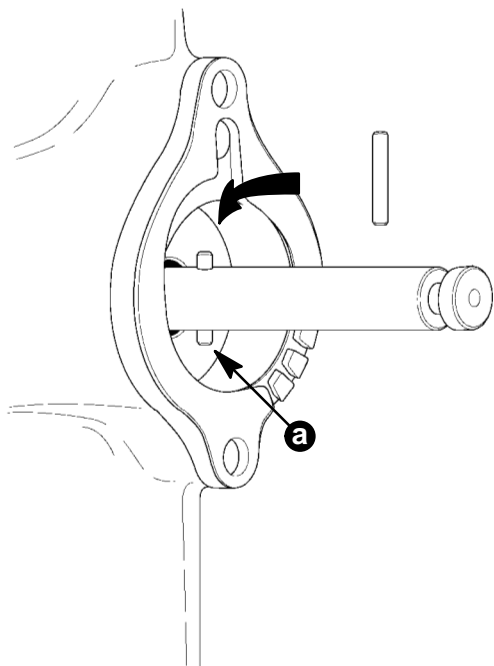


17024



a - Pump Housing

22. Install drive pin.

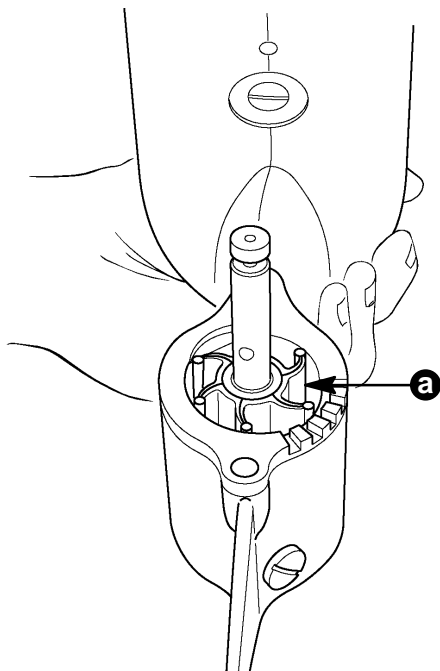


17013

a - Drive Pin

IMPORTANT: Rotate impeller in a clockwise direction during installation.

23. Install impeller on drive pin.

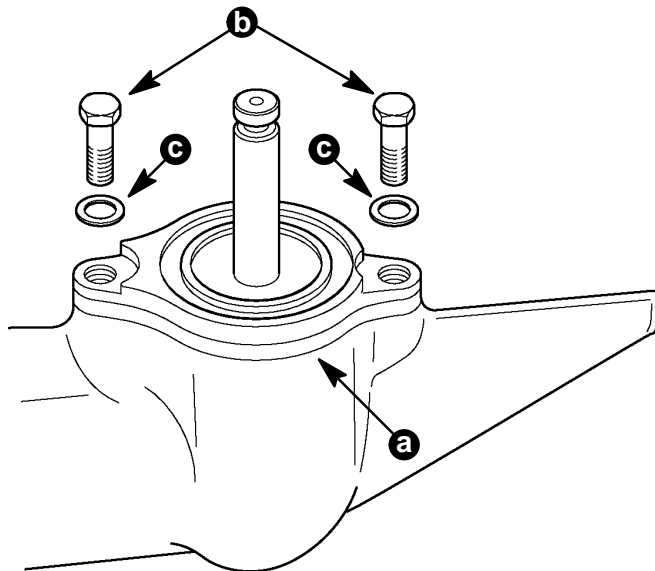


17386

a - Impeller

24. Apply Quicksilver Perfect Seal on threads of bolts. Install components as shown.

25. Torque bolts to 50 lb. in. (5.6 N-m).



17374

a - Cover
b - Bolt [Torque to 50 lb. in. (5.6 N-m)]
c - Washer

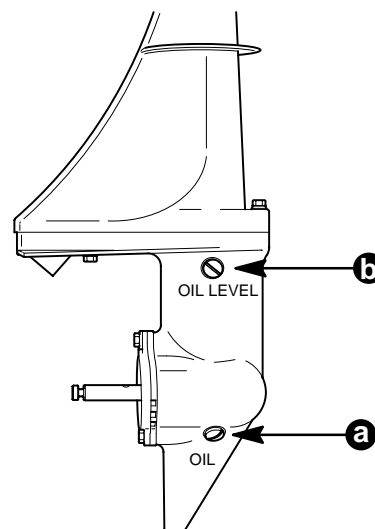
FILLING GEAR HOUSING WITH LUBRICANT

26. Place gear housing in a vertical position.

27. Remove lubricant screws with gaskets.

28. Slowly fill gear housing with Quicksilver Super Duty Lower Unit Lubricant until lubricant flows out OIL LEVEL hole and no air bubbles are visible.

29. Remove grease tube from OIL hole and quickly install screw (with gasket)



17390

a - OIL (Fill) Screw
b - OIL LEVEL Screw

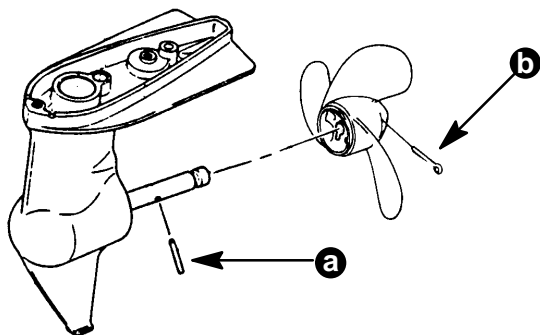


PROPELLER INSTALLATION

⚠ WARNING

BEFORE turning propeller or attempting to install propeller, remove (and isolate) spark lead from spark plug to prevent engine from starting accidentally.

30. Remove (and isolate) spark plug lead from spark plug.
31. Coat the shaft with one of the following Quicksilver products:
 - a. Special Lubricant 101
 - b. 2-4-C Marine Lubricant
 - c. Perfect Seal
32. Insert shear pin.
33. Install propeller onto shear pin.
34. Install cotter pin and bend ends.



- a - Shear Pin
b - Cotter Pin

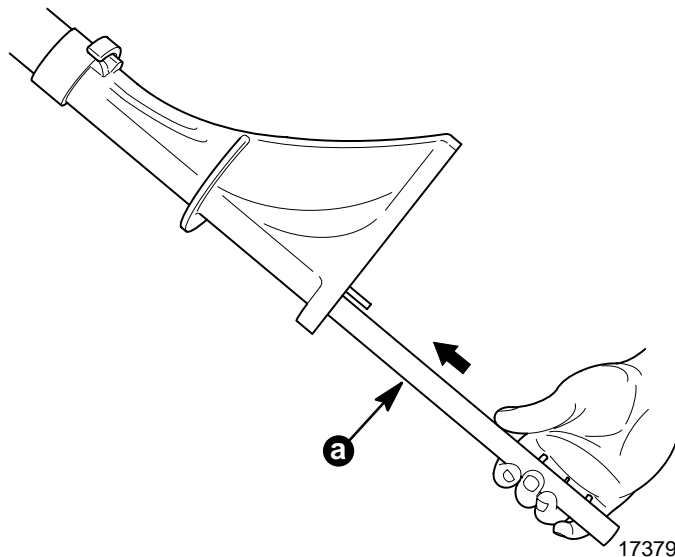
Installation

⚠ WARNING

To prevent accidental engine starting, remove (and isolate) spark plug lead from spark plug BEFORE installing gear housing onto driveshaft housing.

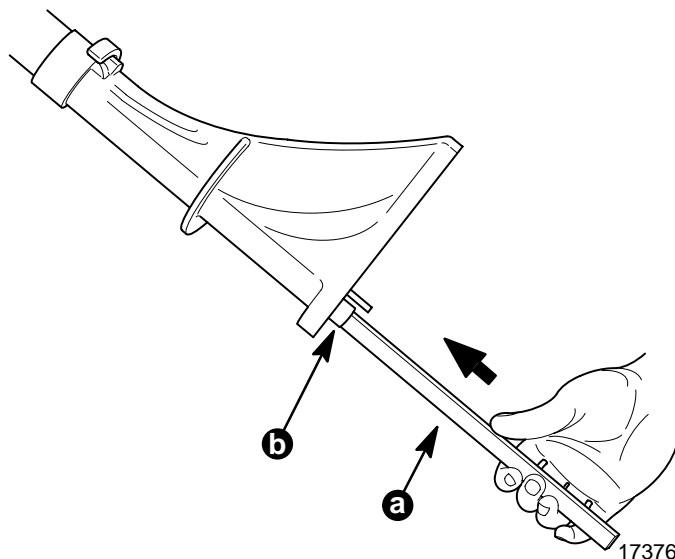
1. Remove (and isolate) spark plug lead from spark plug.
2. Close fuel shut-off valve.
3. Tilt engine to full "UP" position.
4. Apply Quicksilver 2-4-C Marine Lubricant to end of tube O.D.

5. Insert tube into driveshaft housing and push tube into lower crankshaft seal.



- a - Tube

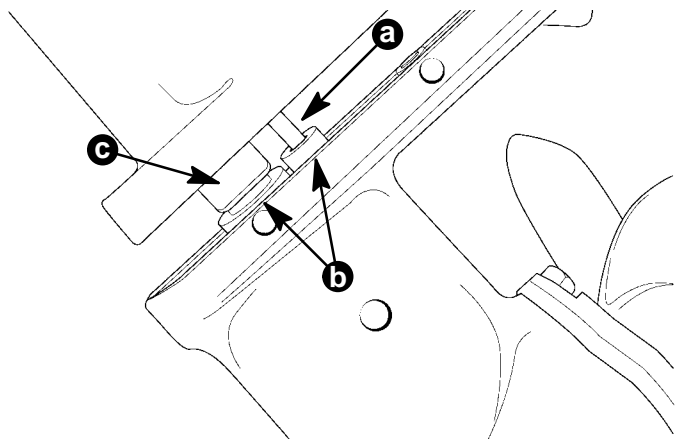
6. Apply Quicksilver 2-4-C Marine Lubricant on I.D. of upper driveshaft at both ends.
7. Insert shaft into tube. Push shaft onto end of crankshaft.



- a - Shaft
b - Tube



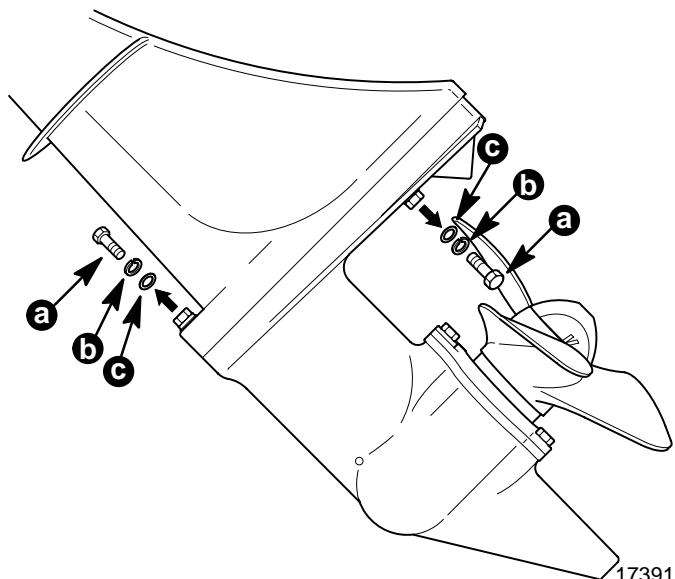
8. Apply Quicksilver 2-4-C Marine Lubricant on I.D. of seals. Align components as shown. While pushing up on gear housing, rotate propeller (clockwise) to engage lower driveshaft into upper driveshaft.



17388

- a - Water Tube
- b - Seal
- c - Tube

9. Secure gear housing as shown. Torque bolts to 50 lb. in. (5.6 N·m)



17391

- a - Bolt [Torque to 50 lb. in. (5.6 N·m)]
- b - Lockwasher
- c - Washer