



# LOWER UNIT

## Section 6 - Gear Housing

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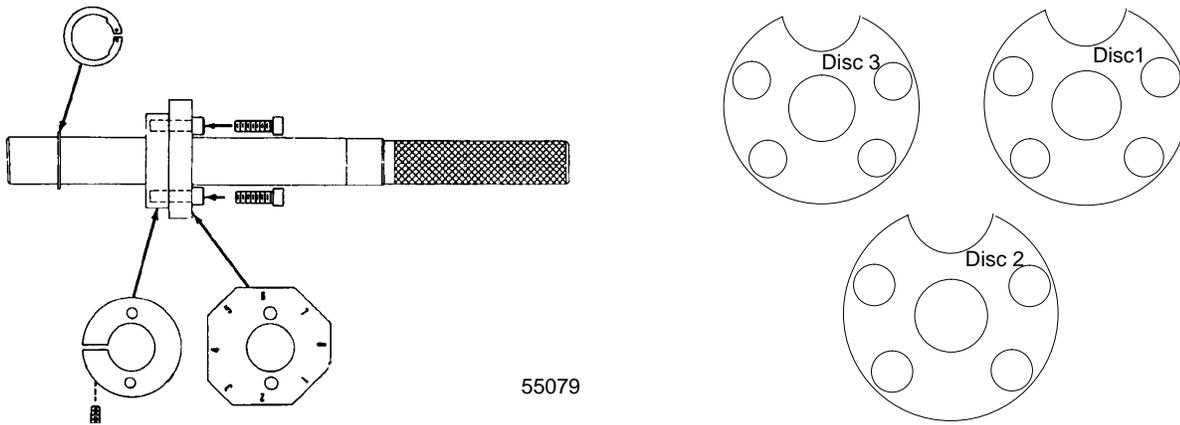
### Specifications

<b>GEAR HOUSING BIGFOOT (2.07:1)</b>	<b>Gear Ratio</b>	2.07:1
	<b>Gearcase Capacity</b>	24.0 fl oz (710 mL)
	<b>Lubricant Type</b>	Quicksilver Gear Lube-Premium Blend
	<b>Forward Gear</b>	
	<b>Number of Teeth</b>	29 Spiral/Bevel
	<b>Pinion Gear</b>	
	<b>Number of Teeth</b>	14 Spiral/Bevel
	<b>Pinion Height</b>	0.025 in. (0.64 mm)
	<b>Pinion Gear Locating Tool</b>	91-12349A2
	<b>Flat Number</b>	#2
	<b>Disc Number</b>	#3
	<b>Forward Gear Backlash</b>	0.015 - 0.022 in. (0.38 - 0.55 mm)
	<b>Backlash Indicating Tool</b>	91-19660--1
<b>Mark Number</b>	#1	
<b>Water Pressure</b>		
<b>@ 1000 rpm</b>	5 psi (34.5 kPa)	
<b>@ 6000 rpm (WOT)</b>	20.5 psi (141.5 kPa)	
<b>Leak Test Pressure</b>	10-12 psi (69-83 kPa) for 5 Minutes	

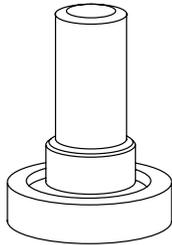


# Special Tools

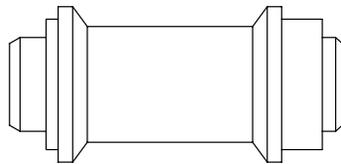
## 1. Pinion Gear Locating Tool (91-12349A2)



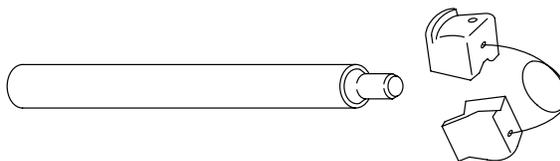
## 2. Bearing Installation Tool (91-13945)



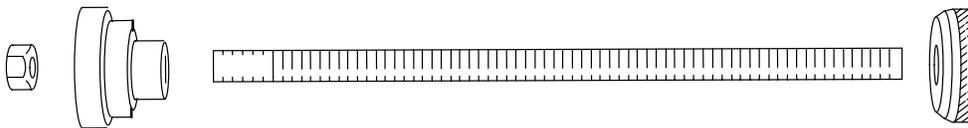
## 3. Oil Seal Driver (91-13949)



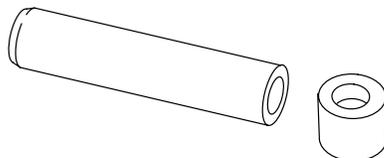
## 4. Bearing Race Tool (91-14308A1)



## 5. Bearing Installation (91-14309A1)

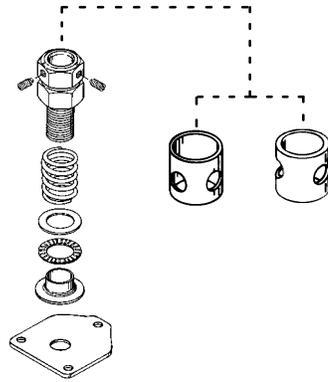


## 6. Wear Sleeve Installation Tool (91-14310A1)

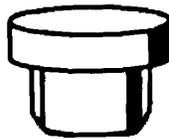




7. Bearing Preload Tool (91-14311A2)

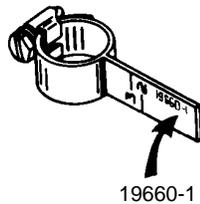


8. Mandrel (91-15755)\*

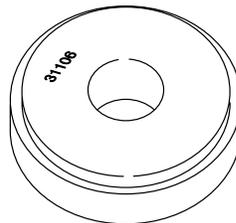


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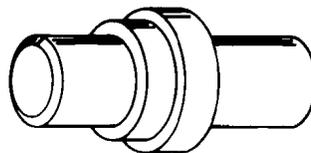
9. Backlash Indicator Tool (91-19660--1) 2.07:1 Gear Ratio (14/29)



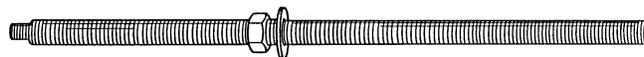
10. Mandrel (91-31106)



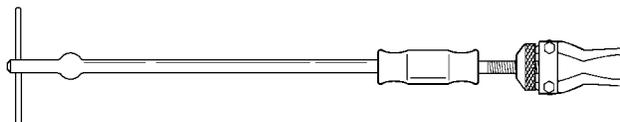
11. Oil Seal Driver (91-31108)



12. Treaded Rod (91-31229) and Nut (91-24156)\*

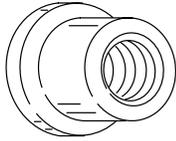


13. Slide Hammer (91-34569A1)

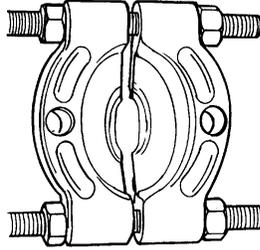




14. Mandrel (91-36569)\*

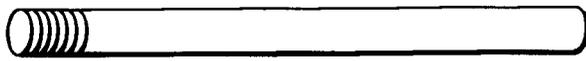


15. Universal Puller Plate (91-37241)



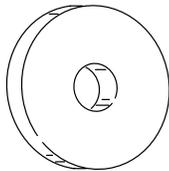
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16. Driver Rod (91-37323)\*

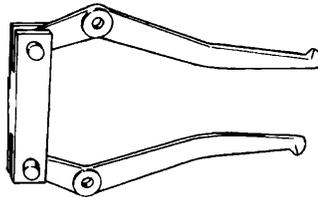


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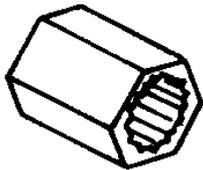
17. Mandrel (91-37350)



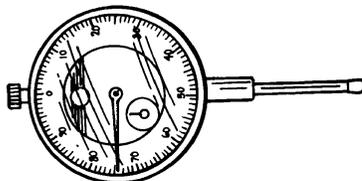
18. Puller Jaws (91-46086A1)



19. Driver Shaft Holding Tool (91-56775, 2-Stroke), (91-817070, 40/50 4-Stroke), (91-817070A1, 50/60 4-Stroke), (91-804776A1, 75/90 4-Stroke)

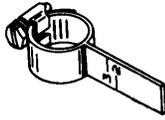


20. Dial Indicator (91-58222A1)





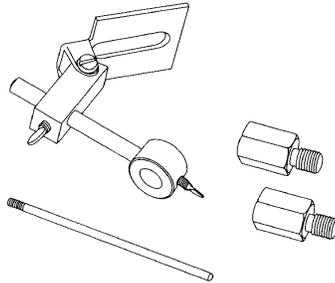
21. Backlash Indicator Tool (91-78473) 2.31:1 Gear Ratio (13/30)



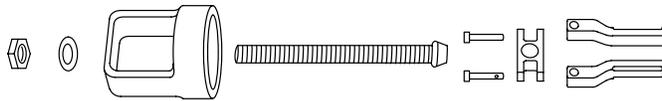
22. Puller Bolt (91-85716)



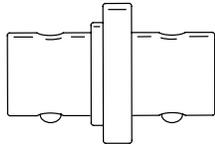
23. Dial Indicator Adaptor Kit (91-83155)



24. Bearing Puller Assembly (91-83165M)

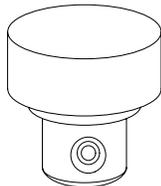


25. Bearing Installation Tool (91-856875A1)



56783

26. Bearing Installation Tool (91-877321A1)



\* From Bearing Removal and Installation Kit (91-31229A7)

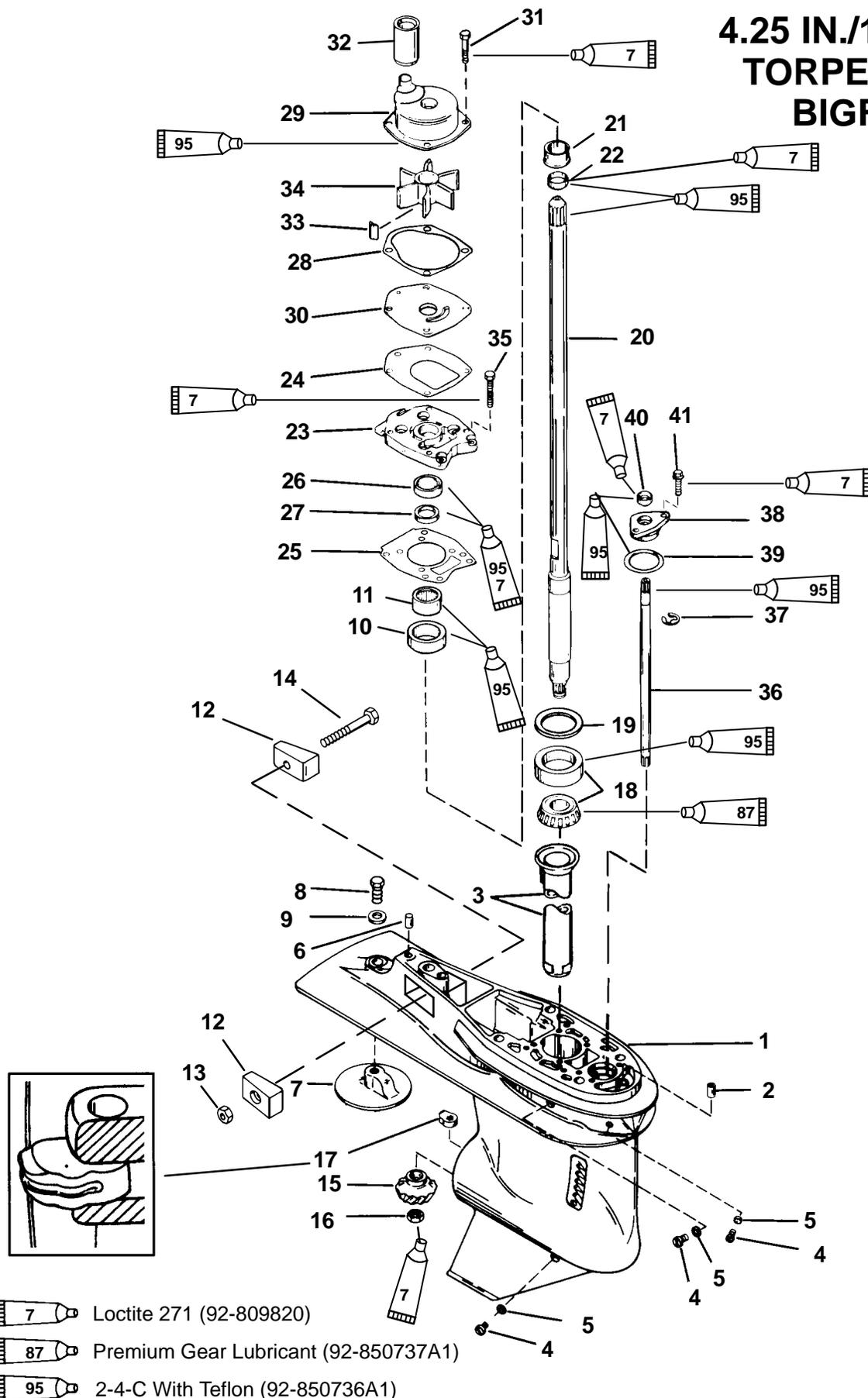
## Quicksilver Lubricants and Service Aids

Part No.	Description
92-809820	Loctite "271"
92-90113--2	RTV Silicone Sealer
92-850737A1	Premium Blend Gear Lube
92-850735A1	Anti-Corrosion Grease
92-850736A1	2-4-C w/Teflon



# GEAR HOUSING (DRIVE SHAFT)(2.31:1 GEAR RATIO)

## 4.25 IN./107.95MM TORPEDO DIA. BIGFOOT



7 Loctite 271 (92-809820)

87 Premium Gear Lubricant (92-850737A1)

95 2-4-C With Teflon (92-850736A1)

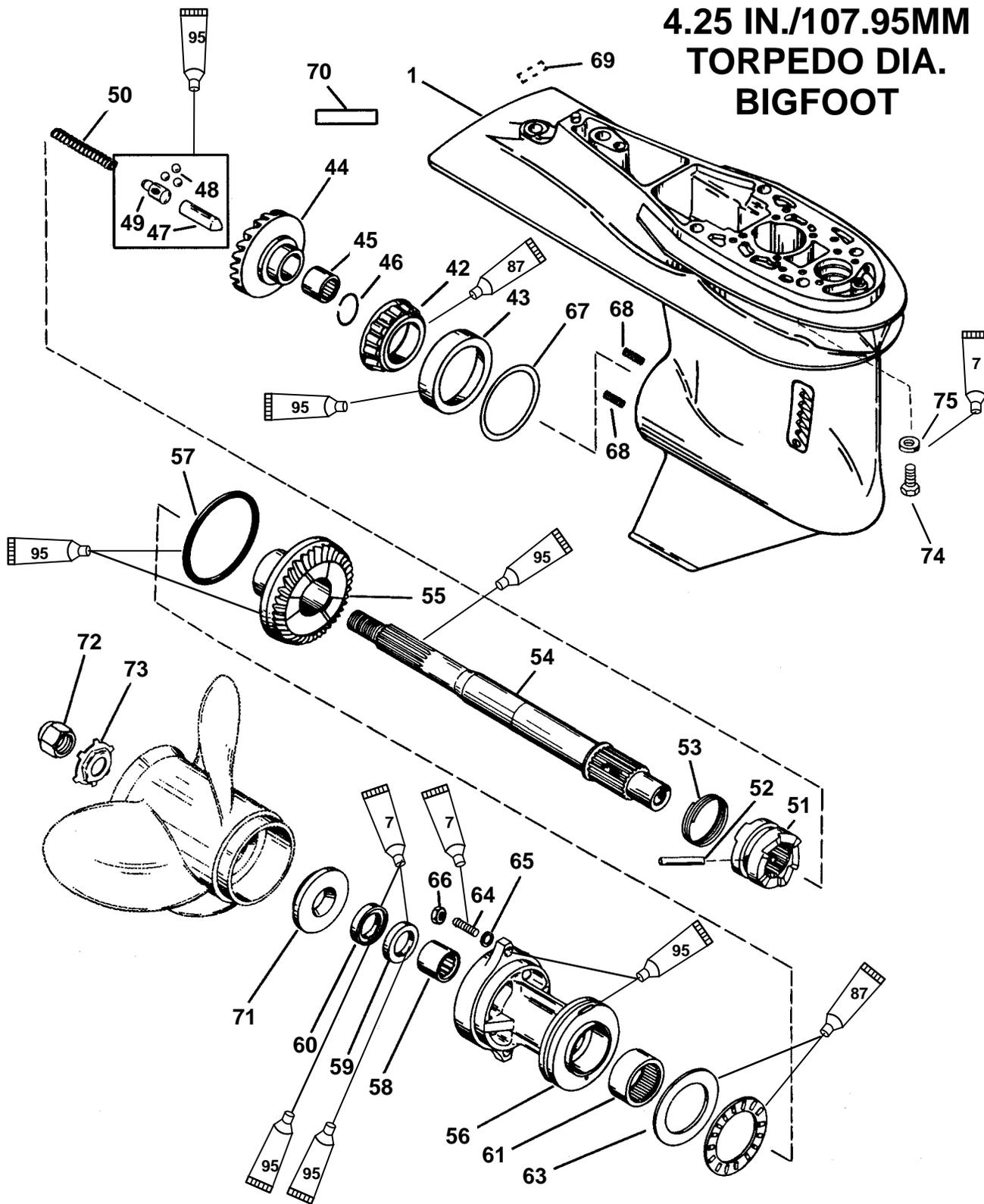
**GEAR HOUSING (DRIVE SHAFT)(2.31:1 GEAR RATIO)**

REF. NO.	QTY.	DESCRIPTION	TORQUE		
			lb-in	lb-ft	Nm.
-	1	GEAR HOUSING			
1	1	GEAR HOUSING ASSEMBLY			
2	1	DOWEL PIN (FRONT)			
3	1	OILER TUBE			
4	3	DRAIN SCREW	60		6.8
5	3	WASHER-Sealing			
6	1	DOWEL PIN (REAR)			
7	1	TRIM TAB			
8	1	SCREW (.437-14 x 1.25)		22	29.8
9	1	WASHER			
10	1	CARRIER			
11	1	NEEDLE BEARING			
12	2	ANODE			
13	1	NUT			
14	1	SCREW (M6 x 40)	60		6.8
15	1	PINION GEAR (13 TEETH)			
16	1	NUT		70	95
17	1	SHIFT CAM			
18	1	TAPERED ROLLER BEARING			
19	AR	SHIM ASSEMBLY (SIZES 006 THRU 048)			
20	1	DRIVE SHAFT ASSEMBLY			
21	1	WEAR SLEEVE ASSEMBLY			
22	1	RING SEAL			
23	1	COVER ASSEMBLY			
24	1	GASKET			
25	1	GASKET			
26	1	OIL SEAL (LOWER)			
27	1	OIL SEAL (UPPER)			
28	1	GASKET			
29	1	WATER PUMP ASSEMBLY			
30	1	FACE PLATE			
31	4	SCREW (M6x30)	60		6.8
32	1	SEAL			
33	1	KEY			
34	1	IMPELLER			
35	6	SCREW	60		6.8
36	1	SHIFT SHAFT ASSEMBLY			
37	1	E-RING			
38	1	BUSHING ASSEMBLY			
39	1	O-RING			
40	1	OIL SEAL			
41	2	SCREW (M6 x 1)	60		6.8



# GEAR HOUSING (PROP SHAFT)(2.31:1 GEAR RATIO)

## 4.25 IN./107.95MM TORPEDO DIA. BIGFOOT



7 Loctite 271 (92-809820)

87 Premium Gear Lubricant (92-850737A1)

95 2-4-C With Teflon (92-850736A1)

**GEAR HOUSING (PROP SHAFT)(2.31:1 GEAR RATIO)**

REF. NO.	QTY.	DESCRIPTION	TORQUE		
			lb-in	lb-ft	Nm.
1	1	GEAR HOUSING ASSEMBLY			
42	1	TAPERED ROLLER BEARING ASSEMBLY			
43	1	CUP			
44	1	FORWARD GEAR (30 TEETH)			
45	1	ROLLER BEARING			
46	1	RETAINING RING			
47	1	CAM FOLLOWER ASSEMBLY			
48	3	BALL			
49	1	SLIDE			
50	1	SPRING			
51	1	CLUTCH			
52	1	CROSS PIN			
53	1	SPRING			
54	1	PROPELLER SHAFT			
55	1	REVERSE GEAR (30 TEETH)			
56	1	BEARING CARRIER ASSEMBLY			
57	1	O-RING			
58	1	ROLLER BEARING			
59	1	OIL SEAL (INNER)			
60	1	OIL SEAL (OUTER)			
61	1	ROLLER BEARING			
62	1	THRUST WASHER			
63	1	THRUST BEARING			
64	2	STUD		100	135
65	2	WASHER			
66	2	NUT		22	29.8
67	AR	SHIM ASSEMBLY (SIZES 006 THRU 038)			
68	2	THREAD INSERT			
69	1	DECAL			
70	1	DECAL-PROP OPERATION			
71	1	THRUST HUB ASSEMBLY			
72	1	PROPELLER NUT ASSEMBLY			
73	1	TAB WASHER			
74	4	SCREW		40	54.2
75	4	WASHER			



## General Service Recommendations

There may be more than one way to “disassemble” or “reassemble” a particular part(s), therefore, it is recommended that the entire procedure be read prior to repair.

**IMPORTANT: Read the following before attempting any repairs.**

In many cases, disassembly of a sub-assembly may not be necessary until cleaning and inspection reveals that disassembly is required for replacement of one or more components.

Service procedure order in this section is a normal disassembly-reassembly sequence.

Threaded parts are right hand (RH), unless otherwise indicated.

When holding, pressing or driving is required, use soft metal vise jaw protectors or wood for protection of parts. Use a suitable mandrel (one that will contact only the bearing race) when pressing or driving bearings.

When compressed air is used to dry a part, verify that no water is present in air line.

## Bearings

All bearings must be cleaned and inspected. Clean bearings with solvent and dry with compressed air. Air should be directed at the bearing so that it passes through the bearing. DO NOT spin bearing with compressed air, as this may cause bearing to score from lack of lubrication. After cleaning, lubricate bearings with Premium Blend Gear Lubricant. DO NOT lubricate tapered bearing cups until after inspection.

Inspect ball bearings for roughness, catches and bearing race side wear. Work inner bearing race in-and-out, while holding outer race, to check for side wear. When inspecting tapered bearings, determine condition of rollers and inner bearing race by inspecting bearing cup for pitting, scoring, grooves, uneven wear, imbedded particles and/or discoloration from over-heating. Always replace tapered bearing and race as a set.

Inspect gear housing for bearing races that have spun in their respective bores. If race(s) have spun, gear housing must be replaced.

Roller bearing condition is determined by inspecting the surface of the shaft that the roller bearing supports. Check shaft surface for pitting, scoring, grooving, imbedded particles, uneven wear and/or discoloration from overheating. The shaft and bearing must be replaced if such a condition exists.

## Seals

As a normal procedure, all O-rings and oil seals should be replaced without regard to appearance. To prevent leakage around seals, apply Loctite 271 to outer diameter of all metal case seals. When using Loctite on seals or threads, surfaces must be clean and dry. Apply 2-4-C w/Teflon on all O-rings and on I.D. of oil seals. Apply 2-4-C w/Teflon to external surfaces of bearing carrier.

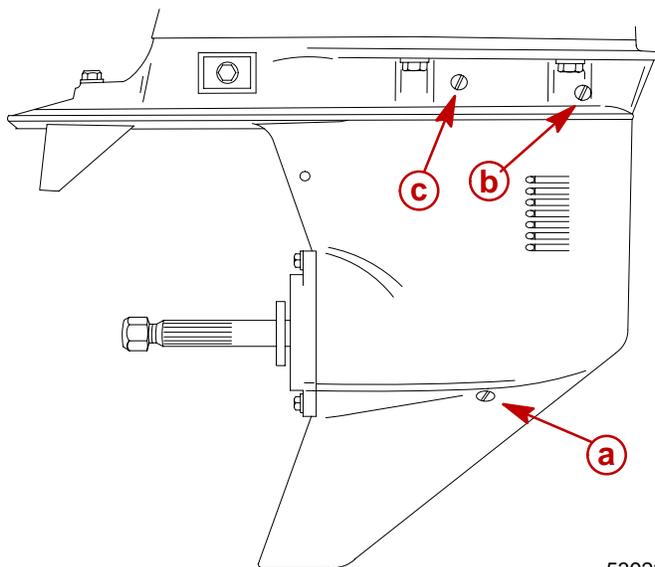


## Draining and Inspecting Gear Lubricant

### **⚠ WARNING**

**If gear housing is installed on engine, to avoid accidental starting, disconnect (and isolate) spark plug leads from spark plugs before working near the propeller.**

1. With gear housing in normal running position, place a clean pan under housing and remove the two vent screws and one fill/drain screw (with gaskets).



53922

- a** - Fill/Drain Screw
- b** - Oil Level Screw
- c** - Vent Screw

2. Inspect gear lubricant for metal particles (lubricant will have a “metal flake” appearance). Drain lube into a clean pan/container. Presence of fine metal particles (resembling powder) in the gear lube indicates normal wear. The presence of metal chips in the gear lube indicates the need for gear housing disassembly and component inspection.
3. Note color of gear lubricant. White or cream color MAY indicate presence of water in lubricant. Gear lubricant which has been drained from a gear case recently in operation will have a yellowish color due to lubricant agitation/aeration. Gear lube which is mixed with assembly lubricant (Special Lube 101 or 2-4-C w/Teflon) will also be creamy white in color. This is normal and should not be confused with the presence of water. If water is suspected to be present in gearcase, a pressure check of gearcase should be made (with no lubricant in gearcase). Gearcase should hold 10 to 12 psi of pressure for 5 minutes without leaking down. Pouring a portion of the gear lubricant into a glass jar and allowing the lubricant to settle will allow any water in the lube to separate and settle to the bottom of the jar.
4. Presence of water in gear lubricant indicates the need for disassembly and inspection of oil seals, seal surfaces, O-rings, water pump gaskets as well as gear housing components for damage. If gearcase is rebuilt, gearcase should be pressure checked before filling with lubricant.



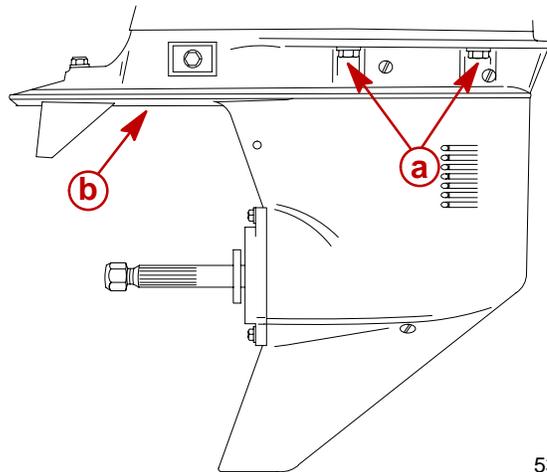
# Removal

## ⚠ WARNING

To prevent accidental engine starting, remove (and isolate) spark plug leads from spark plugs before removing gear housing.

**IMPORTANT: 90 hp (4-Stroke) models, when removing or installing gearcase carefully guide driveshaft through drive shaft bushing to avoid scoring bushing surface.**

1. Remove (and isolate) spark plug leads from spark plugs.
2. Shift engine into forward gear.
3. Tilt engine to full "Up" position.
4. Remove 4 fasteners.
5. Remove locknut and washer.
6. Remove gear housing.



53992

- a** - Fasteners (2 Each Side)  
**b** - Locknut and Washer



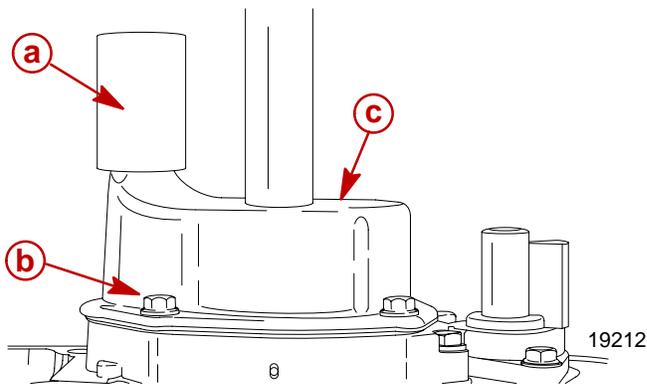
# Disassembly

## Water Pump

**NOTE:** If water tube seal stayed on water tube (inside of drive shaft housing) when gear housing was removed, pull water tube seal from water tube.

**NOTE:** Newer models will not have the isolators installed on the water pump.

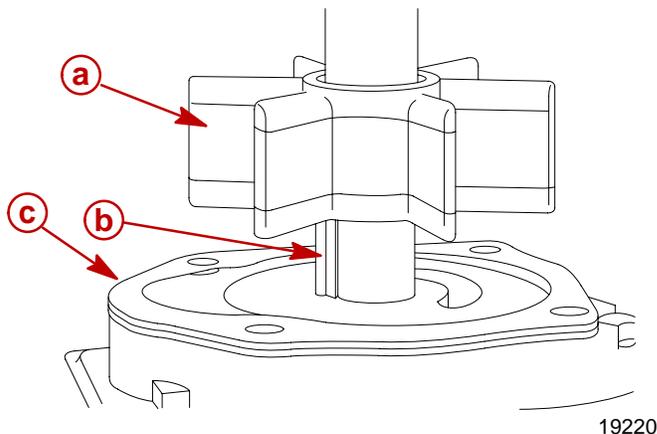
1. Replace water tube seal, if damaged.
2. Remove 4 screws (2 on each side of water pump housing), washers, and isolators.
3. Remove cover.



- a - Water Tube Seal
- b - Screw, Washer, Isolator (4 each)
- c - Cover

**IMPORTANT:** The circular groove formed by the impeller sealing bead should be disregarded when inspecting cover (Step 4) and plate (Step 8), as the depth of the groove will not affect water pump output.

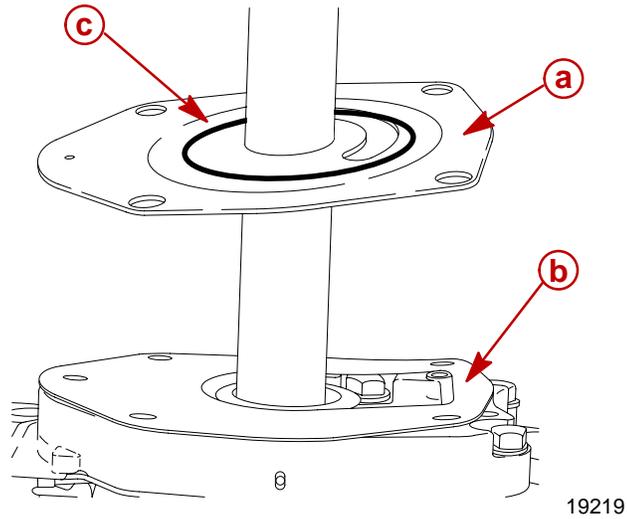
4. Replace cover if thickness of steel at the discharge slots is 0.060 in. or less, or if groove(s) (other than impeller sealing bead groove) in cover roof are more than 0.030 in. (0.762 mm) deep.
5. Lift impeller, drive key, and gasket from drive shaft.



- a - Impeller
- b - Drive Key
- c - Gasket

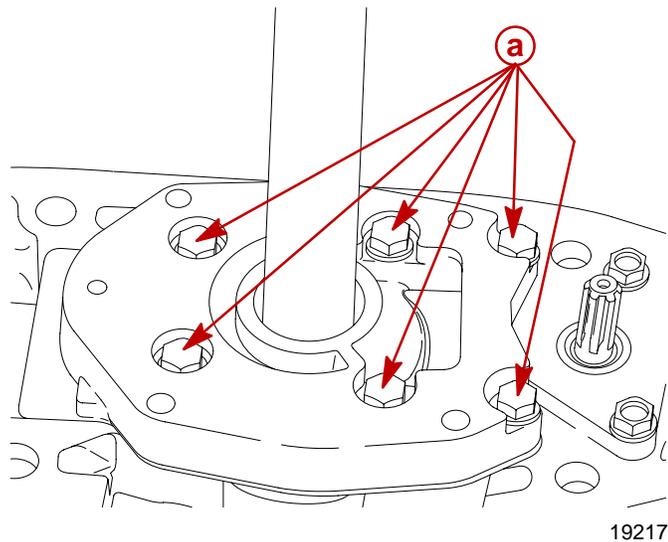


6. Inspect impeller. Replace impeller if any of the following conditions exist:
  - Impeller blade(s) are cracked, torn, or worn.
  - Impeller is glazed or melted (caused by operation without sufficient water supply).
  - Rubber portion of impeller is not bonded to impeller hub.
7. Remove plate and gasket.
8. Replace plate if groove(s) (other than impeller sealing bead groove) in plate are more than 0.030 in. (0.762 mm) deep.



- a** - Plate
- b** - Gasket
- c** - Impeller Sealing Groove

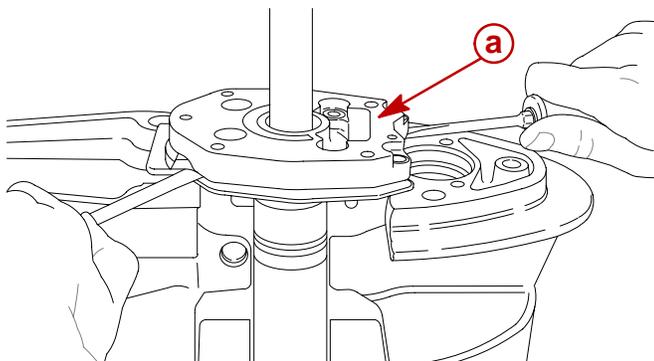
9. Remove screws and washers.



- a** - Screws and Washers (6 each)



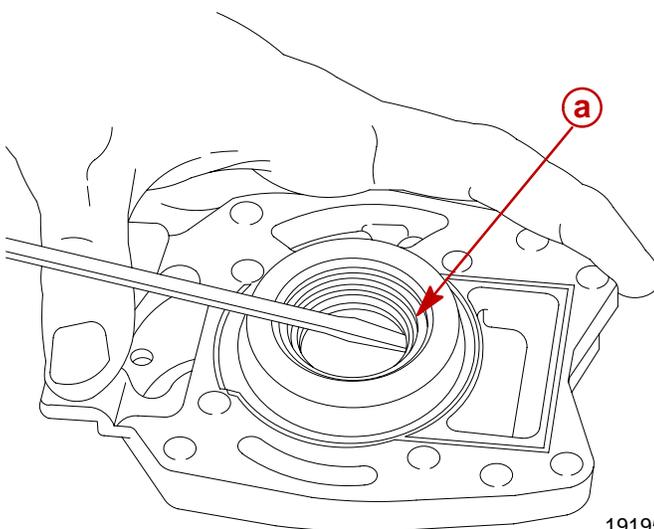
10. Remove water pump base using flat screwdrivers to lightly pry up on base.



19226

**a** - Water Pump Base

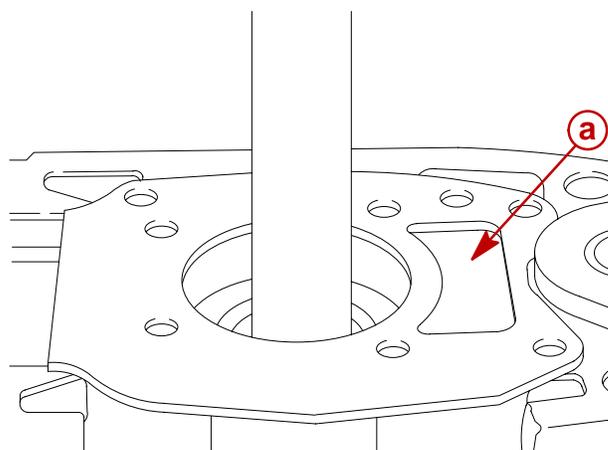
11. Remove (and discard) seals **(IT MAY BE BENEFICIAL TO CLAMP THE WATER PUMP BASE IN A VISE WHILE REMOVING SEALS).**



19195

**a** - Seals

12. Remove gasket.



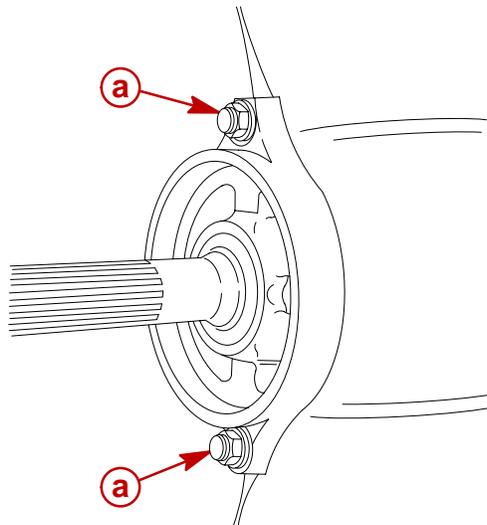
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**a** - Gasket



## Bearing Carrier and Propeller Shaft

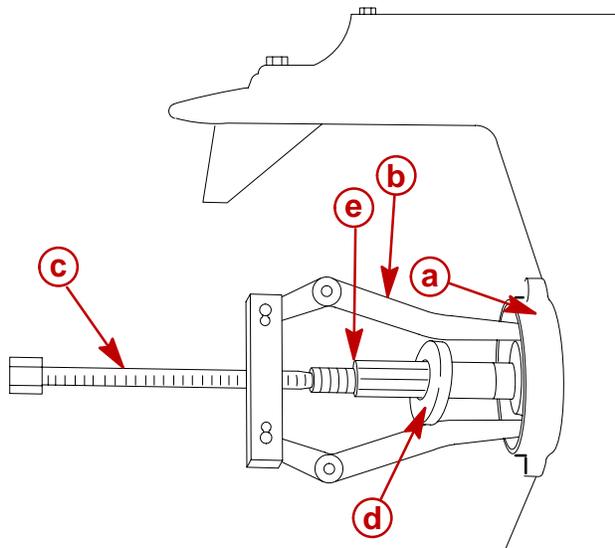
1. Remove fasteners.



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**a** - Fasteners

2. With propeller shaft horizontal, pull carrier (using tool shown) to break seal with gear housing.
3. Remove bearing carrier/propeller shaft components as an assembly by pulling back on the propshaft. Take care not to lose cam follower or 3 metal balls in end of propeller shaft.
4. Remove propeller shaft from bearing carrier.

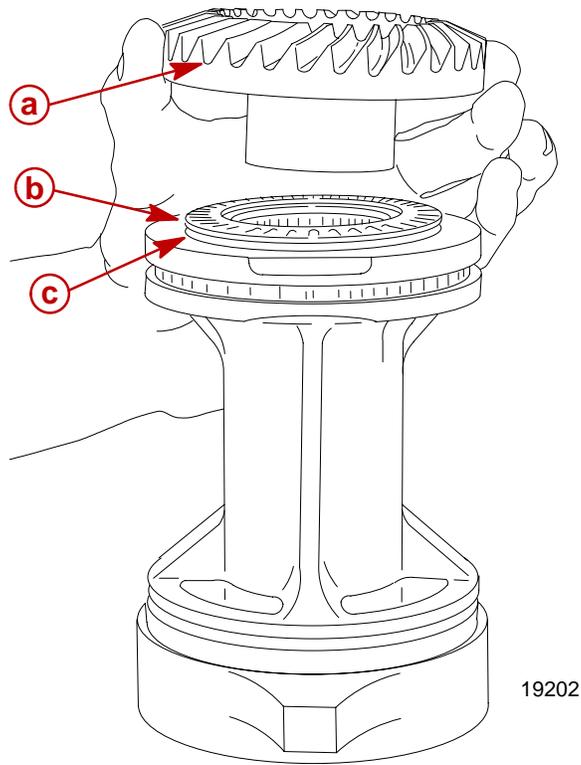


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**a** - Bearing Carrier  
**b** - Puller Jaws (91-46086A1)  
**c** - Puller Bolt (91-85716)  
**d** - Thrust Hub  
**e** - Propeller Shaft

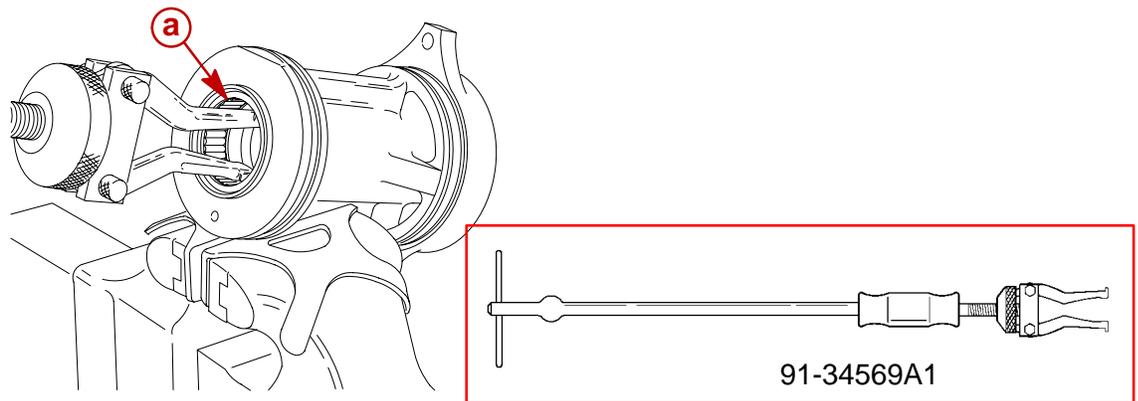


5. Lift reverse gear, thrust bearing and thrust washer from bearing carrier. Replace thrust bearing and thrust washer if rusted or damaged.
6. Replace reverse gear if gear teeth or clutch teeth on reverse gear are rounded or chipped. If reverse gear must be replaced, pinion gear and sliding clutch should be inspected for damage.



- a** - Reverse Gear
- b** - Thrust Bearing
- c** - Thrust Washer

7. If reverse gear radial bearing is rusted or does not roll freely, replace bearing. If the bearing needs to be replaced remove it using Slide Hammer (91-34569A1).

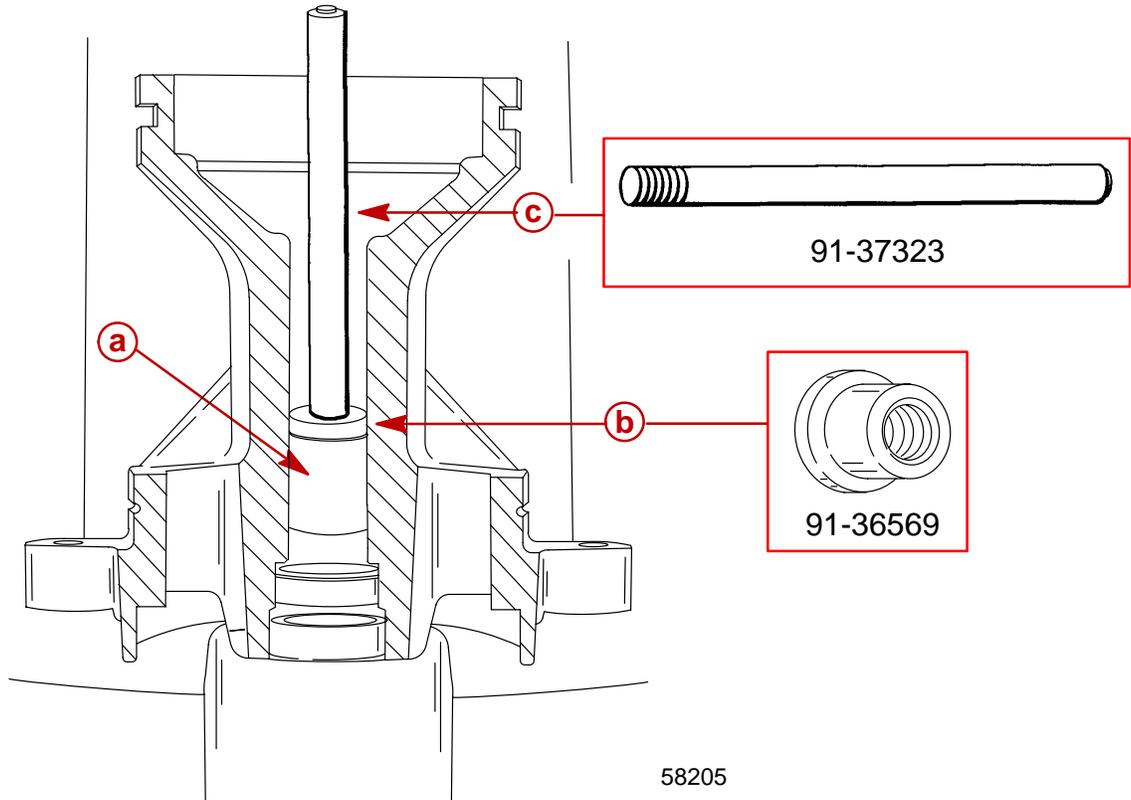


- a** - Radial Bearing



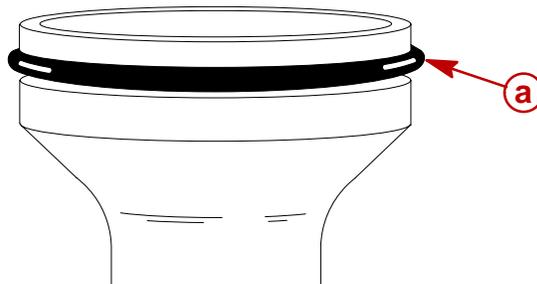
8. If bearing is rusted or does not roll freely, replace bearing. If replacement is necessary, remove bearing and oil seals using Mandrel\* (91-36569) and Driver Rod\* (91-37323). Discard oil seals.

**NOTE:** \*From Bearing Removal and Installation Kit (91-31229A7).



- a** - Bearing  
**b** - Mandrel (91-36569)  
**c** - Driver Rod (91-37323)

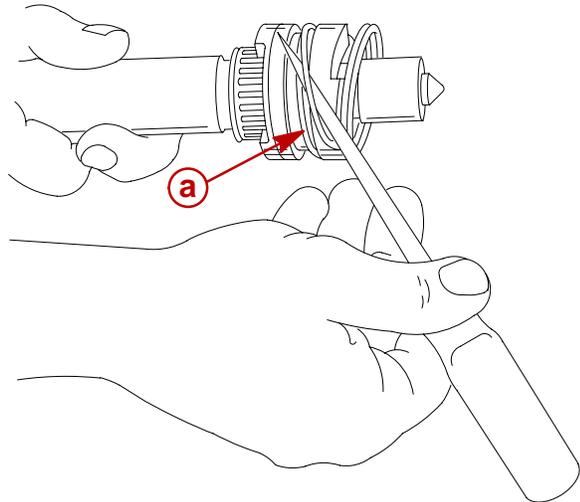
9. Remove propeller shaft seals (if not removed with bearing in Step 9) and bearing carrier O-ring.



- a** - O-ring



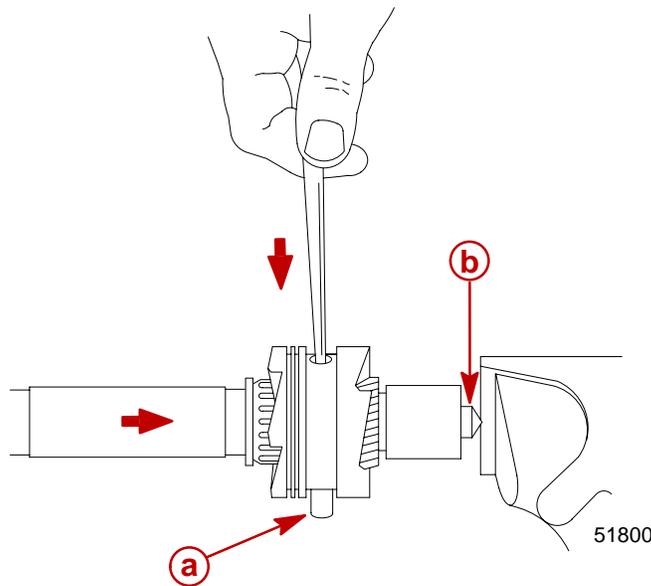
10. Remove spring.



51876

**a** - Spring

11. Apply constant pressure to cam follower in order to prevent it and internal components from ejecting out of the propeller shaft during removal of the cross pin from the clutch.

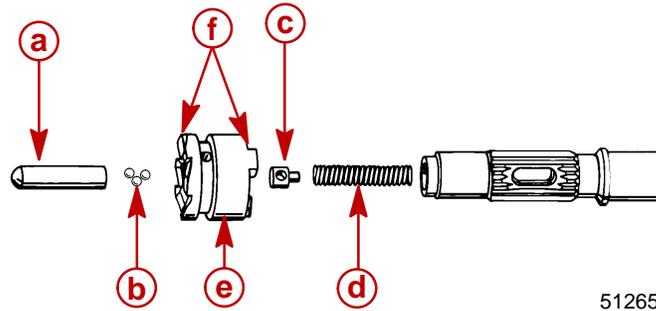


51800

**a** - Cross Pin  
**b** - Cam Follower



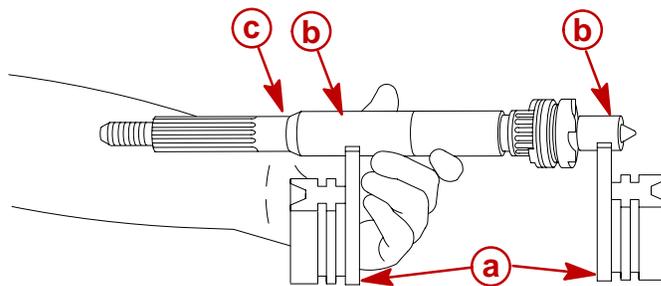
12. Remove components from propeller shaft.
13. Replace cam follower if worn or pitted.
14. Replace sliding clutch if jaws are rounded or chipped. Rounded jaws indicate one or more of the following:
  - Improper shift cable adjustment.
  - Engine idle speed too high while shifting.
  - Shifting from neutral to reverse (or forward) too slowly.



51265

- a** - Cam Follower
- b** - Metal Balls (3)
- c** - Guide Block
- d** - Spring
- e** - Sliding Clutch
- f** - Jaws

15. Replace propeller shaft if any of the following exist:
  - Splines are twisted or worn.
  - Bearing surfaces of propeller shaft are pitted or worn.
  - Oil seal surface is grooved.
  - Shaft has a noticeable “wobble” or is bent more than 0.009 in. (0.228 mm). Prop shaft trueness should be measured with a dial indicator with prop shaft on V-blocks.



51877

- a** - V-Blocks
- b** - Bearing Surfaces
- c** - Measure with Dial Indicator at This Point

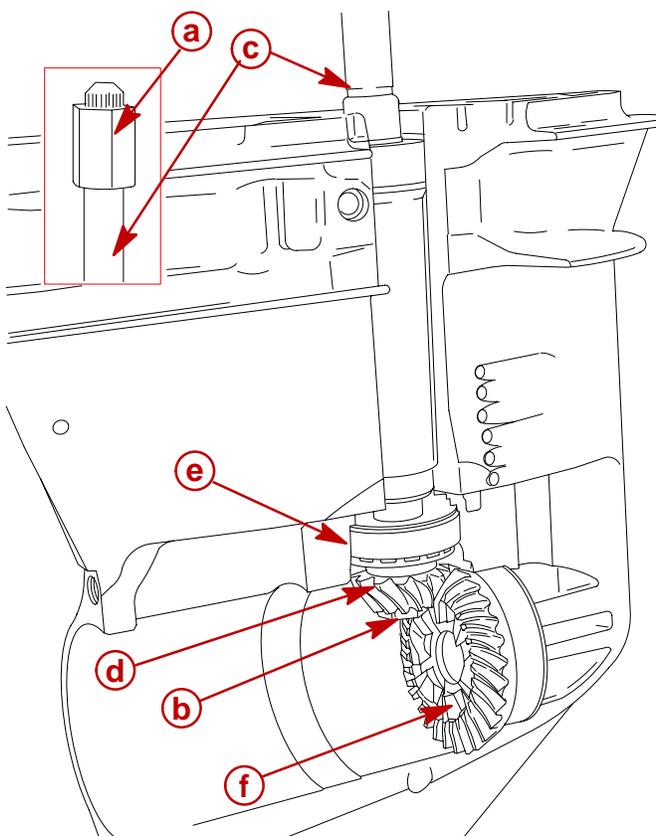


## Pinion Gear, Drive Shaft, and Forward Gear

1. Hold drive shaft using Drive Shaft Holding Tool; remove (and discard) pinion nut.

Model	Drive Shaft Holding Tool
40/50 Bigfoot (4-Stroke)	91-56775
50/60 Bigfoot (4-Stroke)	91-817070A1
75/90/115 EFI (4-Stroke)	91-804776A1
60 Bigfoot (2-Stroke)	91-56775
75/90/100/115/125 (2-Stroke)	91-56775

2. Remove drive shaft, pinion gear, pinion bearing and forward gear.
3. Replace pinion gear if it is chipped or worn.
4. Replace pinion bearing and race if either are rusted, pitted or damaged; or if bearing does not roll freely. To remove race, refer to "Lower Drive Shaft Bearing Race," following.
5. Replace forward gear if gear teeth or clutch teeth are chipped or worn.

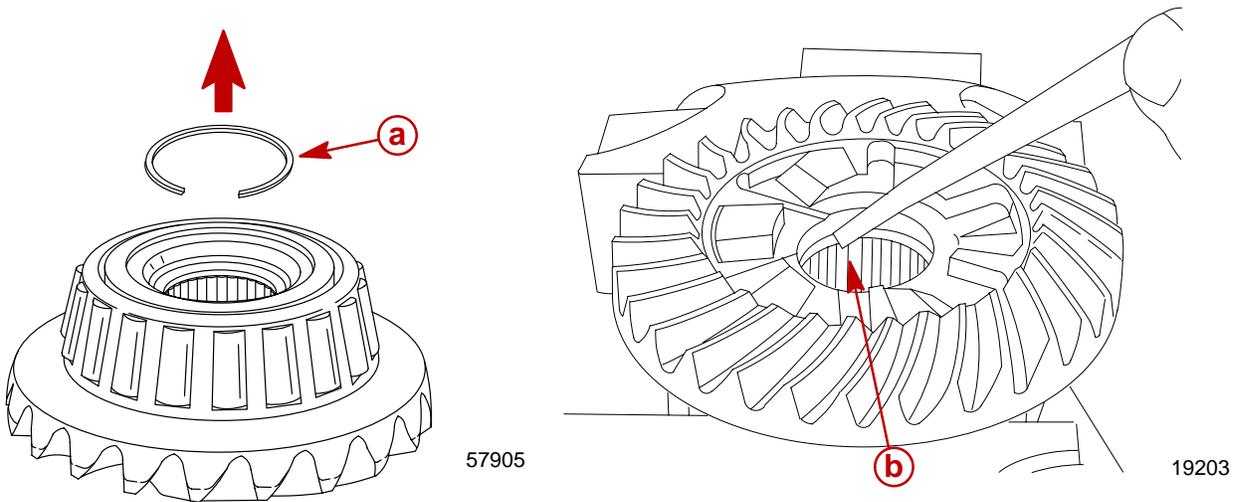


19175

- a - Drive Shaft Holding Tool
- b - Pinion Nut
- c - Drive Shaft
- d - Pinion Gear
- e - Pinion Bearing
- f - Forward Gear

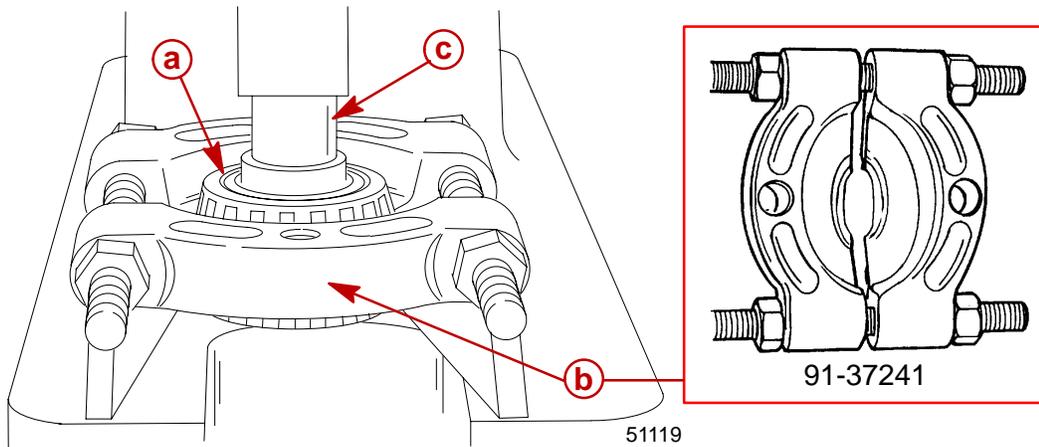


6. Replace forward gear needle bearing if it is rusted or does not roll freely.
7. Use suitable tools (screwdriver and awl) to remove retaining ring. Use a punch and hammer to remove bearing.



**a** - Retaining Ring  
**b** - Forward Gear Needle Bearing

8. Replace forward gear bearing and race if either are rusted, pitted or damaged, or if bearing does not roll freely. Remove bearing from gear using Universal Puller Plate (91-37241) and mandrel. To remove race, refer to "Forward Gear Bearing Race," following.



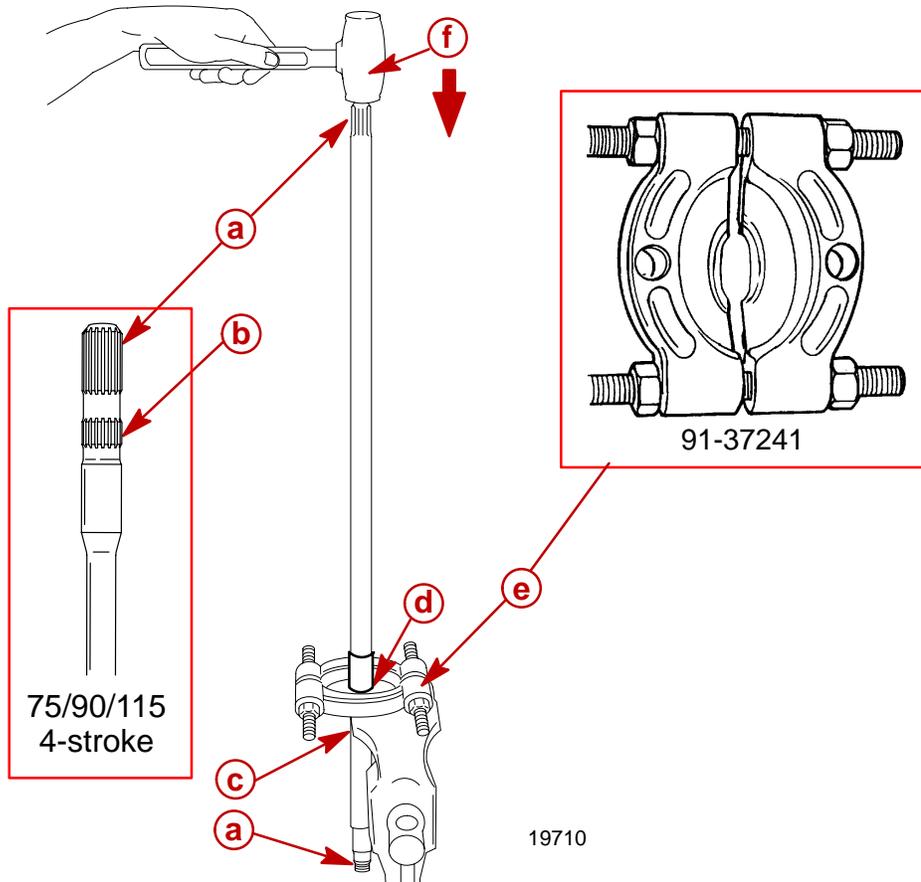
**a** - Forward Gear Bearing  
**b** - Universal Puller Plate (91-37241)  
**c** - Mandrel



- 9. Replace drive shaft if splines are worn or twisted.
- 10. If bearing surface is damaged, replace drive shaft and corresponding bearing.

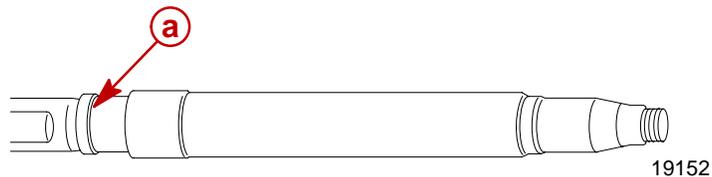
**IMPORTANT: Do not tighten vise against drive shaft.**

- 11. If wear sleeve is deeply grooved allowing water to enter gear case, remove (and discard) sleeve using Universal Puller Plate (91-37241) and mallet.



- a** - Crankshaft/Driveshaft Splines
- b** - Oil Pump Drive Splines 75/90 4-Stroke Only
- c** - Bearing Surface
- d** - Wear Sleeve
- e** - Universal Puller Plate (91-37241)
- f** - Mallet

- 12. Remove (and discard) rubber ring.

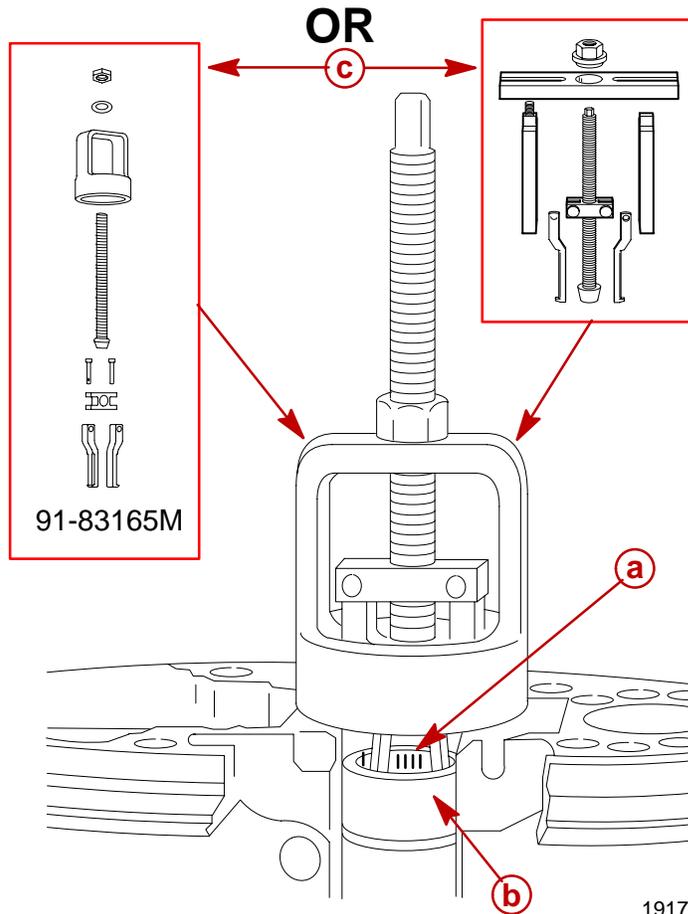


- a** - Rubber Ring



## Upper Drive Shaft Bearing

1. Replace upper drive shaft bearing and sleeve if either are rust stained, or if bearing will not roll freely. Remove bearing and then sleeve using Puller Assembly (91-83165M) with suitable jaws.



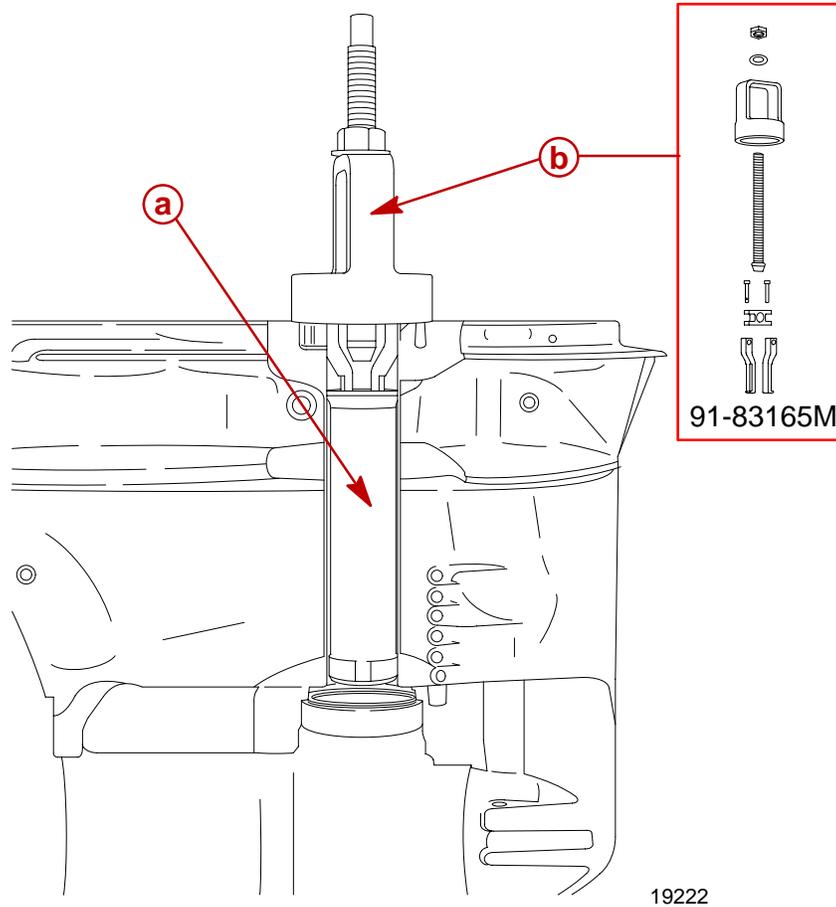
- a - Upper Drive Shaft Bearing
- b - Sleeve
- c - Puller Assembly (91-83165M)

**IMPORTANT:** Upper drive shaft bearing/sleeve must be removed prior to oil sleeve removal. Refer to "Upper Drive Shaft Bearing," preceding.



## Oil Sleeve

1. Remove oil sleeve (if necessary) using Puller Assembly (91-83165M) with suitable jaws.



- a** - Oil Sleeve
- b** - Puller Assembly (91-83165M)

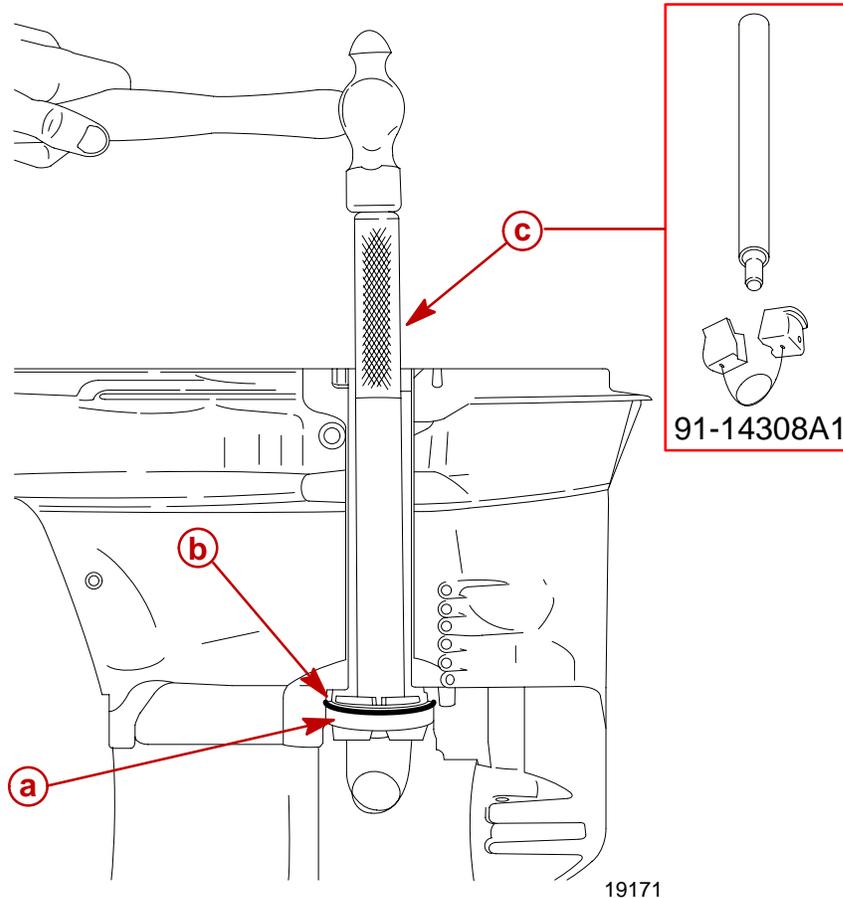


## Lower Drive Shaft Bearing Race

**IMPORTANT:** Upper drive shaft bearing/sleeve and oil sleeve do not have to be removed for lower drive shaft bearing race removal.

**IMPORTANT:** Retain shim(s) for reassembly.

1. Remove bearing race and shim(s) using bearing race tool (91-14308A1).

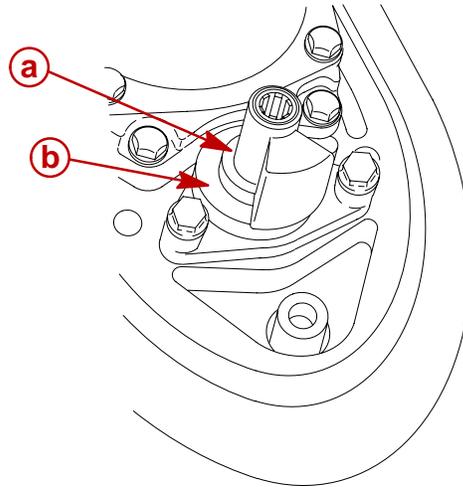


- a - Bearing Race
- b - Shim(s)
- c - Bearing Race Tool (91-14308A1)



## Shift Shaft

1. Remove shift shaft coupler and nylon spacer.



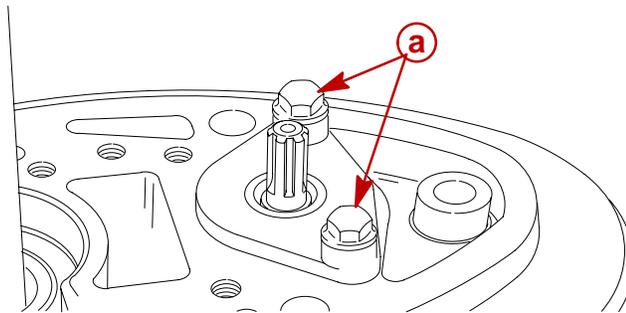
53925

### 75 (2-Stroke) Tiller Model Shown

**a** - Shift Shaft Coupler

**b** - Spacer

2. Remove bolts.

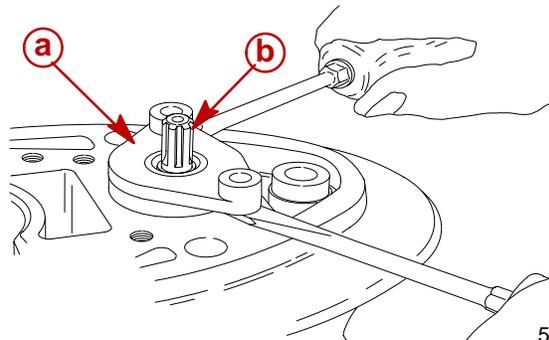


53926

**a** - Bolts

**NOTE:** Remove rough edges from shift shaft splines before removing shift shaft bushing.

3. Remove shift shaft bushing and shift shaft.



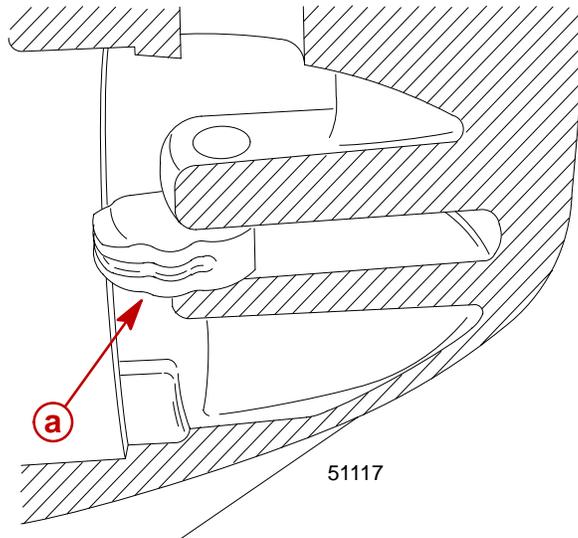
53927

**a** - Bushing

**b** - Shift Shaft



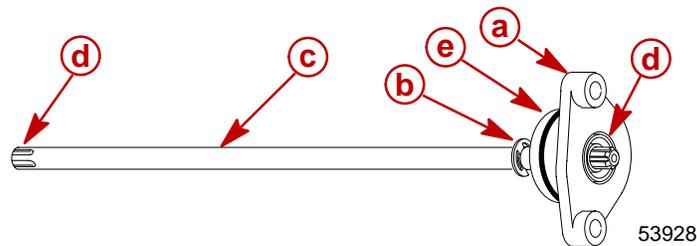
4. Remove shift cam from housing.
5. Replace shift cam if worn.



**60 (2-Stroke) Bigfoot Shown**

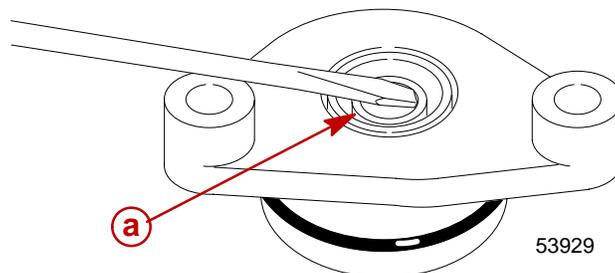
**a** - Shift Cam

6. Remove shift shaft bushing and clip from shift shaft.
7. Replace shift shaft if splines are worn or shaft is twisted.
8. Remove (and discard) O-ring.



**a** - Bushing  
**b** - Clip  
**c** - Shift Shaft  
**d** - Splines  
**e** - O-ring

9. Remove (and discard) seal. (Lightly clamp the bushing in a vise when removing seal.)



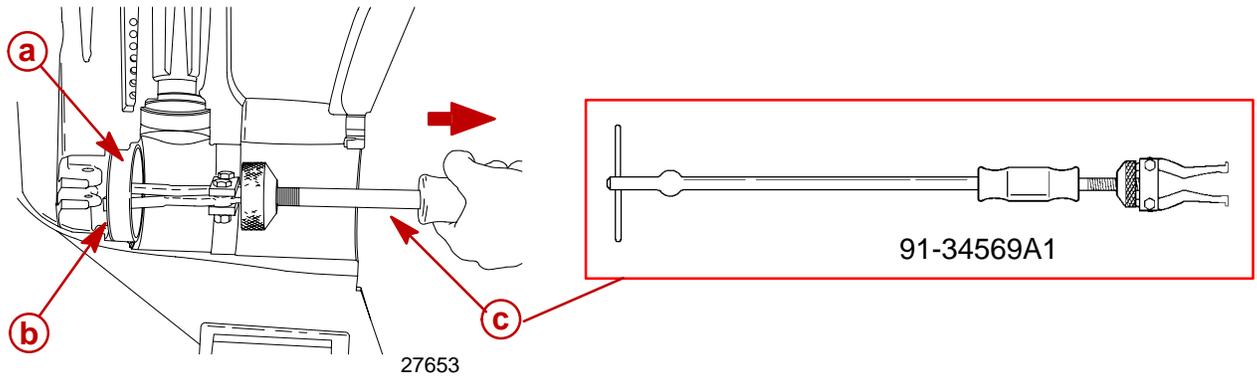
**a** - Seal



## Forward Gear Bearing Race

**IMPORTANT: Retain shim(s) for reassembly. If shims are damaged, replace with new shims of equal thickness.**

1. Remove race and shim(s) using Slide Hammer (91-34569A1).



- a** - Race
- b** - Shim(s)
- c** - Slide Hammer (91-34569A1)



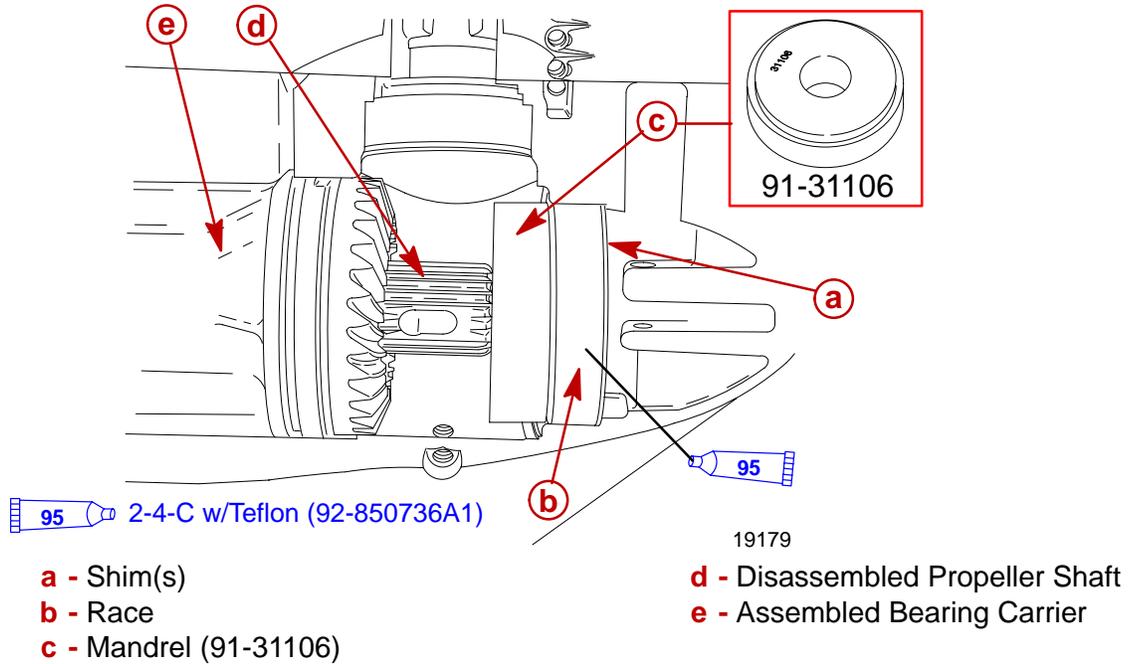
# Reassembly

## Forward Gear Bearing Race

**NOTE:** Propshaft should be vertical when installing bearing race.

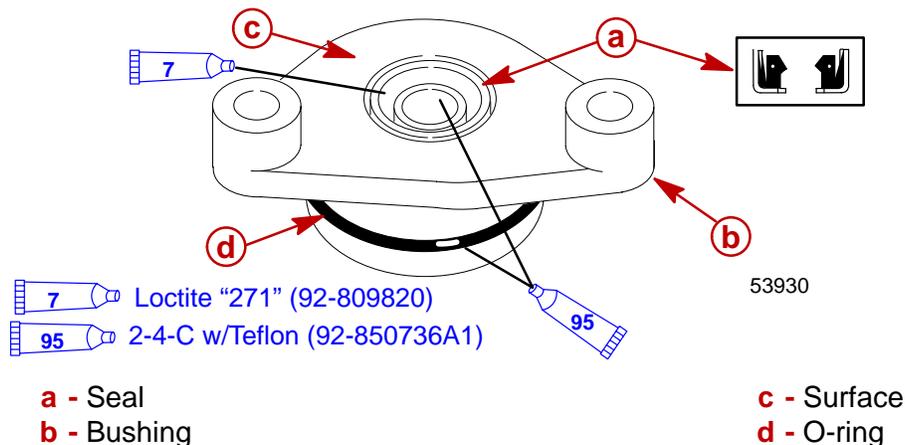
1. Place shim(s) (retained from disassembly) into housing. If shim(s) were lost, or a new gear housing is being assembled, start with 0.010 in. (0.254 mm) shim(s).
2. Assemble components as shown using mandrel (91-31106). Apply 2-4-C w/Teflon to O.D. of race. Drive race into housing by striking propeller shaft end with lead hammer.

**NOTE:** Install a nut on the end of the propshaft to prevent damage to the propshaft threads while performing step 2.



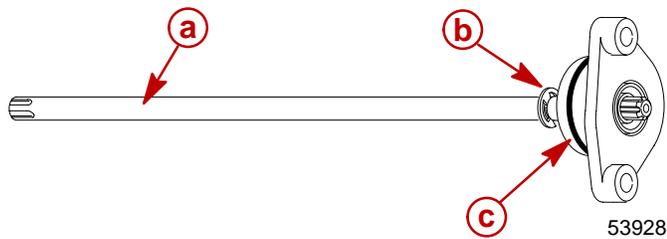
## Shift Shaft

1. Apply Loctite 271 on O.D. of new seal.
2. Press seal into shift shaft bushing until seal is seated against shoulder.
3. Install new O-ring.
4. Apply 2-4-C with Teflon on O-ring and I.D. of seal.





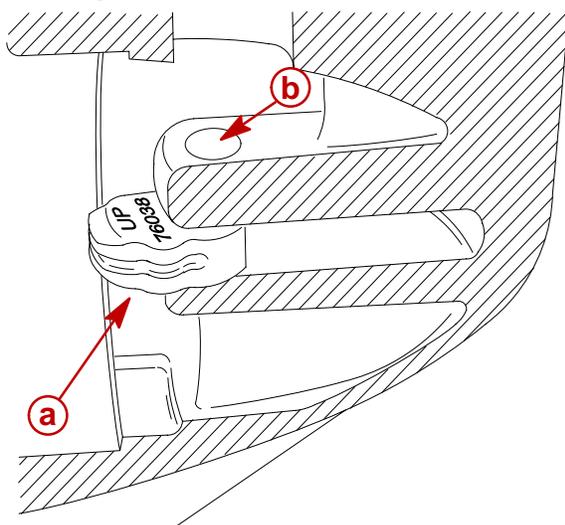
5. Assemble components as shown.



- a - Shift Shaft
- b - "E" Clip
- c - Shift Shaft Bushing

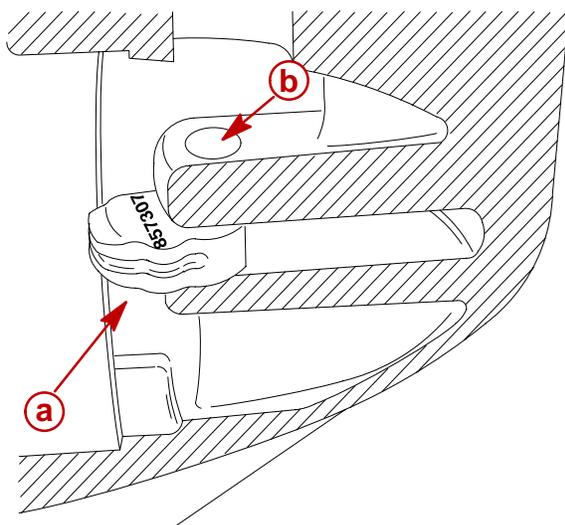
6. Install shift cam; align hole in shift cam with shift shaft pilot bore in gear housing.

**60 Bigfoot, 75/90/100/115/125 (2-Stroke)**



- a - Shift Cam (marked with "UP" and part number)
- b - Shift Shaft Pilot Bore

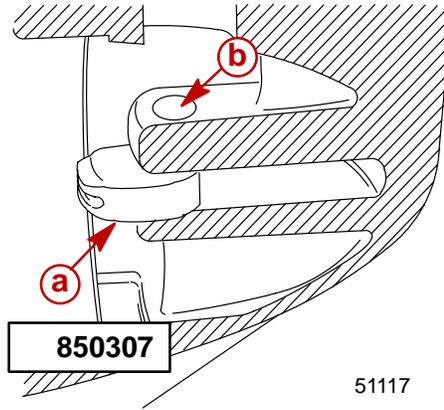
**60 Bigfoot, 75/90/100/115/125 (2-Stroke) & 75/90/115EFI (4-Stroke)**



- a - Shift Cam (marked with part number **only**)
- b - Shift Shaft Pilot Bore

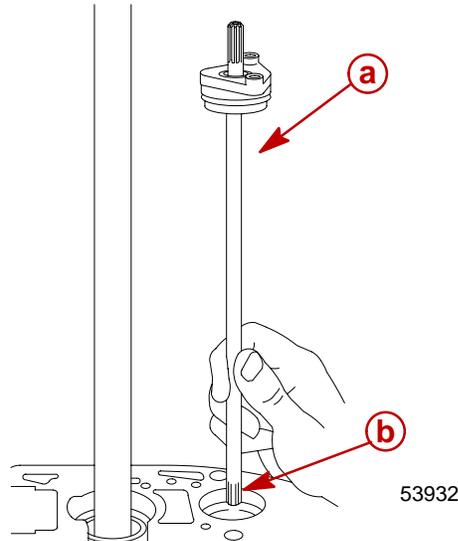


**40/50 Bigfoot (4-Stroke), 50/60 Bigfoot(4-Stroke)**



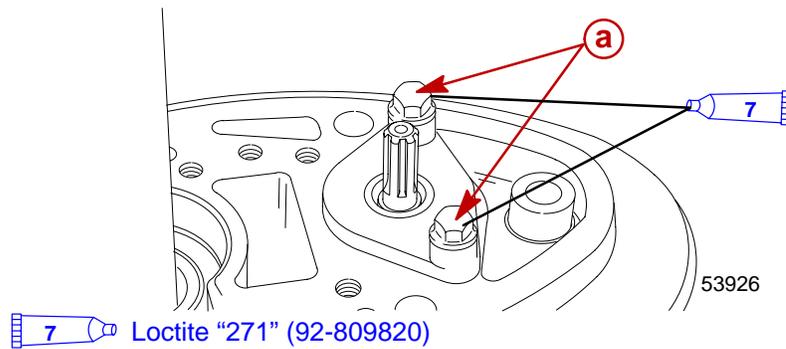
- a** - Shift Cam (Numbers Down)
- b** - Shift Shaft Pilot Bore

7. Install shift shaft assembly; insert splines into shift cam.



- a** - Shift Shaft Assembly
- b** - Splines

8. Apply Loctite 271 to bottom half of threads on each screw. Install screws and tighten to specified torque.



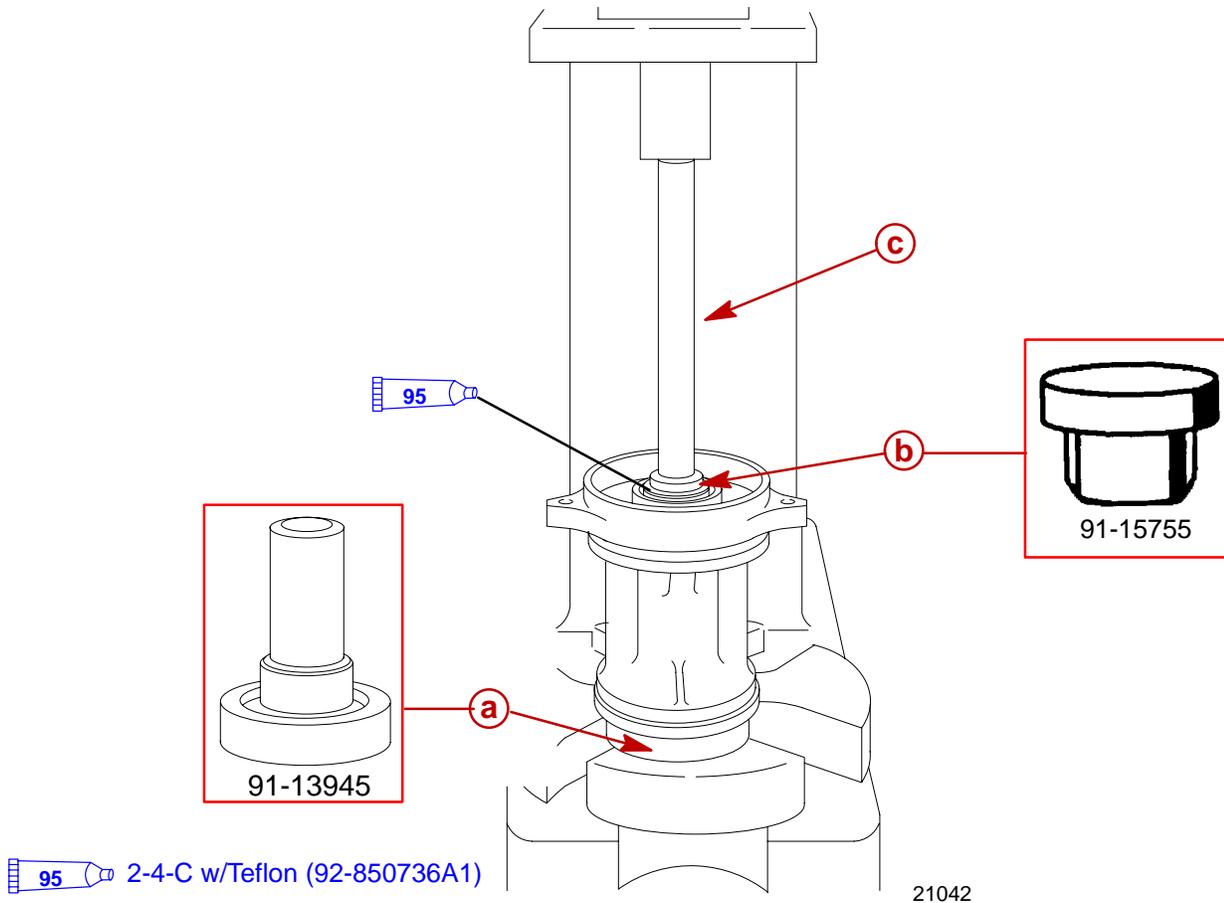
- a** - Screw (2)

<b>Screw Torque</b>
60 lb-in. (6.8 Nm)



## Bearing Carrier Reassembly

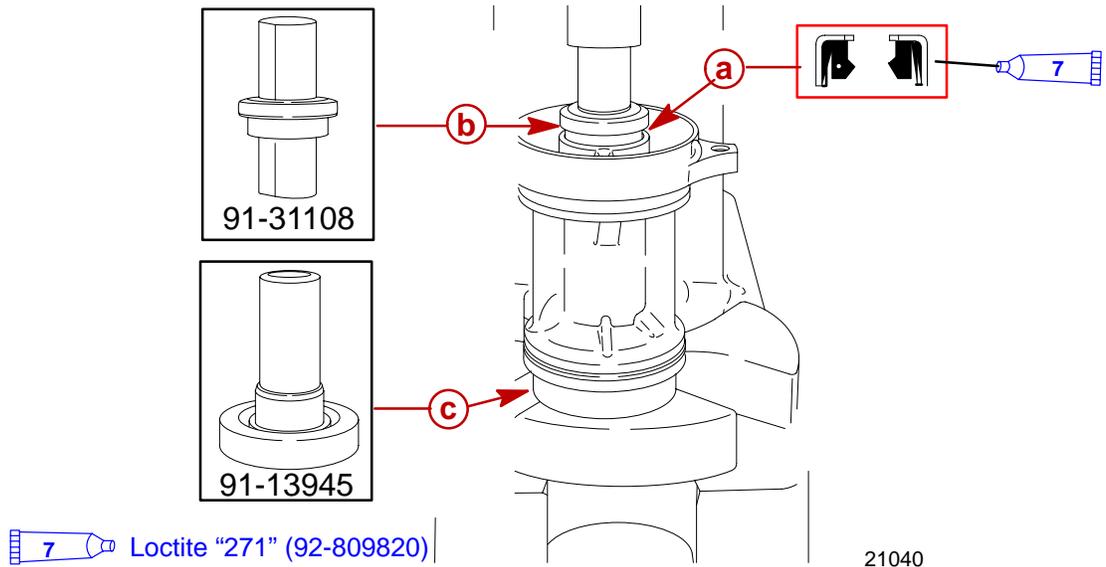
1. Lubricate O.D. of bearing and bearing carrier bore with Quicksilver 2-4-C w/Teflon.
2. Protect lip on forward side of bearing carrier, using bearing installation tool (91-13945).
3. Press propeller shaft needle bearing (number side toward mandrel 91-15755) into carrier, until bearing bottoms out.



- a** - Bearing Installation Tool (91-13945)  
**b** - Mandrel (91-15755)  
**c** - Suitable Driver Rod

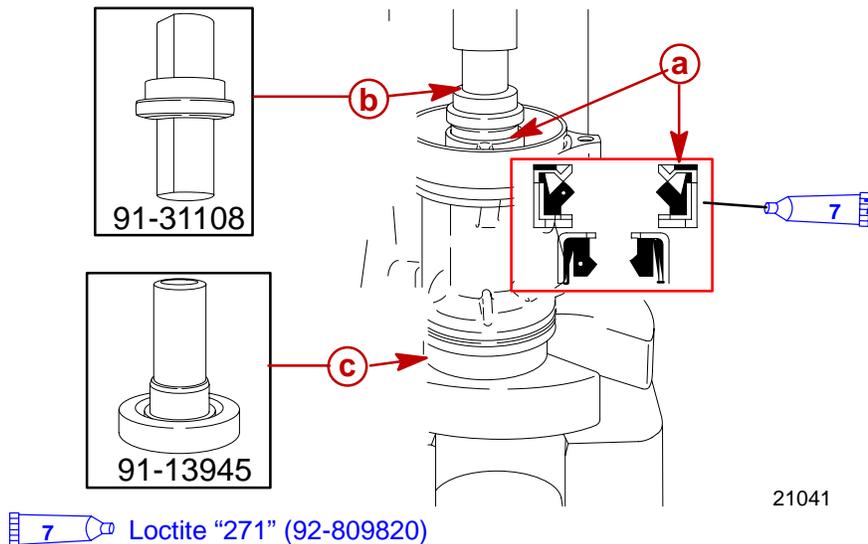


4. Place smaller diameter seal on longer shoulder of Oil Seal Driver (91-31108) with seal lip away from shoulder.
5. Protect lip on front side of bearing carrier using Bearing Installation Tool (91-13945). Apply Loctite 271 on O.D. of seal. Press seal into carrier until tool bottoms.



- a - Seal
- b - Oil Seal Driver (91-31108)
- c - Bearing Installation Tool (91-13945)

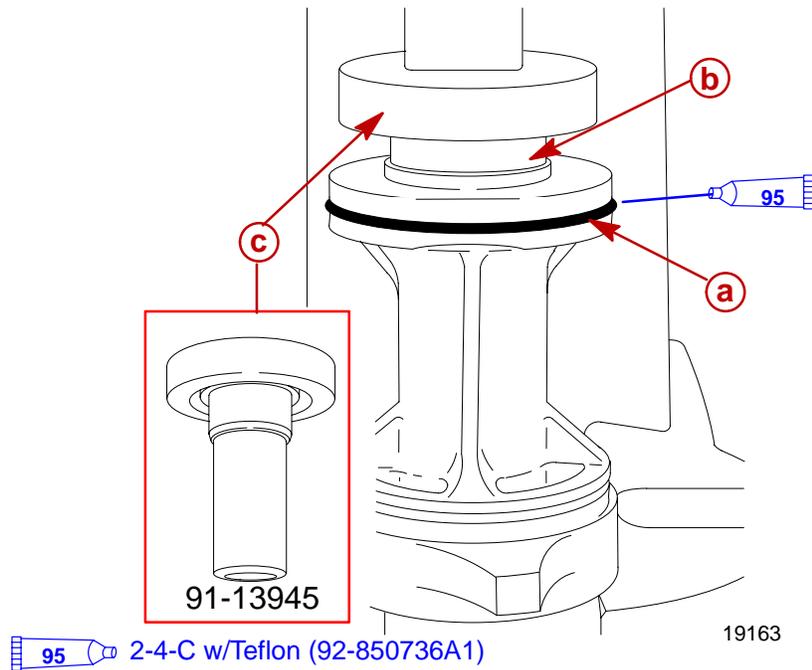
6. Place larger diameter seal on shorter shoulder of Oil Seal Driver (91-31108) with seal lip toward shoulder.
7. Protect lip on front side of bearing carrier using Bearing Installation Tool (91-13945). Apply Loctite 271 on O.D. of new seal. Press seal into carrier until tool bottoms.



- a - Seal
- b - Oil Seal Driver (91-31108)
- c - Bearing Installation Tool (91-13945)

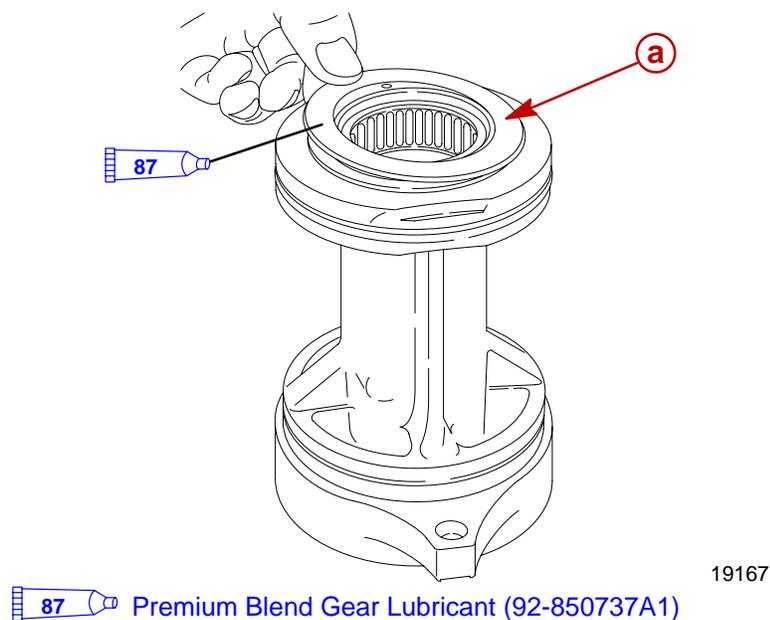


8. Install O-ring. Lubricate O-ring with 2-4-C w/Teflon. Lubricate seal lips with 2-4-C w/Teflon.
9. Lubricate outside diameter of reverse gear bearing and bearing carrier bore with a light coating of 2-4-C w/Teflon.
10. Press bearing into carrier until tool bottoms.



- a** - O-ring
- b** - Bearing, Numbered Side Toward Tool
- c** - Bearing Installation Tool (91-13945)

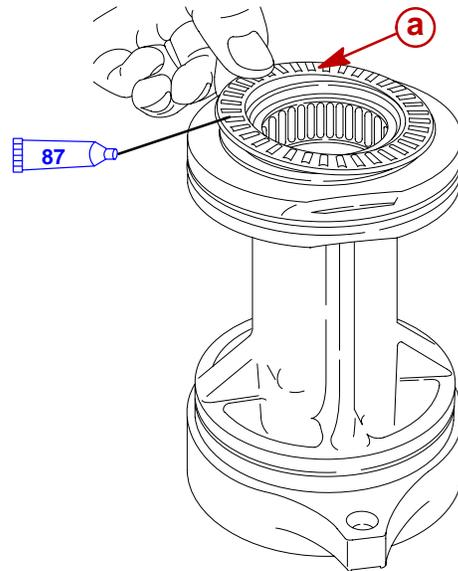
11. Install thrust washer. Coat thrust washer with Premium Blend Gear Lubricant.



- a** - Thrust Washer



12. Install thrust bearing. Coat thrust bearing with Premium Blend Gear Lubricant.

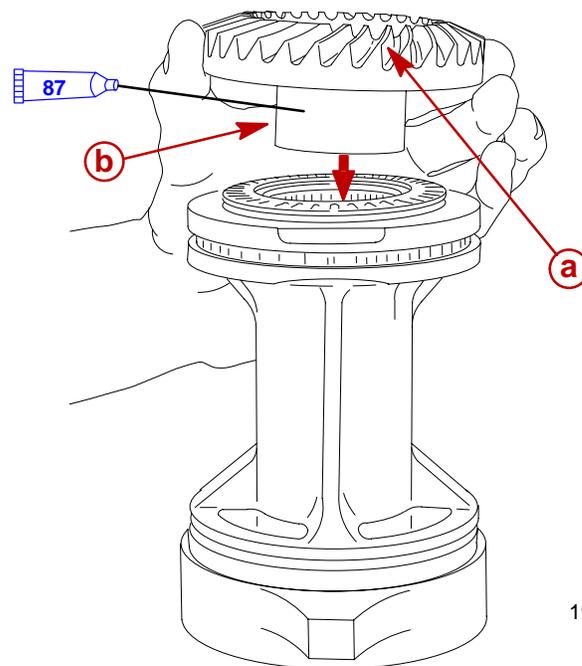


19168

 Premium Blend Gear Lubricant (92-850737A1)

**a** - Thrust Bearing

13. Apply Premium Blend Gear Lubricant to bearing surface of reverse gear and install reverse gear.



19202

 Premium Blend Gear Lubricant (92-850737A1)

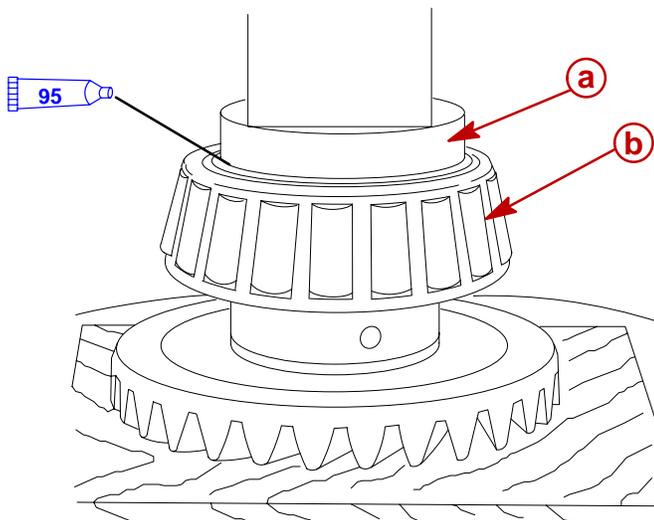
**a** - Reverse Gear

**b** - Bearing Surface



## Forward Gear Reassembly

1. Apply Quicksilver 2-4-C w/Teflon grease to the I.D. of the bearing. Press bearing onto gear using suitable mandrel (press only on inner race of bearing). Because the gear hub is longer than the bearing, a tube type mandrel should be used to install the bearing. This will allow the bearing to bottom out on the gear.



95 2-4-C w/Teflon (92-850736A1)

51869

**a** - Mandrel (91-37350)

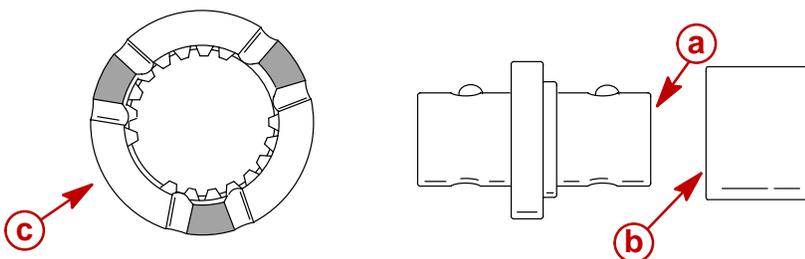
**b** - Bearing; Lubricate I.D. with Quicksilver 2-4-C w/Teflon

2. Inspect reverse gear end of clutch to determine the number of jaws. Refer to chart, following, for tool end selection.

Model	Installation Tool	End Stamped	Bearing Position
3 Jaw Reverse Clutch	91-856875A 1	3	0.155 in. (3.94mm) below surface
6 Jaw Reverse Clutch	91-856875A 1	6	Flush with surface

## FORWARD GEAR NEEDLE BEARING INSTALLATION

### 3 Jaw Reverse Clutch



**a** - Stamped "3"

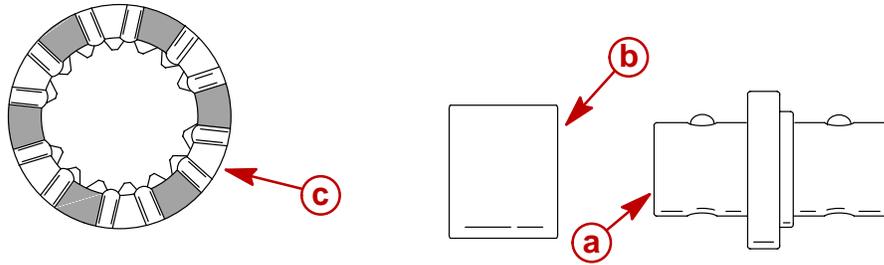
**b** - Numbered end of Needle Bearing

**c** - 3 Jaw Reverse Clutch

56783



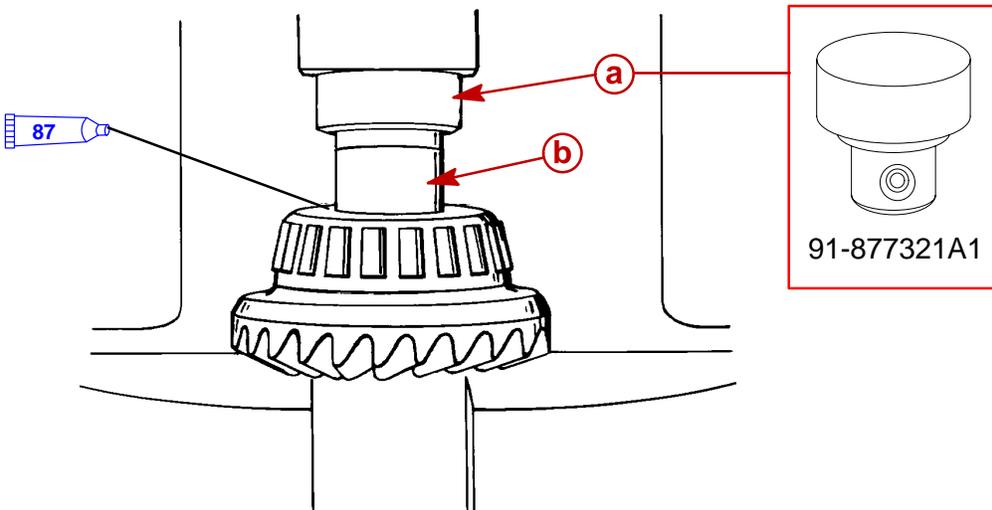
### 6 Jaw Reverse Clutch



56784

- a** - Stamped "6"
- b** - Numbered end of Needle Bearing
- c** - 6 Jaw Reverse Clutch

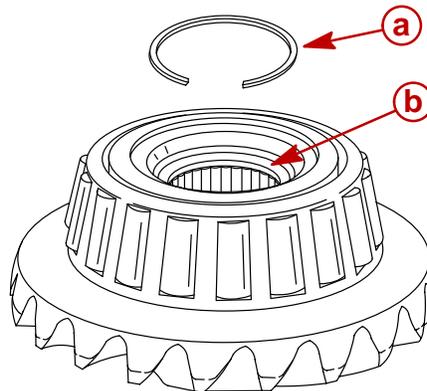
3. Apply Premium Blend Gear Lubricant to I.D. of forward gear, and O.D. of needle bearing. Press needle bearing into forward gear (using forward gear bearing installer tool) until tool bottoms out on gear.



Premium Blend Gear Lubricant (92-850737A1)

- a** - Forward Gear Bearing Installer (91-877321A1)
- b** - Needle Bearing, Numbered Side Toward Installer Tool

4. Install retaining ring into groove of forward gear by starting at one end of retaining ring and working it around until seated in groove.



57905

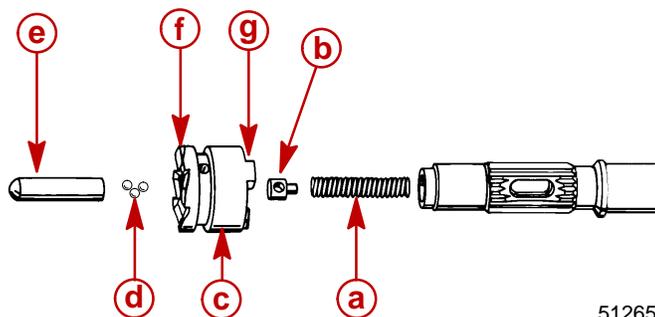
- a** - Retaining Ring
- b** - Groove in Forward Gear



## Propeller Shaft Reassembly

1. Install components into propeller shaft in sequence shown.

**NOTE:** When installing the clutch make sure the ratcheting clutch teeth (angled) are toward forward gear, and non-ratcheting (square on both sides) are toward reverse gear.

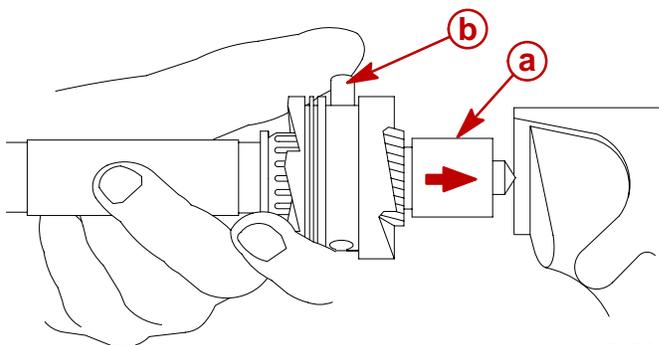


51265

### Assembly Sequence

- a - Spring
- b - Guide Block
- c - Clutch
- d - 3 Metal Balls
- e - Cam Follower
- f - Forward Clutch Teeth
- g - Reverse Clutch Teeth

2. Align the hole in the clutch with the hole in the guide block, install cross pin.

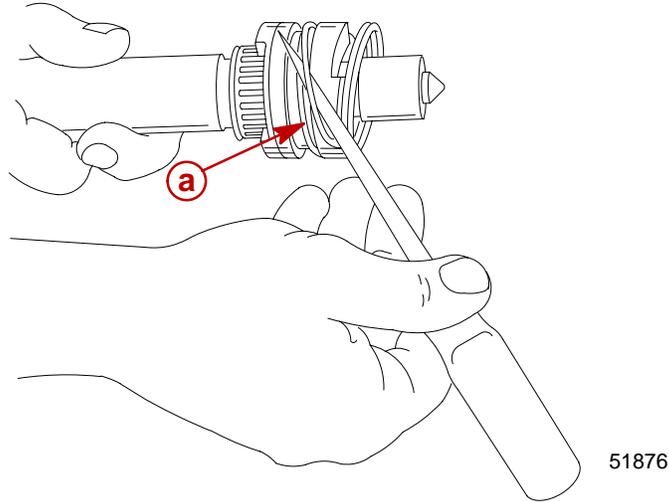


51800

- a - Apply Pressure in This Direction
- b - Cross Pin



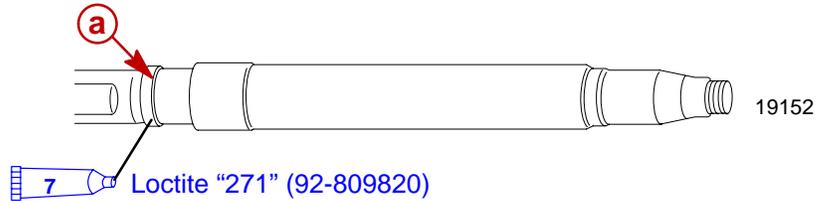
3. Install spring. **DO NOT** allow spring coils to overlap each other.



**a** - Spring

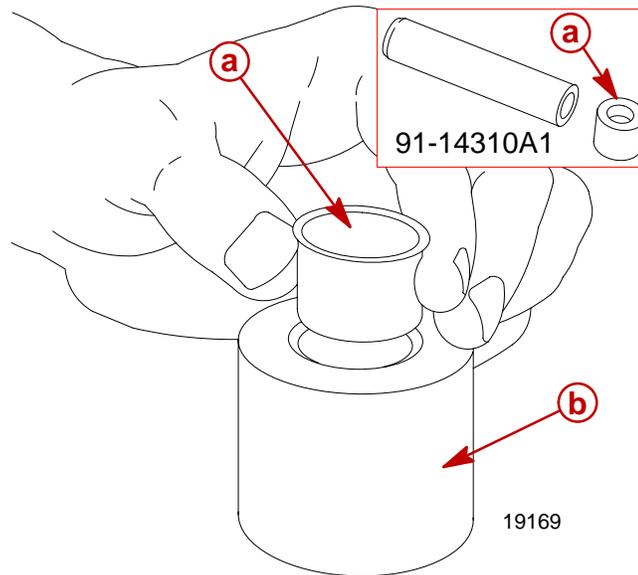
### Drive Shaft Wear Sleeve Installation

1. Install new rubber ring.
2. Apply a light coat of Loctite 271 on outside diameter of rubber ring.



**a** - Ring

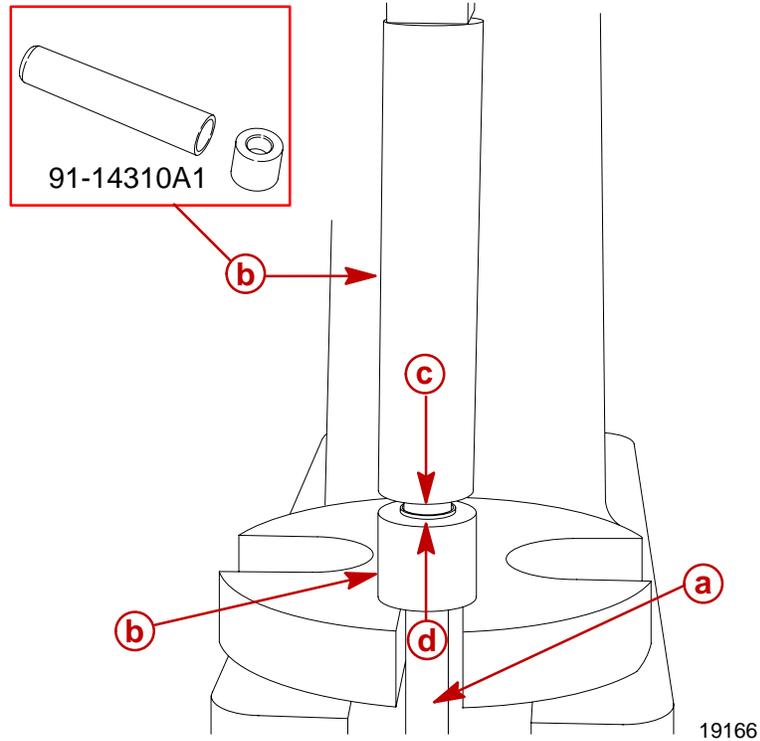
3. Insert sleeve into holder\*.
- \*Component of Wear Sleeve Installation Tool (91-14310A1).



**a** - Sleeve  
**b** - Holder



4. Press sleeve onto drive shaft using Wear Sleeve Installation Tool (91-14310A1); continue pressing until the upper and lower part of the tool make surface to surface contact.



- a** - Drive Shaft
- b** - Wear Sleeve Installation Tool (91-14310A1)
- c** - Upper part of tool (Surface C)
- d** - Lower part of tool (Surface D)

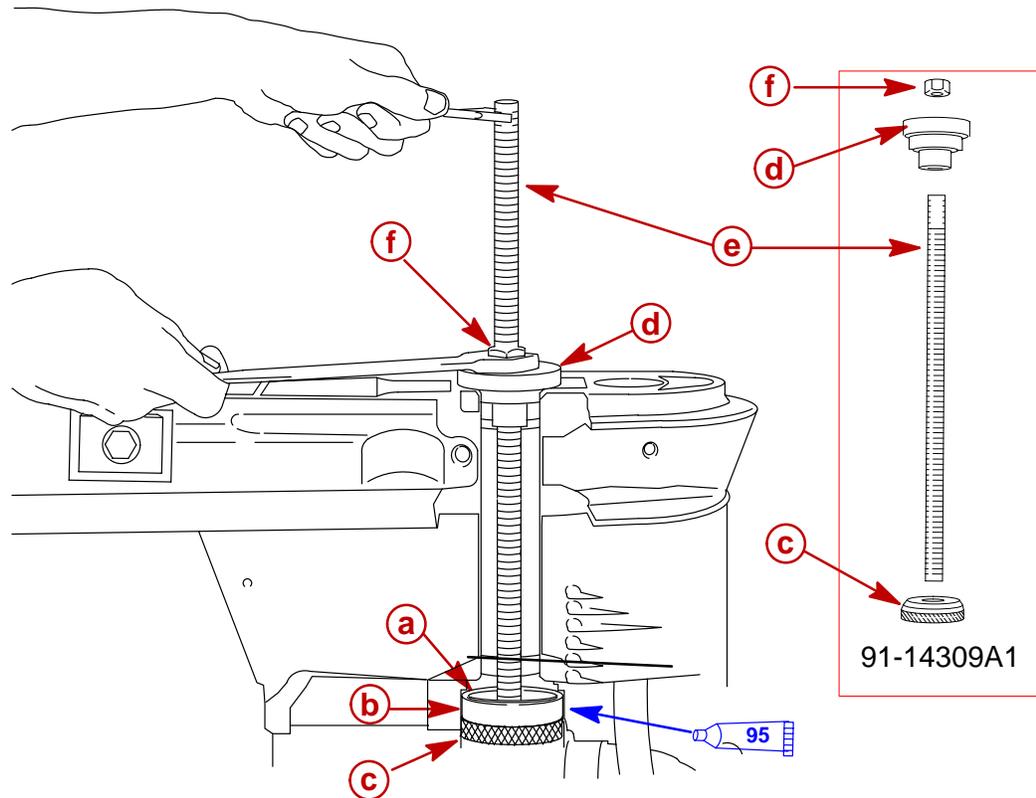
5. Remove excess Loctite from assembled shaft.



## Lower Drive Shaft Bearing Race Installation

1. Lubricate O.D. of bearing race with Quicksilver 2-4-C w/Teflon.
2. Install shim(s) and bearing race into housing. If Shim(s) were lost or a new gear housing is being assembled, start with 0.025 in. (0.635 mm) shim(s).

**NOTE:** Verify shim(s) are not cocked when drawing up race. Once shims and bearing cup are in place, position gearcase assembly so the driveshaft is vertical. This will aid in preventing the bearing cup from becoming cocked in the bore.



 95 2-4-C w/Teflon (92-850736A1)

58207

- a - Shim(s) (Retained From Disassembly)
- b - Bearing Race
- c - Mandrel\* (13780)
- d - Mandrel\* (13781)
- e - Threaded Rod\*\* (91-31229)
- f - Nut\*\* (11-24156)

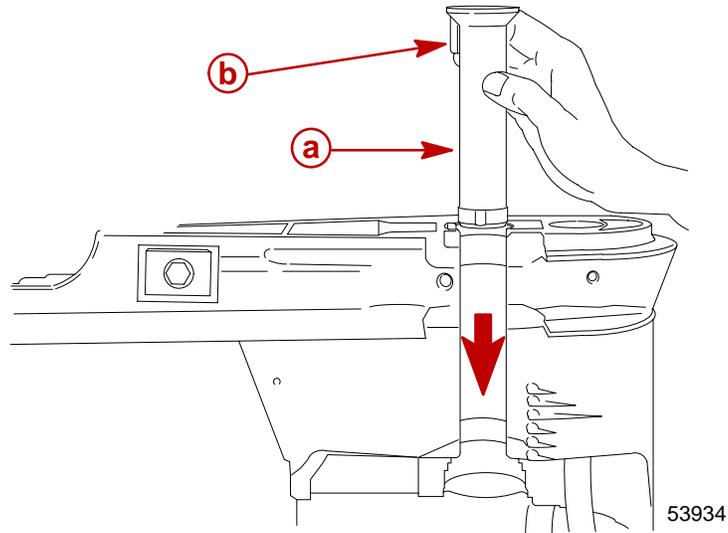
\*From Bearing Installation Tool (91-14309A1)

\*\*From Bearing Removal and Installation Kit (91-31229A7)



### Oil Sleeve Installation

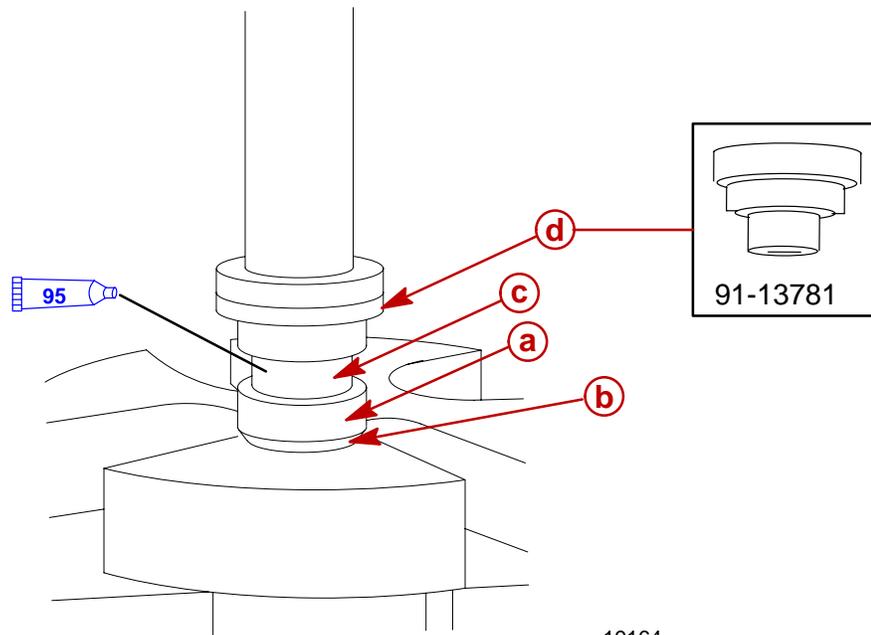
1. Install oil sleeve with tab positioned as shown.

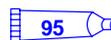


- a - Oil Sleeve
- b - Tab

### Drive Shaft Upper Bearing Installation

1. Lubricate I.D. of bearing sleeve and O.D. of bearing with 2-4-C w/Teflon.
2. Press bearing into sleeve using mandrel from bearing installation tool (91-14309A1).



 2-4-C w/Teflon (92-850736A1)

- a - Bearing Sleeve
- b - Tapered End
- c - Bearing; Numbered Side Toward Mandrel
- d - Mandrel\* (91-13781)

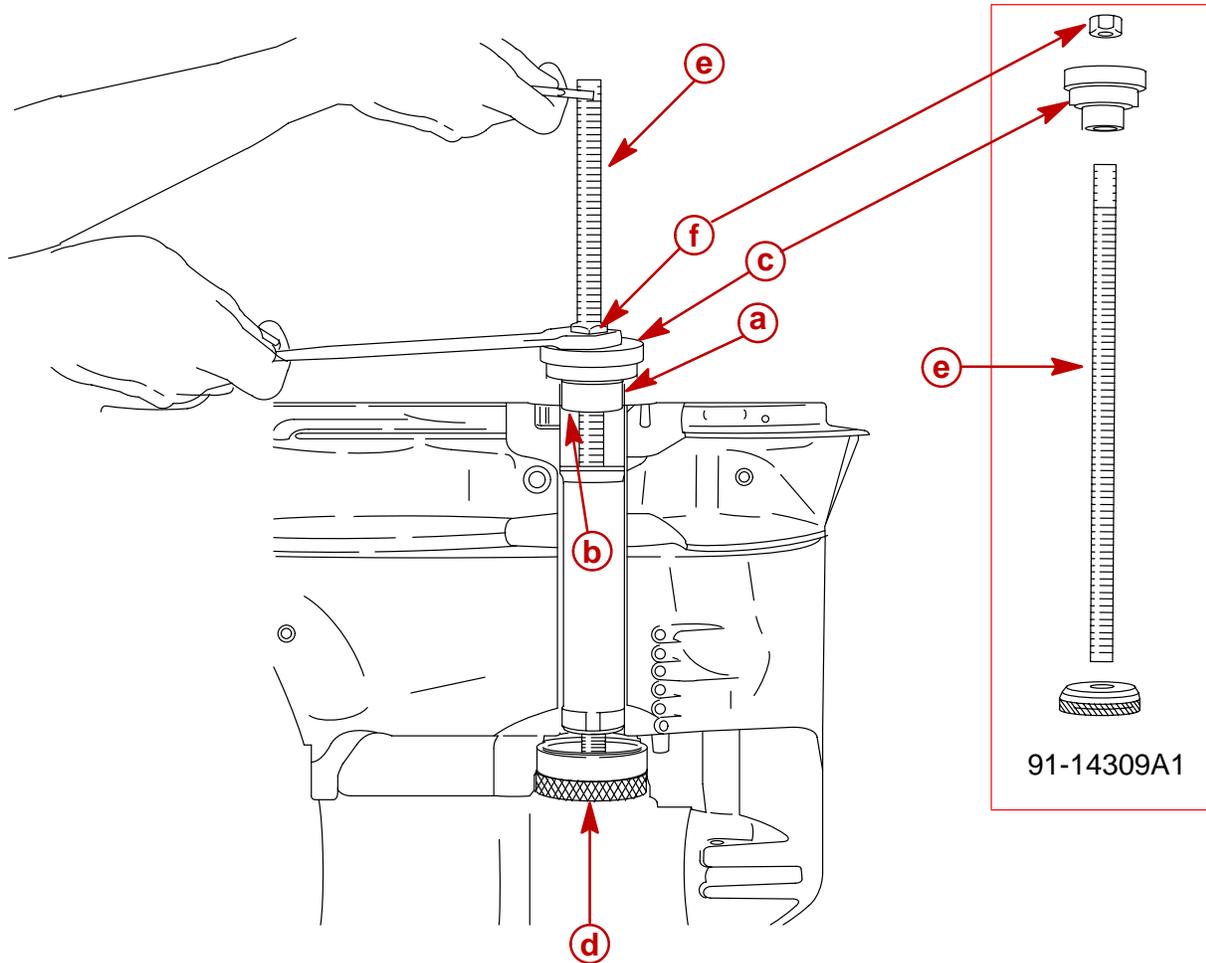
\*From Bearing Installation Tool (91-14309A1)



3. Install bearing/sleeve into housing.

**IMPORTANT:** Oil sleeve must be installed prior to upper driveshaft bearing installation.

**IMPORTANT:** Lower driveshaft bearing cup pilots the mandrel (13780) during installation of the upper driveshaft bearing/sleeve. Lower bearing cup must be installed prior to installing upper bearing/sleeve.



58206

- a** - Bearing/Sleeve
- b** - Tapered End Of Sleeve
- c** - Mandrel\* (13781)
- d** - Mandrel\* (13780)
- e** - Threaded Rod\*\* (91-31229)
- f** - Nut\*\* (11-24156)

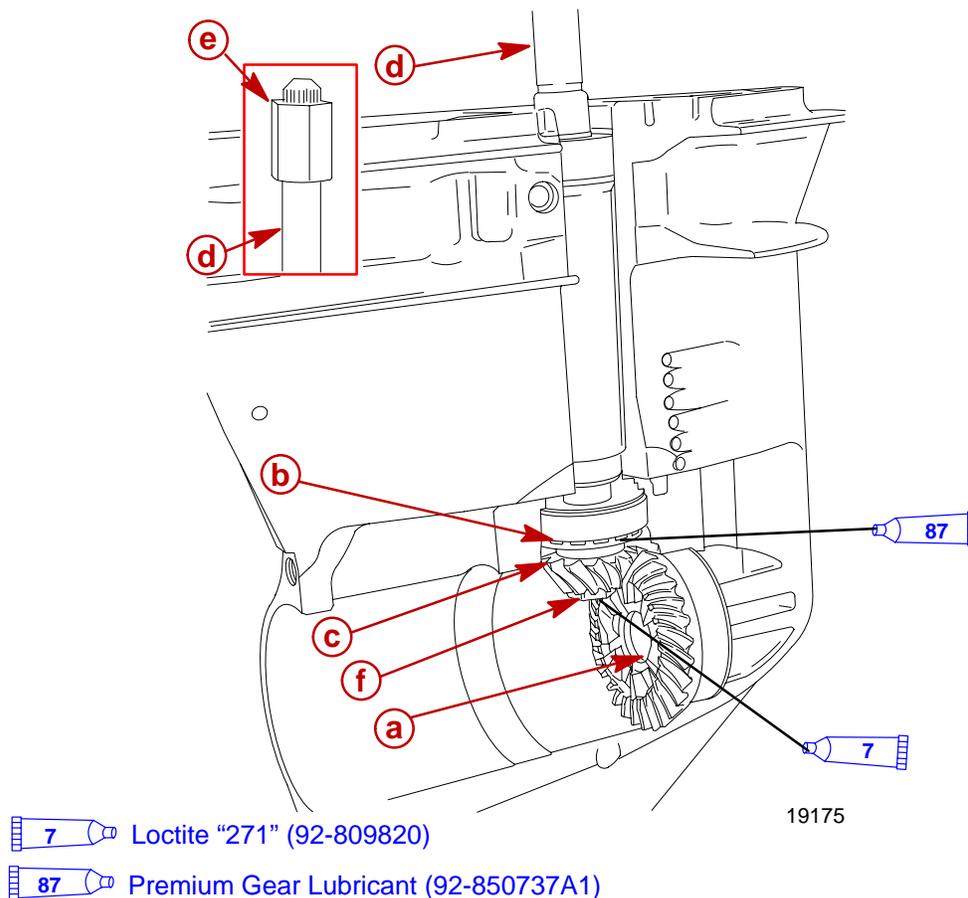
\*From Bearing Installation Tool (91-14309A1)

\*\*From Bearing Removal and Installation Kit (91-31229A7)



## Forward Gear, Drive Shaft Lower Bearing, Pinion Gear, and Drive Shaft Installation

1. Install components per assembly sequence shown.



### Assembly Sequence:

- a** - Forward Gear/Bearing: Work Premium Blend gear lube into bearing rollers.
- b** - Lower Drive Shaft Tapered Roller Bearing: Work Premium Blend Gear Lube into bearing rollers.
- c** - Pinion Gear
- d** - Drive Shaft
- e** - Drive Shaft Holding Tool
- f** - Pinion Nut (New): Clean nut and driveshaft threads with Loctite Primer or suitable de-greaser. Apply Loctite 271 to threads (**not necessary if using a new nut with drylock patch on threads**) during final assembly (after pinion gear depth and forward gear backlash have been set), tighten to specified torque.

Model	Drive Shaft Holding Tool
40/50 Bigfoot (4-Stroke)	91-56775
50/60 Bigfoot (4-Stroke)	91-817070A1
75/90/115EFI (4-Stroke)	91-804776A1
60 Bigfoot/75/90/100/115/125 (2-Stroke)	91-56775

Pinion Nut Torque
70 lb-ft (95 Nm)



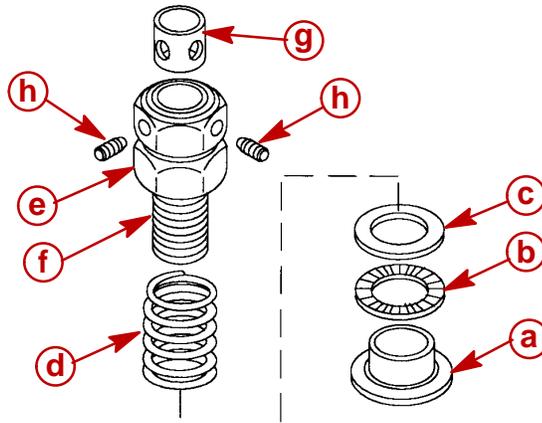
## Pinion Gear Depth and Forward Gear Backlash

### DETERMINING PINION GEAR DEPTH

**NOTE:** Read entire procedure before attempting any change in shim thickness.

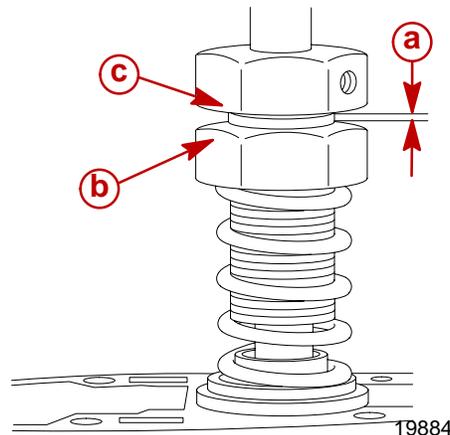
**IMPORTANT:** Forward gear assembly pilots the end of the pinion gauge and must be installed in gear housing when checking pinion gear depth. Without it an inaccurate measurement will be obtained.

1. Clean the gear housing bearing carrier shoulder and diameter.
2. With gear housing positioned up right (drive shaft vertical), install Bearing Preload Tool (91-14311A2) over drive shaft in sequence shown.



- a** - Adaptor: Bearing surfaces clean and free of nicks
- b** - Thrust Bearing: Oiled and able to move freely
- c** - Thrust Washer: Clean and free of nicks and bends
- d** - Spring
- e** - Nut: Threaded all-the-way onto bolt
- f** - Bolt: Held snug against spring
- g** - Sleeve: Holes in sleeve must align with set screws
- h** - Set Screw (2): Tightened against drive shaft, bolt should not slide on drive shaft.

3. Measure distance between top of nut and bottom of bolt head.
4. Increase distance by 1 in. (25.4 mm).
5. Rotate drive shaft 5 to 10 revolutions. This should properly seat drive shaft tapered roller bearing.

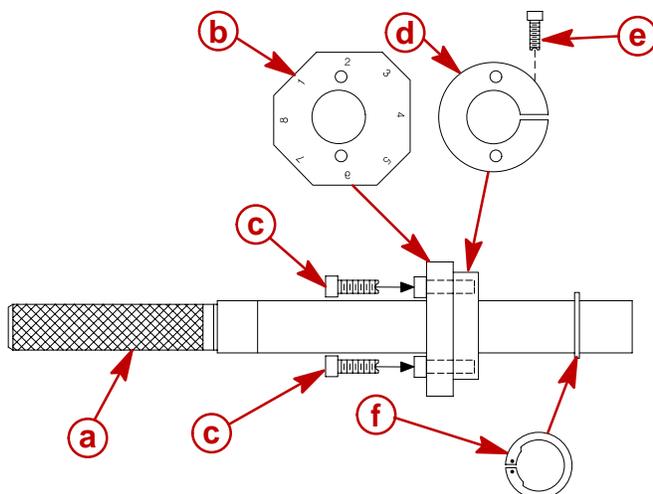


- a** - 1 in. (25.4 mm)
- b** - Nut

**c** - Bolt Head

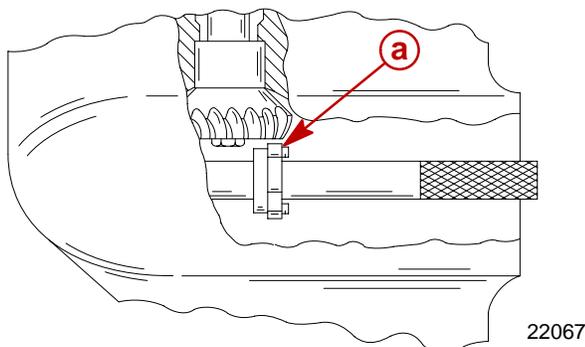


6. Assemble Pinion Gear Locating Tool (91-12349A2) as shown; do not tighten collar retaining screw at this time. Install gauging block with numbers away from split collar.



- a** - Arbor  
**b** - Gauging Block  
**c** - Screw (2)  
**d** - Split Collar  
**e** - Collar Retaining Screw  
**f** - Snap Ring

7. Insert tool into forward gear assembly; position gauging block under pinion gear as shown.



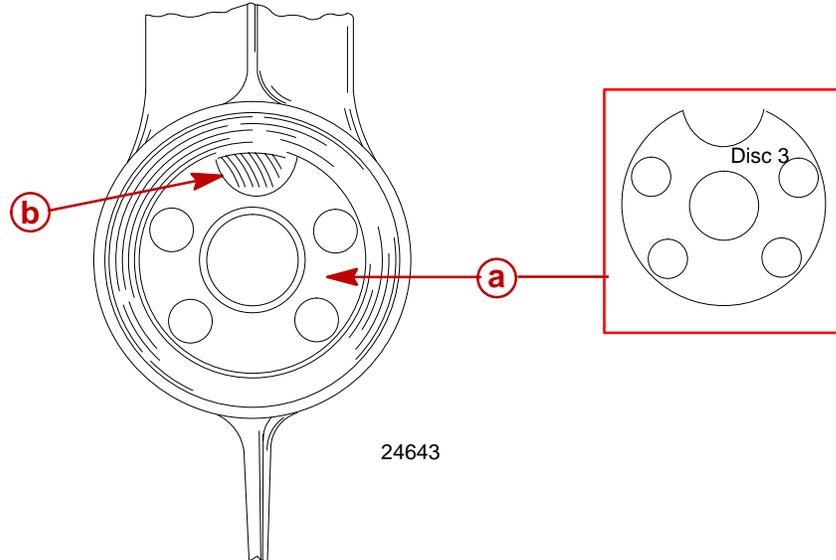
- a** - Gauging Block

8. Remove tool, taking care not to change gauging block position, and tighten collar retaining bolt.
9. Insert tool into forward gear assembly; position proper numbered flat (from chart) of gauging block – under pinion gear.

MODEL	GEAR RATIO (PINION GEAR TEETH/REVERSE GEAR TEETH)	USE FLAT NO.	LOCATING DISC NO.
40/50 Bigfoot (4-stroke)	2.31:1 (13/30)	8	3
50/60 Bigfoot (4-stroke)	2.31:1 (13/30)	8	3
75/90/115EFI (4-stroke)	2.07:1 (14/29)	2	3
60 Bigfoot/60 Seapro 60 Marathon	2.31:1 (13/30)	8	3
75-thru-90 (3 Cylinder)	2.31:1 (13/30)	8	3
100/115/125 (4 Cylinder)	2.07:1 (14/29)	2	3



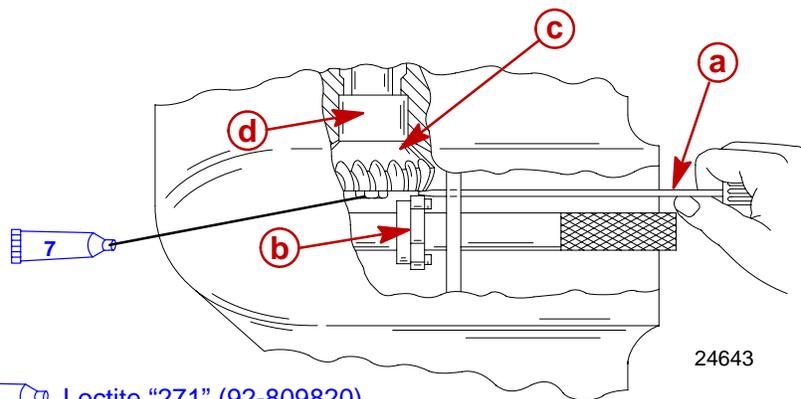
10. Install locating disc against bearing carrier shoulder in gear housing.
11. Position access hole as shown.



- a** - Locating Disc
- b** - Access Hole

12. Determine pinion gear depth by inserting a feeler gauge thru access hole in locating disc.
13. The correct clearance between gauging block and pinion gear is 0.025 in. (0.64 mm).
14. If clearance is correct, leave Bearing Preload Tool on drive shaft and proceed to "Determining Forward Gear Backlash," following.
15. If clearance is more than 0.025 in. (.064 mm) add shims behind the bearing race. If clearance is less than 0.025 in. (.064 mm) remove shims from behind the bearing race. When reinstalling pinion nut, apply Loctite 271 on threads of nut.

**NOTE:** Clean driveshaft and pinion nut threads with Loctite Primer or suitable de-greaser before applying Loctite.



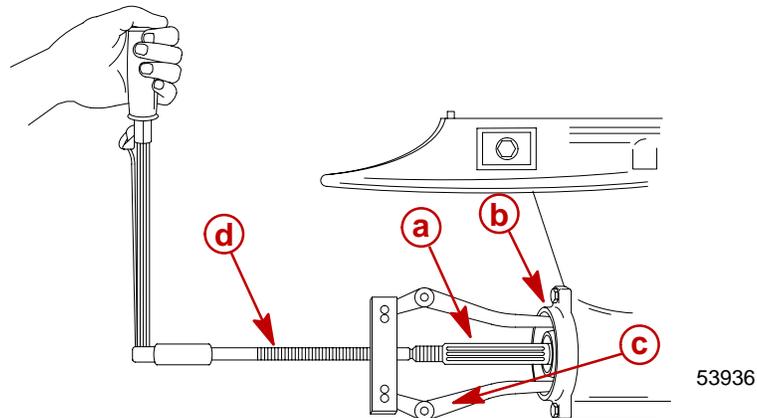
 Loctite "271" (92-809820)

- a** - Feeler Gauge
- b** - Gauging Block
- c** - Pinion Gear
- d** - Bearing Race

**DETERMINING FORWARD GEAR BACKLASH**

**NOTE:** Read entire procedure before attempting any change in shim thickness.

1. Obtain correct pinion gear depth; refer to “Determining Pinion Gear Depth,” preceding.
2. Install Bearing Preload Tool (91-14311A2) on drive shaft; refer to “Determining Pinion Gear Depth,” preceding.
3. Install components as shown.
4. While holding the driveshaft (to prevent from turning), torque the puller bolt to 45 lb-in.
5. Rotate driveshaft 5-10 revolutions. This should properly seat the forward gear tapered roller bearing. **Repeat step 4.**



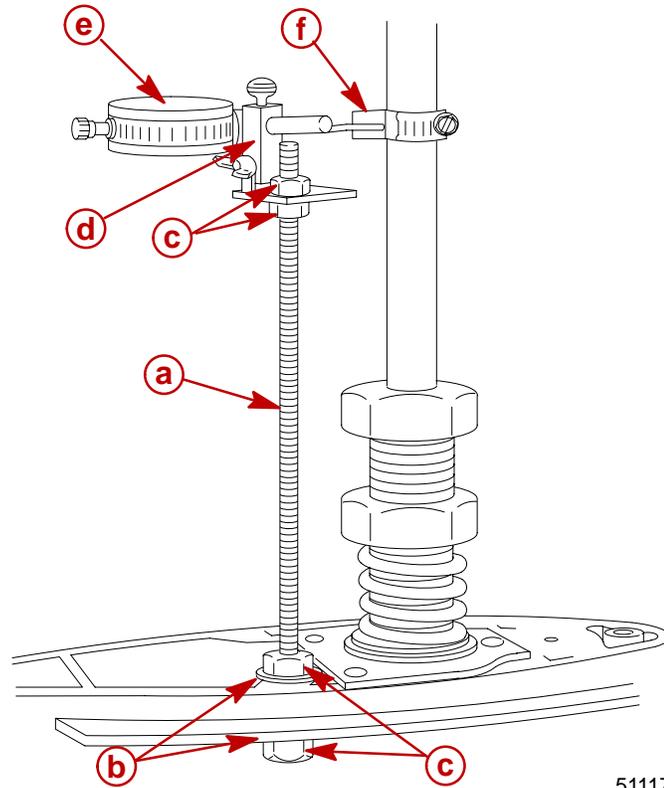
- a** - Propeller Shaft\*
- b** - Bearing Carrier\* (Assembled)
- c** - Puller Jaws (91-46086A1)
- d** - Puller Bolt (91-85716)

Puller Bolt Torque
45 lb-in. (5 Nm)

\*Refer to “**Bearing Carrier and Propeller Shaft Installation,**” following.



6. Install components as shown.



51117

- a** - Threaded Rod (Obtain Locally)
- b** - Washers
- c** - Nuts
- d** - Dial Indicator Adaptor Kit (91-83155)
- e** - Dial Indicator (91-58222A1)
- f** - Backlash Indicator Tool

7. Position Dial Indicator on appropriate line (from chart below) marked on Backlash Indicator Tool. Make sure the dial indicator is perpendicular ( $\perp$ ) to the indicator tool or an inaccurate reading will be obtained.

MODEL	BACKLASH INDICATOR TOOL	ALIGN POINTER OF DIAL INDICATOR WITH MARK
40/50 Bigfoot (4-stroke)	91-78473	4
50/60 Bigfoot (4-stroke)	91-78473	4
75/90/115EFI (4-Stroke)	91-19660--1	1
60 Seapro/60 Marathon 60 Bigfoot	91-78473	4
75-thru-90 (3 Cylinder)	91-78473	4
100/115/125 (4 Cylinder)	91-19660--1	1



8. Grasp the driveshaft pre-load tool bolt head and lightly turn drive shaft back-and-forth (no movement should be noticed at propeller shaft).
9. Dial Indicator registers amount of backlash, which must be between specification shown in chart.

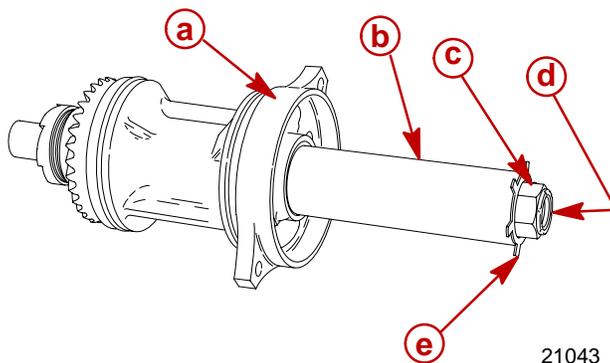
MODEL	DIAL INDICATOR MINIMUM	READING MAXIMUM
40/50 Bigfoot (4-Stroke)	0.012 in. (0.30 mm)	0.019 in. (.48 mm)
50/60 Bigfoot (4-Stroke)	0.012 in. (0.30 mm)	0.019 in. (.48 mm)
75/90/115EFI (4-Stroke)	0.013 in. (0.38 mm)	0.019 in. (.55 mm)
60 Bigfoot	0.012 in. (0.30 mm)	0.019 in. (.48 mm)
75-thru-90 (3 Cylinder)	0.012 in. (0.30 mm)	0.019 in. (.48 mm)
100/115/125 (4 Cylinder)	0.013 in. (0.38 mm)	0.019 in. (0.55 mm)

10. If backlash is less than the minimum specification, remove shim(s) from in front of forward gear bearing race. If backlash is more than the maximum specification, add shim(s) in front of forward gear bearing race. When reinstalling pinion nut, apply Loctite 271 on threads of nut.

**NOTE:** By adding or subtracting 0.001 in. (0.025 mm) shim, the backlash will change approximately 0.001 in.

## Bearing Carrier and Propeller Shaft Installation

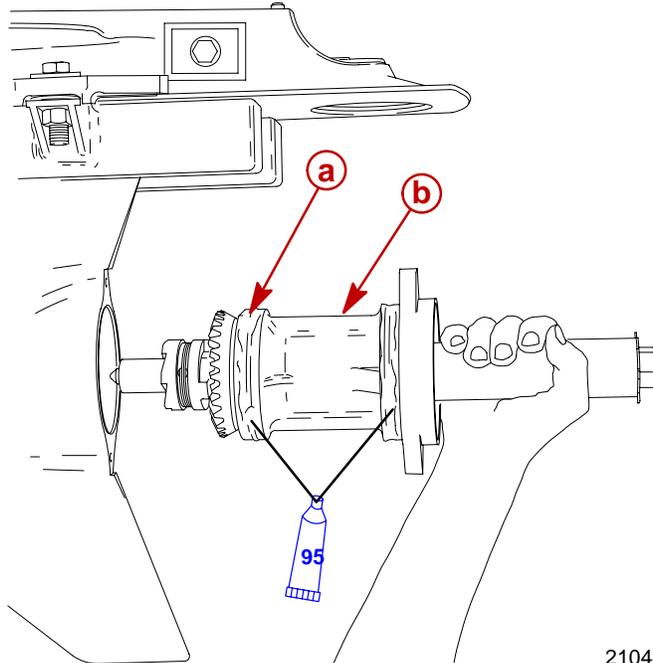
1. Insert propeller shaft assembly into bearing carrier.
2. Before installing bearing carrier assembly into gear housing, obtain locally a 6 in. (152.4 mm) long by 1-1/4 in. – 1-1/2 in. (31.7 – 38.1 mm) diameter piece of PVC pipe. Install the PVC pipe over the prop shaft and secure the pipe against the bearing carrier assembly with the propeller nut and tab washer. This holds the reverse gear and thrust bearing tight against the bearing carrier preventing possible bearing damage during installation.



- a** - Bearing Carrier Assembly
- b** - PVC Pipe
- c** - Propeller Nut
- d** - Prop Shaft
- e** - Tab Washer



3. Generously lubricate O-ring, bearing carrier, and gear housing mating surfaces with 2-4-C w/Teflon.
4. Install bearing carrier and propeller shaft into housing with the word “TOP” (located on flange) toward top of housing.



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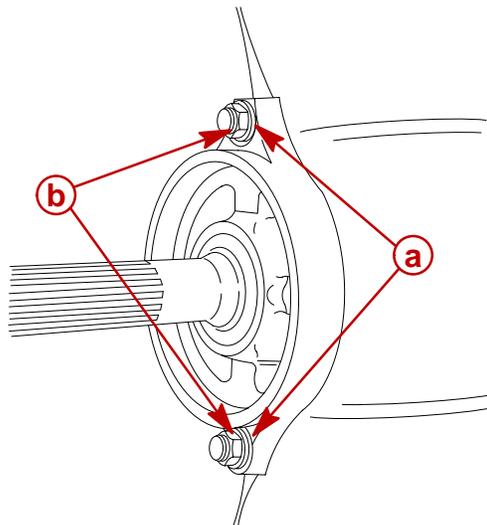


**a** - O-ring

**b** - TOP

**NOTE:** Use thick 0.090 in. (2.29mm) washers (12-855941) under fasteners if not previously installed.

Washer Thickness	Fastener Torque
0.090 in. (2.29mm)	22 lb-ft (29.8 Nm)
0.060 in. (1.53mm)	25 lb-ft (33.9 Nm)



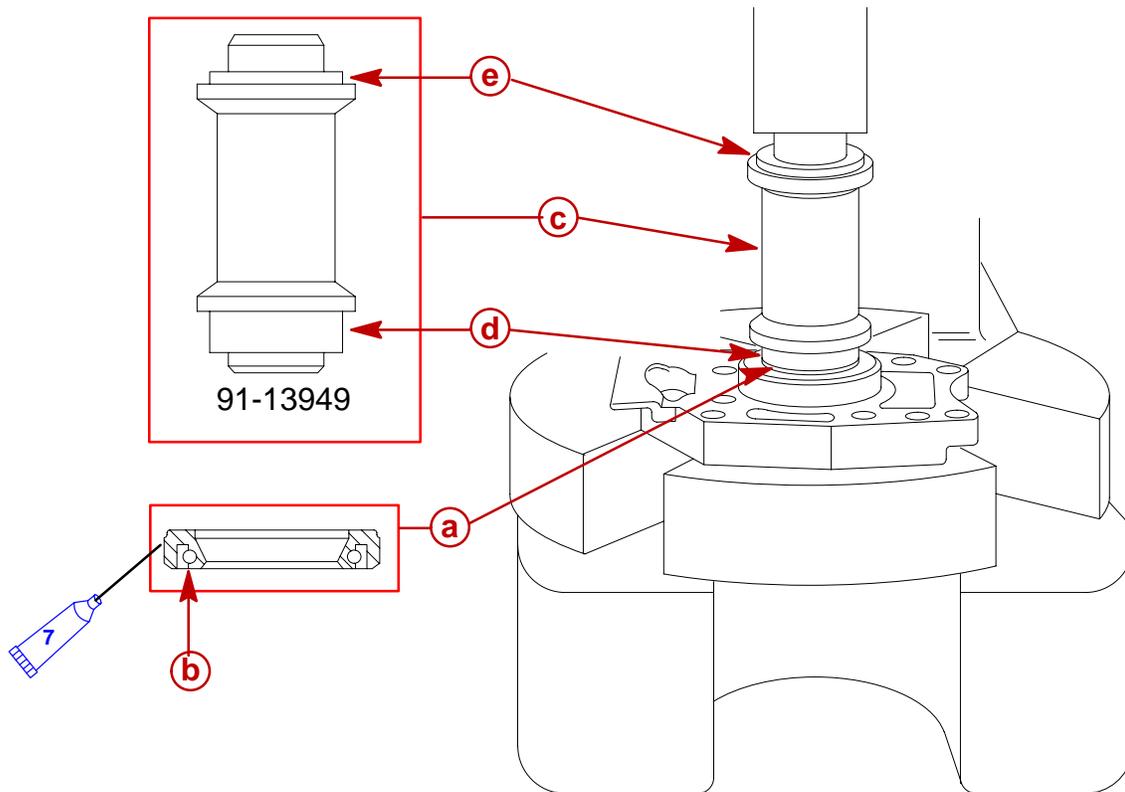
**a** - Washers

**b** - Fasteners (If using Screws Apply Loctite 271 on Threads)



## Water Pump Reassembly and Installation

1. Place water pump base upper seal on longer shoulder side of Oil Seal Driver (91-13949) with seal lip away from shoulder.
2. Apply Loctite 271 on O.D. of seal; press seal into water pump base until tool bottoms.



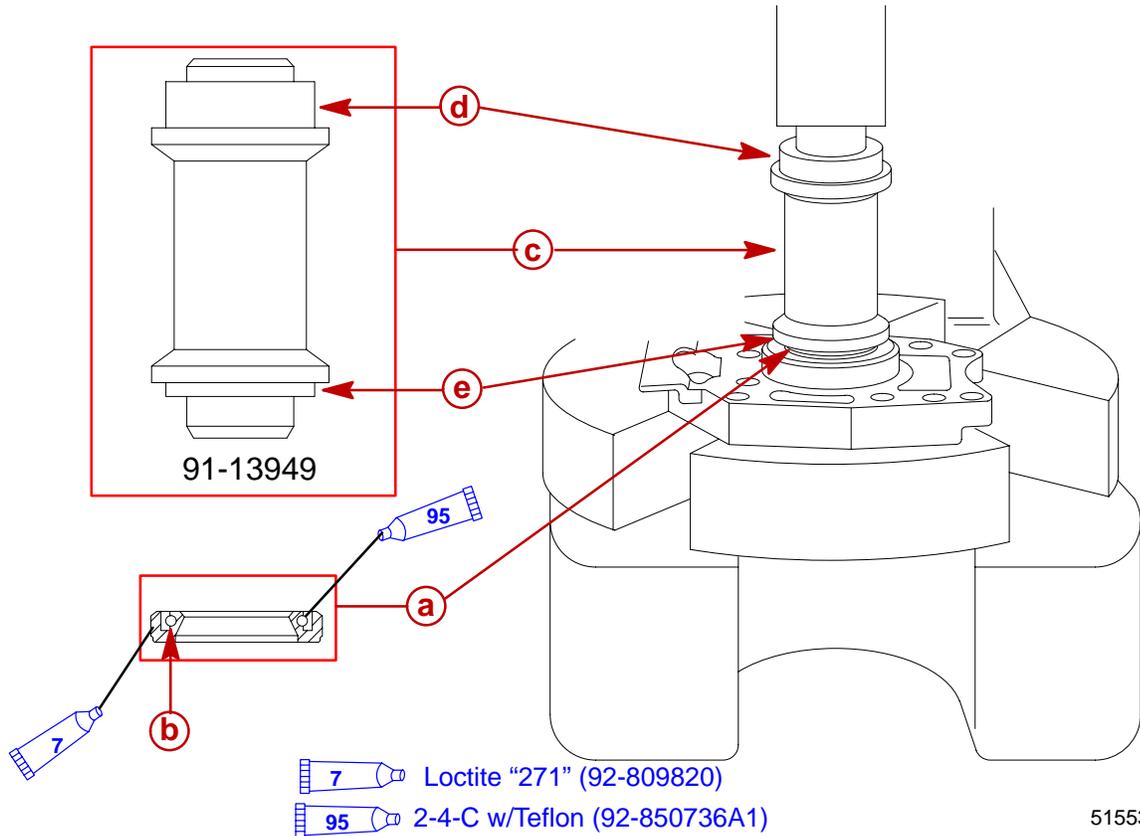
 Loctite "271" (92-809820)

51553

- a** - Seal - Lip Faces UP (when water pump base is installed on gearcase)
- b** - Spring - Faces UP (when water pump base is installed on gearcase)
- c** - Oil Seal Driver (91-13949)
- d** - Longer Shoulder Side of Oil Seal Driver
- e** - Shorter Shoulder Side of Oil Seal Driver

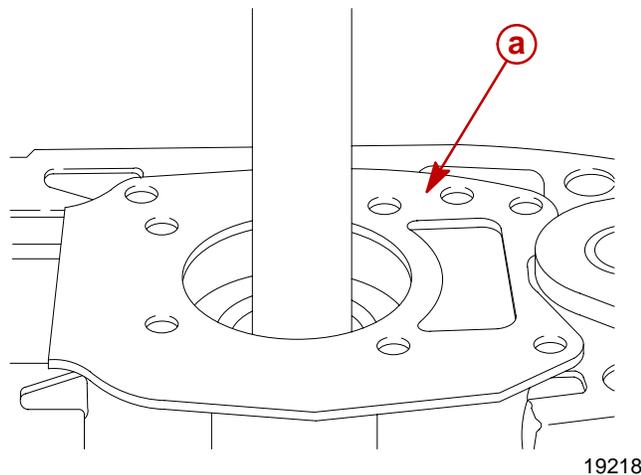


3. Place water pump base lower seal on shorter shoulder side of Oil Seal Driver (91-13949) with seal lip toward shoulder.
4. Apply Loctite 271 on O.D. of seal; press seal into water pump base until tool bottoms.
5. Lubricate lip of each seal with Quicksilver 2-4-C w/Teflon (92-850736A1).



- a** - Seal - Lip Faces DOWN (when water pump base is installed on gearcase)
- b** - Spring - Faces DOWN (when water pump base is installed on gearcase)
- c** - Oil Seal Driver (91-13949)
- d** - Longer Shoulder Side of Oil Seal Driver
- e** - Shorter Shoulder Side of Oil Seal Driver

6. Install gasket.

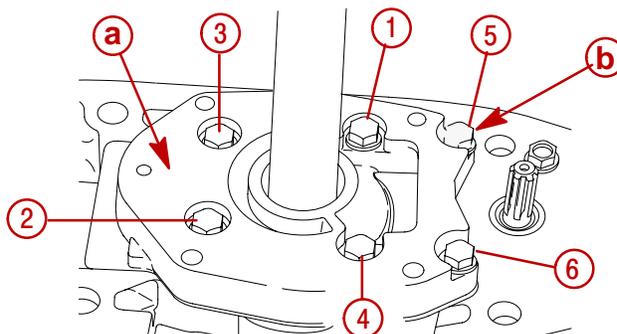


- a** - Gasket



**IMPORTANT:** To prevent cutting the seal lips remove any burrs or sharp edges from the driveshaft splines before installing water pump base assembly.

7. Install components as shown. Apply Loctite 271 on bottom half of screw threads and tighten to specified torque (in sequence shown).



 Loctite "271" (92-809820)

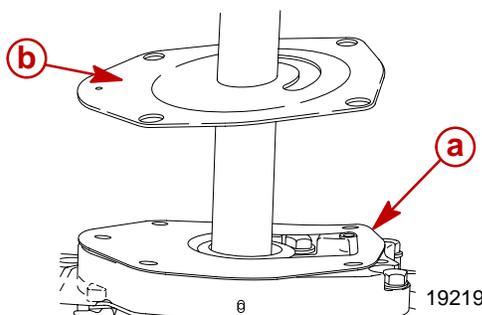
19217

**a** - Water Pump Base

**b** - Screw (6) M6 x 1 and Washers(6)

Screw Torque
60 lb-in. (6.8 Nm)

8. Install gasket and plate.

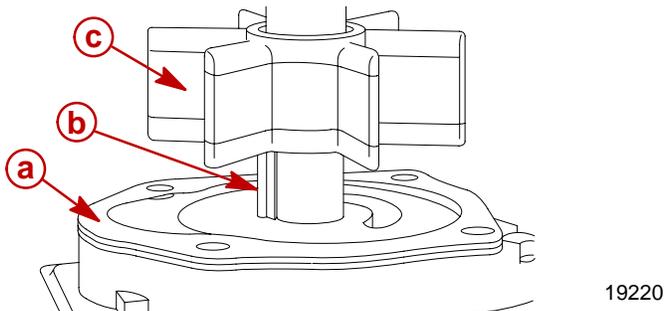


**a** - Gasket

**b** - Plate

**IMPORTANT:** If the old impeller is re-used it must be installed in original (clockwise) direction of rotation.

9. Install gasket, drive key and impeller.



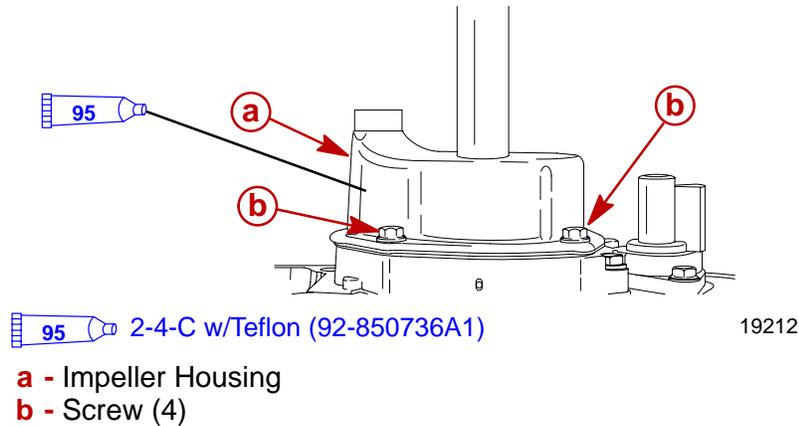
**a** - Gasket

**b** - Drive Key

**c** - Impeller



10. Lubricate I.D. of cover with Quicksilver 2-4-C w/Teflon.
11. Rotate drive shaft clockwise and push impeller housing down (over impeller) until it contacts water pump base.
12. Apply Loctite 271 to bottom threads of cover screws. Install cover screws and tighten to specified torque.



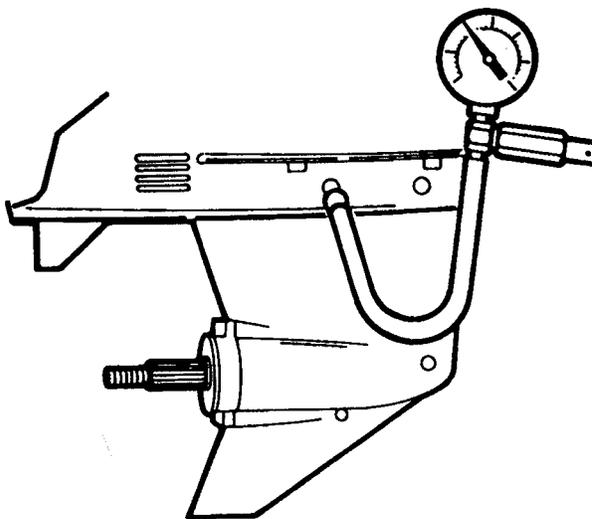
Screw Torque
60 lb-in. (6.8 Nm)

**NOTE:** It is recommended that the gearcase be pressure tested for leaks after reassembly and **BEFORE** gear lube is added. Gearcase should hold 10-12 psi (69-83 kPa) for 5 minutes.

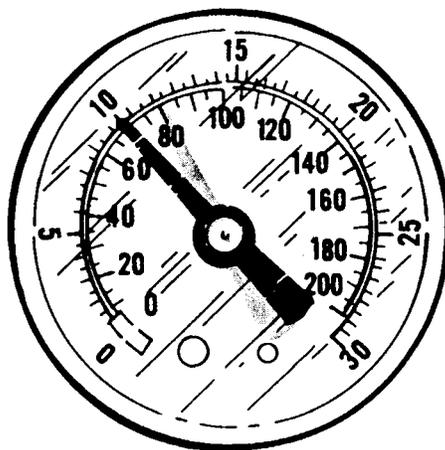


## Gear Housing Pressure Test

1. Remove vent plug and install pressure test gauge.



2. Pressurize housing to 10-12 psi (69-83 kPa) and observe gauge for 5 minutes.
3. Rotate drive shaft, prop shaft and shift shaft while housing is pressurized to check for leaks.



4. If pressure drop is noted, immerse housing in water.
  5. Re-pressurize to 10-12 psi (69-83 kPa) and check for air bubbles.
  6. Replace leaking seals as necessary. Retest housing.
- NOTE:** Gearcase should hold 10-12 psi (69-83 kPa) for 5 minutes.
7. Remove tester from housing and install vent plug and sealing washer.



## Filling Gear Housing With Lubricant

**NOTE:** Gear housing lubricant capacity is 24 fl oz (710 mL).

### ⚠ WARNING

If gear housing is installed on engine, to avoid accidental starting, disconnect (and isolate) spark plug leads from spark plugs before working near the propeller.

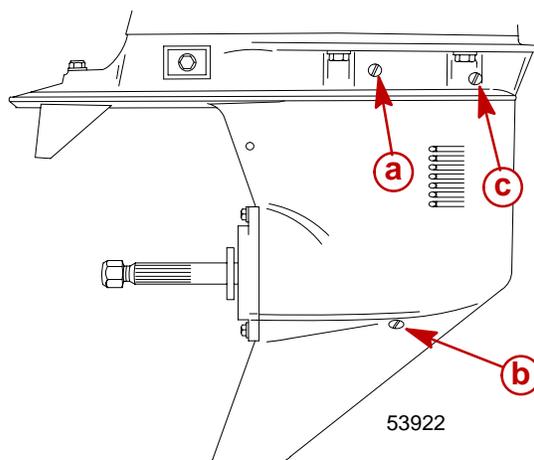
### ⚠ CAUTION

Do not use automotive grease in the gear housing. Use only Quicksilver Premium Blend Gear Lube.

1. Remove any gasket material from “Fill/Drain” and “Vent” screws and gear housing.
2. Install new sealing washer on “Fill/Drain” and “Vent” screws.

**IMPORTANT:** Never apply lubricant to gear housing without first removing “Vent” screws or gear housing cannot be filled because of trapped air. Fill gear housing only when driveshaft is in a vertical position.

3. Remove lubricant “Fill/Drain” screw and sealing washer from gear housing.
4. Insert lubricant tube into “Fill” hole, then remove “Vent” screws and sealing washer.
5. Fill gear housing with lubricant until excess starts to flow out of one (first) “Vent” screw hole.
6. Install this “Vent” screw and sealing washer only and continue filling until excess starts to flow out of second “Vent” screw hole.
7. Rotate driveshaft clockwise approximately 10 revolutions. Let gearcase sit for at least one minute to allow any trapped air to settle out, then top off lubricant level.



- a** - Vent Screw - Torque to 60 lb-in. (6.8 Nm)
- b** - Fill/Drain Screw - Torque to 60 lb-in. (6.8 Nm)
- c** - Oil Level Vent Screw - Torque to 60 lb-in. (6.8 Nm)

8. Replace second lubricant “Vent” screw and sealing washer.

**IMPORTANT:** Do not lose more than one fluid ounce (30cc) of gear lubricant while re-installing “FILL/DRAIN” screw.

9. Remove lubricant tube from Fill/Drain hole; install Fill/Drain screw and sealing washer.



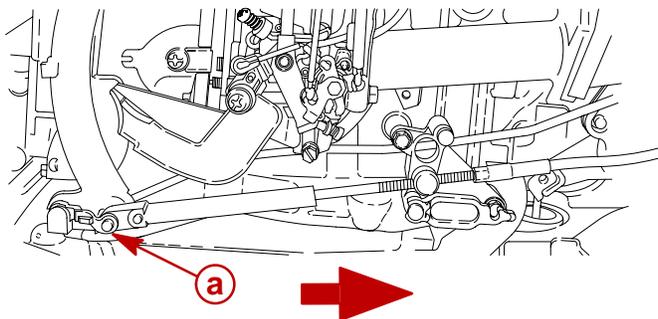
# Gearcase Installation

## ⚠ WARNING

Disconnect (and isolate) spark plug leads from spark plugs before installing gear housing onto drive shaft housing. Failure to follow this warning could result in accidental engine starting and possible injury.

1. Position outboard shift linkage into forward gear position.

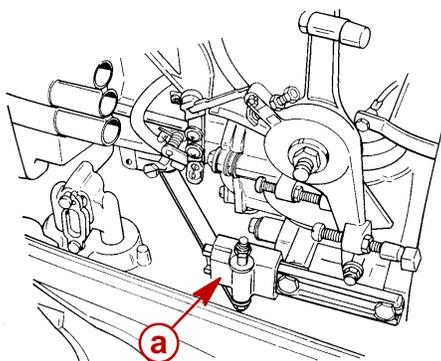
### Models 40-60 Bigfoot (4-Stroke)



#### Remote Control Model Shown

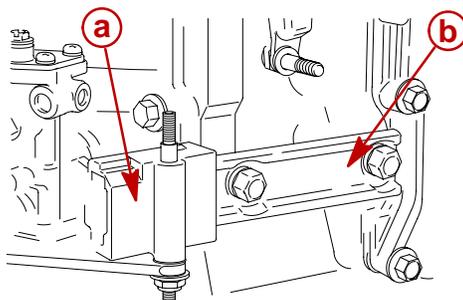
**a** - Shift Lever

### Models 60 Bigfoot (2-Stroke)



**a** - Shift Block

### Models 75/90/100/115/125 (2-Stroke)

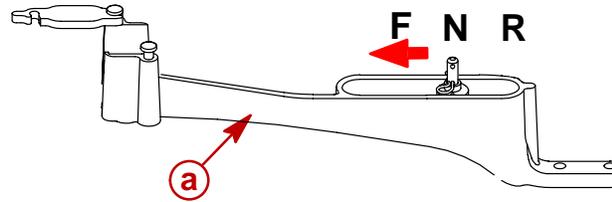


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**a** - Shift Block; Front of Block MUST Extend 1/8 in. (3.2 mm) Past Front of Rail.  
**b** - Rail



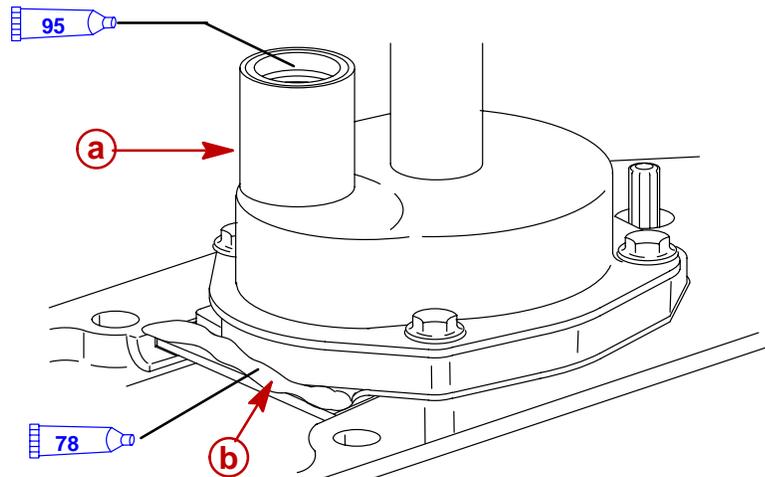
### Models 75/90/115EFI (4-Stroke)



**a** - Shift Block

2. Tilt engine to full up position and engage tilt lock lever.
3. Shift gear housing into neutral position. Propeller shaft will rotate freely in either direction.
4. Install water tube seal; apply 2-4-C w/Teflon to I.D. of seal.
5. Apply a bead of RTV Sealer as shown.

**NOTE:** For ease of gear housing installation, install water tube seal (labyrinth end) onto water tube in drive shaft housing. Tapered end of water tube seal goes onto water pump.



- 78** G. E. RTV Sealant 92-90113--2  
**95** 2-4-C w/Teflon (92-850736A1)

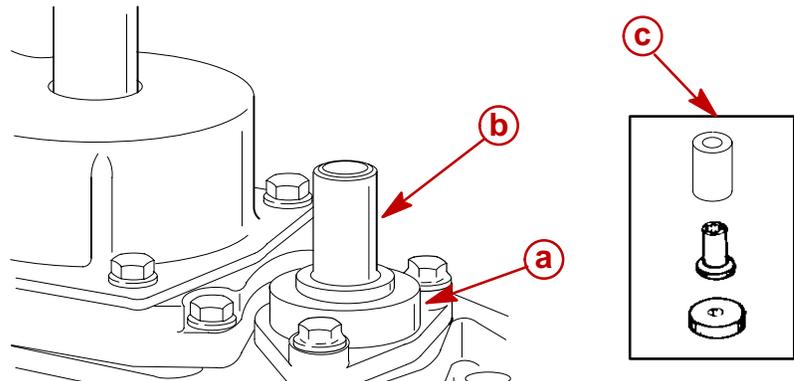
**a** - Water Tube Seal  
**b** - RTV Sealer

53938

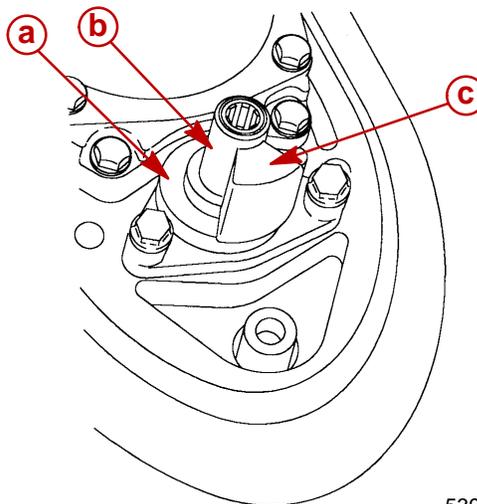
**⚠ CAUTION**

Do not use lubricant on top of drive shaft. Excess lubricant, that is trapped in clearance space, will not allow drive shaft to fully engage with crankshaft. Subsequently, tightening the gear housing fasteners (while lubricant is on top of drive shaft) will load the drive shaft/crankshaft and damage either or both the power head and gear housing. Top of drive shaft is to be wiped free of lubricant.

6. Apply a light coat of Quicksilver 2-4-C w/Teflon onto drive shaft splines.
7. Apply a light coat of Quicksilver 2-4-C w/Teflon on gear case shift shaft splines and upper shift shaft splines. Do not use lubricant on ends of shift shafts.
8. Install components as shown in appropriate photo.

**ALL MODELS EXCEPT 75 (2-STROKE) W/MECHANICAL REVERSE LOCK**

- a** - Nylon Spacer
- b** - Shift Shaft Coupler
- c** - Bushing 40-60 Bigfoot **4-Stroke Only**

**75 (2-STROKE) W/MECHANICAL REVERSE LOCK**

53925

- a** - Nylon Spacer
- b** - Shift Shaft Coupler
- c** - Flat; **MUST BE** Positioned Toward Front of Gear Housing



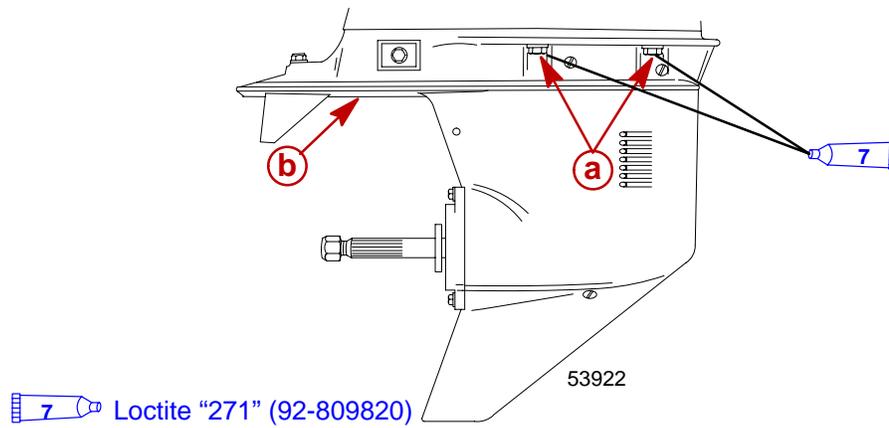
9. Shift gear housing into forward gear position. In forward gear the gear housing will ratchet when propeller shaft is turned clockwise. Resistance will be felt when propeller shaft is rotated counterclockwise.
10. Apply Loctite Grade 271 on threads of gear housing retaining bolts.

**NOTE:** During installation of gear housing, it may be necessary to move the shift block (located under cowl) slightly to align upper shift shaft splines with shift shaft coupler splines.

**NOTE:** On 75/90 hp (4-Stroke) models. If, while performing Step 11, the drive shaft splines will not align with the oil pump splines, place a propeller onto propeller shaft and turn it counterclockwise as the gear housing is being pushed toward drive shaft housing. Continue rotating the propshaft until the driveshaft splines align with the crankshaft splines.

**IMPORTANT:** 75/90 hp (4-Stroke) models, when removing or installing gearcase, carefully guide driveshaft through driveshaft bushing to avoid scoring bushing surface.

11. Position gear housing so that the driveshaft is protruding into driveshaft housing.
12. Move gear housing up toward driveshaft housing, while aligning upper shift shaft splines with shift shaft coupler splines, water tube with water tube seal, and crankshaft splines with driveshaft splines.
13. Install 4 fasteners and washers (two each side). Install locknut and washer.
14. Torque bolts and locknut (or nuts only if applicable) to specified torque.



- a - Fasteners and Washers (2 Each Side)
- b - Locknut and Washer

Bolt or Nut Torque
40 lb-ft (54 Nm)

15. Check shift operation as follows:
  - Place shift lever in forward gear. Gear housing should ratchet when propeller shaft is turned clockwise. Resistance should be felt when propeller shaft is turned counterclockwise.
  - Place shift lever in neutral. Propeller shaft should rotate freely in either direction.
  - While rotating propeller shaft, place shift lever in reverse gear. Resistance should be felt when propeller shaft is rotated in either direction.

**IMPORTANT:** If shift operation is not as described above, the gear housing must be removed and the cause of the problem corrected.



## Trim Tab Adjustment and Replacement

**IMPORTANT:** The trim tab is now painted and does NOT aid in protecting the drive shaft housing and gear housing from galvanic corrosion (corrosion and pitting of metal surfaces). Side anodes now provide protection. Do not paint or place protective coating on the side anodes, or corrosion protection function will be lost.

### TRIM TAB REPLACEMENT

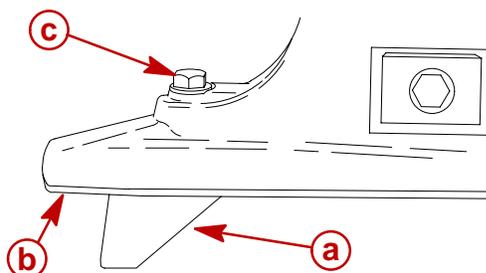
1. Replace trim tab if damaged. Mark location of old trim tab on anti-ventilation plate before removal; install new trim tab in same location.

### TRIM TAB ADJUSTMENT

**NOTE:** The trim tab provides a means to offset (balance) some of the steering load that is caused by propeller torque at higher operating speeds.

**NOTE:** Loosen trim tab bolt sufficiently to allow trim tab to disengage from locking ridges in gear case before attempting to move tab. DO NOT strike trim tab with a hard object to make adjustments.

1. Shift engine control into **NEUTRAL** and turn ignition key to **OFF** position.
2. If at higher speeds the boat turns more easily to the left, loosen screw, move the trim tab (trailing edge) to the left (when viewed from behind). Tighten retaining screw to specified torque.
3. If the boat turns more easily to the right, loosen screw, move the trim tab (trailing edge) to the right (when viewed from behind) turn trim tab (trailing edge) to the right . Tighten retaining screw to specified torque.



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- a - Trim Tab
- b - Anti-Ventilation Plate
- c - Retaining Screw and Washer

Retaining Screw Torque
22 lb-ft (29.8 Nm)