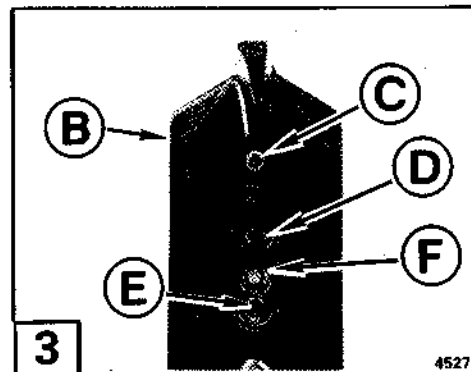
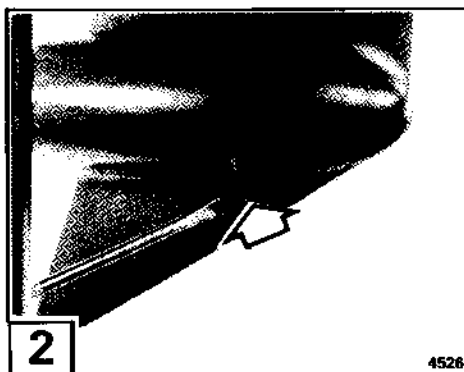
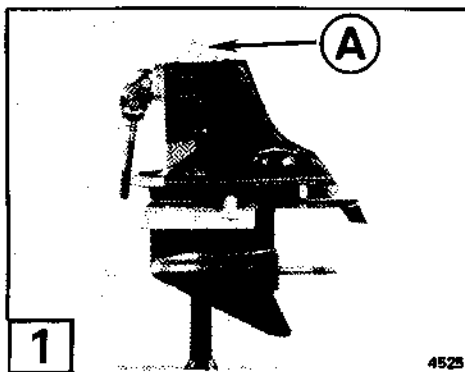




Vertical Drive Removal

To service the lower gearcase assembly, remove the complete vertical drive unit from the transom of the boat. See **Section 17** for the removal procedure.

Upper Gear Housing Removal

1 1. Mount the vertical drive assembly in a suitable holding fixture and clamp it securely. Unscrew the lifting eye (A) and leave the oil level hole open so the oil reservoir vents when draining.

2 2. Place a 4 quart drain pan under the lower gearcase. Remove the lower drain plug, discard the nylon washer, and let the vertical drive drain completely.

3 3. Note the relationship of the gearcase index mark and trim tab grid (B) so the two can be realigned later. Remove the screw (C) and trim tab.

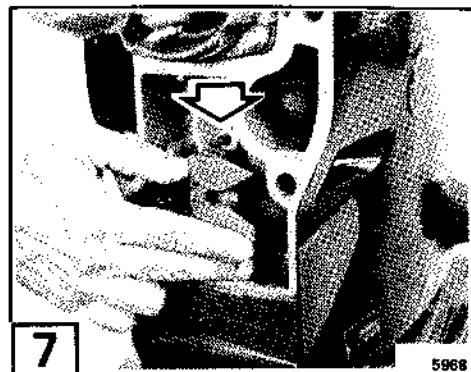
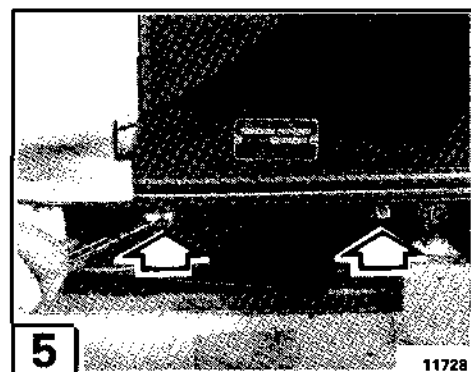
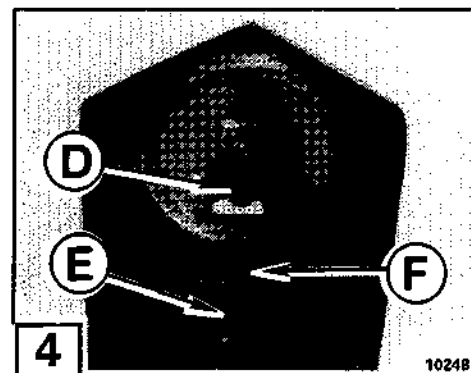
If there is no grid, scribe a reference mark on the gearcase and trim tab so tab can be reinstalled in the same position.

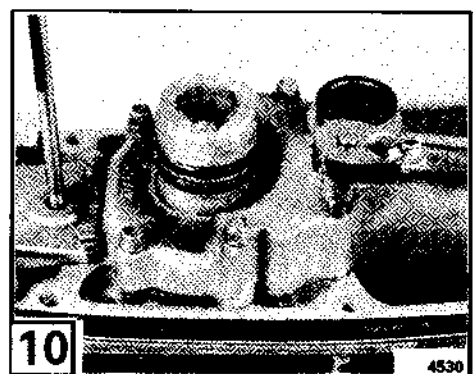
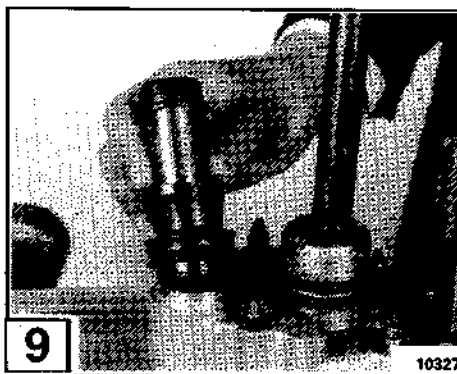
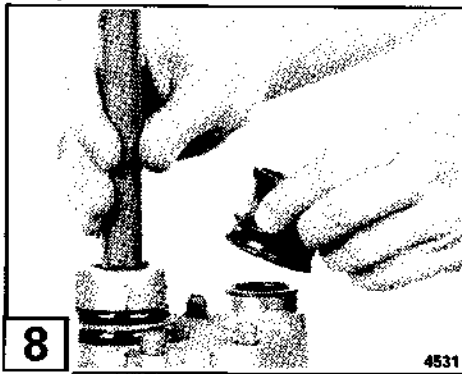
3 **4** 4. Remove screw (D) under the trim tab, then remove screw (E). Do not unscrew the anode screw (F).

5 5. Take out the four bolts along the underside of the upper gear housing.

6 6. The upper gear housing is now held in place only by O-rings. Firmly hold the housing as shown and pull upward forcefully. Rotating the housing side-to-side while pulling will help free it.

7 7. Lift gear housing until shift rod head disengages guide pin, then rotate head of shift rod 90° to port so head clears exhaust opening when removing upper gear housing.





Lower Gearcase Disassembly

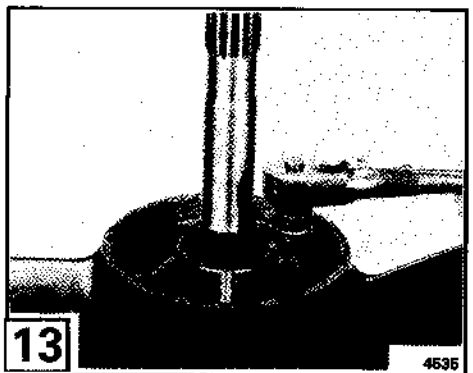
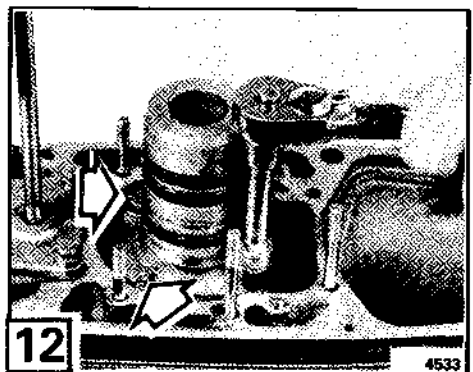
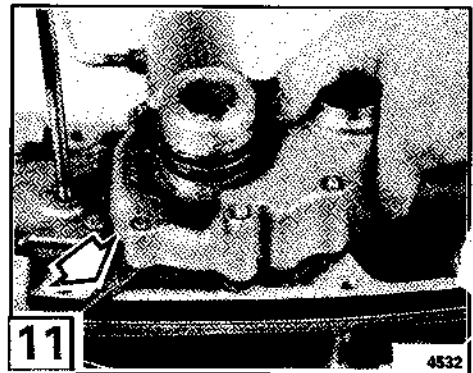
8 9 1. Pull out the intermediate driveshaft and lift off the plastic water tube guide. Also remove water tube and seal if stuck in tube guide.

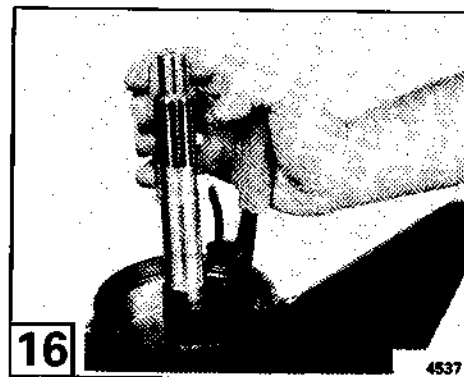
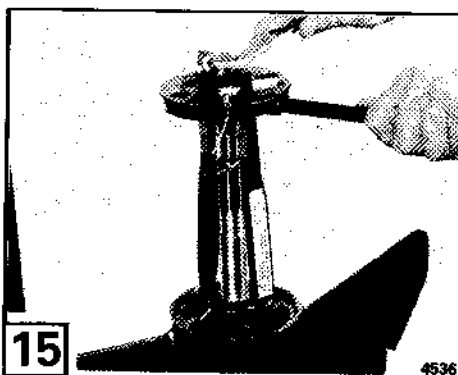
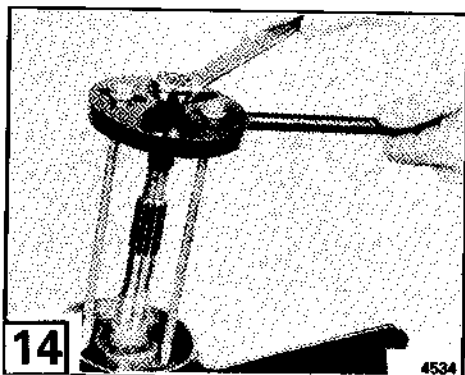
10 2. Remove and discard the elastic locknuts securing the water passage housing. Set the flat washers aside.

11 3. The housing is held by a gasket and an O-ring. Loosen the housing by pulling up on it while gently prying under the edge of the casting near the forward studs. When it's free pull it up over the driveshaft housing and discard the gasket underneath.

12 4. Remove the four driveshaft bearing housing screws and washers. This will allow the driveshaft to move upward when unscrewing the pinion nut.

13 5. Take out the four screws holding the propeller shaft bearing housing and discard them. They have a special sealing head and should not be reused.





Propeller Shaft Bearing Housing Removal

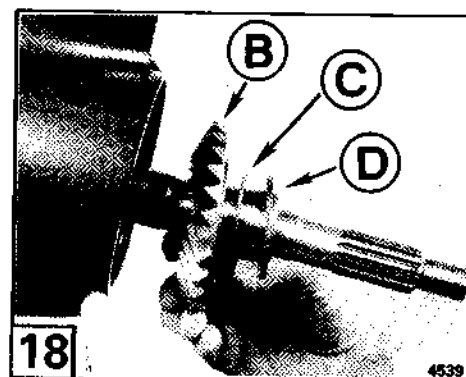
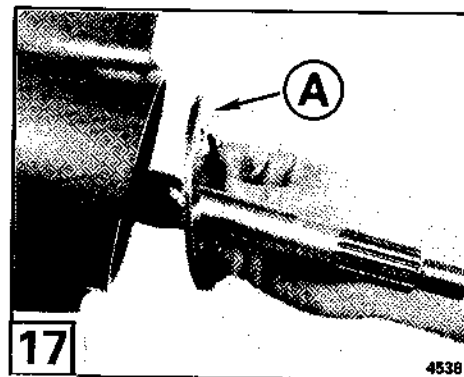
14 • **2.3 Litre Models** - Use two OMC Puller Bolts and Washers P/N 316982, and OMC Puller Head P/N 307636 (from OMC Universal Puller P/N 378103). Insert the bolts through the puller head and thread them into the bearing housing. Screw in the large center puller bolt to remove the housing.

15 • **3.0 thru 5.8 Litre Models** - Use two OMC Puller Legs P/N 330278, and Puller Head P/N 307636. Attach the tools as shown, and pull out the propeller shaft bearing housing by screwing in the puller bolt.

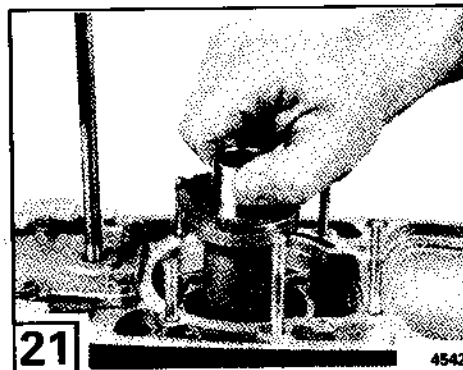
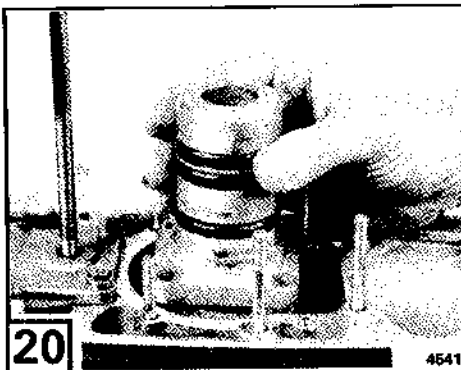
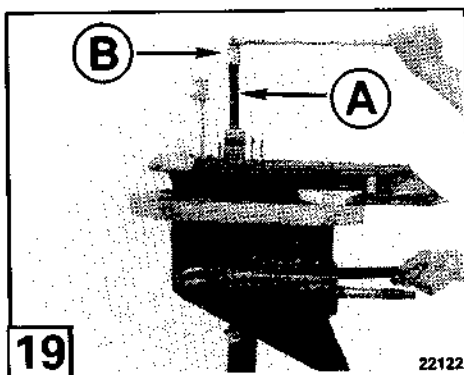
16  **1. Wear safety glasses.** Use OMC Retaining Ring Pliers P/N 331045 to lift the two large retaining rings out of the gearcase. Proceed slowly and with care. Both rings are under extreme pressure when compressed. Carefully release tension on pliers after clearing gearcase, while rings are still around propeller shaft.

17 **18** **2. Lift the retaining plate (A) out of the gearcase, then take out the reverse gear (B), thrust bearing (C) and thrust washer (D).**

3. Rotate the propeller shaft while pulling up on the shift rod. This will engage forward gear and help provide clearance to insert a wrench to unscrew the pinion nut.



Safety Related



19 4. Reinsert the intermediate driveshaft **A**. Hold the pinion nut with OMC Pinion Nut Holder P/N 334455, and unscrew the pinion nut by turning the driveshaft with OMC Spline Socket P/N 311875 **B**.

20 5. Remove the intermediate driveshaft, then pull out the driveshaft bearing housing.

21 6. Pull the lower driveshaft out of the gearcase; try wiggling it to loosen it. A thrust bearing, thrust washer and shims will come out with the driveshaft.

22 7. Reach inside the gearcase and take out the pinion gear, nut and any loose needle bearings that may have fallen into the gearcase when the lower driveshaft was pulled out.

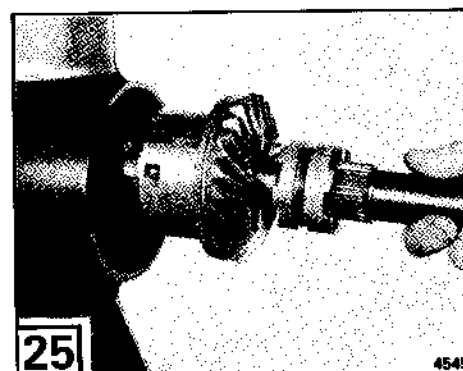
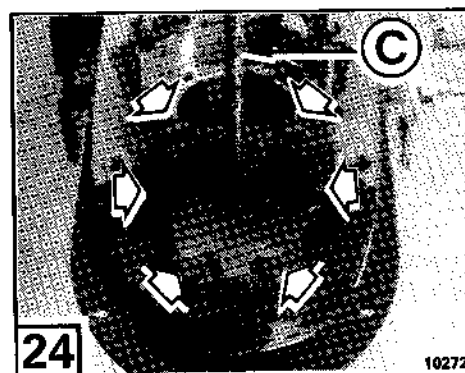
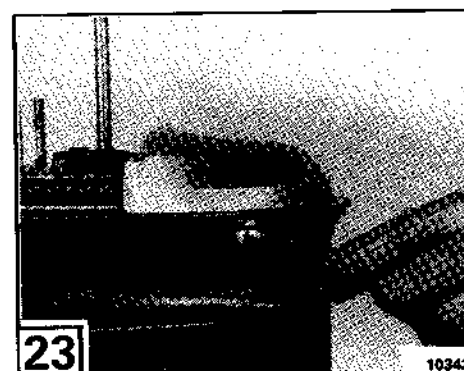
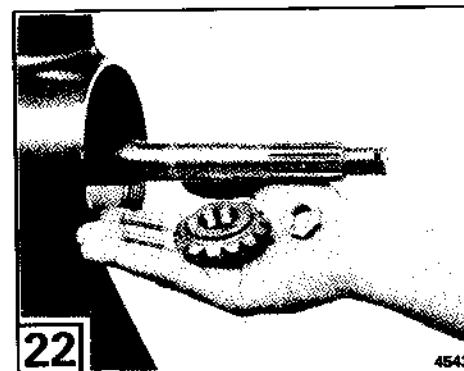
23 8. Remove two anode screws and anode to expose shift rod cover completely.

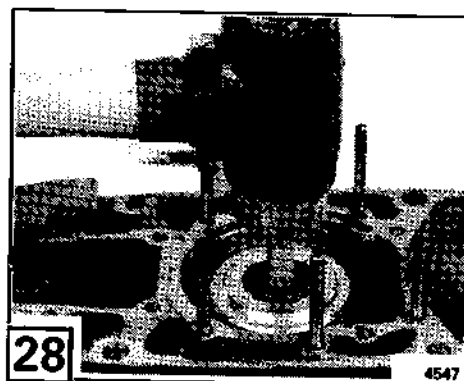
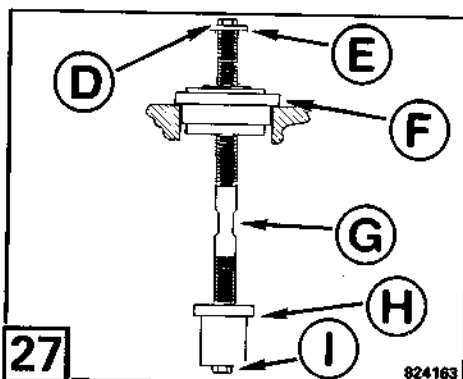
24 9. Push down on the shift rod **C**. This will move the detent lever downward to clear the inside of the gearcase when the propeller shaft assembly is pulled out.

24 10. Completely unscrew the shift rod, but do not pull it out of the shift rod cover. Remove the six cover screws, then lift off the shift rod and cover assembly. Discard the gasket underneath.

Note Remove the magnetic drain plug from the side of the gearcase if you haven't already done so. This will prevent breaking the plug's tip when the propeller shaft is pulled out.

25 11. Pull the propeller shaft, forward gear and bearing housing assembly out of the gearcase.





Lower Driveshaft Bearing Removal

26 **Note** 1. Remove the lower driveshaft bearing only if it needs to be replaced. Before attempting removal, take out the bearing retaining screw on the side of the gearcase, otherwise the gearcase will be damaged. Replace the screw's O-ring.

2. If the driveshaft bearing must be replaced, use OMC Bearing Remover and Installer P/N 391257 and assemble it as follows:

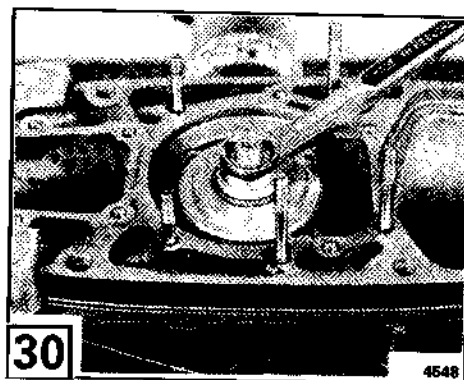
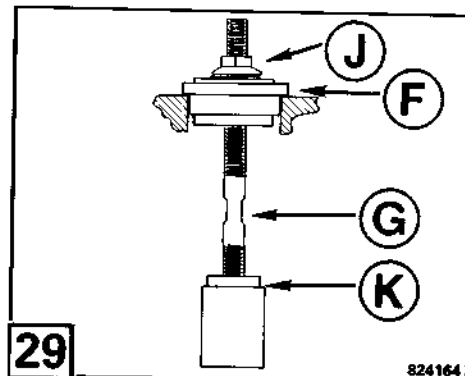
27 **28** • **2.3 Litre Model** - Drive bearing down and out with a soft mallet.

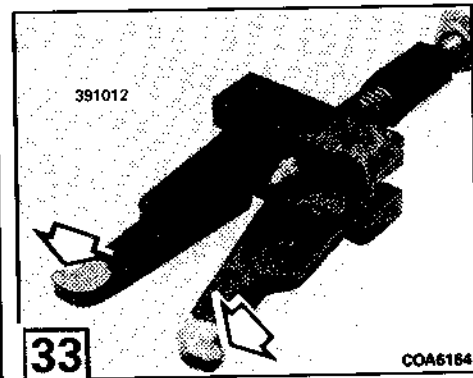
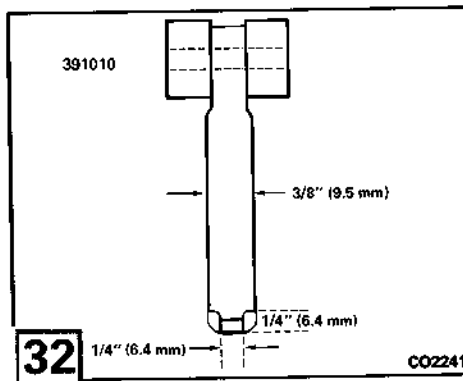
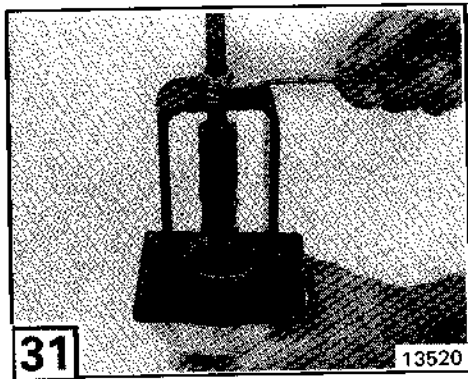
- Ⓓ ¼-20 x ½ in. hex head screw
- Ⓔ 1 in. O.D. flat washer
- Ⓕ Plate, P/N 391260
- Ⓖ Rod P/N 326582
- Ⓗ Remover P/N 326574
- Ⓘ ¼-20 x 1¼ in. hex head screw

29 **30** • **3.0 thru 5.8 Litre Models** - Turn nut and pull bearing up.

- Ⓙ Flange Nut P/N 326586
- Ⓕ Plate P/N 391260
- Ⓖ Rod P/N 326582
- Ⓚ Remover P/N 326579

Note Make sure all loose needles are inside bearing case before pulling bearing. The needles will provide a surface for the remover tool to pull against.





Propeller Shaft Bearing Housing Disassembly

1. Remove and discard the O-ring(s).

31 2. Remove and discard the back-to-back seals using OMC Bearing and Seal Puller P/N 432127 and OMC Two-Jaw Puller P/N 432130.

3. Bearings should be removed only if they are damaged and need to be replaced.

32 **33** **Note** 4. When OMC Two-Jaw Puller P/N 391012 is used, the jaws may have to be ground to fit into puller slots behind bearings. Grind very slowly and quench them often in water so that the temper is not changed.

31 5. Remove the small bearing using OMC Bearing and Seal Puller P/N 432127 and OMC Two-Jaw Puller P/N 432130.

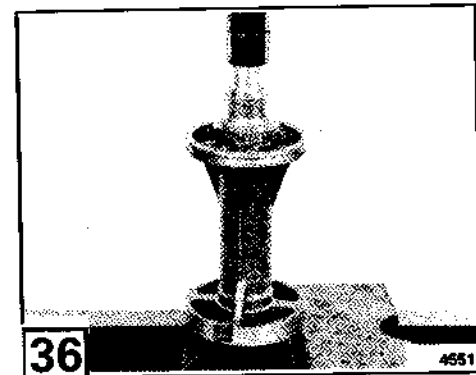
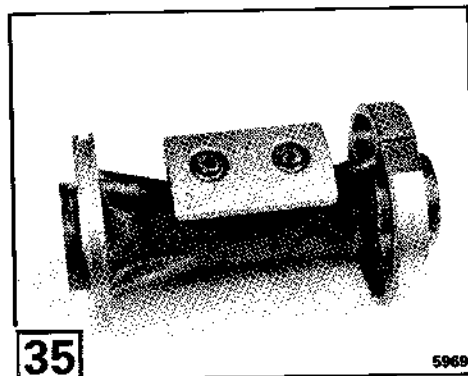
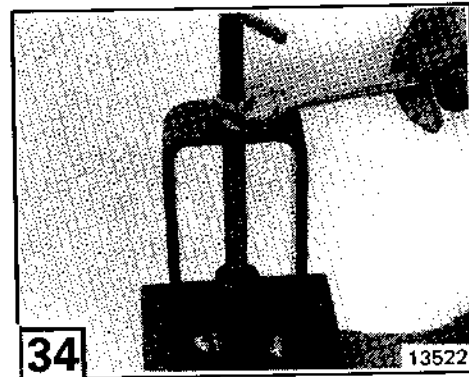
34 6. Remove large bearing using OMC Bearing and Seal Puller P/N 432127 and OMC Two-Jaw Puller P/N 432130.

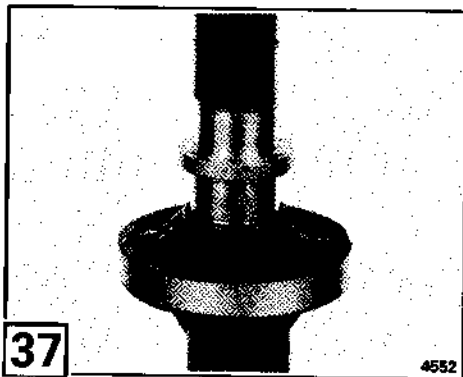
35 7. Inspect the bearing housing anode. Replace it if it's more than 2/3 deteriorated.

8. Clean housing and bearings in solvent and dry thoroughly. If bearings were not replaced, rotate needles with your fingers to check for freedom of movement. Inspect O-ring groove(s) and sand off any sharp edges that would cut O-ring(s) and prevent its sealing.

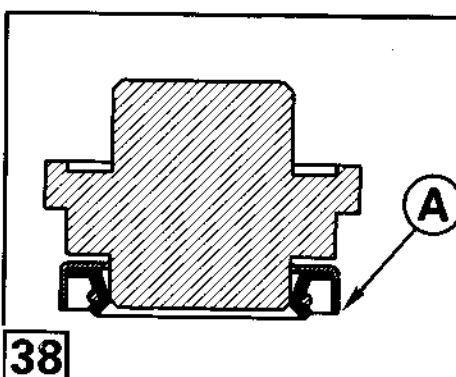
Propeller Shaft Bearing Housing Assembly

36 1. To replace the large bearing, lightly coat the outside case with gearcase oil. Place bearing housing on a suitable fixture. Face the lettered end of the bearing case toward the large diameter end of OMC Bearing Installer P/N 326562 and slide it onto tool. Press bearing into housing until the tool seats.





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38

37 2. To replace the small bearing, lightly coat the outside case with gearcase oil.

- **2.3 Litre Model** - Place lettered end of bearing case on small diameter end of OMC Bearing Installer P/N 326562, then press bearing into housing until the tool seats.
- **3.0 thru 5.8 Litre Models** - Place lettered end of bearing case on small diameter end of OMC Bearing Installer P/N 321517, then press bearing into housing until the tool seats.

38 3. Apply a light coat of *OMC Gasket Sealing Compound* to the metal cases of two new seals. Position the inner seal A with the lip toward the housing and install using stepped side of tool. Face lip of outer seal B away from housing and install using opposite end of tool.

39 4. **2.3 Litre Model** - Position seals on OMC Seal Installer P/N 326551 as shown. Press in one at a time until the tool seats.

39 5. **3.0 thru 5.8 Litre Models** - Position seals on OMC Seal Installer P/N 326690 as shown. Press in one at a time until the tool seats.

40 6. Apply *OMC Triple-Guard®* grease to the lips of both seals, and into the cavity between them. This will prolong the life of the seals.

7. If anode was replaced, tighten the attaching screws to a torque of 5-7 ft. lbs. (7-9 N·m).

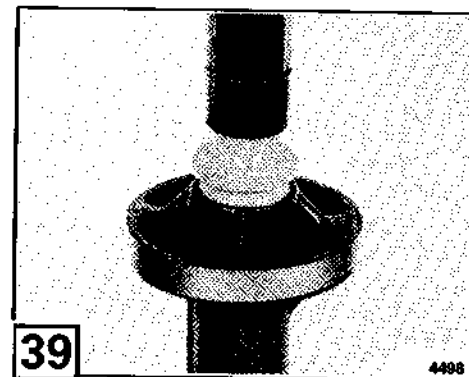
Driveshaft Bearing Housing Disassembly

41 1. Remove and discard all four O-rings.

2. **The internal needle bearing is not serviceable, so do not remove it.**

42 3. Spin the needles with your finger to see if they move freely. If they are damaged or corroded and must be replaced, order a replacement driveshaft housing and bearing assembly.

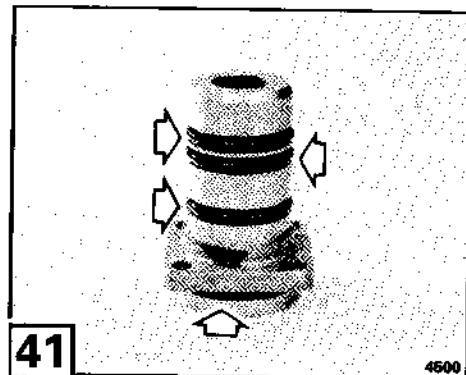
4. Clean the housing in solvent and dry it thoroughly. Inspect the O-ring grooves and sand off sharp edges that would cut the O-rings and prevent them from sealing.



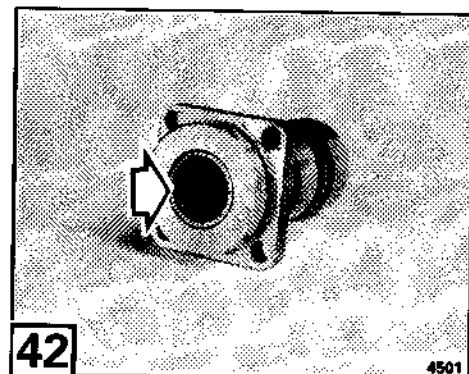
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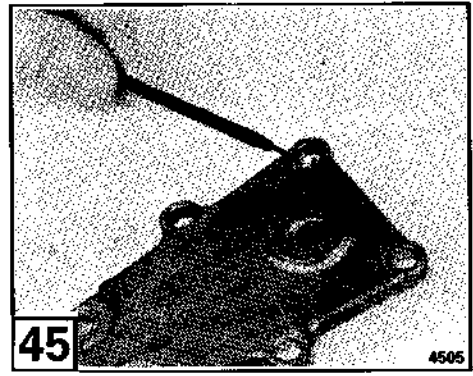
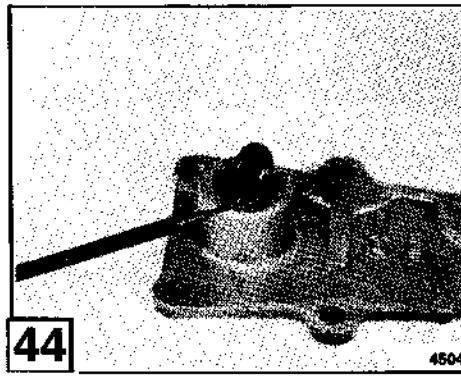
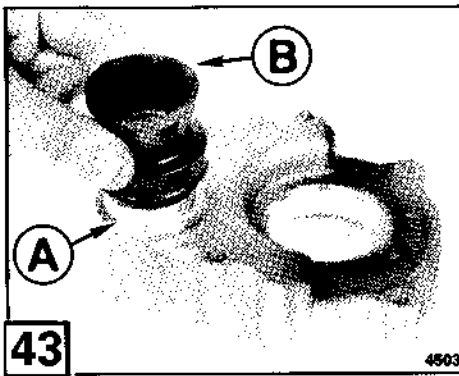
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Water Passage Cover Assembly

1. Clean the housing in solvent to remove traces of gasket material and sealer, then dry thoroughly.

- 43 2. Push the seal (A) into the cover outlet (it doesn't require sealer), then press the guide (B) onto the seal.

Shift Rod and Cover Disassembly

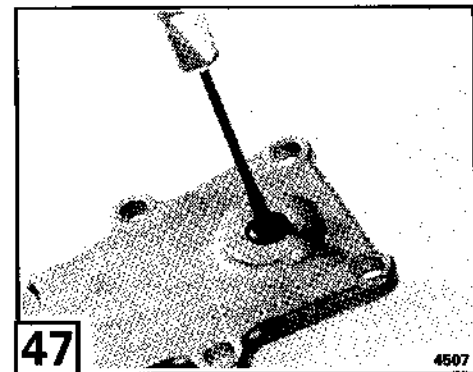
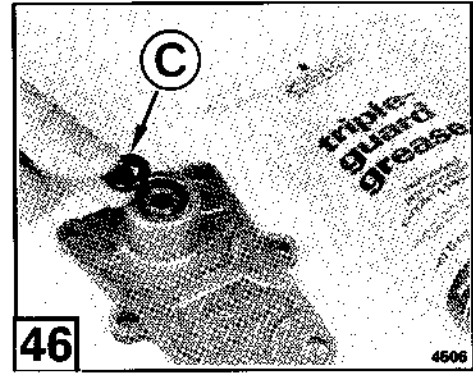
Note Do not pull the shift rod out of the cover unless you intend to replace the rod or one of the cover components.

1. Only two cover components are serviceable: the wiper and an internal O-ring. To replace them, first pull out the shift rod.

- 44 2. Pry the O-ring out of the bottom of the bronze bushing with a small sharp pick. Discard O-ring.

- 45 3. Pry out the wiper in a similar manner and discard it also.

4. Clean the cover in solvent and dry it thoroughly. Inspect the rod threads for damage and replace cover, if necessary.

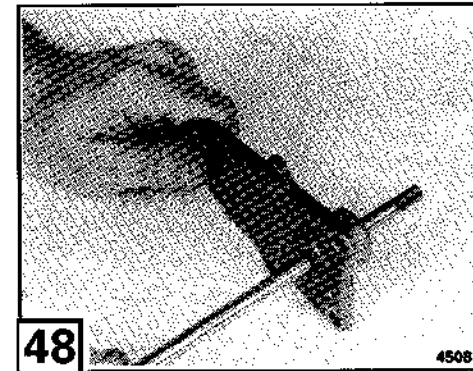


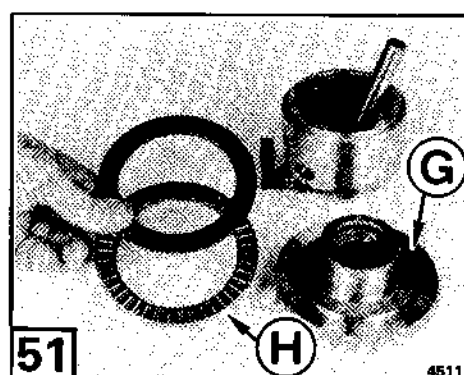
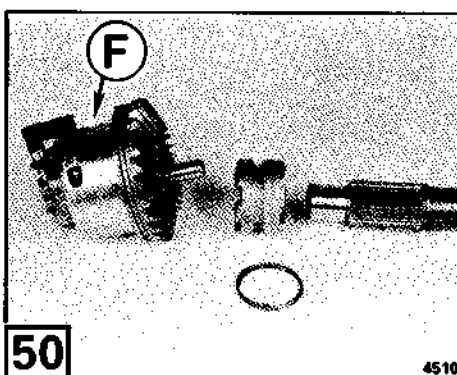
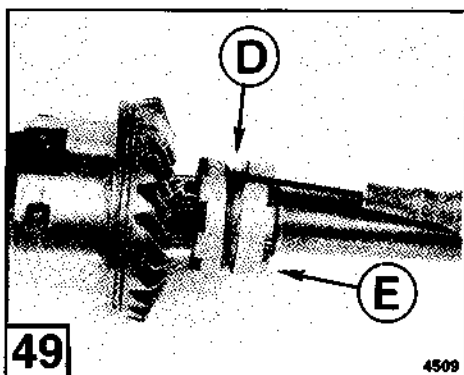
Shift Rod and Cover Assembly

- 46 1. Apply *OMC Triple-Guard* grease to a new O-ring (C) and push it into its seat inside the bushing.

- 47 2. Apply *OMC Triple-Guard* grease to a new rod wiper and press it into the cover. Push around the rim of the wiper with a small screwdriver to be sure it's seated.

- 48 3. Lightly coat the shift rod threads with *OMC Triple-Guard* grease. Slowly screw the rod through the wiper and O-ring. Continue turning it until the last thread is through the bushing, then push the rod at least halfway through the cover.





Propeller Shaft, Forward Gear and Bearing Housing Disassembly

49 1. Insert a small screwdriver under one end of the clutch dog spring (D) and remove it from the groove by unwrapping it from around the clutch dog (E).

50 2. Push the pin out of the clutch dog. The bearing housing assembly (F) will now pull out of the end of the propeller shaft and the clutch dog and spring will slide off the splines.

51 3. Pull the forward gear (G), thrust bearing (H) and thrust washer off the bearing housing.

52 4. Push down on the detent arm (I) to make sure it's in the most depressed position. Lift out the shift shaft (J) and cradle (K).

53 5. Pull up on the detent arm until it snaps into the NEUTRAL position. Push the pivot pin (L) out of the housing, then reach inside and pull the shifter (M) off the detent.

- **2.3 Litre Model Only** - Turn detent arm 90° to either side of housing, and lift shifter out through opening in top of housing.

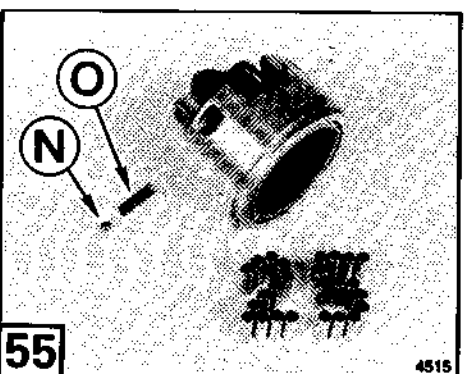
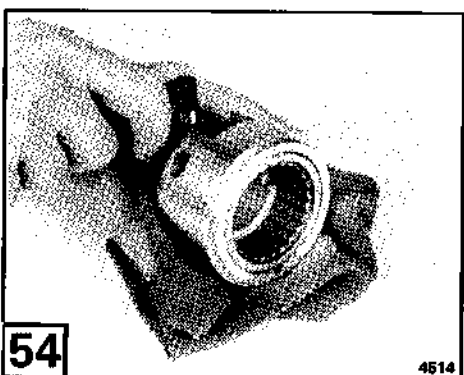
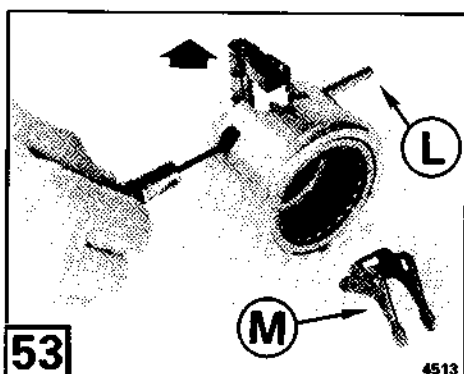
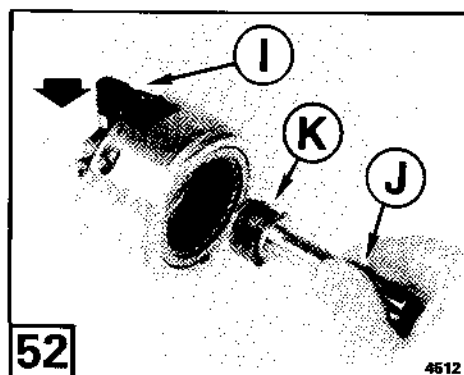
! **Wear Safety Glasses.** The detent ball and spring can pop out with great force while removing the detent.

54 6. Put a shop cloth around the housing. Rotate the detent arm 90° in either direction, then pull the detent out of the housing.

- **2.3 Litre Model** - Lift shifter out through detent opening.
- **3.0 thru 5.8 Litre Models** - Lift shifter out through bearing opening.

55 7. Remove the detent ball (N) and spring (O).

- **2.3 Litre Model** - has captive needle bearings that cannot be removed, and the bearing and housing are serviced as an assembly.
- **3.0 thru 5.8 Litre Models** - have 25 loose needle bearings inside the housing. These parts are not serviced individually, but replaced as an assembly.



Safety Related

8. If either the forward gear bearing, or bearing housing are damaged, replace them as an assembly. These parts are not serviced individually.

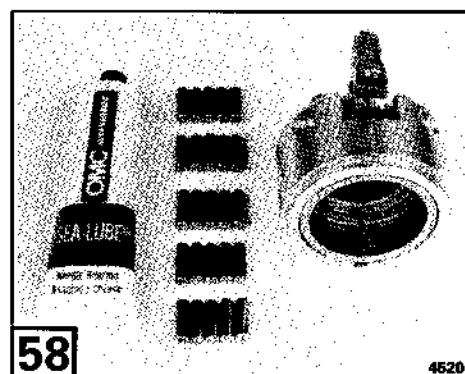
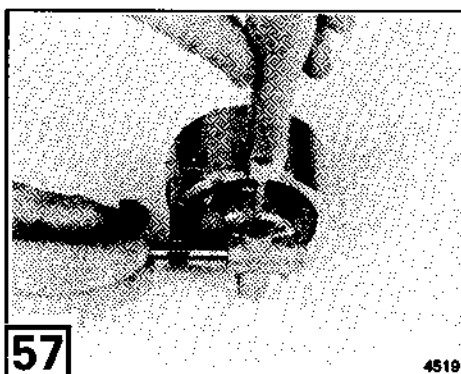
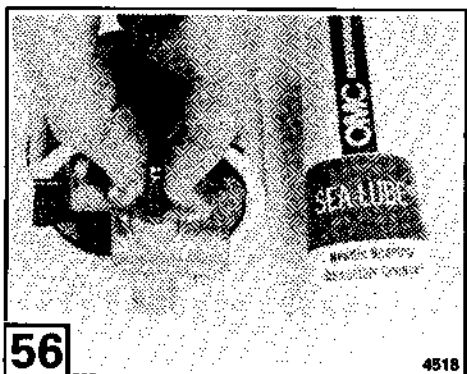
Propeller Shaft, Forward Gear and Bearing Housing Cleaning and Inspection

1. Clean all parts in solvent and dry thoroughly.
2. **Propeller Shaft** - Check splines for burrs that would prevent smooth clutch dog travel or easy propeller installation. Bearing and seal surfaces must be free from pitting and corrosion.
3. **Clutch Dog** - Check drive lugs for wear or damage that would affect gear engagement. The retaining pin hole must not be elongated and internal splines must allow smooth travel.
4. **Forward Gear** - Check drive lugs for wear, damage or discoloration. The bronze bushing must be free from scoring or wear.
5. **Shift Detent, Cradle, Shifter, Shaft and Pin** - Look for burrs, wear, or damage that would prevent slip-fit engagement and complete freedom of movement of shift mechanism.
6. **Bearing Housing and Bearings** - Check detent lever and pivot pin holes for burrs or damage that would prevent free movement of the shift mechanism. Check captive rollers of 2.3 Litre bearings for freedom of movement by turning with your finger. Inspect both loose and captive needles for pitting, corrosion or discoloration.

 **Note** Discoloration of a part usually indicates overheating damage due to lack of lubrication, or use of improper type of oil.

 **Replace suspect components. Shift system failure can lead to operator suddenly and unexpectedly losing control of forward or reverse movement of boat.**





Propeller Shaft, Forward Gear and Bearing Housing Assembly

56 1. Lightly coat the detent ball and spring with *OMC Needle Bearing Assembly Grease*. First, insert the spring in the housing, then the ball.

57 2. Face the detent arm toward either side of the housing. Depress the ball and spring with a punch while pushing the detent into the housing. Once the detent is past the ball, rotate the lever toward the rear of the housing, then move the detent to engage NEUTRAL position.

Note Do not push detent all the way down at this time. Detent ball will jam detent in bearing housing.

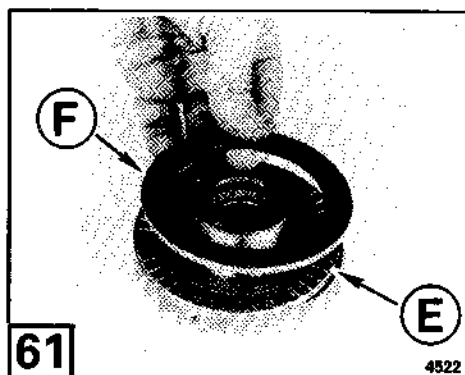
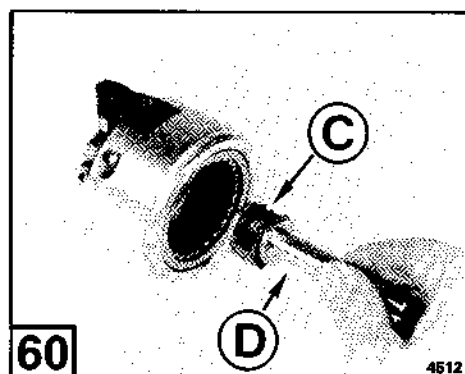
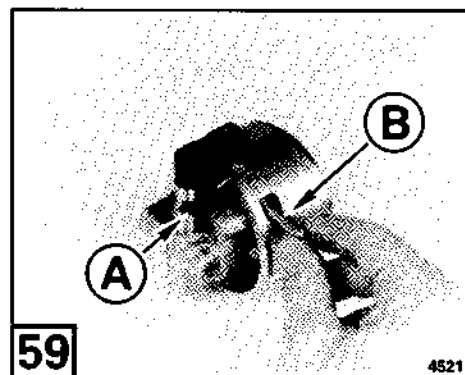
58 3. **3.0 thru 5.8 Litre Models** - Thoroughly grease the original 25 needle bearings with *OMC Needle Bearing Assembly Grease* and place in the bearing case.

59 4. Face the narrow arms of the shifter **A** toward the detent and attach it to the detent neck. Align the pivot holes and insert the retaining pin **B**.

- **2.3 Litre Model Only** - Turn detent arm 90° to either side of housing, and insert shifter through opening in top of housing. Make shifter and pin installation as previously described.

60 5. Push the detent down to its most depressed position. Rest the cradle **C** on the shift shaft **D**, then attach the cradle and shaft to the wide arms of the shifter. Pull the detent back up to NEUTRAL position to hold the cradle and shaft in place.

61 6. Place the thrust bearing **E** on the back of the forward gear. Set the thrust washer **F** on top of the thrust bearing.



62 7. Insert the gear, bearing and washer assembly into the bearing housing. Be careful not to dislodge any of the loose needle bearings in those units so equipped.

63 8. Before installing the clutch dog, you must correctly identify which is the reverse end. Look for the words "prop end" **A** or the OMC part number; both are stamped on the reverse lugs which must face the rear of the propeller shaft. Orient the clutch dog properly, align the clutch dog retaining pin hole with the slot in the propeller shaft, and slide the clutch dog onto the splines.

Note The clutch dog is not symmetrical. If it's installed backward it will not fully engage reverse gear and will cause immediate damage to the gear and clutch dog.

64 9. Insert the shift shaft into the propeller shaft. Align the hole in the shaft with the hole in the clutch dog, then install the pin.

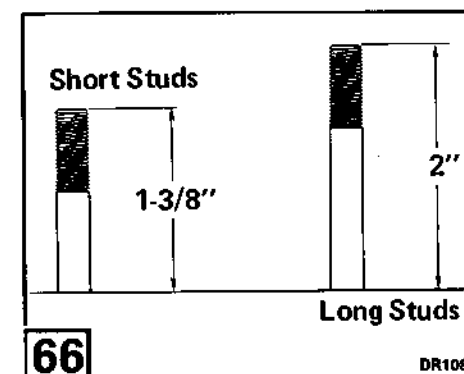
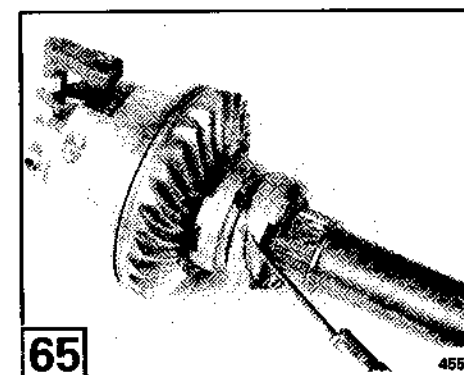
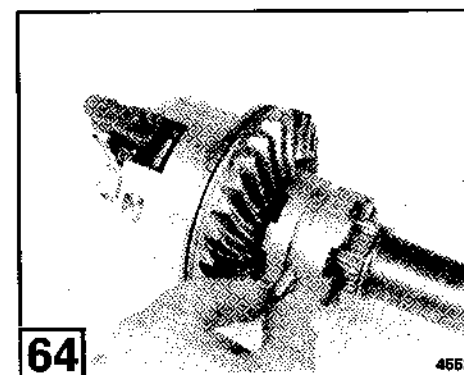
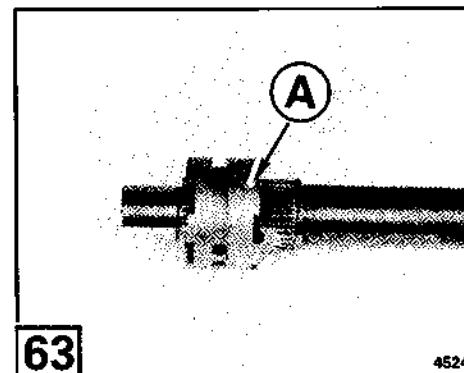
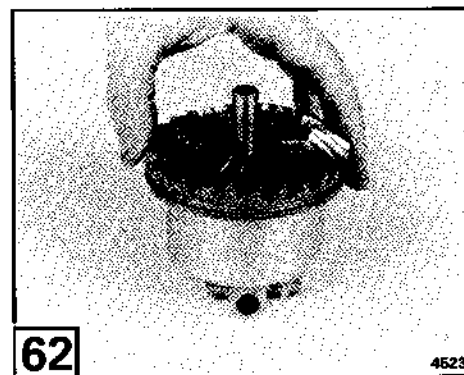
65 10. Slide a new retaining spring up over the propeller shaft and wrap it around the clutch dog pin. Position three coils over each end of the pin, making sure none of the coils overlap.

Lower Gearcase Cleaning and Inspection

Clean all parts in solvent and dry them thoroughly. Parts not covered below will be found in the section dealing with their specific assemblies.

1. Gearcase Housing - Scrape off all gasket material from shift cover and water passage cover surfaces. Use a thread tap to clean corrosion and sealer from all threaded holes. Check oil circulation hole at upper end of driveshaft bore to be sure it's open.

66 **2. Water Cover Studs** - Check for thread damage and looseness. To remove, double-nut stud and unscrew. Clean *Loctite* residue from stud hole with a thread tap. Spray threads of hole and new stud with *OMC Locquic Primer* P/N 384884. Apply *OMC Ultra Lock* P/N 388517 to the stud threads, and install to the depth shown.



67 3. **Water Intake Screen** - If screen cannot be unplugged by cleaning, replace it. Place a screwdriver on each side of the intake screen under the locating tabs. Simultaneously press in and up on both sides to free screen. To install a new screen, face curved side forward and narrow end down. Push screen into housing until detents snap into place. Screen must cover all four intake openings.

68 4. **Gearcase Anodes** - If anodes are two-thirds deteriorated, replace them with new ones.

69 5. **Hydrostatic Seal Rings** - If rings inside gearcase hub are heavily damaged, exhaust gases may enter propeller area and cause ventilation. If problem is severe enough, gearcase will have to be replaced.

6. **Lower Driveshaft** - Check threads as well as internal and external splines for chips or cracks. Tapered gear surface must not show metal transfer or corrosion. The lower bearing surface must be free from corrosion, scoring or discoloration. The thrust bearing and needle bearing surfaces on the upper end must also show no evidence of corrosion, scoring or discoloration. Make sure the oil circulation hole is open and the nylon shaft support plug is inside shaft at base of splines.

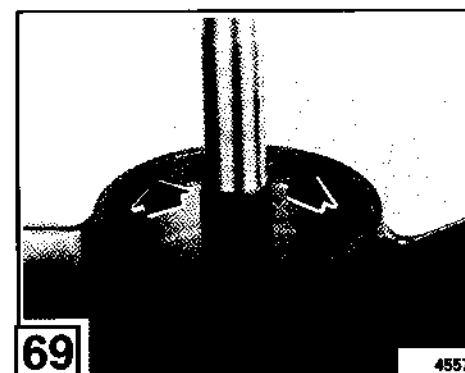
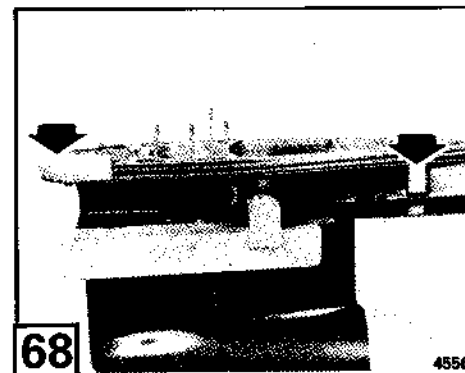
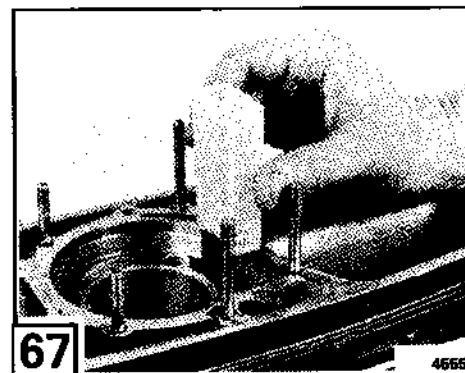
7. **Reverse Gear** - Check teeth for chips or cracks. Inspect drive lugs for damage or wear. Thrust bearing and needle bearing surfaces must not be corroded or discolored.

8. **Pinion Gear** - Check teeth and internal splines for chips or cracks. Inspect tapered seat for metal transfer or corrosion.

9. **Intermediate Driveshaft** - Inspect splines at both ends for wear, cracks, distortion or corrosion. Oil circulation hole through shaft must be open.

10. **Thrust Bearing** - Propeller shaft and driveshaft thrust bearings must turn freely. Rollers must not be pitted, worn or discolored.

Note Discoloration of a part usually indicates overheating damage due to lack of lubrication, or use of improper type of oil. Always replace suspect parts.



Shimming Driveshaft and Pinion Gear

The pinion gear must be precisely meshed with the forward and reverse gears for maximum longevity. This mesh, or tooth contact pattern, is controlled by shims found between the driveshaft bearing housing and thrust washer. Before the driveshaft and pinion are reassembled, you must determine the proper amount of shims.

70 1. Clamp OMC Driveshaft Socket P/N 314438 **(A)** in a vise and slide the driveshaft onto it. Set the pinion gear on the shaft. Tighten the nut to a torque of 70-75 ft. lbs. (95-102 N·m).

71 2. Place the thrust bearing **(B)**, thrust washer **(C)**, and driveshaft bearing housing **(D)** on the driveshaft in that order. Do not install any old shims.

72 3. Face the stepped side of the OMC Alignment Plate **(E)** (from OMC Shim Fixture P/N 984329) away from the driveshaft bearing housing. Slide the plate over the shaft and seat it against the housing. Set the driveshaft and plate assembly into OMC Shim Fixture P/N 984329 and position plate inside fixture as shown.

73 4. Note the groove **(F)** around the pointed end of the fixture's tension screw. Tighten the screw against the end of the driveshaft until the screw sleeve reaches the groove. This will properly preload the assembly. Now tighten the tension screw's external locking ring **(G)**.

5. Tilt the fixture backward until it rests on its support lugs, then select the correct gauge bar:

- **2.3 Litre Models** - Use OMC Gauge Bar P/N 328366.
- **3.0 thru 5.8 Litre Models** - Use OMC Gauge Bar P/N 328367.

74 6. Rest the gauge **(H)** in the fixture with the curved head up behind the pinion gear, and the base against the driveshaft bearing housing. Hold the gauge against the housing, then use a feeler gauge to determine the clearance between the gear and the gauge. Rotate the shaft and take a couple of readings at different locations to verify your measurement.

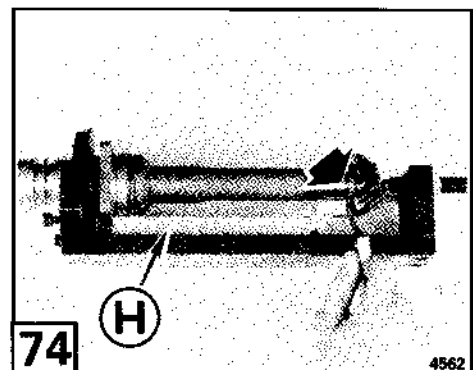
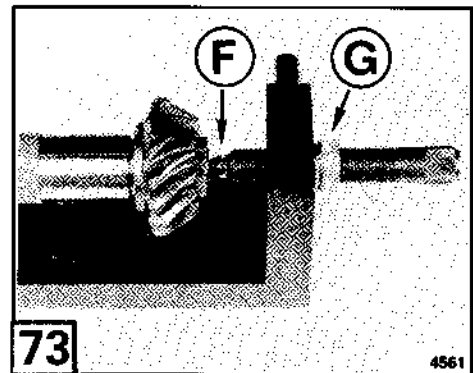
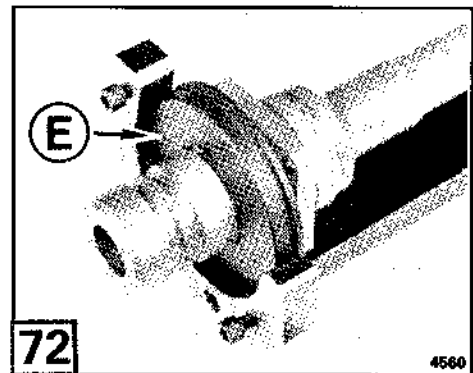
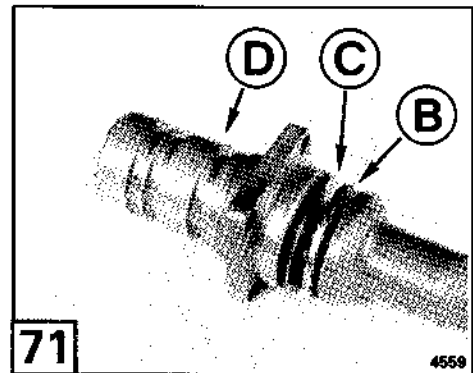
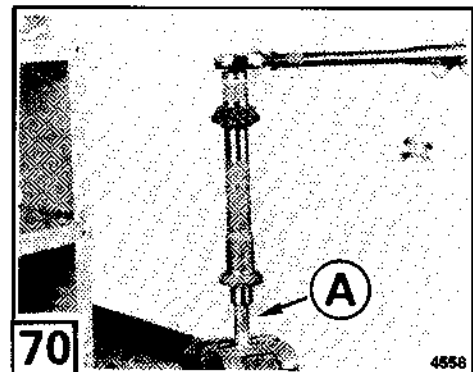
7. Write down your measurement. Subtract this figure from 0.020 in. (.51 mm) to determine the thickness of shims needed to correctly position the pinion gear.

Example Only:

.020 in.
<u>-.014 in.</u>
.006 in. Total

8. Check your shimming accuracy by adding the indicated amount of shims to the driveshaft assembly and placing it back in the shim fixture. A feeler gauge reading between gauge and pinion should be 0.020 in. (.51 mm).

9. Take the driveshaft out of the fixture, then remove all components, including the pinion gear.



Lower Gearcase Assembly

Parts must be clean, dry and in good condition. During reassembly, use recommended OMC lubricants, adhesives and sealers, or equivalent products that meet or exceed OMC specifications.

Lower Gearcase Driveshaft Bearing Installation

1. Servicing old bearings that were not removed:

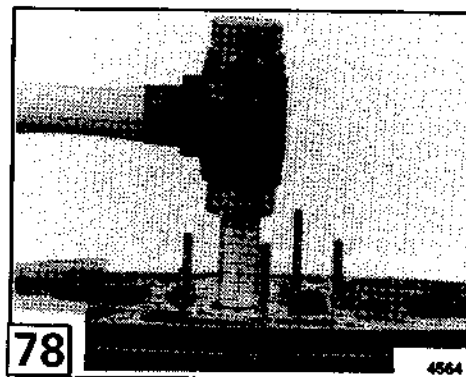
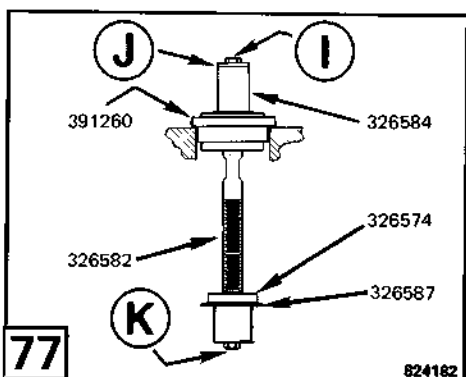
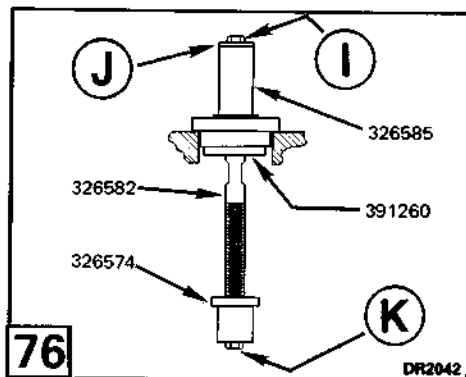
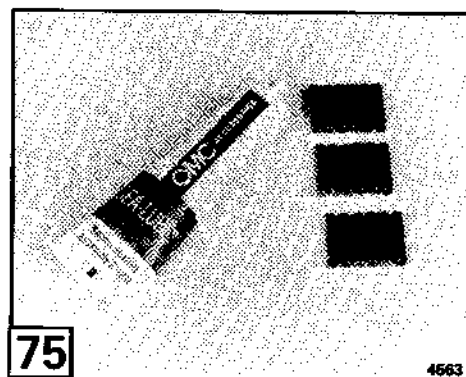
- **2.3 Litre Models** - These units have bearings with captive needles. If the original bearing was not removed, no lubrication or other preparation is necessary.

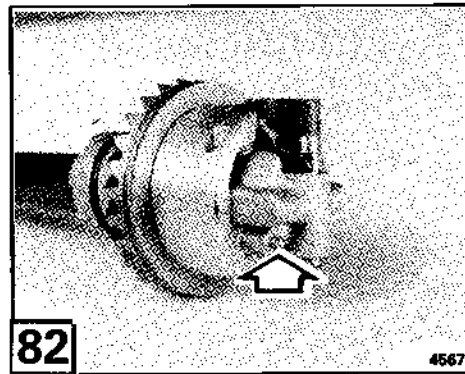
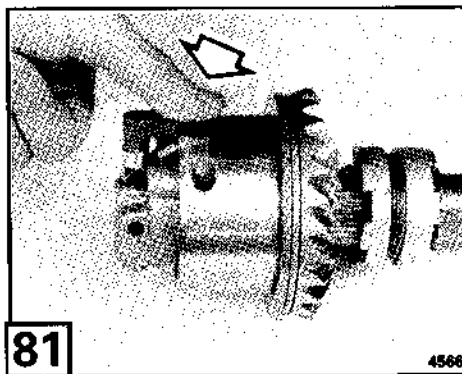
- 75 • **3.0 thru 5.8 Litre Models** - These units have 18 loose needles that should be cleaned in solvent, inspected and dried thoroughly. When installing, liberally apply *OMC Needle Bearing Assembly Grease* to each roller. Reach inside the gearcase hub and push them into the bearing case. Check for cocked needles that would be knocked out when the driveshaft is inserted.

- 76 77 2. Install new bearings with OMC Bearing Remover and Installer P/N 391257. Attach the spacer with a 1/4-20 x 1/2 in. hex head screw (J) and a 1 in. O.D. flat washer (I). Attach the installer with a 1/4-20 x 1 1/4 in. hex head screw (K).

- 76 78 • **2.3 Litre Model** - Use OMC Spacer P/N 326585, OMC Plate P/N 391260, OMC Rod P/N 326582, and OMC Installer P/N 326574. Assemble as shown. Apply *OMC Needle Bearing Assembly Grease* to the outside of the bearing. Face lettered side of case toward installer, then slide on tool. Insert tool and bearing into gearcase, then drive in until driving rod seats on spacer.

- 77 78 • **3.0 thru 5.8 Litre Models** - Use OMC Space P/N 326584, OMC Plate P/N 391260, OMC Rod P/N 326582, OMC Installer P/N 326574 and OMC Washer P/N 326587. Assemble as shown. New bearings have prelubricated needles, so apply a light coat of *OMC Needle Bearing Assembly Grease* only to outside of case. Face lettered side of case toward installer and slide on tool. Insert tool and bearing into gearcase, then drive in until driving rod seats on spacer.

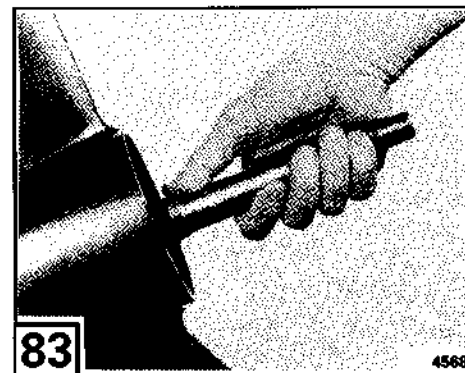




- 80** 3. Position a new O-ring on the pinion bearing screw. Apply *OMC Locquic Primer*, then *OMC Nut Lock* to the threads of screw. Install the screw and tighten to a torque of 48-84 in. lbs. (5-9 N·m).

Propeller Shaft, Forward Gear and Bearing Housing Installation

- 81** 1. Press shift detent down to engage REVERSE (lowest) position. This will provide clearance to install the propeller shaft assembly.
- 82** 2. Note the position of the locating pin at the front of the housing. The pin must engage a corresponding recess inside the nose of the gearcase.
- 83** 3. Tip the gearcase hub slightly upward. This will help hold the gear, washer and bearing in place against the housing while installing the propeller shaft. Insert the propeller shaft assembly. When the housing and pin are properly engaged, the top of the detent arm will appear centered fore and aft at the bottom opening of the shift rod cavity.

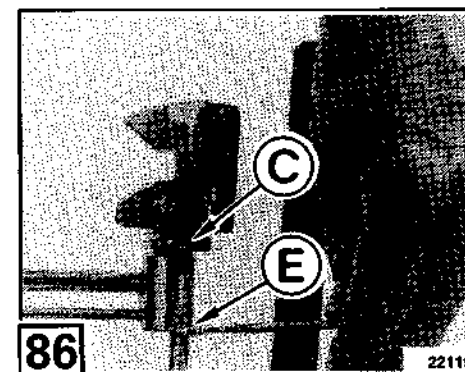
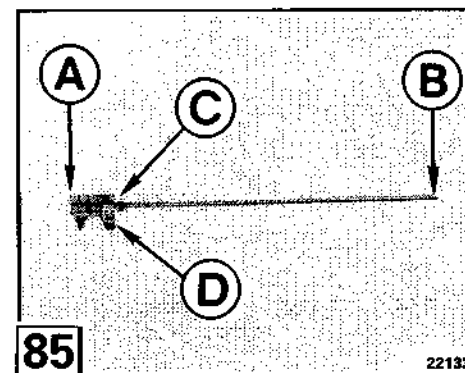
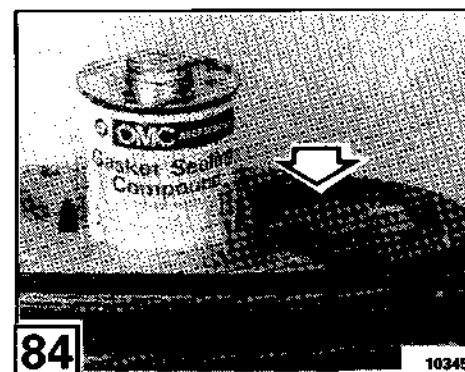


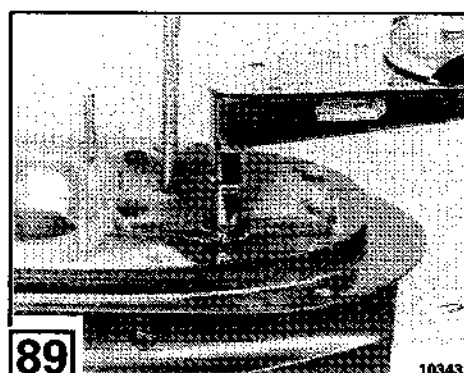
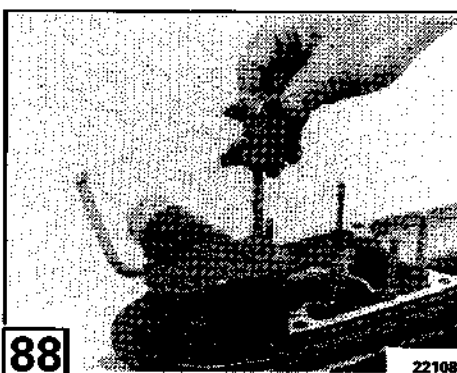
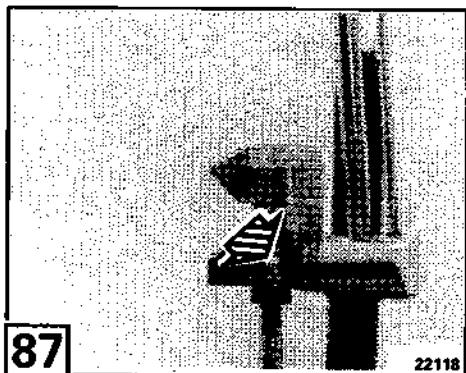
Shift Rod and Cover Installation

- 84** 1. Lightly apply *OMC Gasket Sealing Compound* to both sides of a new shift rod cover gasket, and place it on the housing.
- 85** 2. Measure total length of shift rod (A) to (B):
- **2.3 Litre Models** - length must be 16 1/16 in.
 - **3.0 thru 5.8 Litre Models** - length must be 16 13/16 in.

If adjustment has to be made, loosen locknut (C), and screw (D). Turn rod end to obtain correct measurement, then retighten locknut and screw.

- 86** 3. While holding the shift rod with a wrench (E), attach a crow foot wrench at a 90° angle to torque wrench and tighten nut (C) to a torque of 13-15 ft. lbs. (18-20 N·m).





87 4. Tighten shift rod screw to a torque of 24-36 in. lbs. (3-4 N-m).

88 5. Push the shift rod far enough through the cover so you can start threading the rod into the detent without the cover touching the gasket. Screw the rod into the detent four or five full turns. Final shift rod setting requires a height gauge and will be made later.

89 6. Seat the cover on the gasket. Apply *OMC Gasket Sealing Compound* to six cap screws and install. Tighten the screws to a torque of 60 - 84 in. lbs. (7-9 N-m).

7. While rotating the propeller shaft, pull up the shift rod to engage **FORWARD** position. Look down through the driveshaft bore to make sure the clutch dog and gear lugs completely engage. This will help provide clearance to install the pinion gear and nut.

90 8. Attach anode to front of gearcase. Tighten screws securely.

Driveshaft and Pinion Gear Installation

1. Place the pinion gear inside the gearcase under the driveshaft bearing. Carefully insert the driveshaft into the gearcase, through the bearing, and into the gear.

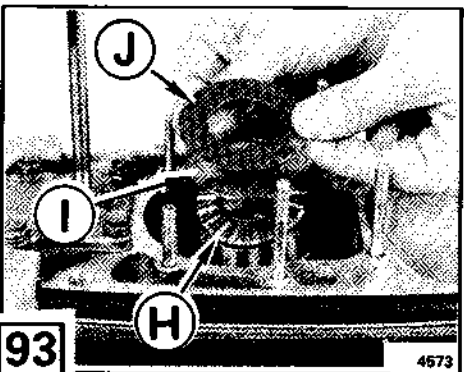
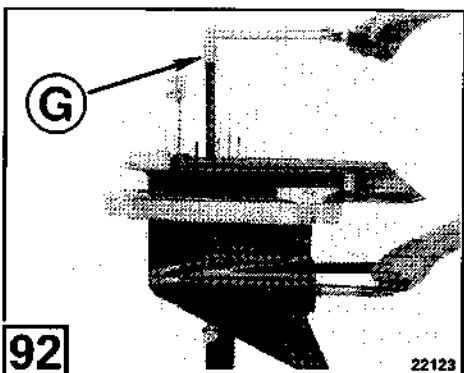
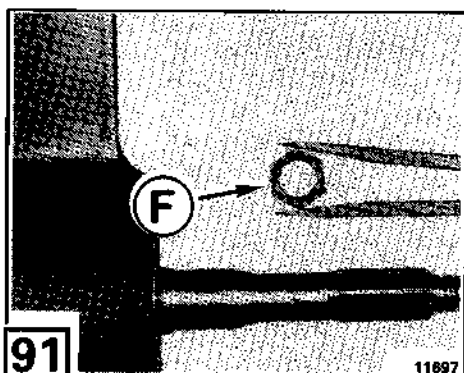
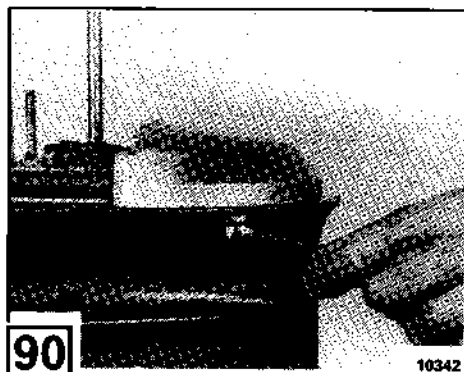
91 2. Put the intermediate driveshaft into the lower driveshaft. Apply *OMC Needle Bearing Grease* to hold pinion nut **F** in holding device and position it under the gear. Rotate the driveshaft and start the nut.

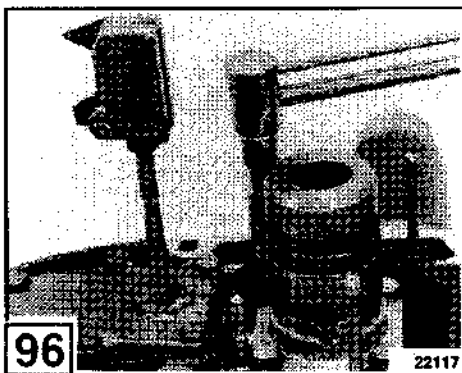
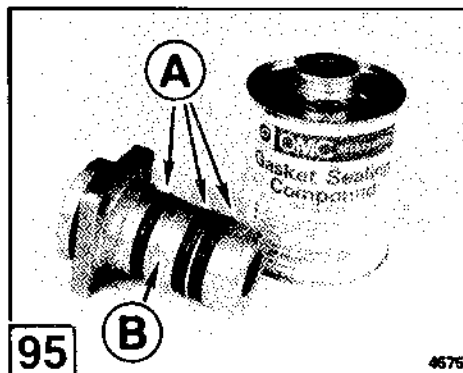
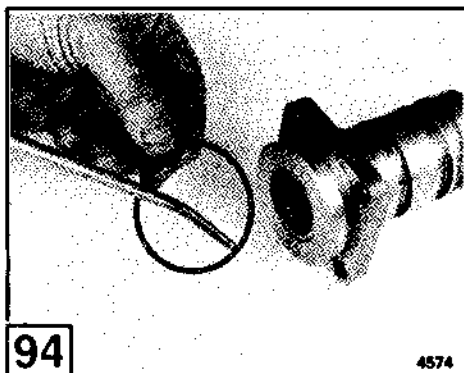
92 3. Hold the nut with OMC Pinion Nut Holder P/N 334455. Place OMC Spline Socket P/N 311875 **G** on the driveshaft. Tighten the nut to a torque of 70-75 ft.lbs. (95-102 N-m).

4. Take out the intermediate driveshaft.

Driveshaft Bearing Housing Installation

93 1. In this order, set the thrust bearing **H**, thrust washer **I**, and shims **J** on the driveshaft.





94 2. Apply gearcase oil to a new small O-ring and place it on the base of the driveshaft bearing housing.

95 3. Lightly coat three new, thick O-rings **A** with *OMC Gasket Sealing Compound*. To ease installation, fit an O-ring into the upper groove first, then fill the remaining grooves consecutively down toward the flange.

95 4. After installing the O-rings, lightly coat the entire housing surface **B** with *OMC Gasket Sealing Compound*. This will prevent corrosion buildup between the housing and the water passage cover.

5. Install the driveshaft bearing housing and seat it with hand pressure.

96 6. Make sure all old sealer has been cleaned from the four mounting bolts. Place the flat washers on the bolts, then lightly coat the threads with *OMC Gasket Sealing Compound*. Install the bolts and tighten them to a torque of 14-16 ft. lbs. (19-22 N·m).

Water Passage Cover Installation

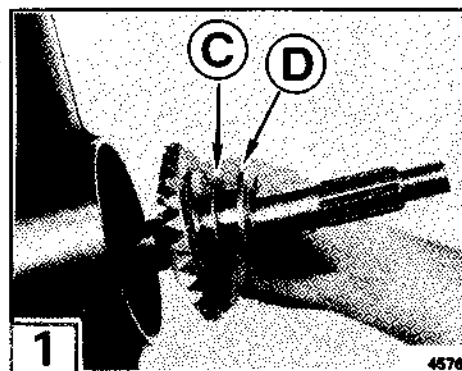
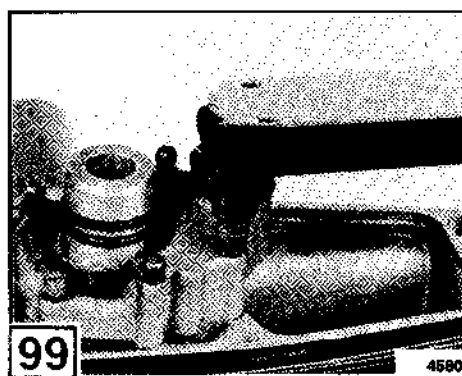
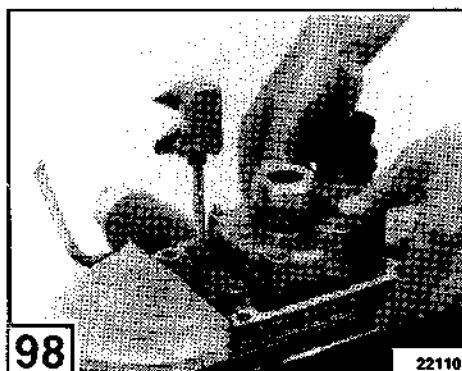
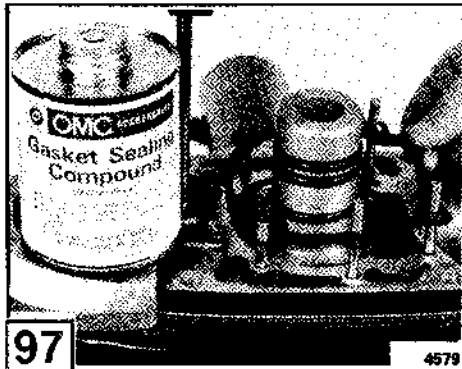
97 1. Coat both sides of a new water passage cover gasket with *OMC Gasket Sealing Compound* and place it on the gearcase. Also coat the length of all studs with *OMC Gasket Sealing Compound* to prevent corrosion.

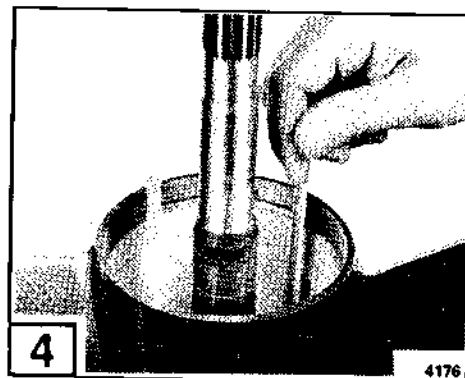
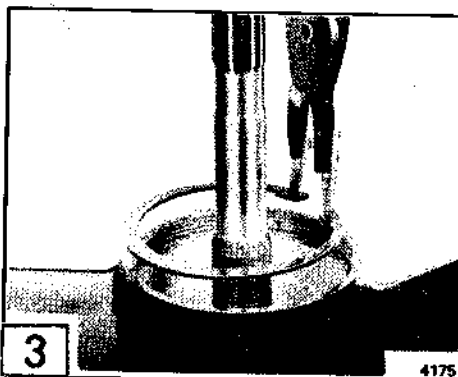
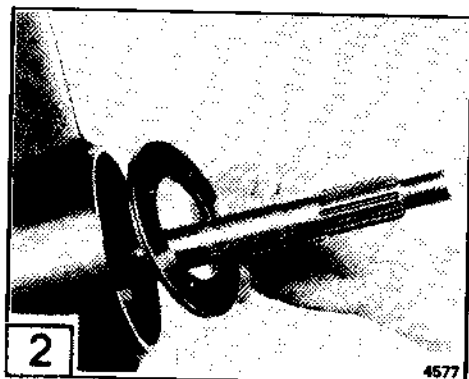
98 2. Install the water passage cover and seat it by hand. If it's difficult, tap it gently with a soft hammer.

99 3. Place flat washers and new locknuts on the studs. Tighten the nuts to a torque of 9-11 ft. lbs. (12-15 N·m).

Propeller Shaft Bearing Housing Installation

1 1. Set the thrust bearing **C** on the back of the reverse gear, and then the thrust washer **D**. Slide the gear down the propeller shaft into the gearcase.





2 2. Slide the retainer plate down the propeller shaft.

3  **3. Wear safety glasses.** Be careful installing the two large retaining rings. They're under extreme pressure when compressed. Use OMC Retaining Ring Pliers P/N 331045 and lower them into the housing. Slowly allow them to expand into their seats, making sure they're completely engaged.

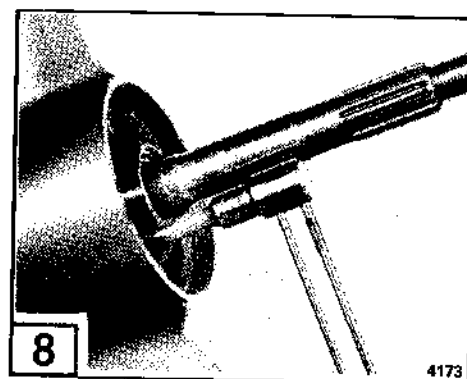
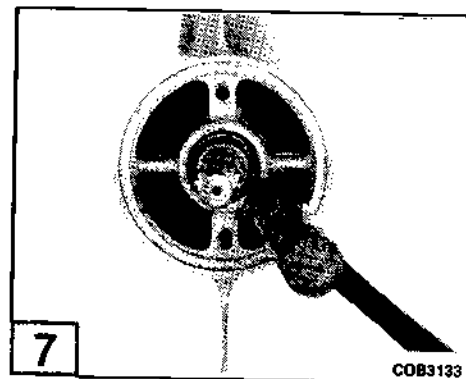
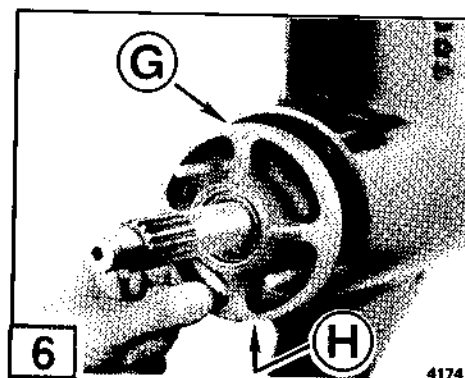
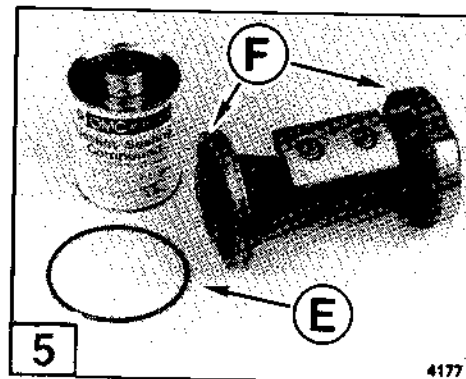
4 4. Thread two OMC Guide Pins P/N 383175 into the retainer plate. Pick two holes 180° apart.

5 5. Lightly apply *OMC Triple-Guard* grease to new O-ring **E** and install it on the bearing housing. Carefully apply *OMC Gasket Sealing Compound* to both housing flanges **F**.

6 **7** 6. Note that the housing has the word "UP" **G** cast on the rear face. Position this at the top and slide the housing onto the guide pins and into the gearcase. The drain slot **H** will now be properly located at the bottom of the hub. Use a soft hammer and tap the housing to seat it below the hydrostatic rings.

Note Do not try to seat the housing by pulling it down with the screws. The retainer plate threads can be stripped.

8 7. Lightly coat the threads and seals of four new screws with *OMC Gasket Sealing Compound*. Install two screws, then unscrew the guide pins. Install the remaining two screws and tighten all four to a torque of 10-12 ft. lbs. (14-16 N-m).



Safety Related

Pressure and Vacuum Testing Lower Gearcase

9 1. Install and tighten a 1 in. expandable rubber plug inside the driveshaft bearing housing.

10 2. Place a new washer on the magnetic drain plug, then install and tighten it to a torque of 60-84 in. lbs. (7-9 N-m).

3. Remove the oil level plug at the top of the gearcase.

11 **Pressure Test** - Attach a pressure tester (such as a *Stevens* S-34) and pressurize gearcase to 3-5 PSI (21-42 kPa). Rotate the propeller shaft to check sealing. If pressure loss is indicated, use a soapy water solution or submerge gearcase in water to find source of leak. Make necessary repairs, then repeat test. If pressure loss is not indicated, increase pressure to 16-18 PSI (110-124 kPa). If pressure loss is indicated, submerge to find source. Gearcase must hold pressure before making vacuum test, and must not lose more than 1 PSI in 3 minutes.

11 **Vacuum Test** - Attach a vacuum tester (such as a *Stevens* V-34) and pull vacuum in the gearcase in two steps. First, 3 to 5 inches of mercury, and then 15 inches of mercury. No loss of vacuum should occur on low test, and no more than 1 inch of mercury in 3 minutes on high test. If gearcase does not hold vacuum, put a heavy oil on seal and gasket surfaces to find source. Make necessary repairs and repeat test.

Shift Rod Height Adjustment

1. Move the shift rod to NEUTRAL position.

12 2. Rest OMC Shift Rod Height Gauge P/N 912277 on the housing surface, as shown. Screw the shift rod in or out until the upper arm of the gauge **A** just contacts the top of the shift rod head. (reference: 7 $\frac{13}{64}$ in. - 18,3 cm). An additional $\frac{1}{2}$ turn either way is acceptable, as long as the final setting has the notched side of the head facing forward.

