merCruiser
STERN DRIVES & INBOARDS

service bulletin

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CIRCULATE TO:
SERVICE MANAGER ☐
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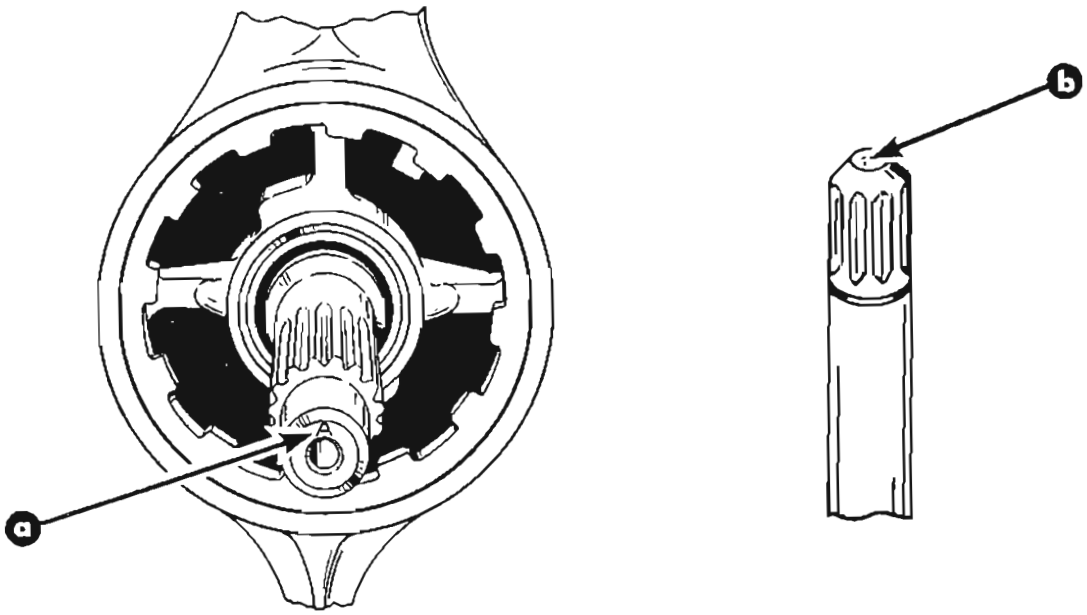
NEW GEAR HOUSING for MERCRUISER I MODELS

A new gear housing assembly is now being used on current production MerCruiser I models. This gear housing will be referred to as the "MR" series. The letter "A" will be stamped in the end of the propeller shaft for approximately one year to identify this housing from the old one. The new housing also can be distinguished from the old one by the fact that it does not have a preload pin at the top of the drive shaft. (Figure 1)



a - "A" Stamped On End of Propeller Shaft
b - Drive Shaft Does Not Have A Preload Pin

Figure 1. "MR" Gear Housing Identification

The starting serial numbers for stern drive units built with the "MR" gear housing are listed following:

1.98:1 Ratio - 6854393 and above (see Note)
1.84:1 Ratio - 6862702 and above
1.65:1 Ratio - 6810538 to 6811037
6864366 and above
1.50:1 Ratio - 6869699 and above

NOTE: The old and the new gear housing was used interchangeably for a period of time on the 1.98:1 ratio units. These units must be inspected visually to determine which housing is being used.

Effective immediately, the "MR" gear housing will be used as the service replacement gear housing assembly complete (part number listed below) for the MerCruiser 250, 260 and 260R. This gear housing is fully interchangeable with the original housing and requires no special modification.

Gear Housing Assembly Complete - 1623-8951A2

Eventually, the "MR" gear housing will supersede gear housing 1623-5356A20 when inventories of these units are depleted. The new gear housing can be used on any of the MerCruiser I models that have the short slot in the shift plate shift lever (Figure 2). This includes the following models.

"MR" Gear Housing Application Chart	
120/140	Serial Number 3780850 and Above
165	Serial Number 3782025 and Above
888	Serial Number 3784375 and Above
120R/140R/470/470R/485/185R/ 488R/898/898R/225-S/228/228R/ 233/250/260/260R	All

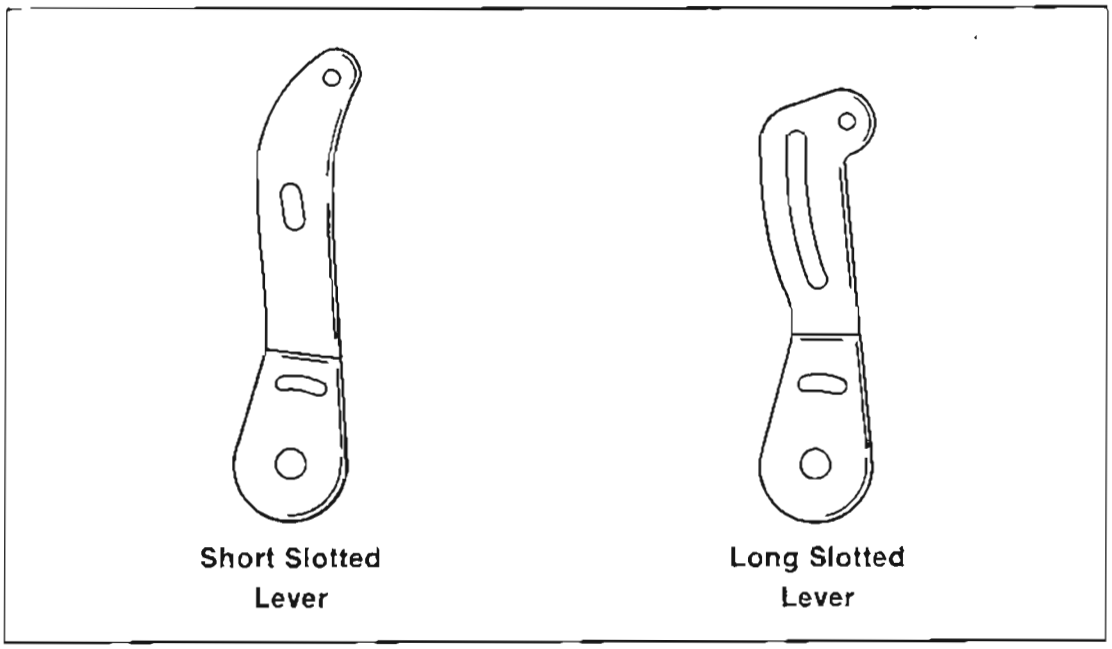


Figure 2. Shift Plate Shift Levers

The service replacement stern drive units complete (shown in the chart below) also will be equipped with the "MR" gear housing. As you will observe, the part number has been changed on some of the units. These units will be equipped with the "MR" gear housing immediately. On the units where the part number was not changed, the "MR" gear housing will be implemented as a running change, as inventories of the old units are depleted.

STERN DRIVE UNITS, COMPLETE WITH "MR" GEAR HOUSING		
MODEL	GEAR RATIO	PART NUMBER
120 & 140 (S/N 3780850 and above)	1.98:1	5-01983010 (Same as old number)
120R/140R	1.98:1	5-01988015 (Supersedes 5-01986013)
165 (S/N 3782025 and above) *470/*485	1.65:1	5-01653010 (Same as old number)
470/485	1.84:1	5-01843010 (Same as old number)
470R/488R/185R	1.84:1	5-01848015 (Supersedes 5-01846013)
*470R/*488R/*185R/898R	1.65:1	5-01658015 (Supersedes 5-01656013)
888 (S/N 3784375 and above) 898/898R/225-S/228/228R/233/ 250/260/260R	1.50:1	5-01508015 (Supersedes 5-01506013)
233/250/*260/*260R	1.32:1	5-01328015 (Supersedes 5-01326013)

** This gear ratio is an option for this model*

FEATURES

The "MR" gear housing has been completely redesigned for extended drive life. Listed following are some of the major changes: (Figure 3)

- **Gears** - The spiral angle of the gear teeth (a) have been reversed and higher strength steel has been utilized for increased load carrying capacity.
- **Drive Shaft Bearing/Retainer** - A new bearing (b) is being used to handle the upward force generated by the new gear design. Bearing is pressed onto the drive shaft with the taper upward (opposite of the old housing). A threaded retainer (c) is used to secure the bearing outer race in the gear housing.
- **Reverse Gear Thrust Ring** - A thicker steel ring (d) is used to precisely position the reverse gear.
- **Forward Gear/Propeller Shaft Bearing** - A closer fit bearing (e) is now employed to reduce gear deflection under high loads.
- **Drive Shaft/Pinion Bearing** - The lower portion of the drive shaft (f) has been enlarged and a larger pinion bearing (g) has been utilized to reduce gear and shaft deflection. The preload pin has been removed from the top of the drive shaft as upward movement is now

controlled by the threaded retainer. The number of splines between the drive shaft and the pinion gear has been increased from 11 to 13.

- **Water Pump Base** - A new water pump base (h) has been used to provide clearance for the oil circulation passage. This base utilizes a new gasket and "O" ring.
- **Water Pump Housing** - The water pump housing (i) has been changed to accommodate the new water pump base.
- **Gear Housing** - The gear housing is machined differently to accept the new drive shaft, bearings and retainer.

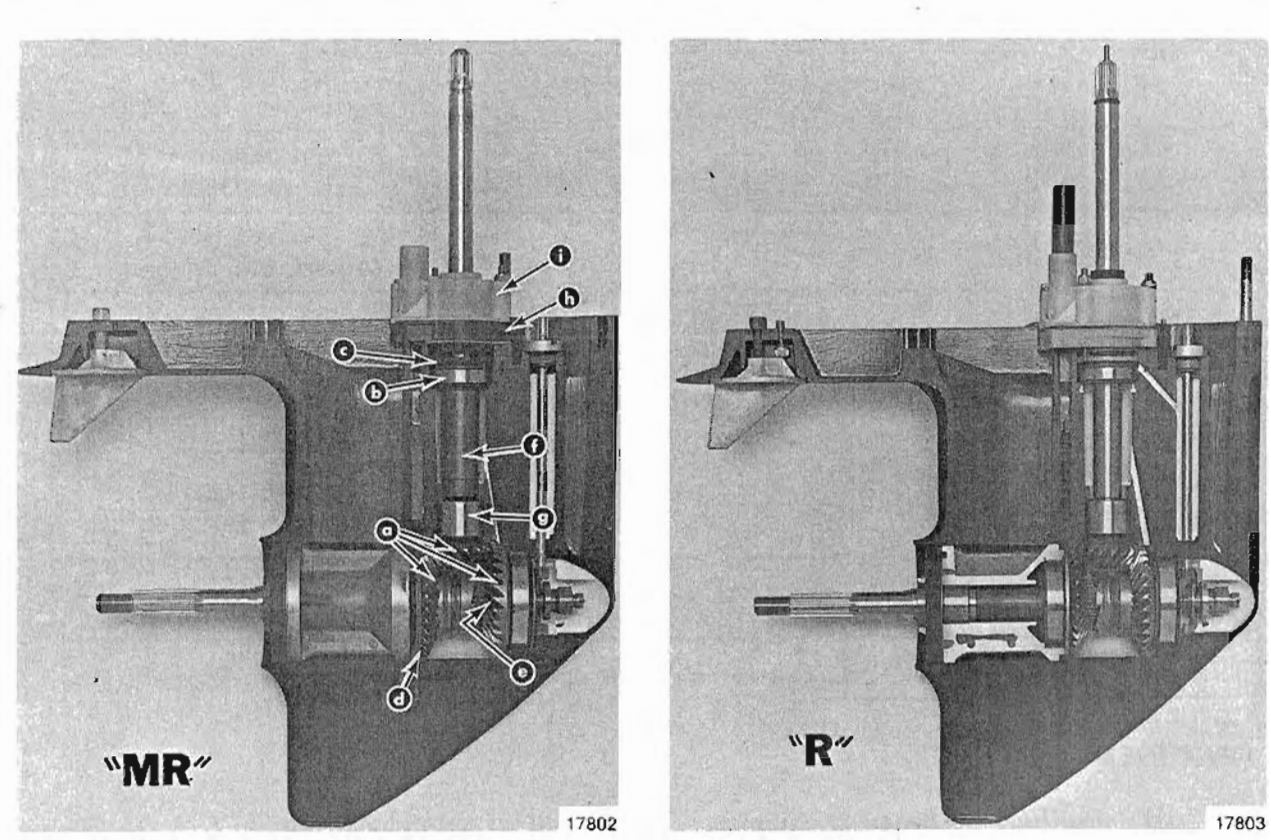


Figure 3. Gear Housing Internal Changes

SERVICING

The service manual for the "MR" gear housing will be available shortly and one will be shipped to each dealership when it is printed. Listed following is some important information to help prepare you for servicing these units.

Shimming Specifications

The gear backlash specifications are different than the old gear housing, and are listed below.

Gear Backlash Specifications	
Forward Gear	.017" - .028" (.432mm - .711mm)
Reverse Gear	.028" - .052" (.711mm - 1.321mm)

Special Tools

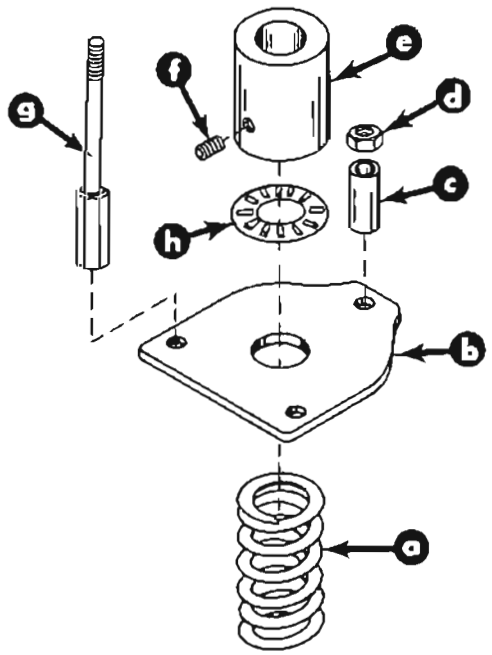
Three new tools are required to service the gear housing.

- **Drive Shaft Bearing Preload Tool, 91-44307A1 (Figure 4)** - Applies upward pressure on the drive shaft to seat the bearing when checking pinion gear height and gear backlash. An adaptor stud is included for mounting the dial indicator when checking backlash.

- **Drive Shaft Bearing Retainer Tool, 91-43506 (Figure 5)** - Required for removing and installing the threaded retainer. Retainer must be torqued to 100 lbs. ft. (136 N.m).

- **Pinion Nut Adaptor Wrench, 91-61067A2 (Figure 6)** - Necessary to remove and install pinion nut. This tool will work on older units as well as the "MR" and will supercede wrench 91-61067A1. New wrench will have 3 positions; 1 for the "MR" and 2 for the older units.

  NOTE: Existing pinion nut adaptor wrench, 91-61067A1 can be modified, as shown in Figure 7, to allow wrench to be used on the "MR" gear housing. Wrench can no longer be used on older units once it has been modified.



a - Spring
b - Plate
c - Spacer (3)
d - Nut (3)
e - Collar
f - Set Screw
g - Adaptor Stud
h - Thrust Bearing

Figure 4. Drive Shaft Bearing Preload Tool 91-44307A1

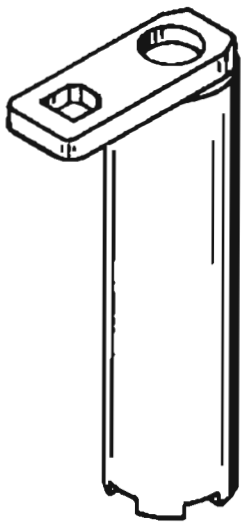


Figure 5. Drive Shaft Bearing Retainer Tool 91-43506

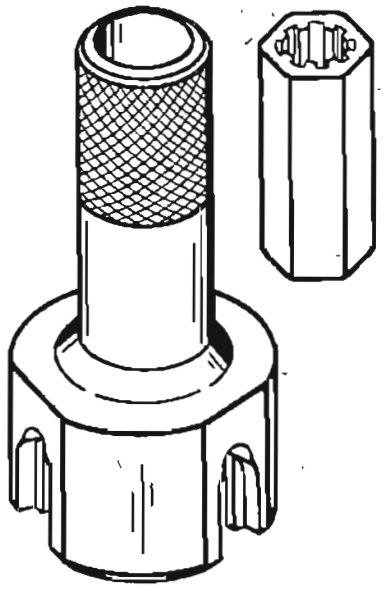
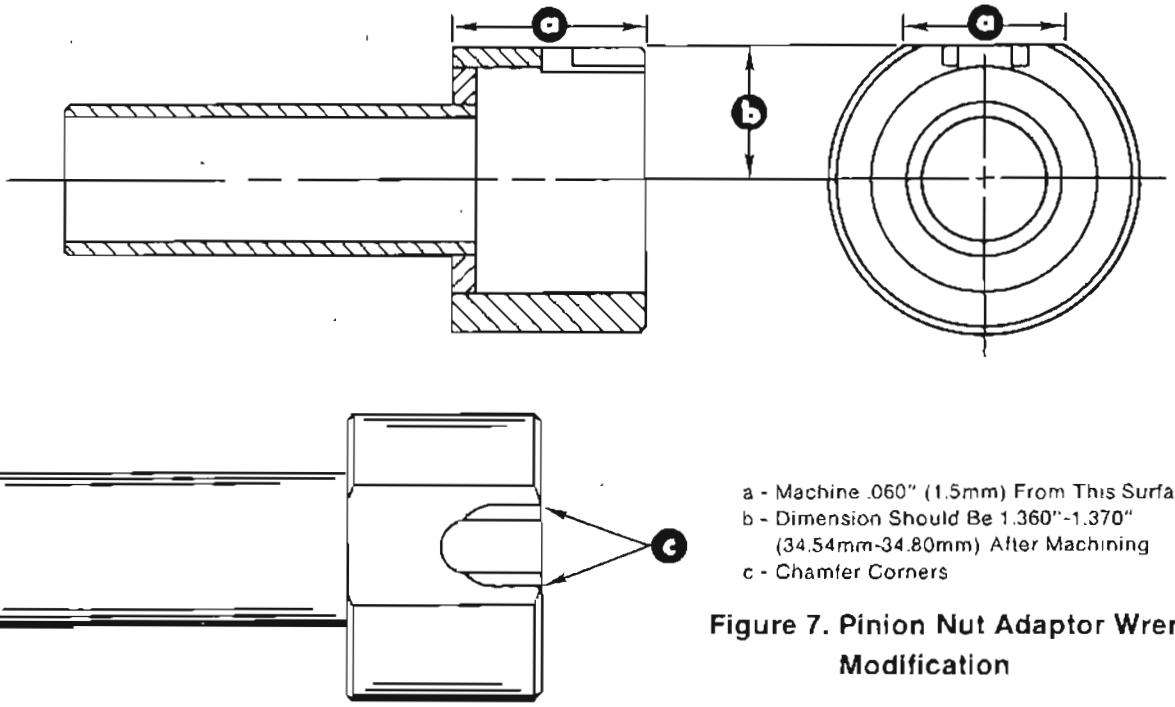


Figure 6. Pinion Nut Adaptor Wrench
91-61067A2



a - Machine .060" (1.5mm) From This Surface
b - Dimension Should Be 1.360"-1.370" (34.54mm-34.80mm) After Machining
c - Chamfer Corners

Figure 7. Pinion Nut Adaptor Wrench Modification

QuicKits

Three kits are available for servicing the "MR" gear housings. These kits will save you a substantial amount of time by eliminating the need to look up and price individual parts. Refer to Figure 8 for parts identification.

- Gear Housing Seal Kit - 26-89238A1
- Water Pump Rebuild Kit - 46-44292A4
- Major Repair Kit - 43-42933A3

IMPORTANT: Major repair kit 43-42933A3 will not be available until August of 1984. DO NOT ORDER KIT UNTIL THAT TIME.

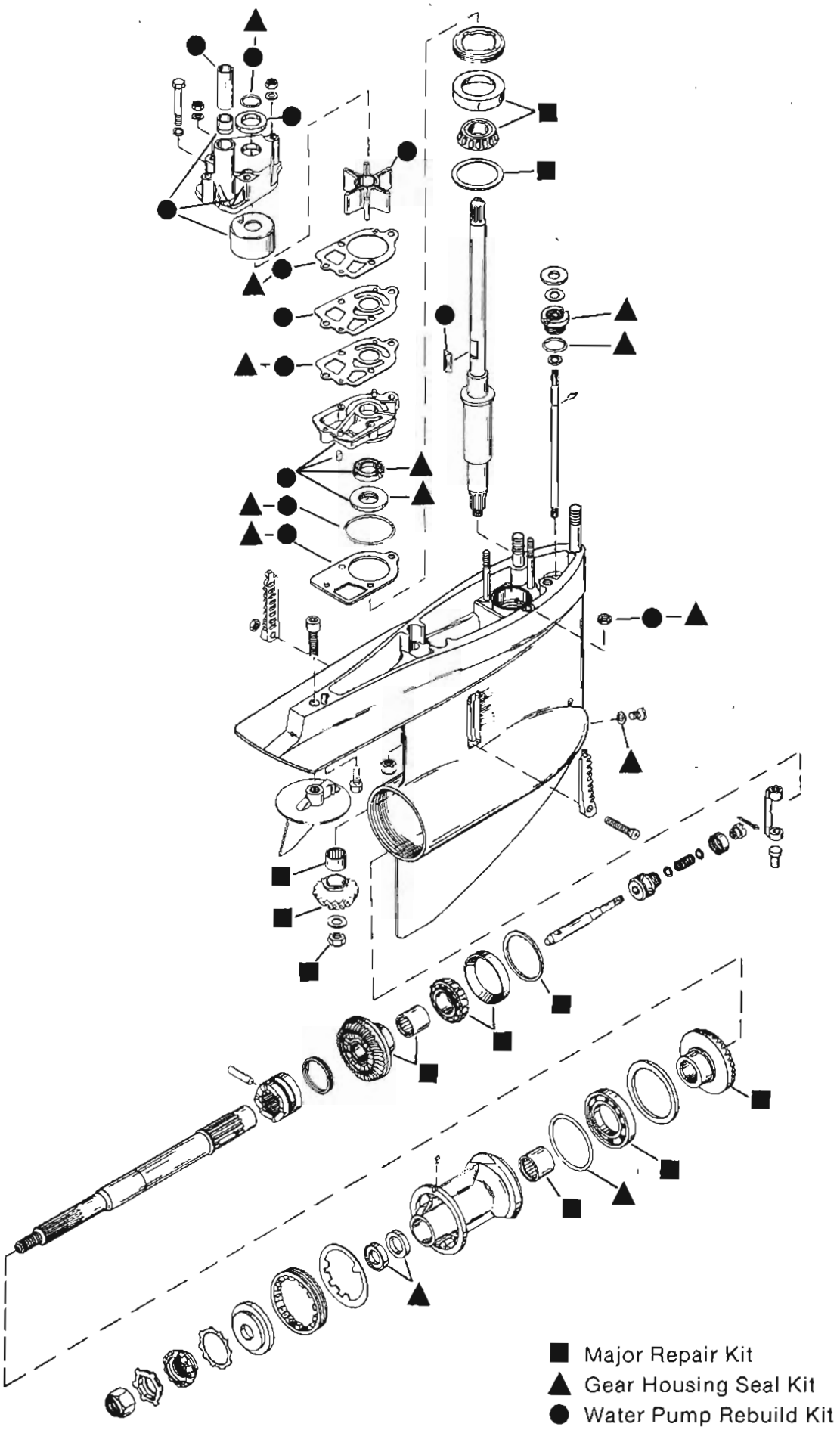


Figure 8. "MR" Gear Housing Kit Contents