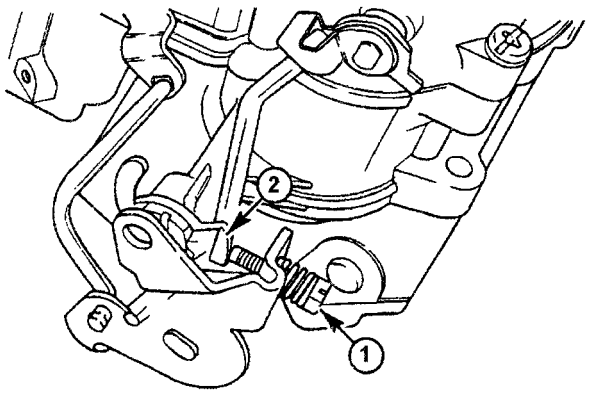


1- Idle Speed Screw
2- Idle Cam

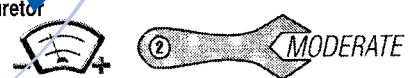
Fig. 84 The idle speed adjusting screw should rest on the idle cam

✳✳ CAUTION

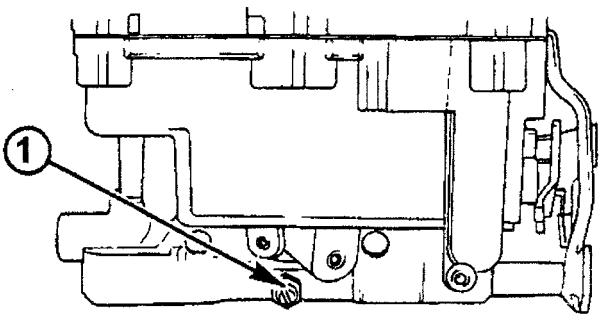
Water must circulate through the lower unit and to the engine anytime the engine is being run. Severe damage could result otherwise. If the boat is not in the water, make sure a flushing attachment has been installed properly.

6. You will need to disconnect the throttle cable from the throttle lever before performing the next step because the boat will need to be in gear.
7. With the engine still running and the tach hooked up, move the shift lever into **F** and turn the mixture screw(s) in (clockwise), carefully and slowly, until the engine speed JUST begins to drop due to a LEAN condition. Jot down the number of turns. If your carburetor has two screws, and it most likely will, there are two schools of thought here—you can adjust them individually or alternately. We prefer the alternating method; that is, turning each screw in a little at a time, the same amount, until you get the LEAN condition. If you go this route, we suggest turning them alternately no more than 1/8th turn at a time.
8. Now, back the screw(s) out (counterclockwise), evenly and alternately, until you achieve the correct idle speed as detailed in the Tune-Up Specifications chart. If the idle begins to drop before you get to the correct speed (due to a RICH condition this time) then back them down slightly until it runs smooth again.
9. Recheck the idle speed and compare it to the recommended speed in the chart. If adjustment is required, now you can use the idle speed stop screw— turn it, gradually and evenly, until the correct idle is achieved.
10. Turn the engine off and reconnect the throttle cable. Disconnect the tachometer.

All Engines W/4BBL Carburetor



1. Locate the idle speed screw on your carburetor and turn it in or out until it is just resting on the idle cam, but is not moving it. The idle screw is threaded into the throttle linkage on the side of the carburetor and has a spring between the screw head and the linkage.
2. Locate the idle mixture screw on the base of the carburetor and turn it in (clockwise) until it just lightly seats itself and then back it out:
- 1986 engines—3 3/4 turns
- 1987-89 engines w/Rochester—3 3/4 turns
- 1987-89 engines w/Holley—1 1/2 turns
- 1990-91 4.3L HO engines—3/4 turn
- 1996-97 4.3GS engines—3/4 turn
- 1998 4.3GS engines—1 1/8 turns
- 1990-92 5.7L engines—1/4 turn
- 1990-91 5.7L LE engines—1 turn
- 1991-92 5.7L engines—1/2 turn
- 1997 5.7GS engines—1/2 turn



1- Idle Mixture Needle

Fig. 85 Never tighten the idle mixture screw against its seat; some models will have two screws

- 1990 350 engines—1/4 turn
- 1990 5.8L engines—1 1/2 turns
- 1991-96 5.8L engines—1 7/8 turn
- 1990 454 engines—1 turn
- 1991-97 7.4L HO engines—1/4 turn
- 1990 7.4L engines—1 1/2 turns

✳✳ CAUTION

Be careful not to turn the idle mixture screw in past the seated position or risk damaging the seat or needle. Both the screw tip and the seat can be affected. Replace any screws suspected of damage.

3. Ensure that the flame arrestor is in place and is free of debris and obstructions. A clogged filter will greatly impact this adjustment.
4. Connect a tachometer as per the manufacturer's instructions—do not use the tach on your boat!
5. Start the engine and allow it to run at idle until it reaches normal operating temperature.

✳✳ CAUTION

Water must circulate through the lower unit and to the engine anytime the engine is being run. Severe damage could result otherwise. If the boat is not in the water, make sure a flushing attachment has been installed properly.

6. You will need to disconnect the throttle cable from the throttle lever before performing the next step because the boat will need to be in gear.
7. With the engine still running and the tach hooked up, move the shift lever into **F** and turn the mixture screw(s) in (clockwise), carefully and slowly, until the engine speed JUST begins to drop due to a LEAN condition. Jot down the number of turns. If your carburetor has two screws, and it most likely will, there are two schools of thought here—you can adjust them individually or alternately. We prefer the alternating method; that is, turning each screw in a little at a time, the same amount, until you get the LEAN condition. If you go this route, we suggest turning them alternately no more than 1/8th turn at a time.
8. Now, back the screw(s) out (counterclockwise), evenly and alternately, until you achieve the correct idle speed as detailed in the Tune-Up Specifications chart. If the idle begins to drop before you get to the correct speed (due to a RICH condition this time) then back them down slightly until it runs smooth again.
9. Recheck the idle speed and compare it to the recommended speed in the chart. If adjustment is required, now you can use the idle speed stop screw— turn it, gradually and evenly, until the correct idle is achieved.
10. Turn the engine off and reconnect the throttle cable. Disconnect the tachometer.

Fuel Injected Engines

Idle speed is constantly monitored by the electronic control module (ECM) and controlled by the idle air control valve (IAC). Idle speed and mixture are not adjustable. Please refer to the Fuel System section for further information on the fuel injection system.

PCV Valve

Many engines are equipped with a positive crankcase ventilation (PCV) circuit that utilizes a PCV valve in the rocker cover in order to ventilate unburned crankcase gases back into the engine via the intake manifold in order that they can be re-burned. The PCV valve should be replaced every boating season or 100 hours of operation.

A PCV system that is malfunctioning can cause rough running or idle, and also increased fuel consumption. Do not attempt to disconnect or bypass the system.

REMOVAL & INSTALLATION

◆ **See Figure 86**

EASY

1. Locate the PCV valve in the cylinder head cover—usually the Port but it could be either.
2. Carefully wiggle it back and forth while pulling upward on the valve itself until it pops out of the cover.
3. Loosen the clamp (if equipped) and disconnect the breather hose from the valve.
4. Reconnect the hose and press the valve back into the cylinder head.

■ **PCV valves are not serviceable. If your valve is clogged or otherwise not working properly, it must be replaced with a new one.**

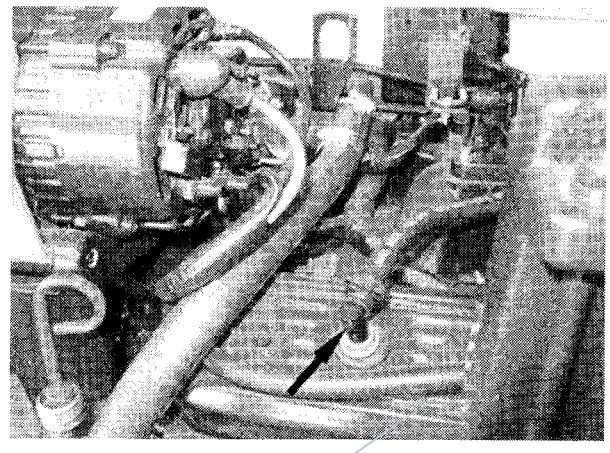


Fig. 86 Typical PCV valve

INSPECTION

◆ **See Figure 87**

Start the engine and allow it to reach normal operating te[mp]. Pu[ll] out the PCV valve as detailed above and cover the opening w[ith] [a] You should be able to feel significant vacuum; if not repl[ace] With the valve still in your fingers, shake it back and forth a fe[w] [sh]ould be able to hear the inside components moving aro[und] a [cli]cking sound.

If the valve passes these two tests, it is fu[nc]tio[nal]. If it fails either of the tests and there are no leaks i[n] [ho]s[es] or connections, it will require replacement.

■ **PCV valves are not servic[eab]l[e] [v]alve i[s] clogged or otherwise not working properly, it mu[st] re[pl]a[ce]d with a new one.**

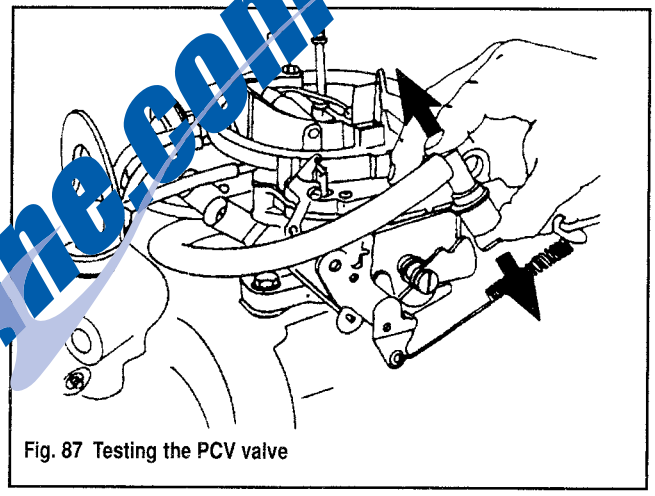


Fig. 87 Testing the PCV valve

Valve Adjustment

All engines covered in this manual are equipped with hydraulic valve lifters and do not require periodic valve adjustment. Adjustment to zero lash is maintained automatically by the hydraulic pressure in the lifters. For initial adjustment procedures after cylinder head work or if a problem is expected, please refer to the appropriate Engine Mechanical section.

FLUIDS AND LU[BRI]CANTS

Fluid Disposal

Used fluids such as engine oil, gear oil, antifreeze and power steering fluid are hazardous waste and must be disposed of properly and responsibly. Before draining any fluids it is always a good idea to check with your local authorities; in many areas there are recycling programs available for easy disposal. Service stations, Parts stores and Marinas also often will accept waste fluids for recycling.

Be sure of your local recyclers' policies before draining any fluids, as many will not accept fluids that have been mixed together.

Fuel And Oil Recommendations

FUEL

All engine covered in this manual are designed to run on unleaded fuel. Never use leaded fuel in your boat's engine. The minimum octane rating of fuel being used for your engine must be at least 86 AKI (outside the US, 90 RON), on early models and 89 AKI (93 RON) on all others, but some engines may require higher octane ratings. OMC actually recommends the use of 89 AKI (93 RON) fuel as the ideal—in fact, anything less than this on many 4.3L, 5.0GL and 5.7L engines will require a change to the ignition timing. Fuel should be selected for the brand and octane that performs best with your engine. Check your owner's manual if in doubt.

The use of a fuel too low in octane (a measure of anti-knock quality) will result in spark knock. Newer systems have the capability to adjust the engine's ignition timing to compensate to some extent, but if persistent knocking occurs, it may be necessary to switch to a higher grade of fuel. Continuous or heavy knocking may result in engine damage.

ENGINE OIL

Nothing affects the performance and durability of an engine more than the engine oil. If inferior oil is used, or if your engine oil is not changed regularly, the risk of piston seizure, piston ring sticking, accelerated wear of the cylinder walls or liners, bearings and other moving components increases significantly.

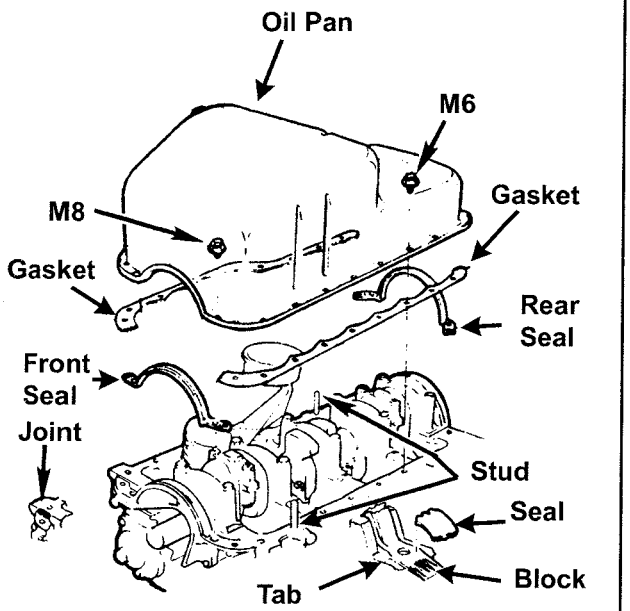
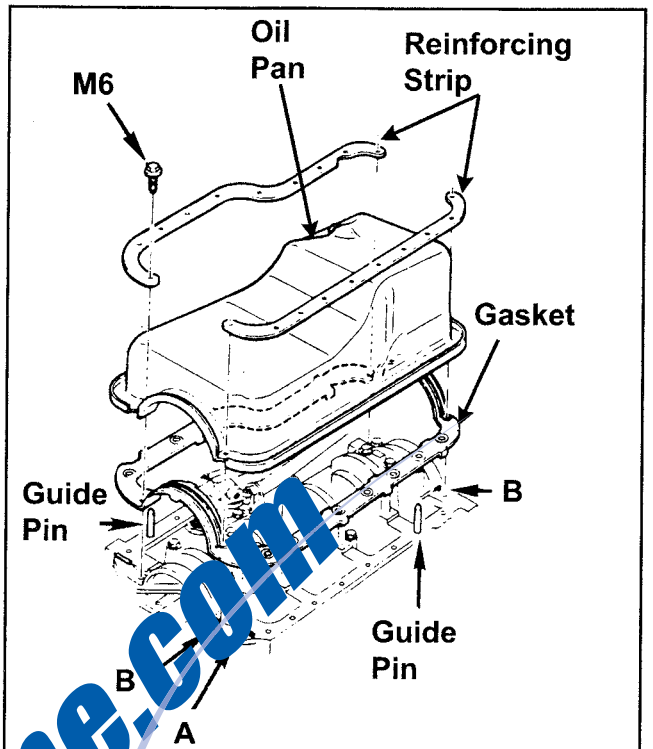


Fig. 14 The oil pan uses a two-piece soft rubber gasket and two seals—1987-89 engines



...il pan uses a one-piece soft rubber gasket—1990

Oil Pump

The two-piece oil pump utilizes an inner and outer rotor and ... relief valve. A baffled pick-up tube is bolted to the body of the ... pump is driven via the auxiliary shaft which is itself driven by the ... via a timing belt.

REMOVAL & INSTALLATION

◆ **See Figures 16 and 17**

DIFFICULT

1. Remove the oil pan as previously d... ...mber that you probably need to remove the engine f... ...dure.
2. Loosen and remove the ... ...ce bolt.
3. Loosen and remove the ... ...bolts and lift off the pump assembly. Pull out th... ...te of its orientation in the bore.
4. Insert the pump shaft ... ...ame manner in which it came out.
5. Check that the pump a... ...block mating surfaces are clean and then position the pump over the block so that the pump shaft slot is aligned correctly. Do not use a gasket or RTV sealant.
6. Tighten the pump mounting bolts to 14-21 ft. lbs. (19-28 Nm).
7. Position the pick-up tube brace and tighten the bolt to 60 inch lbs. (7 Nm).
8. Install the oil pan and engine.

DISASSEMBLY & ASSEMBLY

◆ **See Figure 17**

DIFFICULT

1. Remove the oil pan and oil pump.
2. Remove the mounting bolts (2) and pull off the pick-up tube.
3. Remove the 4 cover screws and lift off the cover.
4. Lift out the two rotors and sit them down carefully as they break very easily.

■ **The pump body, relief valve and spring are serviced as an assembly.**

...ble:

5. Clean all components thoroughly in solvent and allow them to air dry completely—compressed air will speed the process if available. Clean the inside of the housing with a small toothbrush if necessary.
6. Check the cover, inner housing and both rotors for scratching, nicks or any other signs of wear. Replace as necessary.
7. Install the rotors so that the ID marks on each component are facing each other.
8. Measure the clearance between the outer rotor race and the inner bore of the housing. Clearance should be 0.001-0.0013 in. (0.03-0.033mm).
9. With the rotors still installed in the housing, lay a straight edge across the top of the assembly. Use a flat feeler gauge and measure the clearance between the straight edge and the rotors. Endplay must be 0.001-0.004 in. (0.03-0.10mm).
10. Check the bearing clearance by measuring the outer diameter of the pump shaft with a micrometer and then subtracting that figure from the inner diameter of the housing bearing. Clearance should be 0.0015-0.0029 in. (0.04-0.07mm).
11. Measurements outside of the specifications on any of the proceeding steps will dictate replacement of the associated component.
12. Install the housing cover and tighten the screws to 72-120 inch lbs. (8.1-13.6 Nm).
13. Connect the pick-up tube to the housing and tighten the 2 bolts to 14-21 ft. lbs. (19-28 Nm).
14. Install the oil pump and pan.

Engine Coupler And Flywheel

REMOVAL & INSTALLATION

◆ **See Figures 18, 19 and 20**

DIFFICULT

1. Remove the engine from the boat as detailed previously in this section.
2. Although not strictly necessary, we recommend removing the starter.
3. Cut the plastic tie that secures the housing drain hose (if equipped) and the pull the hose out of the fitting.

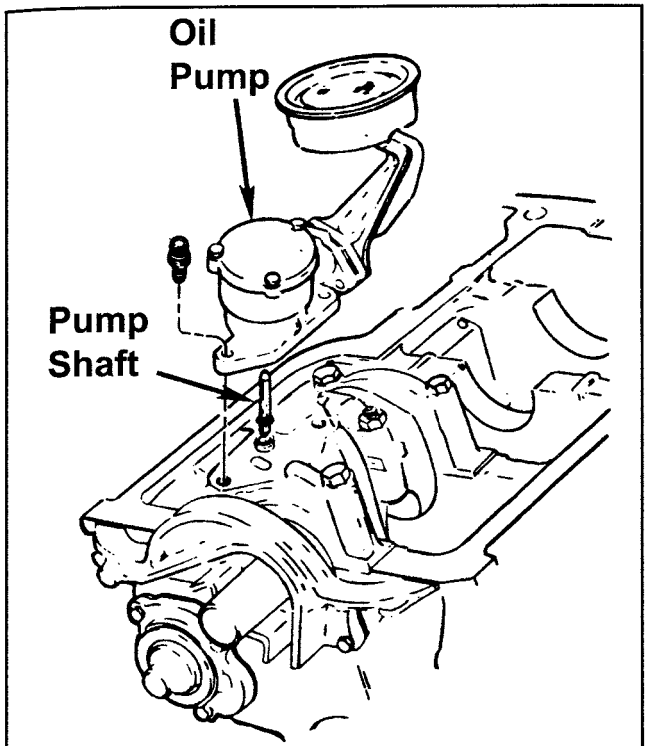


Fig. 16 Removing the oil pump assembly

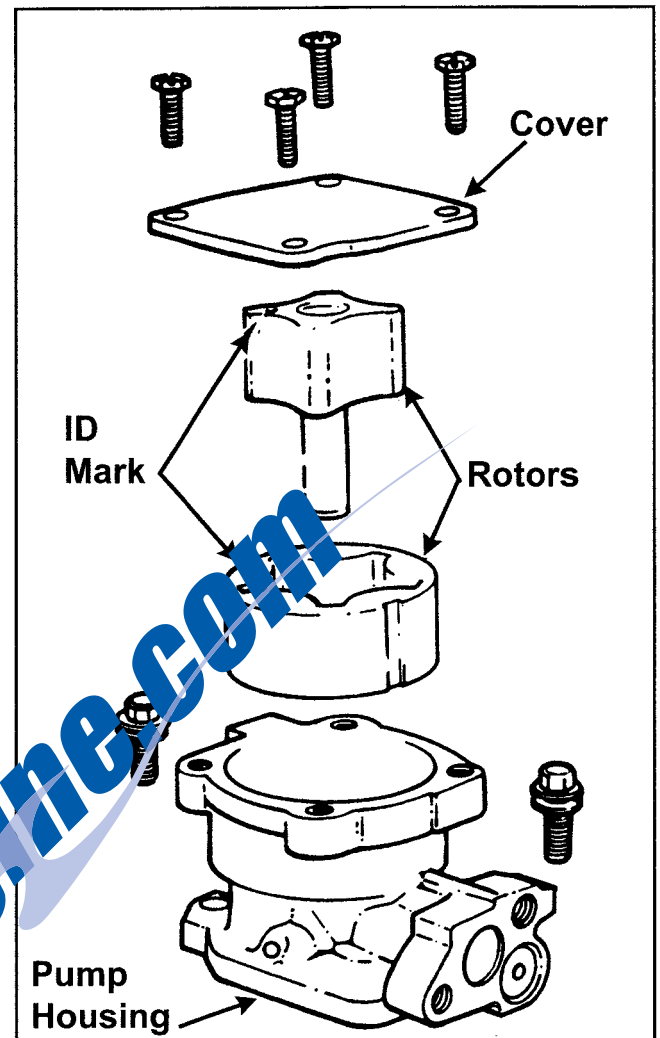


Fig. 17 Exploded view of the oil pump

4. Remove the 4 or 5 mounting bolts and slide out the lower flywheel housing cover.

5. Loosen and remove any connections attached to either of the engine studs on each side of the flywheel. Move the electrical leads out of the way.

6. Loosen the remaining retaining bolts (some of which will already be removed with the shift bracket) for the flywheel housing and remove it. Make note of the positioning of any clamps so they may be installed in the same position.

7. Slide a wrench behind the coupler and loosen the mounting nuts gradually and as you would the lug nuts on your car or truck—that is, in a diagonal star pattern.

8. Remove the coupler and then the flywheel.

To install:

9. Thoroughly clean the flywheel mounting surface and check it for any nicks, cracks or gouges. Check for runout.

10. Install the flywheel over the dowel pins on the crankshaft.

■ **The 2.3L engine uses a slightly different coupler than other OMC engines—make sure that you have the correct part if replacing with a new one.**

11. Slide the coupler over the studs so that it sits in the recess on the flywheel. Install new lock washers and tighten the mounting bolts to 14-17 ft. lbs. (19-23 Nm). Once again use the star pattern while tightening the bolts.

12. Position the flywheel housing and the shift bracket. Make sure that the clamps are in their original positions and insert the mounting bolts. Tighten them to 28-36 ft. lbs. (38-49 Nm).

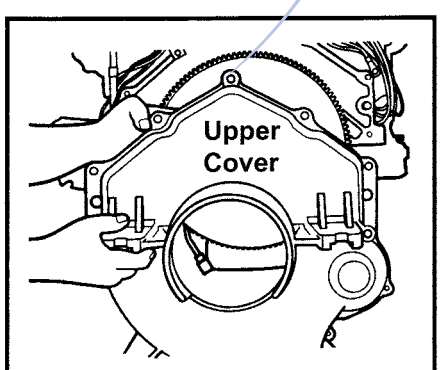


Fig. 18 Remove the upper cover...

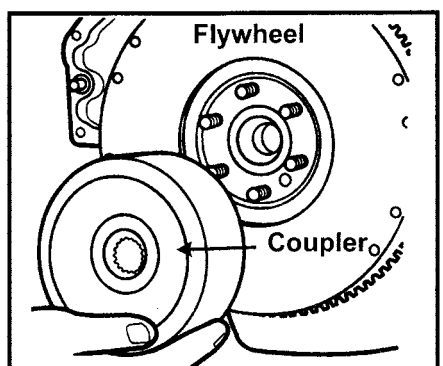


Fig. 19...and then pull off the coupler after removing the bolts

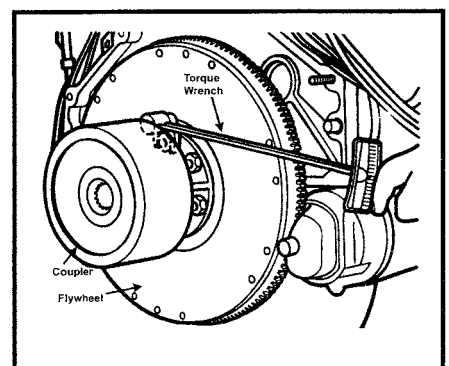


Fig. 20. Tighten the mounting bolts in a criss-cross pattern

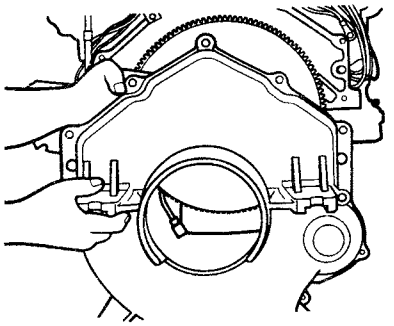


Fig. 22 Remove the upper cover...

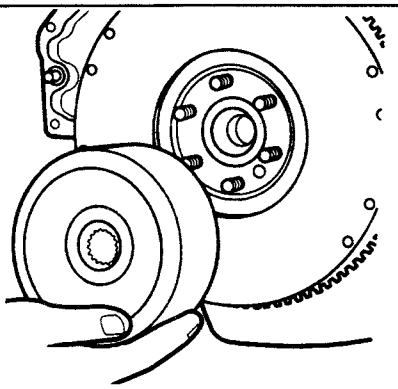


Fig. 23 ...and then pull off the coupler after removing the bolts

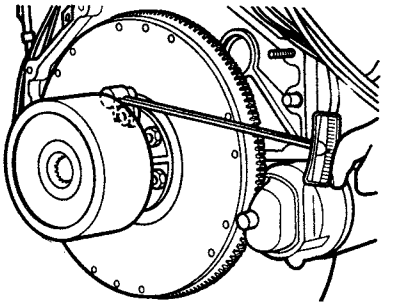


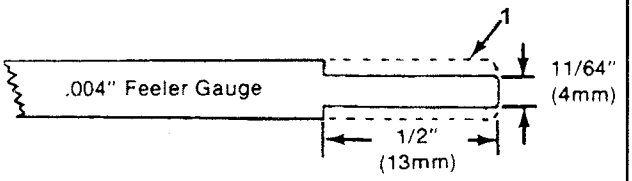
Fig. 24 Tighten the mounting bolts in a criss-cross pattern

2. Remove the oil pan and pump as detailed previously in this section.
3. Loosen the retaining bolts and remove the rear main bearing cap. Carefully insert a small prybar and remove the lower half of the seal from the cap. Do not damage the seal seating surface.
4. Using a hammer and a small drift, tap on the end of the upper seal until it starts to protrude form the other side of the race. Grab the protruding end with pliers and pull out the remaining seal half.

Fig. 25 Drive out the old upper seal with a small drift

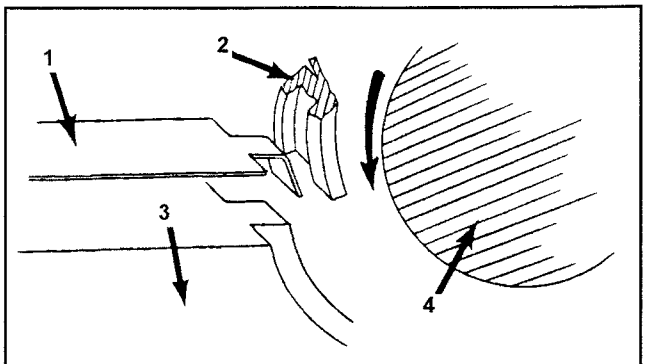
■ **Upper and lower seals must replaced as a pair. Never replace only one seal.**

5. Check that you hav[illegible] new seal. Seals with a hatched inner surface can only be us[illegible] rotation engines, smooth seals can be used on any engine. C[illegible]nd bead thoroughly with motor oil. Keep oil away from the [illegible] surfaces.
6. Your se[illegible] sh[illegible]ome with an installation tool, if not, take a 0.004 in. feeler gauge [illegible] each side back about a half inch so that you're left with an 11/64 inc[illegible]. Bend the tool into the gap between the crankshaft and the [illegible] seating surface. This will be your "shoe horn".
7. [illegible] the upper half of the seal (lip facing the engine) between the [illegible] tool so that the seal's bead is in contact with the tool tip. Roll [illegible] around the crankshaft using the tool as a guide until each end is [illegible] the cylinder block. Remove the tool.
8. [illegible]ert the lower seal half into the main bearing cap with the lip facing [illegible] Start it so that one end is slightly below the edge of the cap and [illegible]e the tool to shimmy the seal all the way in until both edges are flush [illegible]he edge of the cap. Remove the tool.



1- Cut away

Fig. 26 Fabricate a seal installation tool out of an old feeler gauge...



1- Installation tool
2- Seal
3- Engine block
4- Crankshaft

Fig. 27 ...and then use the tool to feed the seal around the crankshaft

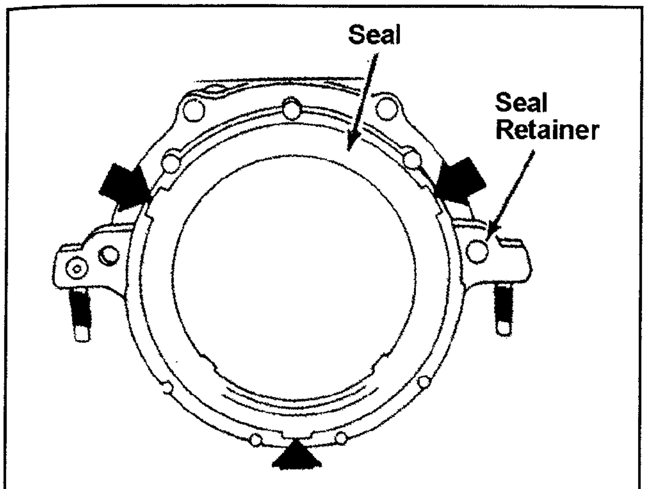


Fig. 28 Use the three slots in the seal retainer when removing the rear main seal

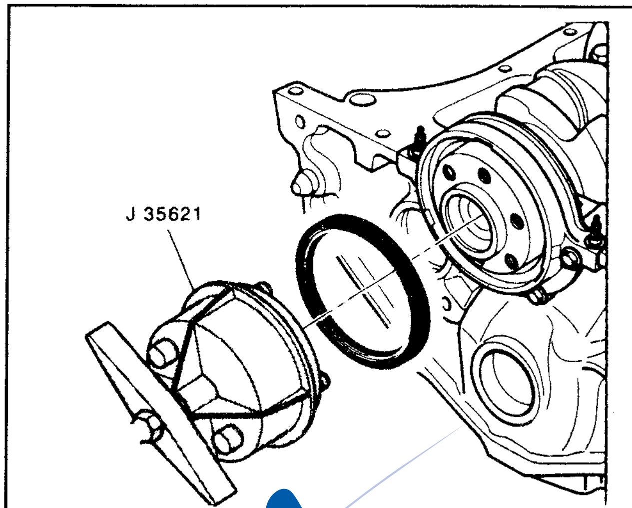


Fig. 29 Use a seal driver to seat the new oil seal

9. Make sure that the cap/block mating surfaces and the seal ends are free of any oil and then apply a small amount of Perfect Seal to the block just behind where the upper seal ends are.
10. Install the bearing cap and tighten the bolts to 10-12 ft. lbs. (14-16 Nm). Tap the end of the crankshaft forward and backward (as detailed in the appropriate section) and then tighten the bolts to 60-70 ft. lbs. (82-94 Nm).
11. Install the oil pump and pan.
12. Install the engine.

One Piece Oil Seal (1991-98)

OEM ③ DIFFICULT

◆ **See Figures 28 and 29**

It is not necessary to remove the engine or rear main bearing cap when removing the one-piece oil seal on these engines although you may find it easier to do just that.

1. Remove the flywheel housing and cover as detailed in this section.
2. Remove the engine coupler and flywheel from the engine as detailed in this section.
3. Remove the seal retainer. This is not absolutely necessary.
4. Insert a small prybar into one of the three slots in the edge of the seal retainer and slowly pry the seal out of the retainer. Be very careful not to nick or damage the sealing surface when prying out the seal.
5. Thoroughly clean the retainer surface and then install the retainer.
6. Spread a small amount of engine oil around the inside and outside edges of a new seal and then press it evenly into the slot in the retainer.
7. Position a seal driver (J 35621) over the seal and crankshaft and then thread the attaching screws into the holes in the crankshaft, tightening them securely. Turn the handle on the tool until it bottoms out—the seal is now in place.
8. Install the flywheel and engine coupler. Install the cover and flywheel housing.

Rear Main Oil Seal Retainer

REMOVAL & INSTALLATION

1991-98 Engines Only

③ DIFFICULT

◆ **See Figure 28**

It is not necessary to remove the engine or rear main bearing cap when removing the one-piece oil seal on these engines although you may find it easier to do just that.

■ **A new oil seal must be installed whenever the retainer is removed.**

1. Remove the oil pan.
2. Remove the flywheel.
3. Loosen the nuts/bolts and then lift out the retainer and gasket.
4. Replace the seal.
5. Clean all old sealant and gasket material from the mating surfaces and position a new seal on the cylinder block.
6. Install the seal retainer, and a new gasket, and tighten the nuts/bolts to 135 inch lbs. (15 Nm).
7. Install the oil pan and flywheel as previously detailed.

Harmonic Balancer, Pulley And Hub

REMOVAL & INSTALLATION

OEM ③ DIFFICULT

◆ **See Figures 30 and 31**

1. If the engine is in the boat, install an engine hoist and tighten the chain so that the engine's weight is removed from the front engine mount. Remove the front engine mount.
2. Remove the seawater pump from the front of the crankshaft on models so equipped.
3. Remove the drive belts.
4. Loosen the bolts securing the pulley/harmonic balancer to the hub and remove the assembly—the 2.5L does not use the balancer.
5. Install special tool #J-6978-E onto the hub with two 3/8-24 x 2 in. bolts and a 5/16-24 x 2 in. bolt for the 2.5L, or three 3/8-24 x 2 in. bolts on the 3.0L. Tighten the tool press bolt and remove the hub. OMC suggests that you do not use a conventional gear puller for this procedure.

To install:

6. Coat the front cover oil seal lip with clean engine oil and then install the balancer/pulley over the crankshaft and key. You can use a rubber mallet to position it temporarily.
7. Install the installation tool #J-5590 onto the hub. Be sure that you thread the tool into the crankshaft at least 1/2 in. to protect the threads.

✱✱ CAUTION

The crankshaft actually extends slightly through the front of the assembly, so make sure to use the correct tool.

■ **In order that the timing mark can be properly positioned, there are two 3/8 in. holes and one 5/16 in. holes in the hub that must be matched.**

8. Install the drive belts and make sure that it is adjusted properly.
9. Install the seawater pump if removed.
10. Install the front mount and unhook the engine hoist.

ENGINE MECHANICAL

General Information

NEVER, NEVER attempt to use standard automotive parts when replacing anything on your engine. Due to the uniqueness of the environment in which they are operated in, and the levels at which they are operated at, marine engines require different versions of the same part; even if they look the same. Stock and most aftermarket automotive parts will not hold up for prolonged periods of time under such conditions. Automotive parts may appear identical to marine parts, but be assured, OMC marine parts are specially manufactured to meet OMC marine specifications. Most marine items are super heavy-duty units or are made from special metal alloy to combat against a corrosive saltwater atmosphere.

OMC marine electrical and ignition parts are extremely critical. In the United States, all electrical and ignition parts manufactured for marine application must conform to stringent U.S. Coast Guard requirements for spark or flame suppression. A spark from a non-marine cranking motor solenoid could ignite an explosive atmosphere of gasoline vapors in an enclosed engine compartment.

V6 ENGINES

The OMC 4.3L, 262 cubic inch displacement V6 engine is manufactured by GMC. This engine is used in numerous models known as the 4.3, 4.3 HO, 4.3GL, 4.3GS and 4.3Gi.

The 4.3 and 4.3GL models are equipped with a 2-barrel carburetor, while the 4.3, 43 HO and 4.3GS models are equipped with a 4-barrel carburetor. Throttle body fuel injection was introduced on the 4.3Gi in 1996.

The lubrication systems and component locations on this engine are virtually identical to the larger V8 engines, except for having only three cylinders in each bank.

A balance shaft is mounted above the camshaft on all 1994 and later models and extends the entire length of the block and is supported on each end by a bearing. The balance shaft is driven by gears on the end of the camshaft and equalizes the dynamic forces known as harmonic vibrations, minimizing engine vibration during routine operation of a V6 engine. Cylinder numbering and firing order is identified in the illustrations at the end of the Maintenance Section.

All 4.3L engines are left hand (counterclockwise) rotation when viewed from the stern of the boat. This does not necessarily indicate that your prop rotation is the same— always check them both!

V8 ENGINES

The OMC 5.0L, 305 cubic inch and 5.7L, 350 cubic inch displacement (small block) V8 engines are manufactured by GMC. These engines are used in the following configurations:

- 5.0 (2/4 bbl)
- 5.0GL (2 bbl)
- 5.7 (4 bbl)
- 5.7Gi (TBI)
- 5.7GL (2 bbl)
- 5.7GS (2/4 bbl)
- 5.7GSi (TBI)
- 5.7 LE (4 bbl)
- 350 (4 bbl)

The OMC 7.4L, 454 cubic inch and 8.2L, 502 cubic inch displacement (big block) V8 engines are also manufactured by GMC. These engines are used in the following configurations:

- 7.4 (4 bbl)
- 7.4 454 (4 bbl)
- 7.4 EFI (MPI)
- 7.4GL (4 bbl)
- 7.4Gi (MPI)
- 7.4GSi (MPI)
- 8.2GL (4 bbl)
- 8.2GSi (MPI)
- 454 (4 bbl)
- 454 HO (4 bbl)
- 502 (4 bbl)

The lubrication system is a force fed type where oil is supplied under full pressure to the crankshaft, main and connecting rod bearings, camshaft bearings and the valve lifters. Oil flow from the valve lifters is metered and pumped by the lifter through the hollow core pushrods to lubricate the rocker arms and valve train. All other components are lubricated by gravity and splash methods.

The oil pump is mounted on the rear main bearing cap and is driven by an extension shaft from the distributor—driven by the camshaft. Oil is drawn into the pump through the oil pick-up tube and screen. Should the screen become clogged, a relief valve in the screen will open and allow oil to be drawn into the pump.

Once oil reaches the pump, the pump forces oil through the lubrication system. A spring-loaded relief valve in the oil pump limits the maximum pump output pressure.

The pressurized oil flows out the pump through a full-flow disposable oil filter cartridge. On engines equipped with an oil cooler, the oil flows through the filter, out to the oil cooler via hoses and then returns to the block. Should the oil filter and/or cooler become clogged, a by-pass valve will open allowing the pressurized oil to by-pass the filter and cooler.

Some of the oil is then routed to the No. 5 crankshaft main bearing, the remainder of the oil pressure goes to the main oil gallery. The main oil gallery is located above the camshaft and runs the full length of the block. Oil from the main gallery is supplied through individual passages to the camshaft bearings, No's 1, 2, 3, 4 crankshaft main bearings and the lifter galley's on each side of the block.

Holes in the camshaft bearings and crankshaft main bearings align with the holes in the block to allow oil flow. Grooves in the bearings allow oil to flow between the bearing and the component.

Oil in the lifter galleries is forced into each hydraulic lifter through a hole in the side of the lifter. Oil flowing through the lifter must pass through a metering valve in each of the lifters. The metered volume of oil then flows up through the hollow push-rods to the valve rockers. A small hole in the rocker arm allows oil to lubricate the valve train bearing surfaces. All excess oil returns to the oil pan through oil return holes in the cylinder head. A baffle plate or "splash pan" mounted below the main bearing caps prevents excess oil being thrown off the crankshaft from aerating the oil in the oil pan.

The distributor shaft and gear is lubricated by oil in the starboard lifter gallery. The timing chain and gears are lubricated with oil flowing out the front of the No. 1 main bearing journal. The mechanical fuel pump and pushrod is lubricated with oil thrown off the camshaft eccentric.

All V8 engines are left hand (counterclockwise) rotation when viewed from the stern of the boat except some inboards which are right hand (clockwise). This does not necessarily indicate that your prop rotation is the same—always check them both!

Cylinder numbering and firing order is identified in the illustrations at the end of the Maintenance Section.

Engine Identification

ENGINE

◆ **See Figures 1, 2, 3 and 4**

The engine serial numbers are the manufacturer's key to engine changes. These alpha-numeric codes identify the year of manufacture, the horsepower rating and various model/option differences. If any correspondence or parts are required, the engine serial number must be used for proper identification.

Remember that the serial number establishes the year in which the engine was produced, which is often not the year of first installation.

The engine specifications decal contains information such as the model number or code, the serial number (a unique sequential identifier given ONLY to that one engine) as well as other useful information.

An engine specifications decal can generally be found on top of the flame arrestor, on the side of the thermostat housing (early V6/V8 engines), or on the inner side of the rocker arm cover, usually near the breather/PCV line (port side on most models) - all pertinent serial number information can be found here—engine and drive designations, serial numbers and model numbers. Unfortunately this decal is not always legible on older boats and it's also quite difficult to find, so please refer to the following procedures for each individuals unit's serial number location.

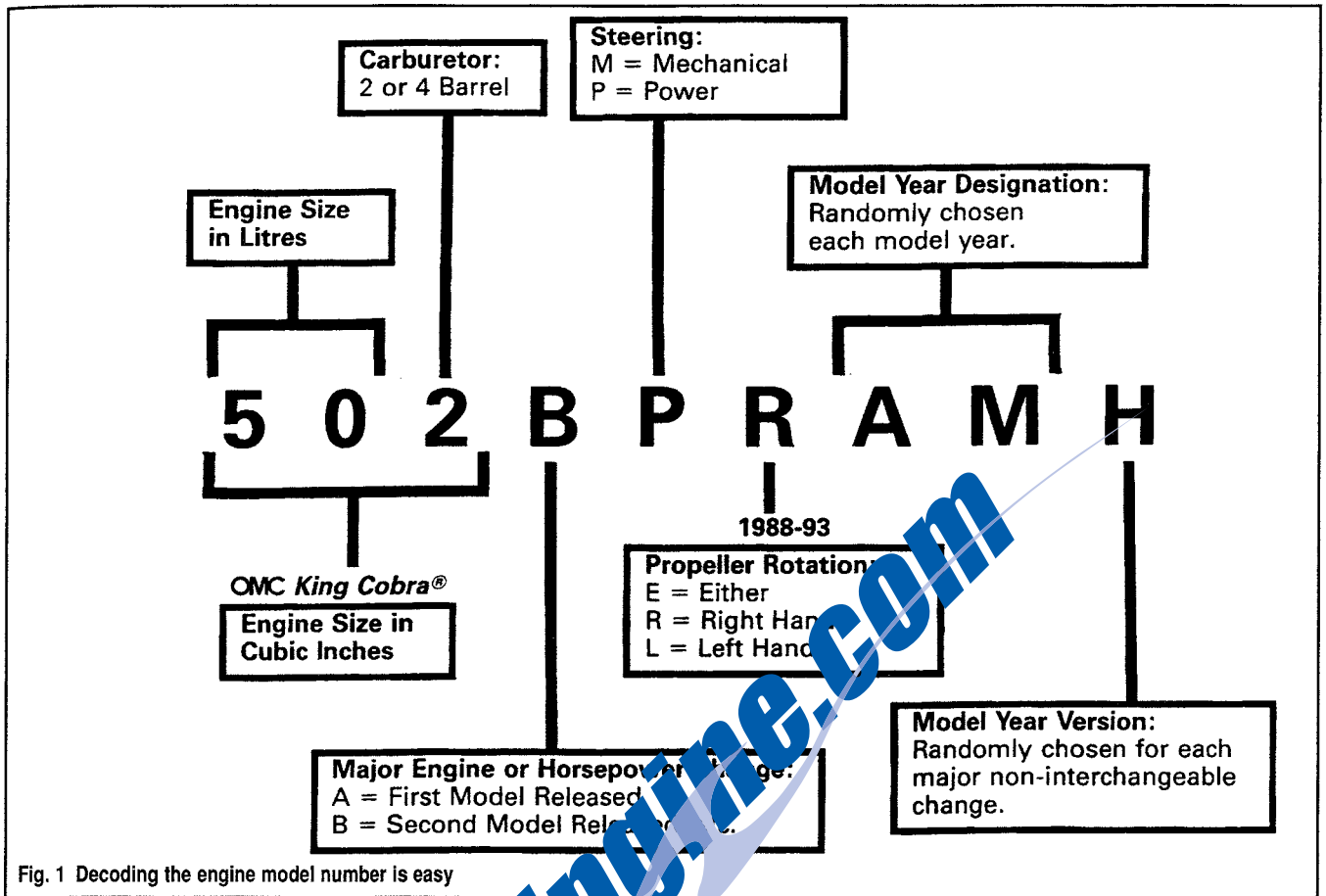


Fig. 1 Decoding the engine model number is easy

■ **Serial numbers tags are frequently difficult to see w engine is installed in the boat; a mirror can be a handy the numbers.**

The engine serial/model number is sometimes al rear side of the engine where it attaches to th most later models it may instead be a metal location. If your engine has a stamped num number; if you have a plate (and you sho number and then the actual Serial n also have this plate or sticker

- The first two characte in liters (L); **43** represents the 4.3L, **50** r and so forth.
- The third character id fuel delivery system; **2** designates a 2 bbl carburetor, **4** is a 4 bbl ca and **F** is a fuel injected engine.
- The fourth character des a major engine or horsepower change—it doesn't let you know what the change was, just that there was some sort of change. **A** means it is the first model released, **B** would be the second, and so forth.
- The fifth character designates what type of steering system was used; **M** would be manual steering and **P** would be power steering.
- Now here's where it gets interesting; on 1986-87 engines and 1994-98 engines, the sixth, seventh and eighth characters designate the model year. The sixth and seventh actually show the model year, while the eighth is a random model year version code. **KWB** and **WXS** represent 1986; and **ARJ, ARF, FTC, SRC** or **SRY** show 1987. **MDA** is 1994, **HUB** is 1995, **NCA** is 1996, **LKD** is 1997 and **BYC** is 1998.
- On 1988-93 engines, the sixth character designates the direction of propeller rotation. **R** is right hand, **L** is left hand and **E** is either.
- Also on 1988-93 engines, the seventh, eighth and ninth characters designate the model year. The seventh and eighth actually show the model year, while the nineth is a random model year version code. **GDE** or **GDP** is 1988, **MED** or **MEF** is 1989, **PWC, PWR** or **PWS** is 1990, **RGD** or **RGF** is 1991, **AMH** or **AMK** is 1992 and **JVB** or **JVN** is 1993.

Any remaining characters are proprietary. So in example, a Model number on the ID plate that reads **574AMFTC** would designate a 1987 5.7L engine with a 4 bbl carburetor and manual steering, first model released. A number reading **74FAPRJVB**would designate a 1993 7.4L engine with fuel injection, power steering and a right hand propeller, first release; get the picture?

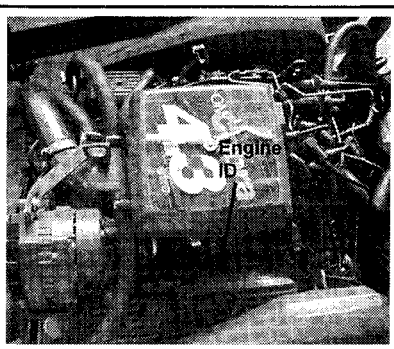


Fig. 2 Engine serial number sticker—4.3L engines

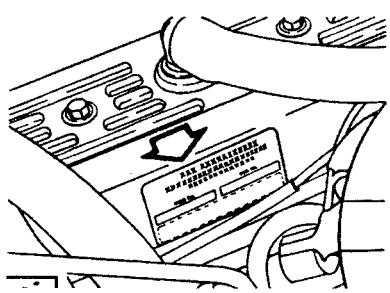


Fig. 3 Engine serial number sticker—V6 and V8 engines

Fig. 4 You should also be able to find a plate on the transom bracket