OMC

STERN DRIVES

owner's-operator's manual

120
140
175
190
235
HORSEPOWER

WELCOME ABOARD

YOU HAVE BOATING RESPONSIBILITIES

As a boat owner, you have certain responsibilities to others. Be sure that all operators read this manual.

You are legally responsible for all occupants of your boat. Instruct at least one of your passengers in the basic fundamentals of handling your boat in case of an emergency. Show all hands the location of emergency equipment and how to use it. You are required by law to have one U.S. Coast Guard approved life jacket for each person aboard plus one throwable approved device for man overboard protection.

Learn the waterway rules of the locality in which you are going to operate your boat. Navigable waterways are controlled by Federal regulations while inland lakes are controlled by local jurisdictions. Obey these regulations to protect yourself, your passengers and fellow boating enthusiasts.

Thoroughly familiarize yourself with weather bureau warning system signals and waterway traffic signs.

Contact your local United States Coast Guard Station, take advantage of their seasonal boat inspections and training courses.

Your new OMC Stern Drive is designed and constructed to give you the maximum in service and performance. Please study this manual so that you will completely understand how the engine operates and be able to take full advantage of its many built-in features. EVERYONE WHO USES THIS EQUIPMENT SHOULD READ THIS MANUAL AND BE FAMILIAR WITH THE SAFETY WARNINGS MARKED △.

SAFETY SYMBOLS

THE PURPOSE OF THE SAFETY SYMBOLS IS TO ATTRACT THE OPERATOR'S ATTENTION TO POSSIBLE DANGERS. THE SYMBOLS, AND THE EXPLANATIONS WITH THEM, DESERVE THE OPERATOR'S CAREFUL ATTENTION AND UNDERSTANDING. SAFETY WARNINGS DO NOT BY THEMSELVES ELIMINATE ANY DANGER. THE INSTRUCTIONS OR WARNINGS THEY GIVE ARE NOT SUBSTITUTES FOR PROPER ACCIDENT PREVENTION MEASURES.

OBSERVE ALL NOTES, CAUTIONS AND SAFETY WARNINGS CONTAINED IN THIS MANUAL. IT IS TO THE OPERATOR'S ADVANTAGE TO DO SO TO PROTECT HIM, HIS PASSENGERS AND HIS INVESTMENT.

△ SAFETY WARNING

FAILURE TO OBEY A SAFETY WARNING MAY RESULT IN INJURY TO YOU OR TO OTHERS

NOTE
Advises you of information specially useful to the operation of your motor or boat.

ILLUSTRATIONS

All photographs and illustrations used in this manual may not necessarily depict actual models or equipment, but are intended for reference only.

Also, all photographs, illustrations and specifications contained in this manual are based on the latest product information available at the time of publication.

TABLE OF CONTENTS - OPERATION

This owner-operator manual is divided into three sections; operation, care and assistance. The operation section tells you about engine and vertical drive starting, controlling and break-in procedures. The care section tells you about adjustment, lubrication, maintenance and storage procedures. The assistance section gives you information about our warranty, our Dealers, and how to obtain warranty service should the need arise. Please read this manual thoroughly.

BEFORE CASTING OFF

Check the weather report, wind and water conditions. Tell someone where you are going and when you expect to arrive or return.

RECOMMENDED MINIMUM ONBOARD TOOLS

Large Blade Screwdriver

Small Blade Screwdriver

Phillips Screwdriver

Pliers

Flashlight (with extra batteries)

Long Nose Pliers

Slip-Jaw Pliers

Set of Wrenches

Spark Plug Wrench

12 Volt Test Light

Electrical Tape

RECOMMENDED MINIMUM ONBOARD SPARE PARTS

Propeller

- Drive Pin
- Cotter Key
- Propeller Nut
- Thrust Washer

Water Pump /Alternator Drive Belt

Fuel Filters

Fuses

Light Bulbs

This list is presented as a suggested MINIMUM, and is not intended to be all inclusive for all boats or boating conditions and uses.

GASOLINE

Use a gasoline of proven dependability and one marketed by a reputable refiner.

OMC STERN DRIVE ENGINE FUEL GRADE REQUIREMENTS:

120 and 140 HP engines can use leaded or low lead automotive regular fuel of 86 or higher AKI Octane*. 89 AKI Octane is recommended. No lead fuel must not be used.

175, 190, and 235 HP engines can use no lead or low lead automotive regular fuels of 86 or higher AKI Octane*. Occasional use of leaded regular fuel is recommended to extend valve seat life.

The use of premium grade fuels is acceptable in all engines.

If detonation or spark rap occurs with the fuel you are using and the engine is properly adjusted, change to a higher grade fuel which will eliminate the detonation or spark rap. We recommend the use of OMC 2+4 Fuel Conditioner in the gasoline to prevent gum formation and corrosion in the fuel system.

If improper gasoline is used it can seriously damage your engine. Engine damage resulting from the use of a lower octane gasoline is considered misuse of the engine and will nullify your warranty on the engine.

*There are two test methods to determine the octane requirements for gasoline engines. One is called the Motor Octane Method (MON) and the other is called the Research Octane Method (RON). The Anti-knock Index (AKI) is arrived at by dividing the sum of these two octane numbers by two as such, $\frac{RON + MON}{2} = AKI$. This is the octane rating which is required to be posted on the service station pumps.

OMC 2+4 fuel conditioner is available from your OMC Stern Drive Dealer.

SAFETY WARNING

GASOLINE IS EXTREMELY FLAMMABLE AND HIGHLY EXPLOSIVE UNDER CERTAIN CONDITIONS. ALWAYS STOP ENGINE, AND DO NOT SMOKE OR ALLOW OPEN FLAMES OR SPARK NEAR THE BOAT WHEN REFUELING GAS TANKS.

WHEN FILLING THE GAS TANK THE OPERATOR SHOULD GROUND THE TANK TO THE SOURCE OF GASOLINE BY HOLDING THE HOSE NOZZLE FIRMLY AGAINST THE SIDE OF THE DECK FILLER PLATE OR GROUNDING IT IN SOME OTHER POSITIVE MANNER.

ENGINE BREAK-IN

All engines have been run for a short period of time on the factory final test. Observe the following break-in instructions to assure maximum engine performance and life:

1. During the first two hours of operation, do not run the engine in excess of 2500 RPM. During this period, frequently vary engine speed by throttling back and then accelerating to 2500 RPM. Do not run constantly at the same RPM.

2. During the next eight hours of operation, do not cruise in excess of 3200 RPM. Every ten to fifteen minutes, throttle back to idle speed and accelerate to 3200 RPM. Follow this by accelerating to full throttle and then back to cruise at 3200 RPM.

3. To insure proper lubrication during break-in period, do not remove factory break-in oil until after 10 hours of break-in.

4. At the end of the break-in period (10 hours), change the crankcase oil and replace the oil filter.

During the break-in period, be particularly observant during the initial running of the engine, as follows:

a. Watch the lubricating oil pressure indicator. If the indicator fluctuates whenever the speed of the engine is changed, it may be the oil pick-up screen is not covered with oil. Check crankcase dip stick, add more oil to the crankcase if required. DO NOT OVER FILL. If oil level is correct, and condition still exists, see your dealer for possible malfunction.

b. Continually watch the engine temperature indicator to be sure there is proper water circulation.

NOTE
The engine warranty will be nullified if the above break-in procedures are not followed.

NOTE
If it is necessary to add any oil, use OMC Premium 4-Cycle Motor Oil or a good quality oil (service classification SE) that meets the General Motors' Specification GM-6136-M or Ford Motor Co. specification ESE-M2C101-C.

RECOMMENDED OPERATION

After break-in, the engine can be operated continuously at any RPM from idle to full throttle. However, cruising at 3600 RPM or less saves fuel, reduces noise, and prolongs engine life.

When starting a cold engine, always allow the engine to warm up gradually. Never open the engine to full throttle until the engine is thoroughly warmed up. Be sure to check the oil level frequently during the first 50 hours of operation, since the oil consumption will be high until the piston rings are properly seated.

CRANKCASE OIL

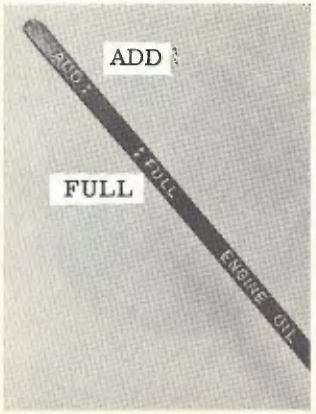
Engine crankcase oil and the oil filter are important factors affecting engine life. They have a definite affect on ease of starting, oil economy, combustion chamber deposits and engine wear. Initial factory fill is a high quality break-in oil for Service SE. During the break-in period (10 hours), frequently check the oil level. Somewhat higher oil consumption is normal until piston rings are seated. The oil level should be maintained between the Add and Full marks on the dip stick. Each space between the marks represents approximately one quart (1 liter).

NOTE
Do not fill above full mark. Overfilling results in high operating temperature, foaming (air in oil), loss of power, and overall reduced engine life.

If OMC Premium 4-cycle Motor Oil is not available, use a reputable brand of automotive oil labeled for Service SE which meets General Motors' Standard GM-6136-M or Ford Motor Co. specification ESE-M2C101-C. Oils conforming to these standards contain detergent and anti wear additives.

NOTE
The use of Multi-Viscosity oils is not recommended.

IF THE LOWEST ANTICIPATED TEMPERATURE IS	THE FOLLOWING SAE VISCOSITY OILS ARE RECOMMENDED
32° F. and above	SAE 30
0° F. to 32°	SAE 20W
Below 0° F.	SAE 10W



ENGINE PERFORMANCE INSTRUMENTS

Tachometer

Oil Pressure

Ammeter

Water Temperature

TACHOMETER - The tachometer indicates the rpm at which the engine is running. For maximum performance at full throttle the engine should run within the specified range. See Specifications.

AMMETER - The ammeter indicates the output of the alternator. If the ammeter shows a constant discharge when engine is running above idle speeds, have the charging circuit checked as soon as possible.

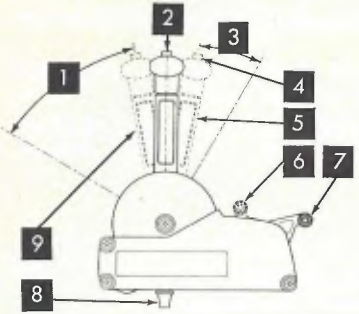
OIL PRESSURE - With engine turning 3000 RPM at normal operating temperature, oil pressure is regulated to about 30 to 50 pounds per square inch. Fluctuating oil pressure below 30 p.s.i. indicates low oil level in the crankcase, a clogged oil filter, or a malfunction in the engine lubricating system. See your OMC engine dealer. At idle speeds, pressure may drop to 10 p.s.i., this is normal.

WATER TEMPERATURE GAUGE - Normal operating temperature is 160° (71C). If the engine is overheating, do not immediately stop engine from planing speed. Throttle back gradually to neutral and allow engine to idle for approximately one minute. Check for possible causes.

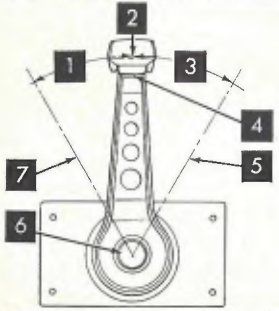
OTHER INSTRUMENTS

See your Authorized OMC Dealer for matching engine and navigating instrument accessories.

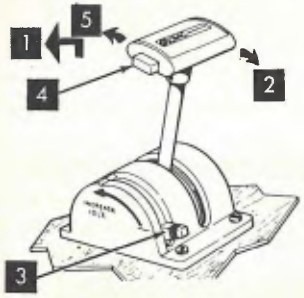
STARTING AND OPERATING INSTRUCTIONS



Single Lever Control
1. Forward Speed Range
2. Neutral
3. Reverse Speed Range
4. Lockout Button
5. Reverse
6. Auxiliary Throttle Idle Position
7. Auxiliary Throttle Start Position
8. Friction Adjustment
9. Forward



Side Mount Control
1. Forward Speed Range
2. Neutral
3. Reverse Speed Range
4. Lockout
5. Reverse
6. Lockout Knob
7. Forward



Binnacle Mount Control
1. Lift Up to Advance Throttle Forward for Neutral Starting
2. Normal Reverse (Handle Shown in Neutral Position)
3. Idle Trim Lever (Shown in Normal Position)
4. Reverse Lockout Pushbutton
5. Normal Forward

GENERAL INFORMATION

Your boat may be equipped with one of three OMC remote controls; Single Lever, Side Mount or Binnacle Mount. All three feature a single control lever to select forward and reverse gear and to regulate engine speed. All three feature a start in Neutral only. Engine will not start in gear. Single Lever and Binnacle Mount feature a throttle friction adjustment to prevent throttle creep. All three feature a lockout lever which must be released to permit shift from neutral to reverse or forward except the Binnacle control which can be shifted to forward without releasing lockout lever.

The Single Lever control features an Auxiliary Throttle Lever for Start and Idle speed control. The Binnacle control features an Idle Speed Trim Lever for adjusting idle speed at remote control - see page 32. It also features a shift lockout to permit use of throttle during engine warm-up. Just lift up on handle and advance control lever to regulate engine speed. The Side Mount Control has a shift lockout knob which must be pulled out fully, when starting and warming up engine.

NOTE
In colder weather, engine may require priming prior to starting. To prime engine, insure ignition switch is in "OFF" position, advance control lever to full forward throttle and then return lever to start position.

Familiarize yourself with the control supplied with your boat, then proceed as follows:

STARTING

SAFETY WARNING

IF THE BOAT IS EQUIPPED WITH A BILGE BLOWER, OPERATE THE BLOWER BEFORE STARTING AS RECOMMENDED BY THE BOAT MANUFACTURER. IF THE BOAT IS NOT EQUIPPED WITH A BILGE BLOWER, OPEN ENGINE COVER OR HATCH PRIOR TO STARTING AND LEAVE OPEN UNTIL AFTER ENGINE IS RUNNING.

1. Move remote control lever to Neutral.
2. Single Lever Control - Advance Auxiliary Throttle to Start position.

   Side Mount Control - Pull out lock out knob.

   NOTE
   The Side Mount Control shift lock out knob must be pulled out fully.

   Binnacle Mount Control - Lift up on handle to disengage shift switch.
3. Turn key switch to "START" position and hold for not over 10 seconds. If engine doesn't start, let go momentarily and then try again.

   NOTE
   NEVER turn key to "START" position when engine is running.
4. As soon as engine starts, release key to the "ON" position. Allow engine to warm up at fast idle (1000 to 1500 RPM) for approximately two minutes. During warm up period avoid excessive engine RPM. (Single Lever Control - use Auxiliary Throttle to control engine speed.)

   NOTE
   Before attemping to shift, reduce engine to idle speed (500-600 RPM).

SHIFTING

1. Single Lever Control - Move Auxiliary Throttle lever to low idle position.

   Side Mount Control - Move control lever to neutral position. Press in button to engage shift.

   Binnacle Mount Control - Move control lever to neutral position and press down on handle to engage shift switch.
2. To go in reverse: All three controls; release lockout button and pull lever back to engage reverse. Continue pulling back to increase engine speed.
3. To go forward: -

   Single Lever and Side Mount - Release lockout button and advance control lever forward to engage forward gear. Continue advancing lever forward to increase engine speed.

   Binnacle Mount - Just advance lever forward to engage forward gear. Continue advancing to increase engine speed.

   NOTE
   When shifting from forward to reverse or reverse to forward, pause at neutral and allow engine speed to return to idle (500 to 600 RPM). It is to your advantage to do so to avoid damage to stern drive unit.

IDLE STOP ADJUSTMENT - See pages 31 and 32.

STOPPING ENGINE

1. Throttle back to idle position.
2. Shift into neutral.
3. Turn ignition key to OFF position.

NOTE
Do not stop engine at speeds above idle RPM as damage to engine could occur. Do not "REV" engine while turning off ignition, as engine damage could occur.

TRU-COURSE STEERING

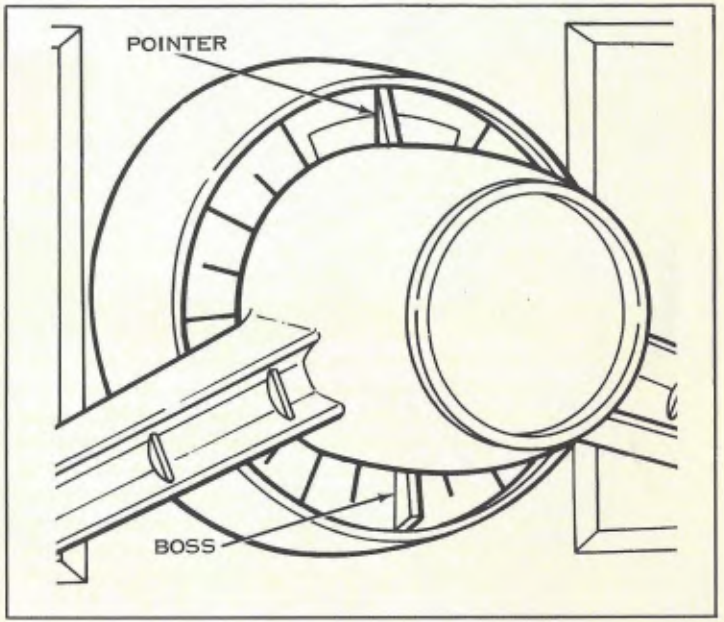
Your Stern Drive engine may be equipped with Tru-Course steering. Tru-Course steering is equally efficient in either direction. After heading is attained there is no feedback through steering wheel. See Cable Tension Adjustment and Cable Adjustment pages 34 and 35.

MECHANICAL RACK AND PINION STEERING

Your Stern Drive engine may be equipped with mechanical rack and pinion type steering. This type of steering requires no adjustment. If service is needed see your nearest authorized OMC Service Dealer.

RUDDER POSITION INDICATOR

Steer boat to dead ahead course then position rudder indicator by grasping boss on lens and turning lens. The pointer will then indicate the steering position of the vertical drive unit.



Rudder Position Indicator
Shown In Dead Ahead Position

POWER TILT

The power tilt for the drive unit on your stern drive engine is electrically operated. The drive unit is raised by holding the switch in the "UP" position and lowered by holding the switch in the "DOWN" position. The drive unit raises or lowers depending upon the position of the switch, but movement stops when the switch is released.

SAFETY WARNING

DO NOT USE DRIVE UNIT AS A LADDER OR AS A LIFT TO BOARD BOAT.

When operating in the "FORWARD" range the tilt clutch is designed to allow the drive unit to tilt upward when an underwater object is hit. This helps to prevent serious damage to the drive unit. The drive unit can be lowered using the power tilt switch. Possible damage may result if an underwater obstruction is struck at high speed.

NOTE
If the outdrive assembly should hit a solid object either in the water or on the trailer, stop and examine closely for damage. If damage is visible or suspected, ask your Authorized OMC Service Dealer to check and make necessary repairs immediately. If necessary repairs are not made immediately, additional damage could occur and become very costly to you as a consumer.

When moving in "REVERSE" no protection is afforded as the unit tilts only one way. Use CAUTION when moving in reverse.

Should the electric motor stop while tilting, release the switch and allow the circuit breaker to cool and automatically reset itself. When the circuit breaker has reset, tilting may be resumed -- however, the drive unit should be checked to see that it is not being restrained from tilting, causing the power tilt motor to overheat.

NOTE
To protect your power tilt electric motor from possible damage due to overload, always return switch to the center position when drive unit reaches maximum raised or lowered position. The drive unit should always be fully down when the engine is started and when the boat is under way.

SHALLOW WATER OPERATION

The drive unit should be operated in the down position whenever possible. However, in an emergency, the unit may be tilted and the boat operated for very short periods if no greater power than is necessary to move the boat is applied. Tilting the unit reduces the draft of the boat for emergency operation in shallow water. ALWAYS RETURN TO THE VERTICAL POSITION AS SOON AS POSSIBLE.

The drive unit should be raised when launching, recovering or beaching your boat. Also see trailing your boat, page 37. It should also be raised when your boat will be moored for an extended period of time to prevent accumulation of marine growth.

SELECTRIM MODELS OPERATION AND ADJUSTMENT

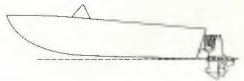
The SelecTrim feature provides for changing the angle of the vertical drive unit with respect to the boat bottom, in order to obtain optimum boat attitude and performance for

a given boat load. On 120 and 140 models this is accomplished by raising and lowering the front of the engine through a power operated jackscrew attached to the front mount. The jackscrew is driven by an electric motor through a worm and wheel combination and is actuated by a spring loaded toggle switch. On 175, 190, and 235 models this is accomplished by an electro-hydraulic unit. The hydraulic pump, reservoir, and electric motor are mounted as a unit on the front of the engine. Two hydraulic actuators are located under the forward motor mounts. The electric motor is actuated by the SelecTrim toggle switch. The electric motor powers the hydraulic pump which provides fluid pressure to the hydraulic actuators to raise or lower the front of the engine.

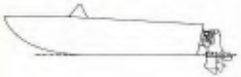
Actuating the SelecTrim switch to the "Hi" position causes the vertical drive to move away from the transom and results in raising the bow. Actuating the switch to the "Lo" position causes the vertical drive to move in towards the transom and results in lowering the bow. (See page 39 Maintenance instructions.)

The boat will be properly trimmed when the SelecTrim unit is adjusted to provide a bow position that results in optimum boat performance for given conditions of boat load, speed and load distribution. See Rudder Trim Tab Adjustment page 35.

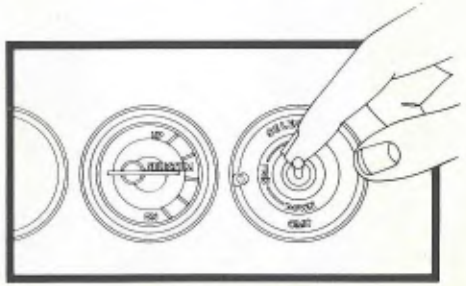
BOW POINTER "LO"
TRIM IN



BOW POINTER "HI"
TRIM OUT



BOW POINTER
CENTERED-
TRIM NORMAL



SAFETY WARNING

OPERATING AT THE EXTREMES OF "HI" AND "LO" BOW POSITION, WILL ON SOME BOATS CAUSE STEERING TO BECOME HARD IN ONE DIRECTION AND RELATIVELY EASY IN THE OPPOSITE DIRECTION. THIS IS DUE TO THE INCREASED STEERING TORQUE REACTION AT THE VERTICAL DRIVE DUE TO THE CHANGE IN ANGLE. THE BOAT TRIM SHOULD BE ADJUSTED TO PROVIDE FOR BALANCED STEERING AS SOON UNDERWAY AS IS POSSIBLE. (SEE RUDDER TRIM TAB ADJUSTMENT.)

The selecTrim motor is protected from overload by an internal circuit breaker and a 100 amp in-line fuse located on the main post of the starter assist solenoid. This fuse also protects the power tilt electrical system. A 6 amp 3 AG fuse, protects the selecTrim wiring from the switch to the selecTrim solenoids. Continued actuation of the switch after the selecTrim unit has reached the end of its travel particularly in the "Hi" bow position will cause the circuit breaker to trip. Should this occur, release the switch and allow 10 - 20 seconds for the motor to cool. The circuit breaker will automatically reset and trimming can be resumed.

SAFETY WARNING

THE TRIM TAB WILL FUNCTION MOST EFFECTIVELY ONLY AT THE THROTTLE AND SELECTRIM SETTING FOR WHICH THE TRIM TAB WAS ADJUSTED.

WHEN BOAT TRIM IS CHANGED FROM THE OPTIMUM SETTING TO THE "LO" BOW POSITION, THE STEERING EFFORT TO TURN IN ONE DIRECTION WILL BECOME PROGRESSIVELY GREATER.

CONVERSELY TRIMMING THE BOAT FROM "LO" TO "HI" BOW POSITION WILL CAUSE STEERING EFFORT IN THIS DIRECTION TO LESSEN UNTIL THE POINT OF BALANCED STEERING IS AGAIN OBTAINED. CONTINUED TRIMMING TO THE "HI" BOW POSITION WILL CAUSE STEERING EFFORT TO BECOME PROGRESSIVELY GREATER BUT IN THE OPPOSITE DIRECTION.

ALWAYS MAINTAIN A FIRM GRIP ON THE STEERING WHEEL WHEN UNDERWAY AND DURING RAPID ACCELERATIONS. THIS IS ESPECIALLY TRUE WHEN OPERATING THE SELECTRIM UNIT SINCE THE STEERING EFFORT WILL CHANGE AS INDICATED ABOVE, AND SUDDEN CHANGES IN BOAT DIRECTION CAN BE AVOIDED.

THE SELECTRIM SHOULD BE RETURNED TO THE POSITION THAT PROVIDES FOR BALANCED STEERING AS SOON AS PRACTICABLE.

BOAT LOADING

For best boat and motor performance, the boat should be driven as nearly parallel as possible to the water with the vertical drive perpendicular to the line of travel. Passengers and equipment should be located in the boat so that it is balanced fore and aft and abeam.

TWIN ENGINES

On boats equipped with twin engines do not attempt planing boat while operating on a single engine. Propellers are matched for both engines to be in operation. Heavy loads on a single engine could cause engine damage.

Always operate both engines when moving in reverse.

SAFETY WARNING

DO NOT ATTEMPT TO OPERATE A DUAL ENGINE INSTALLATION WITH ONE OUT-DRIVE IN FULL TILT POSITION. FORCING THE STEERING WHEEL MAY CAUSE DAMAGE TO THE STEERING SYSTEM COMPONENTS. IN THE EVENT, OPERATION OF ONE ENGINE IS NECESSARY, THE OTHER OUTDRIVE SHOULD BE TILTED TO LESS THAN THE FULL TILT POSITION. CHECK THE STEERING WHEEL TRAVEL BEFORE GETTING UNDERWAY.

OPERATING IN WEEDS

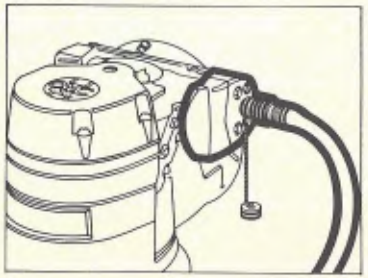
The drive unit will operate efficiently through normal marine growth with relatively little trouble. In dense growth, however, weeds may become entangled in the propeller, causing a loss of speed and control. Normally, stopping and reversing the propeller will dislodge any entangled weeds. If it does not, stop, tilt drive unit - and clean the water inlet located directly behind and above the propeller. If this is not done, the engine may overheat. Clear the propeller completely of weeds before resuming speed in deep water.

SAFETY WARNING

BE SURE REMOTE CONTROL IS IN NEUTRAL POSITION AND REMOVE IGNITION SWITCH KEY.

OPERATING IN FREEZING TEMPERATURES

Keep the drive unit submerged at all times to keep water from freezing in the vertical drive cavaties. Upon completion of engine operation, open drain petcock(s) on engine block and drain petcocks on manifold(s). Disconnect and drain long hose at top of thermostat housing on top of engine. See pages 45 thru 48. On V-8 engines also disconnect hoses from water pump and remove drain caps at lower rear of manifolds to drain water. KEEP PETCOCKS OPEN. It is extremely important to insure that complete drainage of cooling system has taken place. If complete draining of engine block or exhaust manifold is in doubt, remove drain petcock valves and clear openings with small piece of wire.



NOTE
When draining the engine, raise the bow of the boat. This will raise the front of the engine thereby providing for complete drainage of the block and manifold. If it is not possible to raise the bow of the boat for complete draining of the manifolds, remove the drain plugs below the forward end of the manifolds on V-8 models. After draining is complete return boat to level position. If retreiving boat from water, refer to page 45 for further off-season storage instructions.

When preparing to operate the boat, shut the petcocks and connect hoses and replace drain caps before starting the engine.

OPERATING IN SALT WATER

If you operate in salt or polluted waters, you can protect your investment and extend its life by flushing the block for 10 minutes at the end of a day's boating. The accessory Flushing Adaptor Kit, P/N 172914, is ideal for this purpose.

NOTES

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SPECIFICATIONS

HORSEPOWER	120 HP	140 HP
Displacement	153 cubic inches (2507 cm^3)	181 cubic inches (2966 cm^3)
Bore and Stroke	3.875 x 3.250 inches (98.43 x 82.55 mm)	4 x 3.60 inches (101.6 x 91.44 mm)
Number of Cylinders	4-in-line	
Firing Order	1-3-4-2	
Full Throttle Operating Range	4,000 to 4,400 RPM	
Idle RPM	500-600 RPM	
Ignition System		
Breaker Point Gap	.019 inch (0.48 mm)	
Dwell	31° to 34°	
Timing	4° before top dead center	
Recommended Spark Plugs	AC-MR43T or Champion RBL8, no gaskets	
Spark Plug Gap	.035 inch (0.89 mm)	
Spark Plug Installation Torque	15 foot pounds	
Charging System	30 amp Alternator, Transistorized Voltage Regulator	
Carburetor	Two barrel fixed high speed jet Adjustable low speed jet, automatic choke	
Cooling	Variable volume pump in lower unit. Recirculating pump on engine. Thermostatically controlled temperature.	
Crankcase Capacity	3.5 quarts, 4 (3.3, 3.8 liters) with filter	
Oil Filler Cap Location	Valve cover	Valve cover
Dip Stick and Oil Drain Tube Location	Starboard side	
Oil Filter	OMC Part Number 173232 AC PF25 or Purolator PER 49	
Oil Filter Location	Starboard front	Starboard front
Shift Control	Electric - Forward, neutral, reverse. Optional Remote Controls: OMC Single Lever, OMC Side Mount, OMC Binnacle Mount	
Gear Ratio Overall	1.92:1	1.61:1
Upper	16:20	19:20
Lower	15:23	15:23
Propeller	Alternate propellers available. See your OMC Dealer.	
Drive Unit Oil Capacities		
Lower Gearcase	33.9 ounce (1003 cc) OMC Sea-Lube Premium Blend Gearcase Lube	
Upper Gearcase	13.5 ounce (399 cc) OMC Sea-Lube Premium Blend Gearcase Lube	
Intermediate Housing	6.25 ounce (185 cc) OMC Sea-Lube Premium Blend Gearcase Lube	
Boat Trim Adjustment	Manual adjustable jack screw front motor mount, SelecTrim optional, includes Bow Position Indicator and Toggle Switch	
Steering Control	Tru-Course Steering or Mechanical Steering.	
Instrumentation	Optional Individual Tachometer, Ammeter, Oil Pressure, Water Temperature, Speedometer, Voltmeter, Hourmeter and Clock.	
Miscellaneous Accessories	See your Dealer	

The manufacturer reserves the right to make changes in weight, construction, materials or specifications without notice or obligation.

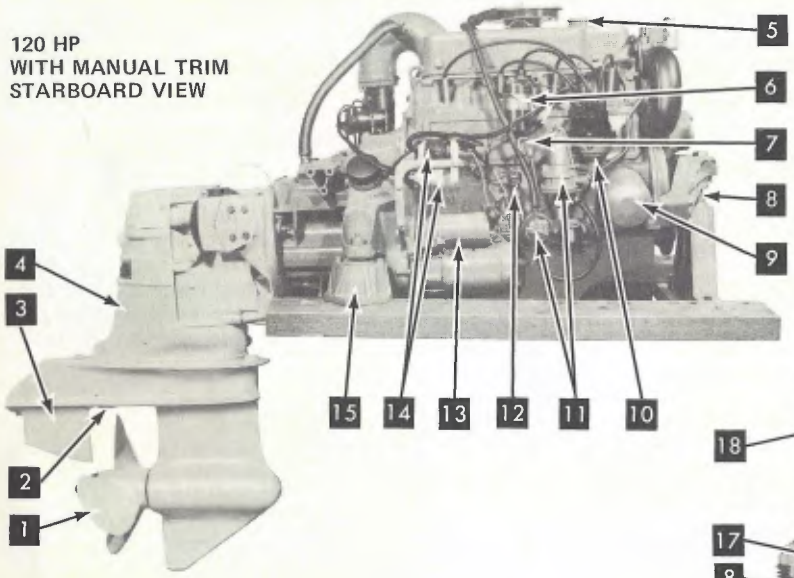
HORSEPOWER	175, 190, 235 HP
Displacement	175, 190 HP - 302 cubic inches (4948 cm^3), 235 HP - 351 cubic inches (5750 cm^3)
Bore and Stroke	175, 190 HP - 4.00 x 3.00 inches (101.6 x 76.2 mm), 235 HP - 4.00 x 3.50 (101.6 x 88.9 mm)
Number of Cylinders	90° V-8
Firing Order	175 HP - 1-5-4-2-6-3-7-8 190, 235 HP - 1-3-7-2-6-5-4-8
Full Throttle Operating Range	3,800 to 4,200 RPM
Idle RPM	500-600 RPM
Ignition System	
Breaker Point Gap	.014 - .019 inch (0.36 - 0.48 mm)
Dwell	31°
Timing	10° before top dead center
Recommended Spark Plugs	Autolite ARF-32 or Champion RBL-8
Spark Plug Gap	.030 inch (0.76 mm)
Spark Plug Installation Torque	15 - 20 foot pounds
Charging System	30 amp Alternator, Transistorized Voltage Regulator
Carburetor	Two barrel fixed high speed jets (four barrel 235 HP) Adjustable low speed jets, electric choke
Cooling	Variable volume pump in lower unit. Recirculating pump on engine. Thermostatically controlled temperature.
Crankcase Capacity	5 quarts, 6 (4.7, 5.7 liters) with filter
Oil Filler Cap Location	Port side valve cover
Dip Stick and Oil Drain Tube Location	Port side
Oil Filter	OMC Part Number 173231 AC PF2 or Purolator PER 1
Oil Filter Location	Port front
Shift Control	Electric - Forward, neutral, reverse. Optional Remote Controls: OMC Single Lever, OMC Side Mount, OMC Binnacle Mount
Gear Ratio Overall	1.39:1 (1.16:1 235 HP)
Upper	21:19 (21:16 235 HP)
Lower	15:23
Propeller	Alternate propellers available. See your OMC Dealer.
Drive Unit Oil Capacities	
Lower Gearcase	33.9 ounce (1003 cc) OMC Sea-Lube Premium Blend Gearcase Lube
Upper Gearcase	13.5 ounce (399 cc) OMC Sea-Lube Premium Blend Gearcase Lube
Intermediate Housing	6.25 ounce (185 cc) OMC Sea-Lube Premium Blend Gearcase Lube
Boat Trim Adjustment	Rubber Cushioned Floor Mount, SelecTrim optional
Steering Control	Tru-Course Steering or Mechanical Steering.
Instrumentation	Optional Individual Tachometer, Ammeter, Oil Pressure, Water Temperature, Speedometer, Voltmeter, Hourmeter and Clock.
Miscellaneous Accessories	See your Dealer

The manufacturer reserves the right to make changes in weight, construction, materials or specifications without notice or obligation.

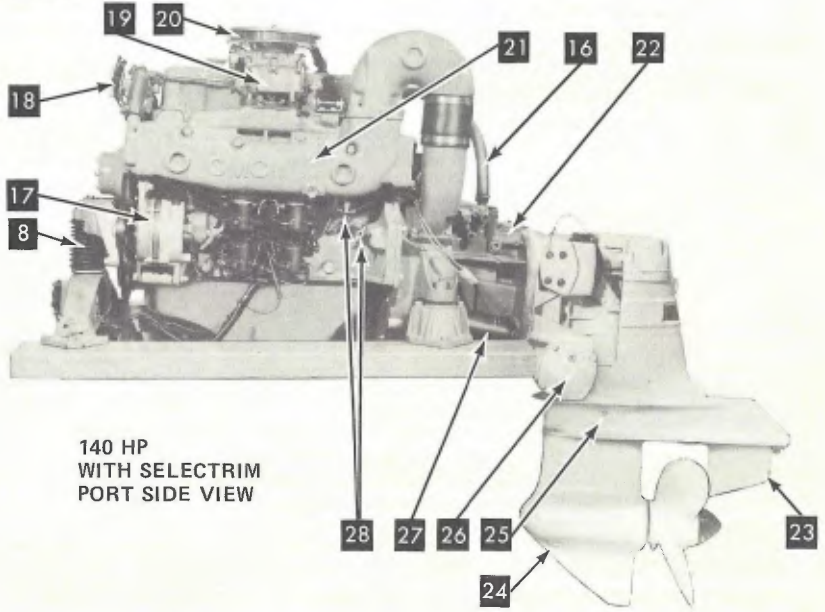
BATTERY

Your boat should be equipped with a 12 volt battery capable of handling all normal electrical needs. We recommend a 12 volt battery with a 60 ampere hour rating or better, and a minimum of 2.0 minutes cold starting capacity at 300 amperes discharge, 0° (-17C) and a 10 second voltage rating at 7.5 volts.

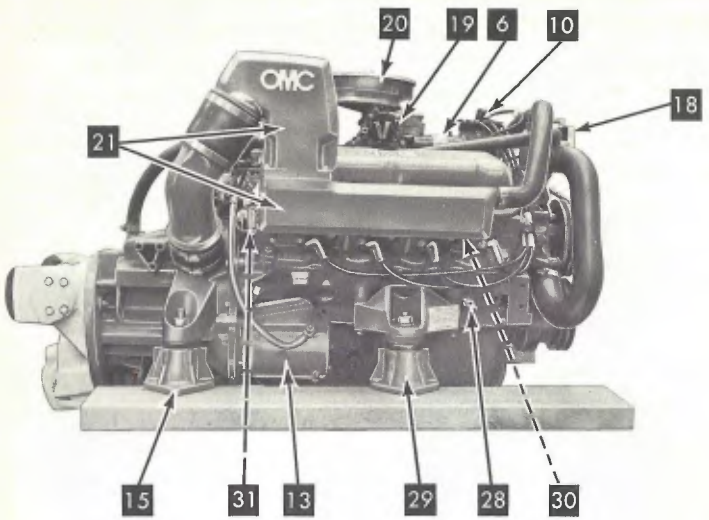
120 HP
WITH MANUAL TRIM
STARBOARD VIEW



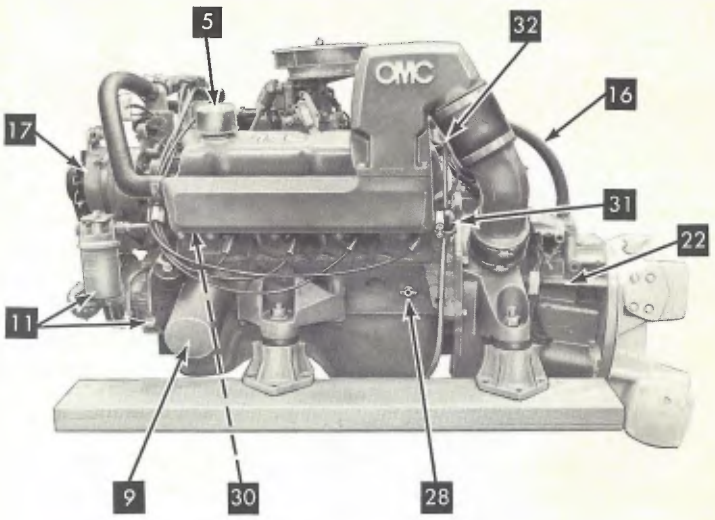
1 Propeller
2 Water Intake
3 Rudder Trim Tab
4 Vertical Drive Unit
5 Crankcase Oil Filler Cap
6 Coil
7 Crankcase Oil Dip Stick
8 Adjustable Front Motor Mount - SelecTrim as shown optional
9 Oil Filter
10 Distributor
11 Fuel Pump, Filter, and Sight Glass
12 Crankcase Oil Drain Tube and Cap
13 Starter Motor
14 Motor Cable Connectors
15 Rear Motor Mount
16 Incoming Water Hose
17 Alternator
18 Voltage Regulator



140 HP
WITH SELECTRIM
PORT SIDE VIEW

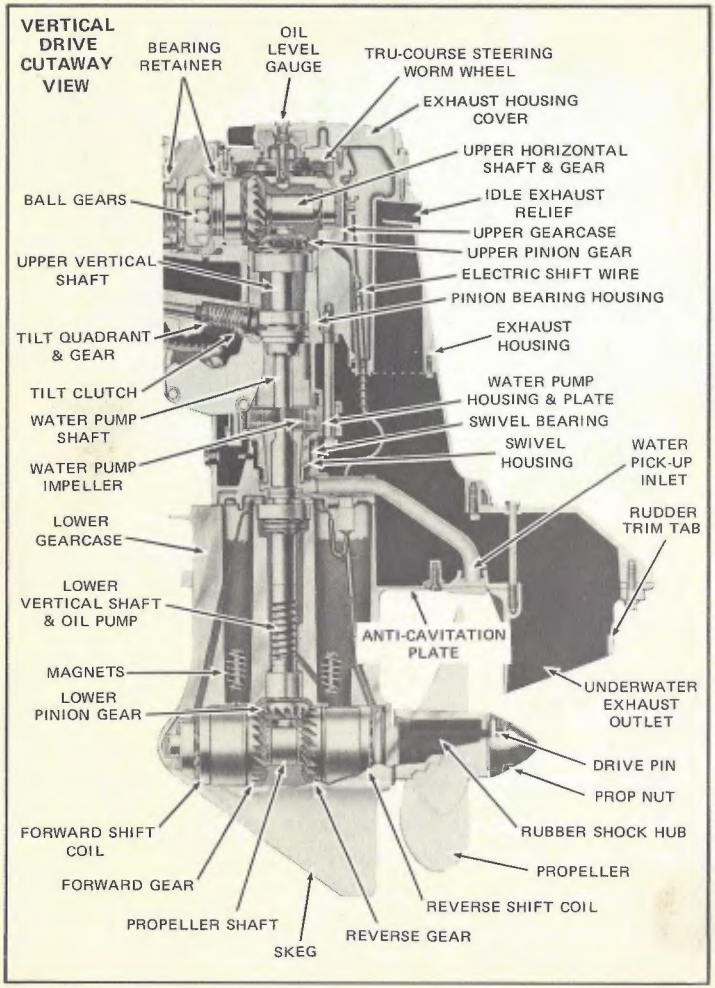


V-8 MODELS
STARBOARD VIEW



V-8 MODELS
PORT SIDE VIEW

19 Carburetor
20 Flame Arrestor
21 Water Cooled Exhaust Manifold and Elbow
22 Intermediate Housing
23 Exhaust Outlet
24 Lower Gearcase Oil Drain and Fill Plug
25 Lower Gearcase Oil Level Plug
26 Tilt Unit Gearcase
27 Tilt Motor
28 Water Drain Petcocks, Port Side (2-140, 3-120), Port and Starboard, 2 Each (175, 190, 235)
29 Front Motor Mount - Manual Trim shown
30 Drain Plug, Port and Starboard
31 Drain Cap Clamp, Port and Starboard
32 Crankcase Oil Drain Tube and Dipstick



PREVENTIVE MAINTENANCE

Preventive maintenance is the elimination of a potential cause of trouble before it occurs. To realize the full value and pleasure from your investment and prevent unnecessary repair bills SEE your local AUTHORIZED SERVICE DEALER at regular intervals for prompt and efficient service.

REPLACEMENT PARTS

Never use inferior parts on your OMC engine. Insist on only genuine OMC replacement parts. See your local AUTHORIZED SERVICE DEALER, he can be depended upon to furnish expert service and OMC approved parts.

SAFETY WARNING

DO NOT SUBSTITUTE AUTOMOTIVE PARTS FOR THE FOLLOWING MARINE COMPONENTS: STARTER, ALTERNATOR, VOLTAGE REGULATOR, DISTRIBUTOR AND RELATED IGNITION PARTS, SPARK PLUGS, SPARK PLUG LEADS, SOLENOIDS, CARBURETOR (AND RELATED PARTS) OR FUEL PUMP.

THESE COMPONENTS HAVE BEEN SPECIFICALLY DESIGNED NOT TO EMIT FUEL VAPORS OR TO CAUSE IGNITION OF FUEL VAPORS IN THE BILGE.

TO PREVENT AN UNWANTED ACCIDENT - DO NOT SUBSTITUTE AUTOMOTIVE COMPONENTS OR PARTS.

DRAINING AND FILLING THE CRANKCASE

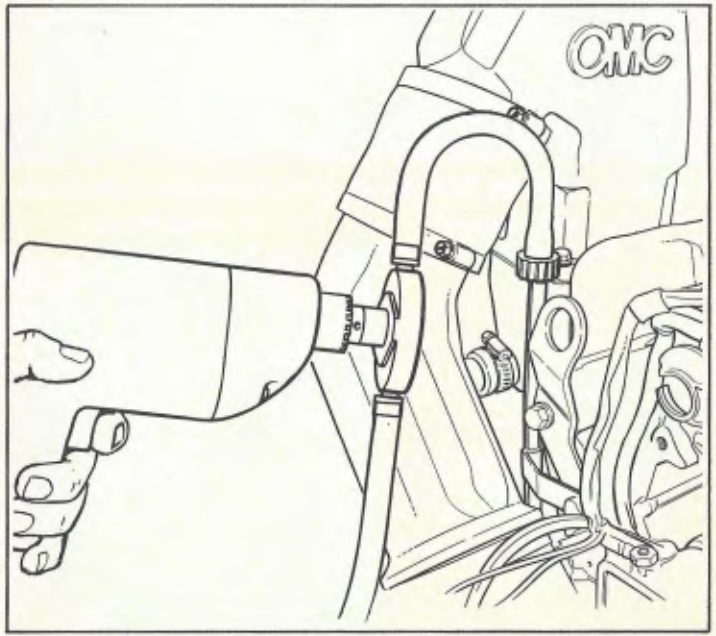
Check the oil level frequently with the dip stick. When oil is to be changed, drain crankcase completely by removing the oil drain tube cap on in-line engines or the oil dip

stick on V-8 engines and withdrawing oil with a suction pump, or use OMC Accessory Oil Drain Kit Part Number 172473. The suction tube removes oil, sludge and sediment from crankcase.

CRANKCASE CAPACITIES

Four Cylinder Models - 3-1/2 quarts, 4 (3.3, 3.8 liters) with filter

V-8 Cylinder Models - 5 quarts, 6 (4.7, 5.7 liters) with filter



Oil Withdrawal

NOTE
Before checking oil insure that dipstick finger ring is looped toward the front of the engine.

OIL FILTER

The oil filter should be replaced whenever the crankcase oil is changed. This filter is a self-contained, screw-on type. To remove, twist counterclockwise and turn off. When attaching a new filter, be sure the gasket is lightly finger lubricated with engine oil. Hand tighten only, run engine and check for leaks. Do not run engine out of water.

OIL FILTER REQUIREMENTS
120-140 HP Engines OMC Part Number 173232 - AC-PF 25 or Purolator PER 49

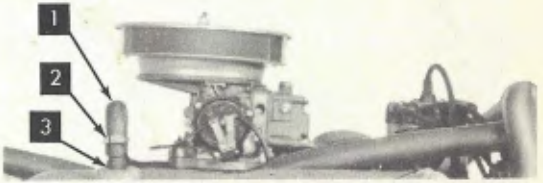
175-190-235 HP Engines OMC Part Number 173231 - AC-PF 2 or Purolator PER 1

See pages 20 and 21 for location of oil drain tube, dip stick, oil filler cap, and oil filter for your engine.

PCV VALVE - 175, 190, 235 HP ENGINES

To insure proper operation of crankcase ventilating system, have your authorized OMC Service Dealer inspect and clean PCV valve every 50 hours and replace every 100 hours.

1. Hose
2. Clamp
3. PCV Valve



HIGH RISE ELBOW REMOVED FOR CLARITY

FUEL PUMP, FUEL FILTERS AND SIGHT GLASS

OMC stern drive engines are equipped with a sight glass connected to the fuel pump. The sight glass must be positioned as shown to be visible for inspection. The sight glass gives visible evidence of a fuel pump malfunction such as a ruptured diaphragm.

NOTE
Under normal operation, the sight glass should contain no fuel or oil.

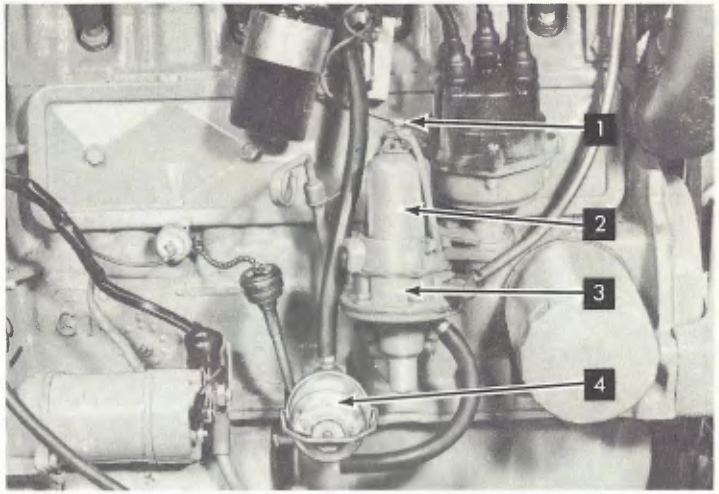
If fuel or oil is visible, immediately have your OMC Stern Drive Dealer service or repair the fuel pump. OMC stern drive in-line engines are equipped with a fuel filter located on top of the fuel pump. V-8 engines have a fuel filter located on the forward port side of the engine.

TO REPLACE FUEL PUMP FILTER (IN-LINE MODELS):

1. Loosen yoke screw and remove bowl.

2. Remove filter element by pulling up with a twisting motion.

3. Wash bowl thoroughly with clean gasoline. Replace bowl if it is dented, damaged or corroded.



In-Line Engines, Fuel Filter, Fuel Pump and Sight Glass

1. Yoke Screw
2. Fuel Filter and Bowl
3. Fuel Pump
4. Sight Glass

4. Reassemble using a new filter and bowl gasket.

5. Tighten filter bowl screw securely.

6. Start engine and check for leakage.

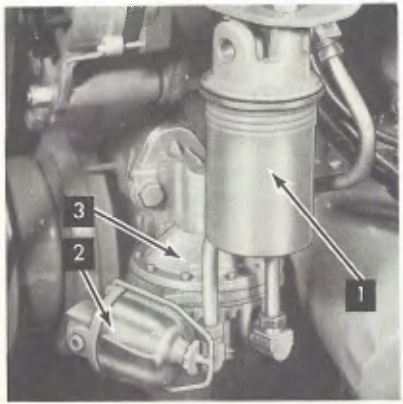
TO REPLACE FUEL FILTER AND CANISTER (V-8 MODELS):

1. Unscrew filter canister counterclockwise.

2. Remove and discard filter element and gasket.

3. Wash canister in solvent and blow dry. Inspect canister for corrosion.

4. Install new element and gasket.



V-8 Engines
1. Fuel Filter and Canister
2. Sight Glass
3. Fuel Pump

SAFETY WARNING

ACCUMULATION OF WATER AND OTHER FUEL CONTAMINANTS MAY FORM CORROSIVE COMPOUNDS IN THE FUEL FILTER CANISTER. FOR THIS REASON ANNUAL REPLACEMENT OF THE METAL CANISTER IS REQUIRED.

5. Screw filter canister on clockwise and tighten securely.

6. Start engine and check for leakage.

SAFETY WARNING

DO NOT SUBSTITUTE AUTOMOTIVE PARTS FOR THE FOLLOWING MARINE COMPONENTS: STARTER, ALTERNATOR, VOLTAGE REGULATOR, DISTRIBUTOR AND RELATED IGNITION PARTS, SPARK PLUGS, SPARK PLUG LEADS, SOLENOIDS, CARBURETOR (AND RELATED PARTS) OR FUEL PUMP.
THESE COMPONENTS HAVE BEEN SPECIFICALLY DESIGNED NOT TO EMIT FUEL VAPORS OR TO CAUSE IGNITION OF FUEL VAPORS IN THE BILGE.
TO PREVENT AN UNWANTED ACCIDENT - DO NOT SUBSTITUTE AUTOMOTIVE COMPONENTS OR PARTS.

ELECTRICAL SYSTEM

The electrical system of your stern drive engine primarily consists of an alternator, transistorized voltage regulator, battery and all necessary connecting cables and leads.

ALTERNATOR

The alternator is belt driven from the engine crankshaft. Its high capacity design will charge your battery at all engine speeds. The output at idle speed is approximately 5 amperes and rapidly increases to the maximum output of 32 amperes at 2500 RPM. A 60 ampere fuse is provided in the wiring circuit to protect the alternator.

VOLTAGE REGULATOR

The function of the transistorized voltage regulator in your electrical system is to control the alternator output so as to protect the battery and other accessories in the electrical circuit.

BATTERY

Inspect your battery at regular intervals for specific gravity (state of charge), individual cell water level, cleanliness and clean tight connections.

SAFETY WARNING

DO NOT USE JUMPER CABLES AND A BOOSTER BATTERY TO START ENGINE. REMOVE BATTERY FROM BOAT AND RECHARGE. DO NOT CHARGE BATTERY IN BOAT. FUMES VENTED DURING BATTERY CHARGING CAN LEAD TO AN EXPLOSION.

SAFETY WARNING

BATTERY ELECTROLYTE IS A CORROSIVE ACID AND SHOULD BE HANDLED WITH CARE. IF ELECTROLYTE IS SPILLED OR SPLASHED ON ANY PART OF THE BODY, IMMEDIATELY FLUSH THE EXPOSED AREA WITH LIBERAL AMOUNTS OF WATER AND OBTAIN MEDICAL AID AS SOON AS POSSIBLE.

High resistance in the charging circuit can seriously affect the operation of the electrical system. Unless there is a definite malfunction in the electrical system, high resistance is sometimes caused by corroded or loose connections. Wherever practical, the electrical connections on your engine have been sealed. However, we recommend that you make periodic inspections to insure clean, tight connections throughout the electrical system.

NOTE

It is important that the battery connections are correct. The negative battery cable must be attached to the negative terminal (-) on the battery and positive cable must be attached to the positive terminal (+) on the battery. If these connections are reversed, the transistorized regulating unit may be immediately damaged.

If battery has become discharged for no apparent reason, check all electrical system components for malfunction or a switch left in the "ON" position prior to installing a recharged battery.

NOTE
A 20 AMP fuse is located in the wiring between the starter switch and the ammeter to protect the electrical system on all models. A 100 AMP in-line fuse is located on the starter motor battery terminal to protect the main wiring harness.

NOTE
Do not attempt to connect or disconnect any part of the electrical circuit while the engine is running.

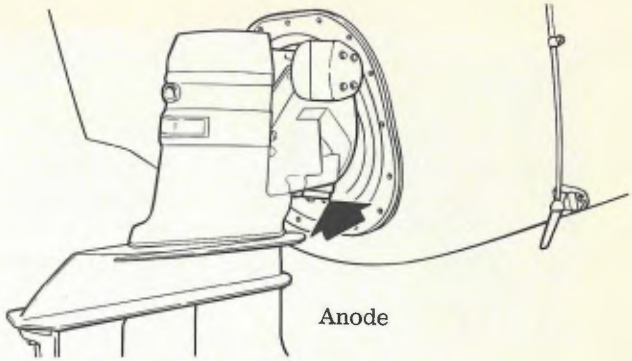
When installing additional electrical accessories always utilize individual fused circuits. Power takeoff should be made at terminal strip.

TILT MOTOR

The electric motor operating the tilt is protected from overload by circuit breakers, and a 100 amp fuse located on assist solenoid on the starter motor battery terminal. This fuse also protects the selecTrim electrical system.

ANTI-CORROSION ANODE

The zinc Anti-Corrosion Anode, is attached to the bottom of the intermediate housing. It is designed to be slowly "eaten away" by electrolytic action. If the anode shows considerable erosion, it should be replaced in order to maintain protection for the drive unit and other metallic submerged parts of the boat.



Anode

NOTE
Inspect anode every 30 days, or more frequently if used in extremely salty water. If anode shows 50% wear it should be replaced.

In extreme salty areas, an OMC accessory anode, part number 171637, plate may be necessary to provide sufficient protection for OMC Accessories.

If additional electronic or electrical equipment, other than OMC accessories, are installed; each should have an individual anode or grounding device and all grounding devices to be inter-connected. Follow equipment manufacturers' recommendations.

SAFETY WARNING

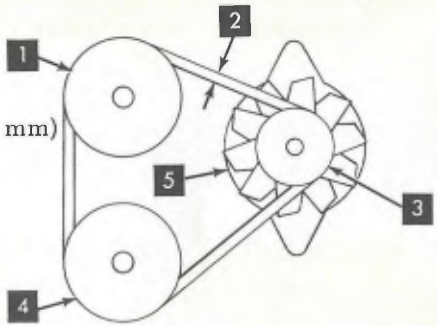
DO NOT SUBSTITUTE AUTOMOTIVE PARTS FOR THE FOLLOWING MARINE COMPONENTS: STARTER, ALTERNATOR, VOLTAGE REGULATOR, DISTRIBUTOR AND RELATED IGNITION PARTS, SPARK PLUGS, SPARK PLUG LEADS, SOLENOIDS, CARBURETOR (AND RELATED PARTS) OR FUEL PUMP.
THESE COMPONENTS HAVE BEEN SPECIFICALLY DESIGNED NOT TO EMIT FUEL VAPORS OR TO CAUSE IGNITION OF FUEL VAPORS IN THE BILGE.
TO PREVENT AN UNWANTED ACCIDENT - DO NOT SUBSTITUTE AUTOMOTIVE COMPONENTS OR PARTS.

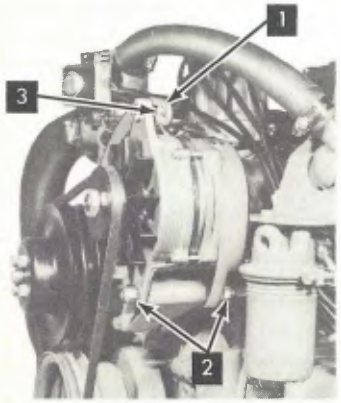
BELT TENSION

The belt should be tight enough so that it will give 1/4" to 1/2" (6 - 13 mm) when pressed with the finger at the point indicated. To adjust belt tension, loosen bottom attaching nut on alternator. Loosen screw in slot at top of alternator and pivot alternator to change belt tension. If the belt is too tight, excessive belt and bearing wear can occur. If it is too loose, slippage can occur, resulting in belt wear, and poor water pump and alternator operation. Tighten nut and screw securely after belt is adjusted. The belt tension should be checked after 20 hours of service and every 50 hours thereafter.

Belt Tension

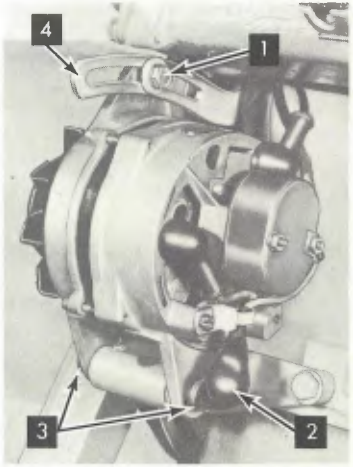
1. Water Pump Pulley
2. 1/4" to 1/2" (6 - 13 mm) Give
3. Alternator Pulley
4. Crankshaft Pulley
5. Alternator





175-190-235 HP Alternator

1. Adjustment Slot
2. Bolt and Nut
3. Screw



Alternator - 120, 140 HP Engines

1. Screw
2. 60 Amp Fuse
3. Bottom Nut and Screw
4. Adjustment Slot

IGNITION SYSTEM

SPARK PLUGS

For the most efficient operation of your engine use the recommended spark plugs.

To service spark plugs, detach rubber covered spark plug terminal from plug by twisting rubber cover slightly and pulling off. Remove the spark plug for inspection.

NOTE
Always clean area around spark plug before removing spark plug completely.

Clean and check gap with feeler gauge. If necessary replace spark plugs.

NOTE
Before installing new spark plugs always check for proper gap.

Before reinstalling a spark plug, the spark plug seat in the cylinder head should be wiped clean.

NOTE
All models have tapered seat spark plugs (without gasket).

Tighten plug securely (see Recommended Torque) and that the spark plug terminals are fully seated on the spark plugs. Replace spark plug leads.

When spark plug leads are removed, be sure they are replaced in the correct order.

RECOMMENDED SPARK PLUGS

120-140 HP Models: AC-MR43T or Champion RBL-8

175-190-235 HP Models: Autolite ARF-32 or Champion RBL-8

GAP

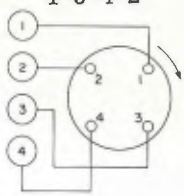
120-140 HP: .035 inch (0.89 mm)
175-190-235 HP: .030 inch (0.76 mm)

RECOMMENDED TORQUE

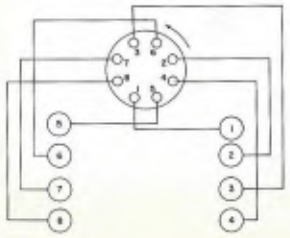
120-140 HP: 15 foot pounds
175-190-235: 15-20 foot pounds

HIGH TENSION LEAD ROUTING

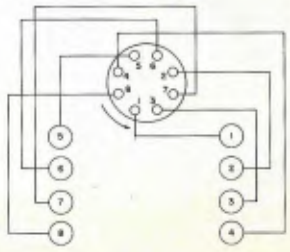
FIRING ORDER 120, 140 HP
1-3-4-2



FIRING ORDER 175 HP
1-5-4-2-6-3-7-8



FIRING ORDER 190, 235 HP
1-3-7-2-6-5-4-8



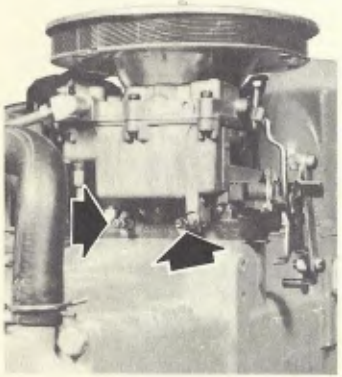
CARBURETOR ADJUSTMENTS

IDLE MIXTURE NEEDLES

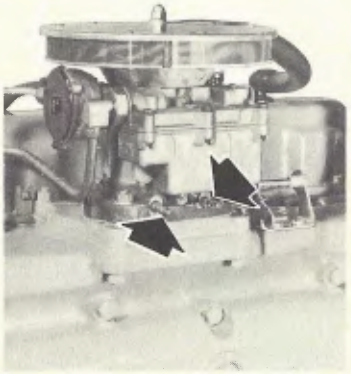
Changes in fuel, altitude and climate may make it advisable to adjust the idle mixture needles to obtain a smooth idle. With the engine up to operating temperature and throttle set at idle speed, turn the idle mixture needle(s), one at a time, in or out until engine runs smoothly. Insure 500-600 RPM idle speed after adjusting idle mixture needles.

If your engine still fails to operate smoothly, take your boat to your nearest AUTHORIZED SERVICE DEALER for inspection.

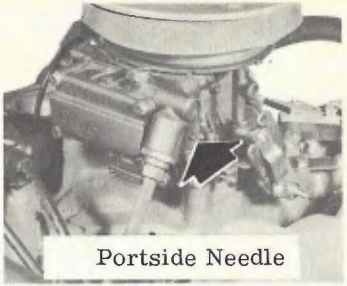
NOTE
For operation over 5000' of altitude, see your OMC Stern Drive Dealer about installing a high altitude carburetor kit on 120 and 140, HP models.



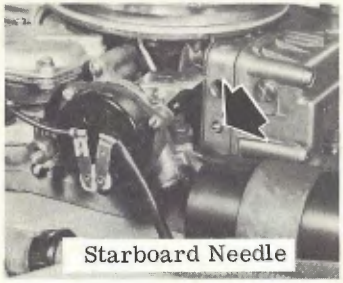
120 HP Idle Mixture Needles

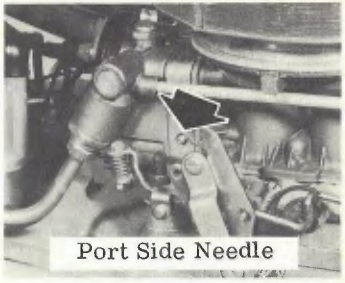


140 HP Idle Mixture Needles

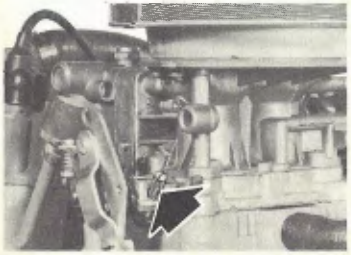


175 and 190 HP Idle Mixture Needles

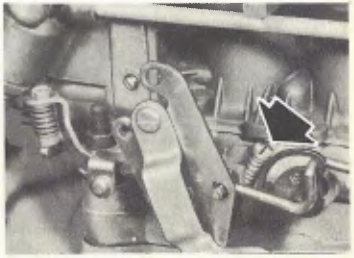




235 HP Idle Mixture Needles



175 and 190 HP Idle Stop Screw



235 HP Idle Stop Screw

IDLE STOP ADJUSTMENT

Under actual operating conditions it may become necessary to adjust your idle speed. Insure that controls with auxiliary idle or warm-up levers are fully retarded. With the engine in forward gear and running adjust the throttle adjustment screw on carburetor to obtain the 500-600 RPM idle speed.

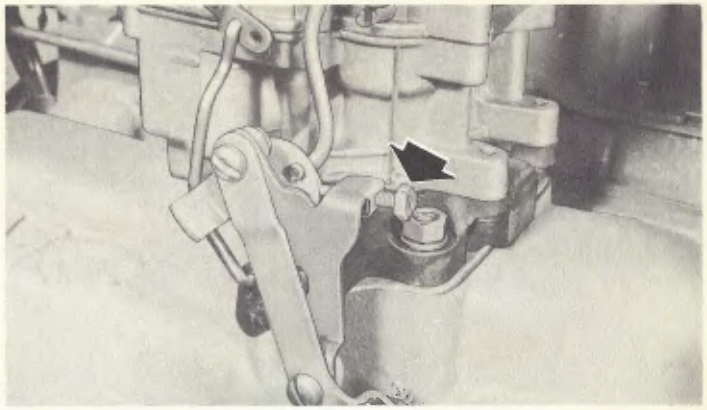
SAFETY WARNING

HAVE SOMEONE AT CONTROLS. STOP ENGINE AFTER ADJUSTING CARBURETOR IDLE STOP.

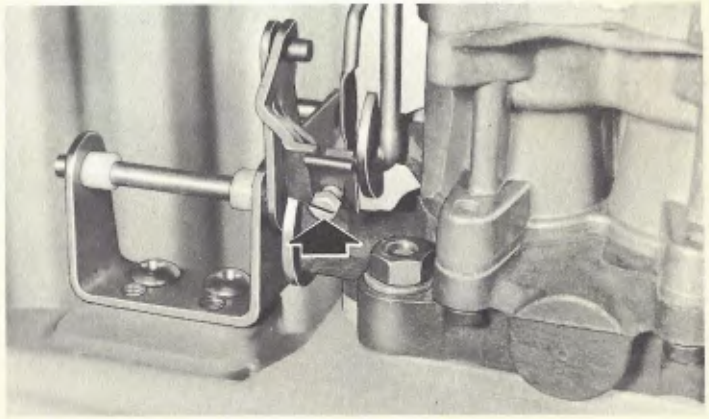
DO NOT WEAR LOOSE CLOTHING, AND BEWARE OF ROTATING PARTS WHILE MAKING ADJUSTMENTS WHEN ENGINE IS RUNNING.

If 500-600 RPM idle range cannot be attained, see your authorized service dealer for further adjustment.

NOTE
Do not attempt to increase idle speed except by the above procedure. Excessive idle speeds may result, causing damage to the gearcase during gear shifting maneuvers.



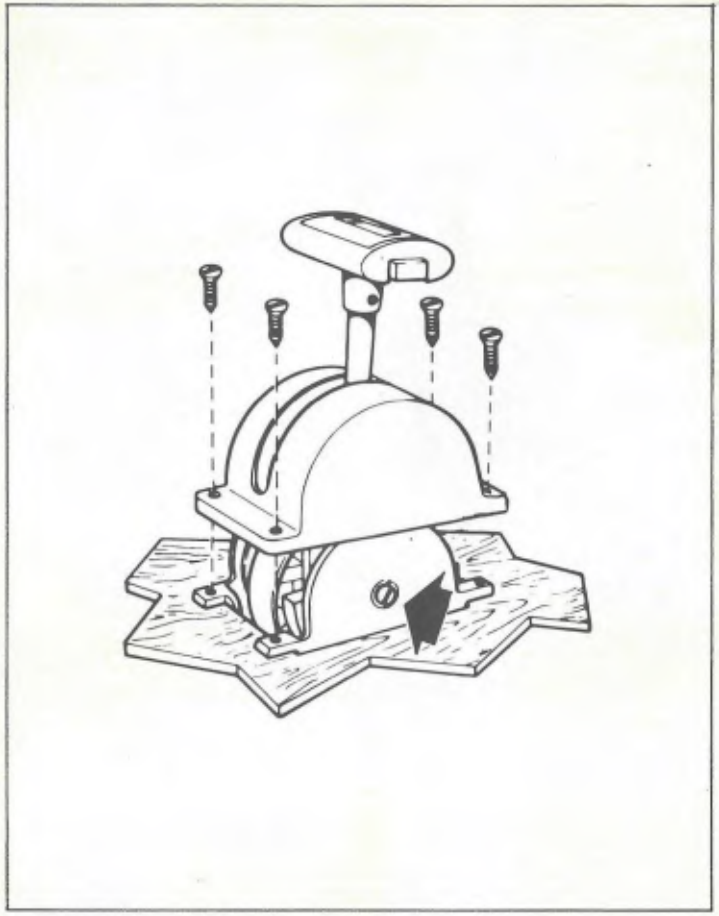
120 HP Idle Stop Screw



140 HP Idle Stop Screw

BINNACLE MOUNT THROTTLE FRICTION ADJUSTMENT

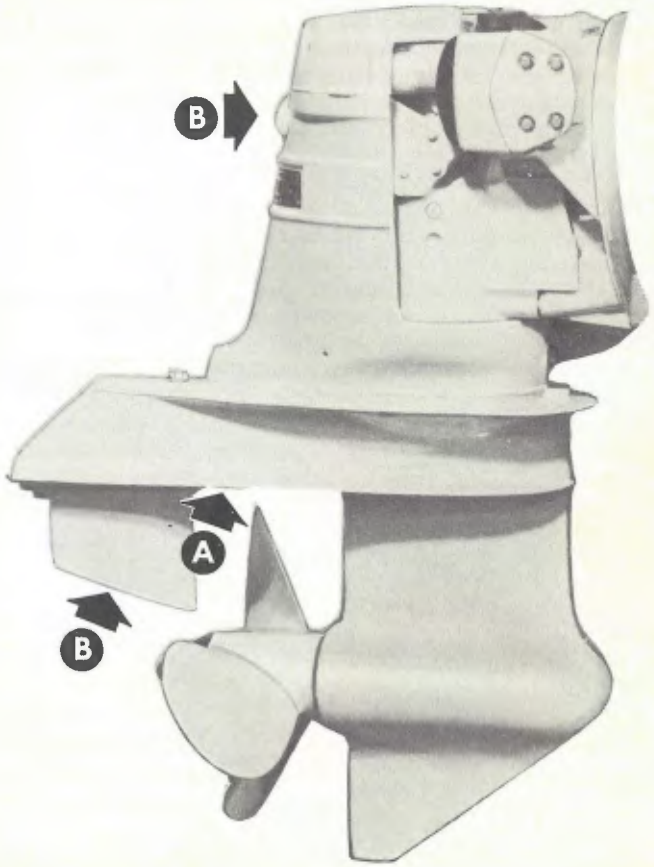
Throttle friction may be increased, if necessary, by tightening throttle friction adjusting screw. The chrome cover must be raised to expose this screw on the starboard side of the control.



BINNACLE MOUNT THROTTLE
FRICTION ADJUSTMENT SCREW

COOLING SYSTEM

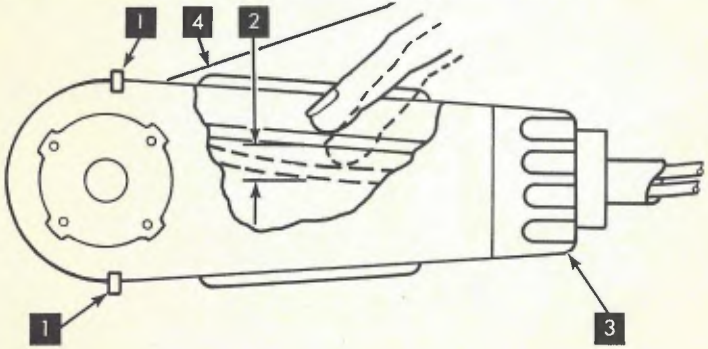
OMC stern drive engines have a thermostatically controlled recirculating type cooling system. Water is recirculated in the cooling system and cold water is drawn in only as required. The cooling system temperature is accurately controlled for peak performance and long engine life. The variable-volume water pump operates as a centrifugal pump at high speeds and as a positive displacement pump at low speeds. Water is taken in by the pump through the water inlet located directly behind the propeller (A). The water is then circulated throughout the engine water jackets to cool the engine. The thermostat determines the amount of coolant to be taken in, recirculated and discharged to control engine operating temperatures. Water is discharged on the ball gears and with the exhaust (B). Coolant discharged at the exhaust, cools engine exhaust gas as it is being discharged. A temperature gauge located on your boat dashboard will warn the operator if the engine overheats. See page 45 for cooling system draining instructions.



NOTE
Should engine overheat, gradually throttle back to idle position for approximately one minute before stopping engine, as engine damage could occur.

CABLE TENSION ADJUSTMENT TRU-COURSE STEERING

Steering cable tension adjustment nuts are located at the helm pulley and at the stern pulley. To adjust, remove plastic shield from end of cable. Tension is adjusted by tightening nut until cable deflection is restricted to one-half inch (13 mm). Completely cycle steering wheel (lock-to-lock) a few times and retighten nut if necessary. Replace plastic shield. Proceed to stern and perform same adjustment procedure. No binding or roughness should be felt in steering system after tension adjustment is completed. Replace plastic shield. Readjustment should be performed periodically as needed. Be sure steering system is properly lubricated prior to any adjustments. Follow maintenance instructions on pages 39 and 40.

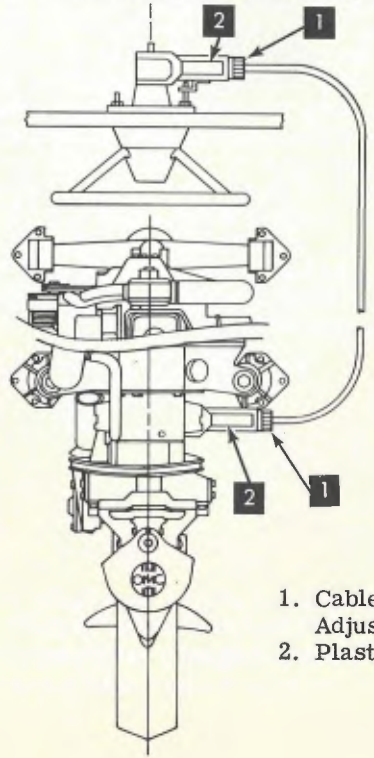


1. Cable Guide
2. Deflection with Finger Pressure
3. Adjust Nut to Allow 1/2 Inch (13 mm) Cable Deflection as Shown
4. Plastic Shield

SAFETY WARNING

ALWAYS BE SURE TO REINSTALL PLASTIC SHIELD; IT IS INTENDED TO KEEP ELECTRICAL WIRES FROM GETTING CAUGHT IN THE STEERING CABLES. ALSO, BE SURE NO WIRES ARE CONTACTING THE STEERING SYSTEM AT ANY POINT.

The cable guides are to keep cable from jumping pulley grooves. DO NOT USE SYSTEM WITHOUT GUIDES.

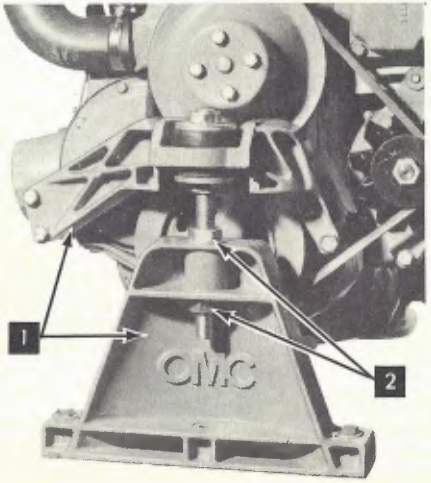


1. Cable Tension Adjustment Nuts
2. Plastic Shield

MANUAL TRIM MODEL ADJUSTMENT (INLINE ENGINES ONLY)

This is accomplished by raising and lowering the front of the engine by turning nuts on the jackscrew attached to the front mount. Lowering the engine causes the vertical drive to move away from the transom. This results in raising the bow. Raising the engine causes the vertical drive to move in towards the transom and results in lowering the bow.

The boat will be properly trimmed when the vertical drive angle is adjusted to provide a bow position that results in optimum boat performance for given conditions of boat load, speed and load distribution.



Manual Trim - In-line Engines

1. Front Motor Mount Assembly
2. Adjustment Nuts

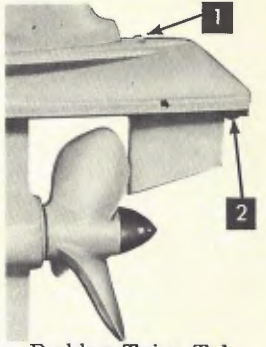
RUDDER TRIM TAB ADJUSTMENT

A rudder trim tab adjustment is provided at the vertical drive unit to compensate for driveshaft torque. This adjustment allows the steering to be balanced so that the steering effort is near equal when turning in either direction.

This adjustment has been made by your boat builder for average conditions and standard propeller supplied with your boat. However, if boat trim angle is changed or if a propeller of a different size and pitch is installed, steering may be affected, and a difference in steering effort could occur between port and starboard. See Selectrim Operation page 12.

To adjust the rudder trim tab, run the boat at the throttle position that will be used most frequently and adjust the trim to provide the proper bow position for best performance. (See SelecTrim or Manual Trim Operation.)

Turn the steering wheel in both directions to determine the direction that requires the least amount of steering effort. Once this is determined, loosen the trim tab screws and proceed as follows:



Rudder Trim Tab
1. Top Screw
2. Trim Tab Screw

1. If less steering effort is required in a port turn, move the trim tab slightly to port.
2. If less steering effort is required in a starboard turn, move the trim tab slightly to starboard.
3. Retighten the trim tab screws and recheck the adjustment. Repeat the above procedure as necessary until the steering effort is equal in both directions.

PROPELLER SELECTION

Your stern drive engine should be equipped with a propeller that will perform satisfactorily under average conditions. However, since some boats do have a speed potential which is quite high or low, it may be necessary to install a propeller having an increased or decreased blade pitch to achieve maximum performance. When operating your boat at full throttle under normal load conditions, the engine RPM is the controlling factor in determining the correct propeller blade pitch. To obtain peak performance the engine RPM at full throttle should be in the specified FULL THROTTLE OPERATING RANGE (see Specifications). If the engine RPM is below the recommended range, install a propeller of reduced pitch and the engine RPM will increase. If the engine RPM is above the recommended range, install a propeller of an increased pitch to reduce engine RPM.

PROPELLER CARE

Always carry a spare propeller. A damaged or unbalanced propeller, may cause your engine to lose power or to vibrate excessively. Under these conditions, stop the engine and check the propeller for damage. If the propeller appears damaged, have it checked and repaired by your local AUTHORIZED SERVICE DEALER. He is properly equipped to do this. Have this done as soon as possible so that you will always have a spare for such emergencies.

PROPELLER REPLACEMENT

A shock absorber in the propeller hub minimizes the chances of damaging the propeller. However, if it should become damaged, it can be easily replaced.

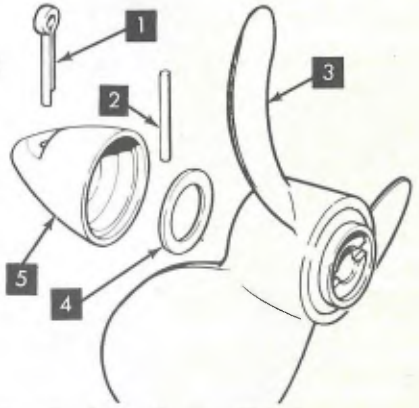
SAFETY WARNING

BE SURE REMOTE CONTROL IS IN NEUTRAL POSITION AND REMOVE IGNITION SWITCH KEY.

To replace propeller, pull out cotter pin and remove propeller retainer. Retainer is not threaded - DO NOT TURN. Remove drive pin. Remove propeller and thrust washer. Coat propeller shaft with OMC Sea-Lube Anti-Corrosion Lube and install propeller. Replace thrust washer and drive pin. Be sure that thrust washer is in position between drive pin and propeller hub. Install propeller retainer and a new cotter pin. Bend double end of cotter pin over against retainer.

A. Propeller Attaching Components

1. Cotter Pin
2. Drive Pin
3. Propeller
4. Thrust Washer
5. Retainer



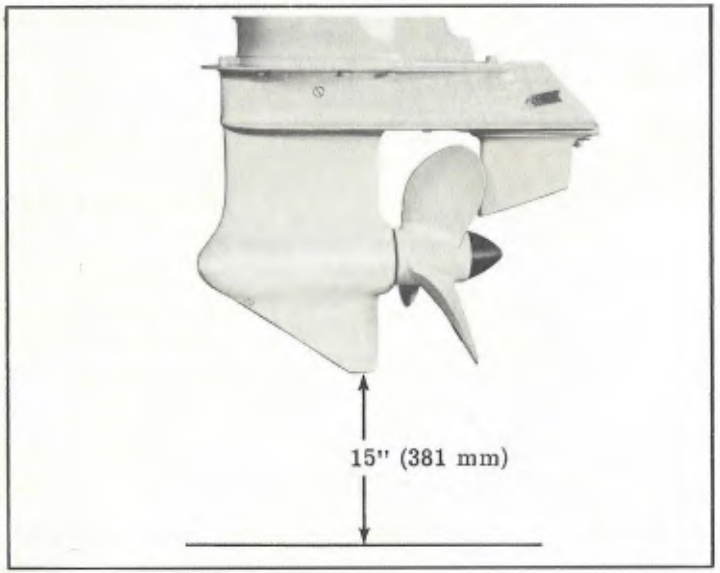
ENGINE SUBMERSION

If this occurs, recover engine as quickly as possible and contact your local AUTHORIZED SERVICE DEALER for service.

Frequently check engine bilge for gasoline fumes and excessive water accumulation; water depth in bilge should be kept well below flywheel.

TRAILING YOUR BOAT

Before attempting to move the boat check the ground clearance. When trailing, the drive unit may be in the up or down position. It is advisable that there be at least 15" (381 mm) clearance between the skeg and the ground. If the clearance is less than 15", the drive unit should be raised while trailing.



Ground Clearance

NOTE
Use caution when backing out of driveways or crossing railroad tracks, so that the skeg does not hit the ground.

It is extremely important that your boat fits your trailer properly. Loss in performance and speed in many cases, is due to improper trailer support and excessive tie-down pressure which has caused the boat bottom to hook.

The boat should rest firmly on the trailer with maximum tie-down pressure applied at the bow and transom only.

BOAT BOTTOM

The condition of the boat bottom has a great affect on your boat's performance. Marine growth, present in fresh water as well as salt water, will cut down on boat speed. A boat bottom with evidence of slime, barnacles or other foreign matter will cause a reduction in top speed of 20 per cent or more. It is suggested that you periodically clean the bottom of your boat in accordance with manufacturer recommendations.

BOTTOM PAINTING

In some areas it is advisable to coat the boat bottom with anti-fouling paint. Your local AUTHORIZED SERVICE DEALER should know enough about local conditions to tell you if it is necessary. Ask him. He has the proper anti-fouling compounds to apply to your hull for best protection. Some types of anti-fouling paints are metallic based and could cause harmful galvanic corrosion.

LUBRICATION AND INSPECTION

Your local AUTHORIZED OMC SERVICE DEALER is a factory trained Technician -- he can be depended upon for proper service.

OUTDRIVE

NOTE
Do not use hypoid 90W oil or any 90W general purpose lubricant in drive unit.

IMPORTANT

Use only OMC recommended lubricants. See your local AUTHORIZED OMC SERVICE DEALER. He will gladly lubricate your engine at the required intervals. If you choose to lubricate your OMC Stern Drive yourself your Local AUTHORIZED OMC SERVICE DEALER has the OMC recommended lubricants available.

The upper and lower gearcases were filled at the factory with OMC Sea-Lube Premium Blend Gearcase Lube. When adding to, or refilling gearcases, ALWAYS USE OMC SEA-LUBE PREMIUM BLEND GEARCASE LUBE. It has been specially formulated to protect against damage to bearings and gears. Improper lubrication of bearings and gears can result in extensive damage.

SAFETY WARNING

TO PREVENT ACCIDENTAL STARTING OF THE ENGINE, ALWAYS REMOVE IGNITION KEY FROM START SWITCH WHEN CHECKING, DRAINING OR FILLING GEAR CASE.

NOTE
Due to local conditions it may be necessary to lubricate your OMC Stern Drive at more frequent intervals. Check with your local AUTHORIZED SERVICE DEALER. He will be familiar with local requirements.

LOWER GEARCASE

When a complete change of lubricant is required in the lower gearcase, place drive unit in the down position and remove "OIL DRAIN" and "OIL LEVEL" plugs. Tilt drive unit slightly to permit oil to drain completely.

We recommend adding to, or refilling lower gearcase as follows: Using a tube of OMC Sea-Lube Premium Blend Gearcase Lube fill lower gearcase through lower hole marked "OIL DRAIN" until lubricant appears at upper hole marked "OIL LEVEL." Replace "OIL LEVEL" plug securely before removing the tube from the lower hole. This will create an air lock and hold the oil in the gearcase until "OIL DRAIN" plug can be secured.

UPPER GEARCASE

When a complete change of lubricant is required in the upper gearcase remove "FILLER PLUG" on the top of drive unit and "OIL DRAIN" plug on starboard side of upper gearcase. Tilt drive unit slightly to allow complete draining of upper gearcase.

We recommend refilling the upper gearcase as follows: Place drive unit in the down position (vertical). Remove oil level dipstick on top of gearcase. Fill upper gearcase with OMC Sea-Lube Premium Blend Gearcase Lube through the oil drain hole on side of gearcase. When oil appears at the oil level mark on dipstick, the unit is filled to proper level. Securely replace oil level dipstick before removing the tube from the lower hole. This will create air lock and hold the oil in the gearcase until the oil drain plug can be secured.

When adding to (topping off) the upper gearcase use the dipstick hole on top of gearcase.

If adding to, or refilling an empty gearcase, always allow some time for oil to fill all cavities of the gearcase. Recheck oil level.

INTERMEDIATE HOUSING OIL RESERVOIR

Remove fill plug as illustrated. Add OMC Sea-Lube Premium Blend Gearcase Lube through opening until lubricant is visible at top. Replace fill plug.

TILT BEARINGS

To lubricate tilt bearings, pry off rubber cushions to expose lube fittings. See page 40.

NOTE
Tru-Course steering shaft on intermediate housing must be lubricated with OMC Sea-Lube Anti-Corrosion Lube. See pages 40 and 41.

TILT UNIT GEARCASE

The tilt unit gearcase must be lubricated with OMC Premium 4 Cycle Motor Oil. Add oil through hole opening which also serves as oil level check.

SELECTRIM (120 and 140 HP models)

Seasonally lubricate jackscrew under rubber boot by hand using OMC Sea-Lube Multi-Purpose Grease. Lubricate grease fitting on SelecTrim with hand operated grease gun.

NOTE
Do not use a power operated grease gun. Overfilling will cause unit to malfunction.

SELECTRIM (175, 190, and 235 HP models)

The reservoir, hydraulic pump, and electric motor is a self-contained sealed unit. No maintenance is necessary other than a check for leaks and operation. If service is necessary see your Authorized OMC Service Sealer. (See Lubrication chart page 41.)

MANUAL TRIM (120 and 140 HP models)

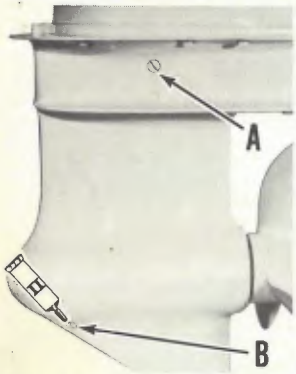
Seasonally lubricate jackscrew by hand using Sea-Lube Anti-Corrosion Lube.

LUBRICATION SYMBOLS SHOWN ON CHART

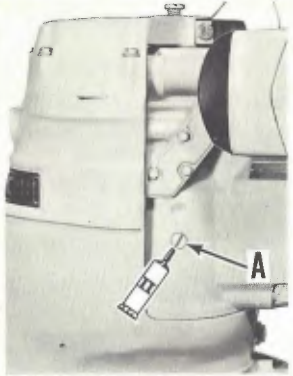
I. OMC SEA-LUBE ANTI-CORROSION LUBE FOR GREASE FITTINGS -- Frictional Surfaces and Linkages -- This lubricant has high resistance to temperature changes and high affinity for metal surfaces -- important qualities for use on motors used in salt water or fresh water.

II. OMC SEA-LUBE PREMIUM BLEND GEARCASE FOR GEARCASE -- To avoid possible damage, this lubricant must be used in the gearcase -- for all models. It has been developed for the high speed gearcases of OMC Stern Drives. Specifically formulated to protect against damage to lower unit gearcase bearings and gears.

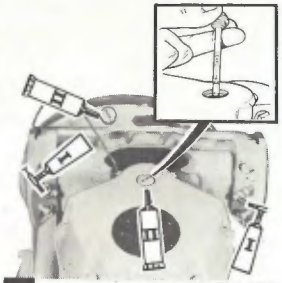
LUBRICATION INSTRUCTIONS



1 LOWER GEARCASE
A. Oil level plug
B. Oil drain and fill plug

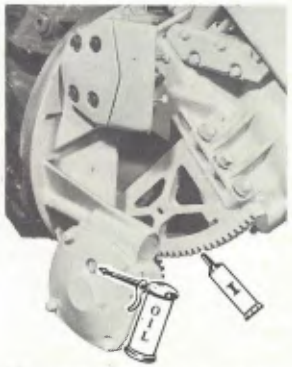


2 UPPER GEARCASE
A. Oil drain and fill plug



2 UPPER GEARCASE (topping off)
3 INTERMEDIATE HOUSING
4 TILT BEARINGS (2 FITTINGS)

4 PRY OFF RUBBER CUSHIONS FOR ACCESS TO LUBE FITTINGS



5 TILT UNIT GEAR-CASE
6 TILT GEAR

7 SWIVEL BEARING

8 STEERING SHAFT (OUTBOARD)

9 STEERING SHAFT (INBOARD)

10 SELECTRIM
A. Jack Screw
B. Worm Gear Fitting

LUBRICATION AND INSPECTION CHART

SERVICE POINT	DAILY	EVERY 25 HOURS	EVERY 50 HOURS	OTHER	RECOMMENDATION
Crankcase	Check oil level		Drain and refill		See Page 22.
Oil Filter			Replace		See Specifications pages 18 and 19
Lower Gearcase 1			Drain and refill	Check level occasionally during boating season.	OMC Sea-Lube Premium Blend Gearcase Lube
Upper Gearcase 2			Drain and refill	Check level occasionally during boating season.	OMC Sea-Lube Premium Blend Gearcase Lube
Intermediate Housing 3			Check Level	*	OMC Sea-Lube Premium Blend Gearcase Lube
Tilt Bearings (2 Fittings) 4				Every 20 hours	OMC Sea-Lube Anti-Corrosion Lube
Tilt Unit Gearcase 5			Check Level	*	OMC Premium 4 Cycle Motor Oil Only
Tilt Gear 6			Lubricate		OMC Sea-Lube Anti-Corrosion Lube
Swivel Bearing 7			Lubricate		OMC Sea-Lube Anti-Corrosion Lube
Tru-Course Steering Shaft 8 9			Lubricate	Tilt up outdrive for access to outboard fitting	OMC Sea-Lube Anti-Corrosion Lube (one or two strokes of gun)
SelecTrim System (Jack Screw and Worm) 10				Seasonally lube jack screw and worm lube fitting NOTE: Do not use a power operated grease gun. Overfilling will cause unit to malfunction.	Sunaplex 992-EP Grease or OMC Sea-Lube Multi-Purpose Grease
Manual Trim				Seasonally lube jack screw	OMC Sea-Lube Anti-Corrosion Lube
SelecTrim Hydraulic Pump				Check for leaks and operation	See your Authorized OMC Service Dealer

* Seasonally change Intermediate and Tilt Clutch Reservoirs - See your OMC Stern Drive Service Dealer.

LUBRICATION AND INSPECTION CHART

SERVICE POINT	DAILY	EVERY 25 HOURS	EVERY 50 HOURS	OTHER	RECOMMENDATION
IGNITION SYSTEM			Check connections and insulation		Tighten loose connections. Tape or replace deteriorated wiring.
Battery		Check electrolyte level and specific gravity			Recharge battery if specific gravity reads below 1,220 temperature corrected. Add distilled or mineral free water.
Distributor			Adjust breaker points and timing		See Specifications pages 18 and 19.
Spark Plugs				Seasonal - check porcelain and electrodes. Clean and regap or replace.	See Specifications pages 18 and 19.
High Tension Leads and Distributor Cap	Check all connections for security		Check for deterioration or arcing		Replace with specified OMC components.
ELECTRICAL SYSTEM		Insure all connections are clean and tight			
Alternator			Check belt for tension and deterioration		Adjust tension to 1/4" to 1/2" (6 - 13 mm) give. Replace deteriorated belt. Keep spare on board. See page 28.

SERVICE POINT	DAILY	EVERY 25 HOURS	EVERY 50 HOURS	OTHER	RECOMMENDATIONS
FUEL SYSTEM	For leakage				Tighten connections.
Fuel Pump and Filter	Check sight glass for fuel leakage indicating loose mounting or ruptured diaphragm			At start and periodically during boating season	Inspect for dirt, replace filter and gasket if clogged. Have your OMC Dealer service leaking fuel pump.
FUEL FILTER Canister (V-8 Engines only)				Annually	Replace filter canister. See page 25.
Carburetor				Seasonal or as needed	Adjust idle mixture and idle speed stop.
Fuel Tank	Check supply. Open fuel valve for operation		Check for water in fuel tank.	Close fuel valve at end of day's operation	Keep tank filled with recommended fuel. Drain tank during seasonal lay-ups.
Flame Arrestor		Check for dirt			Clean in solvent, air dry before installation.
COOLING SYSTEM	Check for leaks	Check alternator belt for correct tension		Seasonally check for hose deterioration	Drain after operation in freezing temperatures or during seasonal lay-up. Tighten connections.
BILGE AREA	Check for fuel fumes and leaks				Repair or see your boat dealer.
CONTROL LINKAGE	Check operation	Check adjustment. Lubricate.			Adjust as required. Use OMC Sea-Lube Anti-Corrosion Lube for smooth operation of shift, throttle and steering controls.

SERVICE POINT	DAILY	EVERY 25 HOURS	EVERY 50 HOURS	OTHER	RECOMMENDATION
STEERING SYSTEM		Readjust steering cable tension. See page 34.			
HULL		Check for marine growth			See your boat dealer for care.
Running Lights, Horn	Check operation			Seasonally - Service as required.	
Instruments	Check operation			Seasonally - Service as required.	
Safety equipment	Check equipment and condition			All safety equipment should be checked for condition and proper operation each season	Be sure you have Coast Guard required equipment aboard (check Coast Guard regulations).
TRAILING	See p. 37.			Drain cooling system and bilge	Be sure hull is properly supported. Check tie downs for security.
STORAGE					See OFF SEASON STORAGE pages 45 thru 48.
PREPARATION FOR BOATING SEASON					See PREPARATION FOR BOATING SEASON page 49.

OFF-SEASON STORAGE PREPARATIONS

1. Drain the crankcase oil. The engine should first be operated under load using gum inhibitor in gasoline such as OMC 2+4, until the oil is thoroughly warmed up. If the oil is allowed to warm up before draining, a more complete draining will be accomplished since hot oil flows better than cold. In addition, the accumulated impurities will be held in suspension by the oil and removed during the draining operation. Next, install a new oil filter and fill the crankcase with fresh oil.

NOTE
Outdrive should be submerged in water or use accessory flushing adaptor kit. See your authorized OMC Dealer.

SAFETY WARNING

STAND CLEAR OF EXPOSED ROTATING PROPELLER. BE SURE THAT LOOSE CLOTHING OR HAIR IS CLEAR OF MOVING PARTS ON ENGINE.

2. After changing the engine oil, run the unit at a fast idle for a few minutes to distribute the clean oil through the engine and check oil filter gasket for leaks. Shut off the engine and check the oil level. Add oil if necessary to bring the oil level up to, but not over, the full mark.

3. Drain the upper and lower gearcases and refill with fresh OMC Sea-Lube Premium Blend Gearcase Lube.

4. FOGGING ENGINE. Run engine to bring up to operating temperature and to insure 2+4 fuel conditioner is throughout fuel system. Close off fuel supply from engine. Use 1/2 pint (.25 liter) of OMC Rust Preventative to fog engine. Remove flame arrestor from carburetor. Bring engine up to fast idle, slowly pour 2/3 or rust preventative into carburetor. Keep engine running while pouring rust preventative (a thick smoke will develop) into carburetor throat. As the engine runs out of fuel, rapidly dump the remaining 1/3 of rust preventative into carburetor. Turn off ignition and replace flame arrestor.

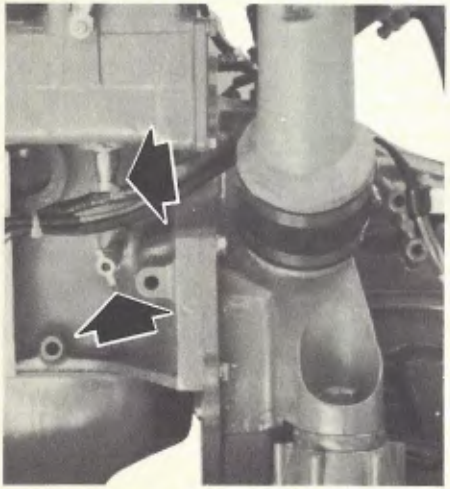
5. Drain the cylinder block and exhaust manifolds completely. This can be accomplished by opening drain petcock(s) or removing drain plugs on block and exhaust manifold(s) or rubber caps on drain nipples on V-8's. Disconnect large hose from water pump. Disconnect and drain long hose at top of thermostat housing on top of engine (Not on 120 hp). See page 48.

NOTE
It is extremely important to insure that complete drainage of cooling system has taken place. If complete draining of engine block or exhaust manifold is in doubt, remove drain petcock valves and clear openings with small piece of wire.
When draining the engine, raise the bow of the boat. This will raise the front of the engine thereby providing for complete drainage of the block and manifold. If the bow of the boat is lower than the stern, some water may be trapped in the block. After draining is complete return boat to level position. V-8 models are equipped with drain plugs in the forward bottom area of the exhaust manifolds. These plugs may be removed if raising the bow of the boat is not possible.
DO NOT shut the drain petcocks after draining the block. Leave them open during storage. With vertical drive in down position, crank engine to expel water from lower unit water pump. Store vertical drive in down (vertical) position.

6. Disconnect the battery and place in storage. If storage will be for a considerable length of time, the battery should be periodically recharged.

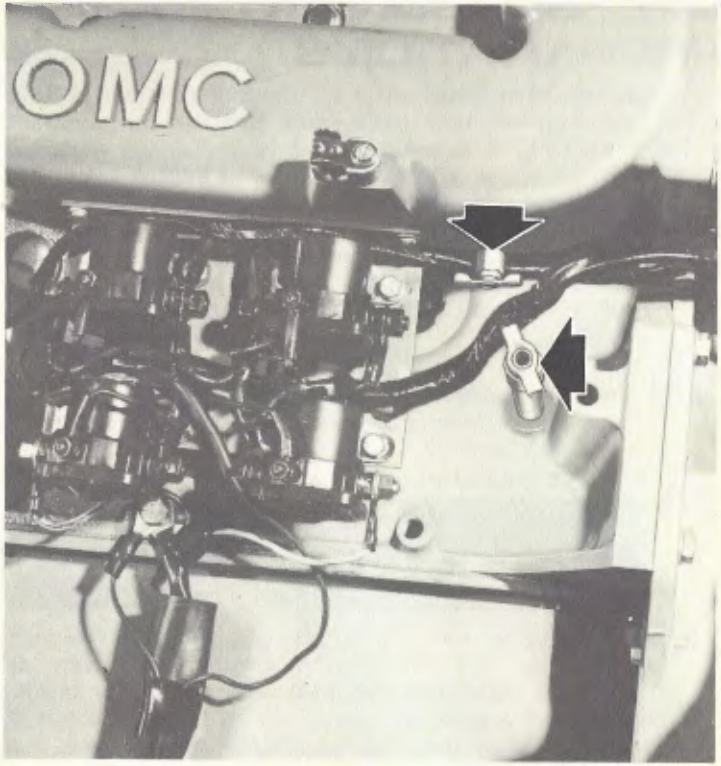
7. Drain the fuel tank, fuel lines and carburetor unless you are adding a fuel conditioner such as OMC 2+4. If untreated gasoline is left in the tank for a considerable length of time, a gum-like deposit may develop. Draining the fuel tanks is also a good safety precaution against fire.

8. Spray entire engine and outdrive with a rust preventive coating such as OMC Sea-Lube Rust Preventative, following the directions on the container.



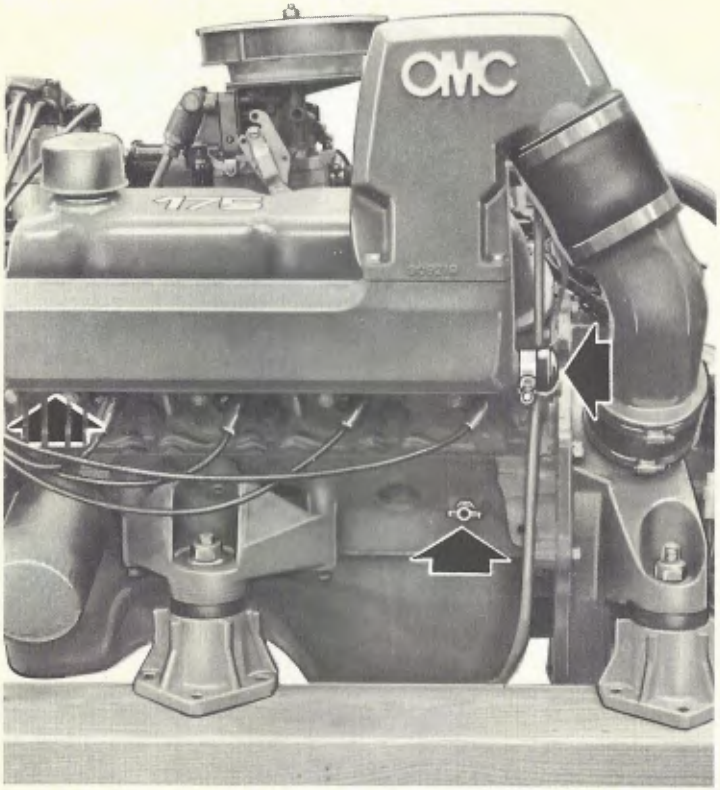
120 HP Port Side Aft

1. Open Two Exhaust Manifold Petcocks
2. Open One Cylinder Block Petcock



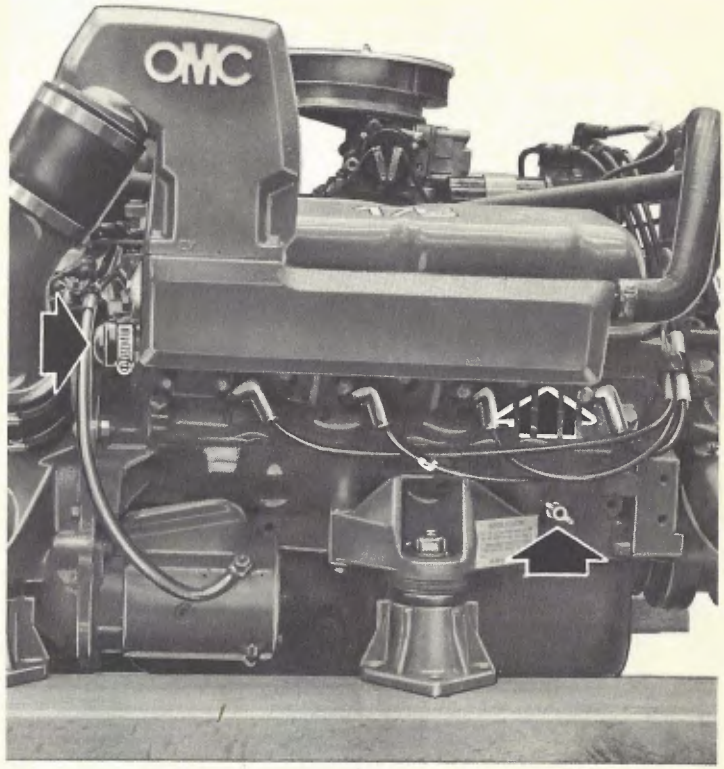
140 HP Port Side Aft

1. Open One Exhaust Manifold Petcock
2. Open One Cylinder Block Petcock



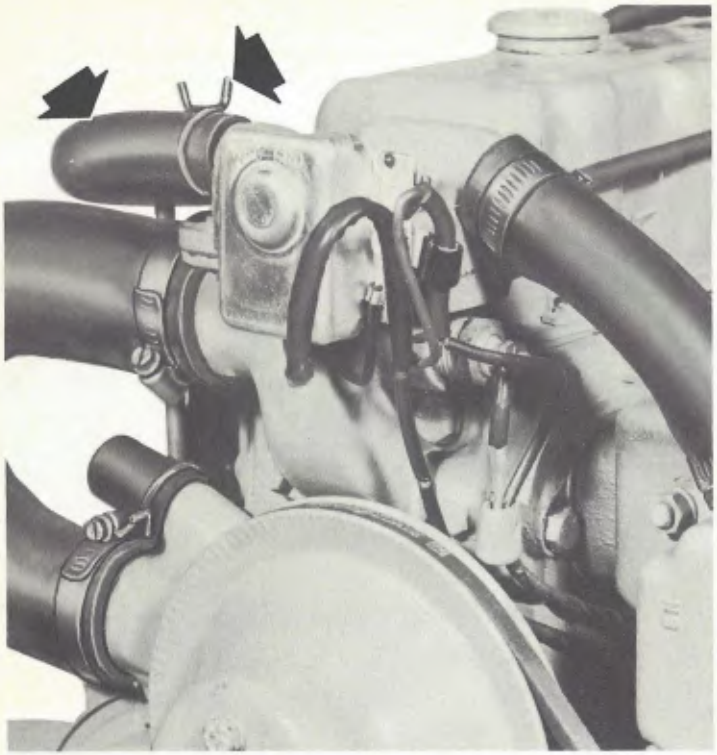
175-190-235 HP Port Side

1. Remove rubber cap and clamp from drain nipple.
2. Open one cylinder block petcock.
3. Drain plug (remove if raising bow of boat is not possible.



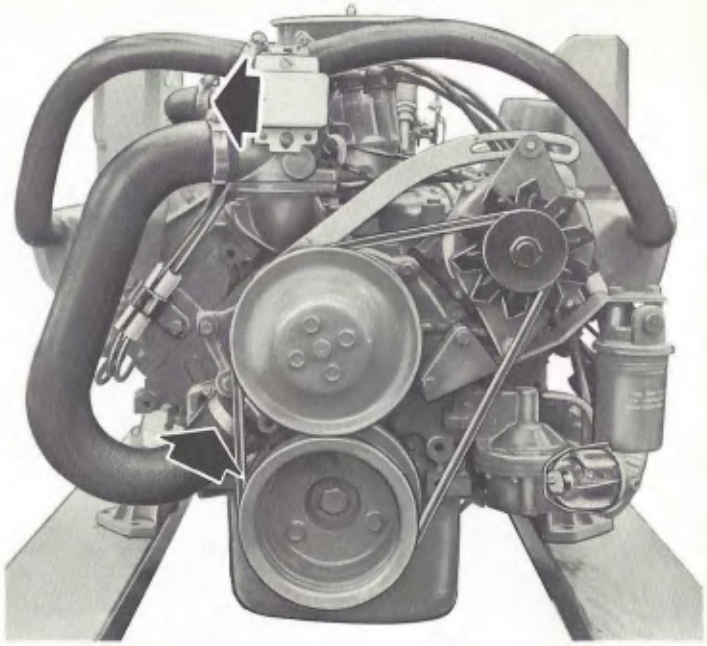
175-190-235 HP Starboard Side

1. Remove rubber cap and clamp from drain nipple.
2. Open one cylinder block petcock.
3. Drain plug (remove if raising bow of boat is not possible.



140 HP Long Hose

1. Slide clamp back, remove and drain long hose at thermostat housing.



175-190-235 HP Water Hoses

1. Loosen clamp, remove and drain long inlet hose at thermostat housing.
2. Loosen clamp, remove and drain bottom of large hose at circulating pump.

PREPARATION FOR BOATING

1. Close all drain petcocks, replace rubber caps and clamps or plugs, connect hoses, and check the condition of hoses and connections. Install boat drain plug, if removed.

2. Remove the distributor cap and rotor. Inspect the breaker points and check the point gap. Wipe the inside of the distributor cap dry and replace the rotor and cap.

3. Clean the battery terminal posts, install the battery and attach the battery cables.

4. Fill the fuel tank, open the shut-off valve and check all fuel line connections for leaks.

5. Check the flame arrester and clean if necessary.

6. Make a thorough check of the boat and engine for loose or missing nuts and screws. Pump the bilge dry and air out the engine compartment.

7. Launch boat or use flushing adapter. See page 15.

SAFETY WARNING

STAND CLEAR OF EXPOSED ROTATING PROPELLER.

8. Start the engine. Check the water temperature gauge to make sure that water is properly circulating through the engine cooling system. Also check the oil pressure gauge and ammeter gauge to make sure the lubrication and electrical systems are operating properly.

TROUBLE CHECK CHART

TROUBLE	POSSIBLE CAUSE	ACTION
Engine won't start	1. No fuel in tank or gasoline shut-off valve closed	Fill tank or open valve
	2. Clogged fuel filters	Replace fuel filter.
	3. Plugged fuel line or defective pump	Fuel pump may be defective. Inspect sight glass for fuel leakage from fuel pump or oil from crankcase. See authorized OMC service dealer.
	4. Carburetor float valve stuck	Tap float chamber with a screwdriver handle to free needle valve.
	5. Damp spark plugs	Dry ceramic with clean dry cloth.
	6. High tension leads wet and/or loose	Dry and tighten connections at spark plugs, distributor and coil.
	7. 20 amp fuse or in-line fuse	Check and replace if necessary.
	8. No spark SAFETY WARNING BE CAREFUL OF GAS VAPOR BUILD UP. GAS VAPOR IS EXPLOSIVE.	Disconnect spark plug lead and place a spare drive pin in end of lead. Hold lead about 1/4" (6 mm) away from engine block. Crank engine to check for spark. If no spark, see your dealer.
	9. Water in fuel supply or old gasoline	Check fuel supply for water contamination. If gasoline is old or if water is present, drain fuel tank and flush with fresh gasoline.

TROUBLE	POSSIBLE CAUSE	ACTION
Starter won't crank engine	1. Ignition switch	If inoperative, see OMC Dealer.
	2. Throttle position	Check to see that remote control is in start position. Change position of throttle lever slightly.
	3. Dead battery	Check level of electrolyte and charge battery.
	4. Battery connections loose or corroded	Check for loose connections and corrosion. Clean connections and tighten.
	5. Starter connections loose	Check connections and tighten. If solenoid clicks when attempting to start engine, see your authorized OMC Service Dealer.
Engine runs erratically	1. Automatic choke out of adjustment	See your Authorized OMC Service Dealer.
	2. Water and/or dirt in fuel filter(s)	Clean and inspect filter.
	3. Fuel pump malfunction	Check operation of pump. Replace fuel pump. See your Authorized OMC Service Dealer.
	4. Fuel tank vent and line plugged	Check for restrictions in line and vent. Blow out line and vent.
	5. Suction air leaks	Tighten connections if necessary. Check for punctures.
	6. Carburetor inlet screen plugged	Clean and inspect screen.
	7. Antisiphon valve stuck	Clean and inspect or replace.
Engine vibrates	1. Propeller condition	Check for bent, broken or damaged propeller. Check for weeds on propeller or gearcase.
	2. Carburetor out of adjustment	Adjust carburetor.
	3. Spark plug condition	Check spark plug electrodes and ceramic. Clean and regap. Replace plugs, if necessary.

TROUBLE	POSSIBLE CAUSE	ACTION
Engine vibrates (Cont.)	4. High tension leads loose or deteriorated	Insure all connections are clean and tight. Replace leads, if necessary.
	5. Incorrect firing order	Correct firing order, see page 29.
	6. Engine out of time	Check timing and dwell specifications of engine. See Specifications, pages 18 and 19.
Engine runs but boat makes little or no progress	1. Fouled or damaged propeller	Check for weeds on propeller, sheared drive pin, bent or broken propeller. Remove weeds, replace sheared pin or replace a damaged propeller. Check outdrive and hull for excessive marine growth.
Performance loss	1. Throttle not fully open	Check to see that throttle opens fully at carburetor.
	2. Improper fuel	Fill tank with correct fuel.
	3. Overheating	Check cooling system. Remove weeds from water intake. Check alternator belt tension.
	4. Boat overloaded	Reduce load.
	5. Boat trim	Distribute boat load evenly. Adjust trim, (inline engines) see page 35.
	6. Improper propeller selection	Select proper propeller pitch and diameter.
	7. Excessive bilge water	Check for excessive water, drain bilge.
	8. Boat hull condition	See paragraph "Boat Bottom."
Excessive free play in steering wheel	1. Loose steering cables	Readjust steering cable tension. See page 34.

TABLE OF CONTENTS - ASSISTANCE

OMC STERN DRIVE WARRANTY SERVICE AND OWNER'S OBLIGATIONS

To make a claim under warranty, contact the OMC Stern Drive dealer from whom the OMC Stern Drive Product was originally purchased, or the nearest authorized OMC Stern Drive service dealer. It is recommended that warranty service on your OMC Stern Drive Product be performed by the OMC Stern Drive dealer from whom the unit was purchased because of his personal interest in you. Remember, your OMC Stern Drive Product must be delivered to an OMC Stern Drive dealer within the warranty period. Proof of purchase will be required by the OMC Stern Drive dealer to substantiate any warranty claim. Use your OMC Owner Identification card to establish proof of purchase.

EXAMPLES OF ITEMS NOT COVERED BY WARRANTY

Provision of the Warranty Will Not Apply To:

Normal service requirements arising during the warranty period, such as carburetor or ignition adjustment or repair, or normal wear of a piston ring, cylinder or water pump.

Normal service work over and above the repair and replacement of defective parts including such items as water entering the engine from the fuel tank or through the carburetor, damage to the upper and lower gearcase or propeller blades of a stern drive or sail drive, damage to the impeller or rudder of a jet drive, or damage to the OMC Stern Drive Product due to submersion.

OMC Stern Drive Products subject to misuse, neglect, negligence, accident, or used for racing purposes.

Improper winterizing resulting in freezing and breaking of the engine block, cylinder heads or exhaust manifolds.

OMC Stern Drive Products that have been altered or modified so as to adversely affect their operation, performance or durability or to change their intended use.

Repairs made necessary by normal wear, rust or corrosion, or by the use of parts or accessories which are either incompatible with the OMC Stern Drive Product or adversely affect its operation, performance or durability.

OMC Stern Drive Products not operated or maintained in accordance with the instructions in the OMC Stern Drive Owner's-Operator's Manual for the product.

Failure or damage due to overheating as a result of lack of maintenance or by operation of the OMC Stern Drive Product after the "hot" light or temperature gauge has indicated overheating.

Service check-ups, tune-ups or diagnosis.

Normal cleaning, adjusting or replacing of spark plugs in the OMC Stern Drive Product.

Periodic checking or adding of lubricant such as motor oil, grease or gearcase lubricant to various parts of the OMC Stern Drive Product.

Expense of returning the OMC Stern Drive Product to the dealer for warranty service and expense of returning it back to the owner after repair or replacement, removal of the OMC Stern Drive Product or any part thereof from a boat and reinstallation, mechanic's travel time, and in-and-out-of-water charges.

The warranty applies only to the original retail purchaser. Used or second-hand OMC Stern Drive Products are not covered under the provisions of this warranty.

OWNER ASSISTANCE

The satisfaction and goodwill of OMC Stern Drive Product owners is of primary concern to us. Normally, any problems that arise in connection with the operation of your OMC Stern Drive Product will be handled by your dealer's service department. We know that despite the best intentions of everyone concerned, misunderstandings will sometimes occur. If you have a problem which has not been handled to your satisfaction through normal channels, it is suggested that you take the following steps:

STEP ONE - Discuss the problem with your dealer. Frequently, complaints are the result of a breakdown in communications and can quickly be resolved by the dealer. If the problem already has been reviewed with the service manager, talk to the dealership management.

STEP TWO - When it appears that your problem cannot be readily resolved by the dealership without additional assistance, the matter should be brought to our attention.

When contacting OMC Stern Drive, please supply the following information:

- Your name, address, telephone number
- Engine model and serial number
- Dealer's name and location
- Purchase date of the OMC Stern Drive product

STEP THREE - If after a review of all facts involved, we feel that further action can be taken, we will advise the dealer. In all cases we will answer your letter and indicate OMC Stern Drive's position in the matter.

When contacting us, understand that ultimately your problem likely will be resolved in the dealership, utilizing the dealer's facilities and personnel. It is suggested, therefore, that you follow the above steps.

OMC Stern Drive
Service Department
Outboard Marine Corporation
3145 Central Avenue
Waukegan, Illinois 60085
Phone No. (312) 689-5700

DEALER'S OBLIGATION AND RESPONSIBILITIES

A dealer's responsibility to the customer is to make certain that the boat is powered correctly and is properly equipped according to Coast Guard requirements. He should assist you in familiarizing yourself with the equipment on board, the operation of that equipment, and above all go for a "ride" permitting you to familiarize yourself with the handling and operation of the boat.

During your test ride with the dealer, you may have other questions concerning performance, handling, maintenance, etc. You should not hesitate to ask them at that time.

Prior to the delivery of your new OMC powered boat, the dealer should complete the predelivery checklist provided on the Warranty Registration Card. The engine crankcase should be filled with the correct oil, fuel in the gas tanks, and both gearcases on the outdrive assembly and the oil reservoirs in the intermediate housing assembly filled with OMC Sea-Lube Premium Blend Gearcase Lubricant.

The dealer should then determine how many people will normally be riding in the boat, what the additional weight of extra gear would be, and how it is to be distributed for best operation. With this total weight determined, the dealer should then run the unit at maximum speed to determine if it is running within the recommended rpm's.

(See Specifications.) If the operation is not within the recommended operating range, the dealer should then install a propeller of the correct diameter and pitch to obtain the specified rpm at full throttle.

In general, after the dealer has rigged out and has made all adjustments that are necessary, the boat and the OMC Stern Drive unit will give you many hours of reliable boating pleasure.

OMC STERN DRIVE REGISTERED SERVICE

OWNER'S REGISTRATION CARD

At the time you purchase your new boat equipped with OMC STERN DRIVE power, your dealer and yourself must fill out all portions of the Warranty Registration Card. At the bottom of this card is a temporary Owner's Identification Card and a Dealer Record Card. The temporary Owner's Identification Card should be carried with you until you receive your permanent plastic card. The selling dealer will retain the dealer record card for his reference. The Warranty Registration Card will be sent by the dealer to OMC STERN DRIVE, who will issue your permanent plastic Owner's Identification Card. Please allow minimum of 3 weeks from date of purchase to receive your permanent OMC Stern Drive Registered Service Card. This card will provide proof of ownership, as well as warranty validation, should warranty service be necessary. The card should be carried with you at all times and will assure prompt, courteous service. While traveling, always refer to your OMC Stern Drive Dealer Service Directory to locate the nearest authorized OMC Service dealer.

10 HOUR CHECK-UP AND INSPECTION CERTIFICATE

In an effort to assure your continued boating enjoyment, a 10 HOUR CHECK-UP AND INSPECTION CERTIFICATE is included with the Owner-Operator Manual and Warranty Registration Card.

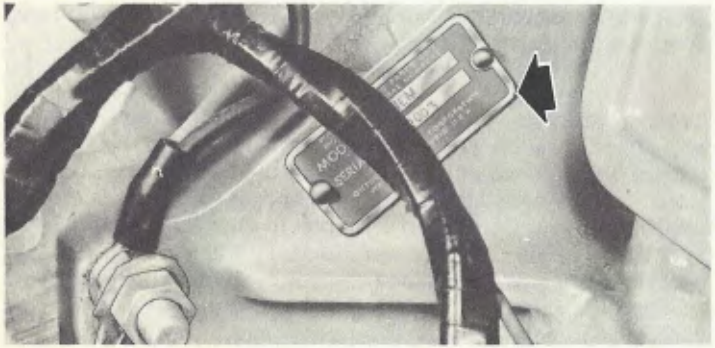
This certificate entitles you to a free 10-hour check-up and inspection on your OMC Stern Drive. Lubricants and filters used to complete the 10-hour check-up and inspection and in-and-out of water charges are at customer expense. Any OMC Stern Drive dealer will perform all specified items on the certificate. When completed the certificate must be signed by yourself and the servicing dealer. You will receive the blue copy, the servicing dealer will retain the yellow copy and the white copy forwarded to the OMC Stern Drive service department.

This is an opportune time to discuss with your dealer any questions on your stern drive unit which have arisen in the first 10 hours of operation, and establish a routine preventative maintenance schedule. After the 10 hour check, your OMC Stern Drive should be taken to an authorized OMC dealer every three months or 50 hours for: oil change and new filter; change of gear lubricant; and tune-up.

NOTE
Original Purchasers should inform OMC Stern Drive of a change in address. In case of Ownership change, the second owner should use the OWNERSHIP CHANGE CARD in the front of the Owner Manual.

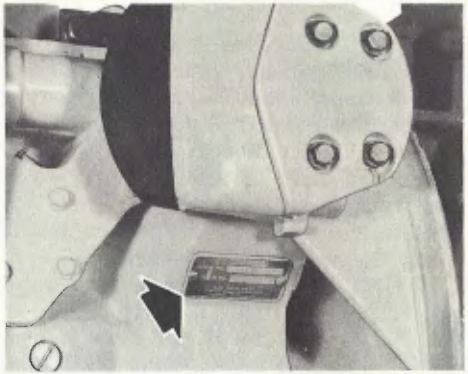
WHERE TO FIND MODEL AND SERIAL NUMBERS

(Record engine and outdrive model and serial numbers on inside back cover)



120 AND 140 HP - Plate attached to the starboard side flywheel housing above starter motor.

175, 190 AND 235 HP - Plate attached to fuel filter bracket on the front port side of engine.



OUTDRIVE - Plate attached below starboard side trunnion, all models.

ENGINE, BOAT AND OUTDRIVE MODEL AND SERIAL NUMBERS

Record your engine Model and Serial Numbers immediately after purchase. This will enable you to have them available for quick reference when ordering parts or literature.

Engine Model No. _____

Engine Serial No. _____

Boat Model No. _____

Boat Serial No. _____

Ignition Key No. _____

Vertical Drive Model No. _____

Vertical Drive Serial No. _____

Recommended Propeller Size _____

REPLACEMENT PARTS

Never use inferior parts on your OMC stern drive unit. Insist on only genuine OMC replacement parts. See your local AUTHORIZED SERVICE DEALER.

LIMITED WARRANTY

OMC Stern Drive (OMC), a division of Outboard Marine Corporation, warrants each new marine propulsion unit marketed by the division including the OMC stern drive, jet drive, sail drive, and inboard (hereinafter referred to as an "OMC Stern Drive Product") to the original retail purchaser for one (1) year according to the following terms.

Any part of the OMC Stern Drive Product manufactured or supplied by OMC and found in the reasonable judgment of OMC to be defective in material or workmanship will be repaired or replaced by an authorized OMC Stern Drive service dealer without charge for parts and labor.

The OMC Stern Drive Product including any defective part must be returned to an authorized OMC Stern Drive service dealer* within the warranty period. The expense of returning the OMC Stern Drive Product to an authorized dealer for warranty service and the expense of returning it back to the owner after repair or replacement will be paid for by the owner. OMC's responsibility in respect to warranty claims is limited to making the required repairs or replacements, and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any OMC Stern Drive Product. Proof of purchase will be required by the OMC Stern Drive service dealer to substantiate any warranty claim. One way to meet the requirement of proof of purchase is to present your dealer with your OMC Owner Identification card. The presentation of the OMC Owner Identification card is not a prerequisite to warranty service; however, the procedures set up by OMC for issuing an OMC Owner Identification card to first purchasers meet certain requirements of the Federal Boat Safety Act.

If any OMC Stern Drive Product is used for commercial purposes, such as rental or other income-producing activities, then this warranty is limited to six (6) months from the date of original retail purchase.

This warranty does not cover any OMC Stern Drive Product that has been subject to misuse, neglect, negligence, or accident, or that has been operated for racing purposes. The warranty does not apply to any damage to an OMC Stern Drive Product that is the result of improper installation or maintenance, or to any such product that has been operated or maintained in any way contrary to the operating or maintenance instructions as specified in the OMC Stern Drive Owner's-Operator's Manual for the product. The warranty does not cover any OMC Stern Drive Product that has been altered or modified so as to adversely affect the product's operation, performance or durability, or that has been altered or modified so as to change the intended use of the OMC Stern Drive Product. In addition, the warranty does not extend to repairs made necessary by normal wear, or by the use of parts or accessories which in the reasonable judgment of OMC are either incompatible with the OMC Stern Drive Product or adversely affect its operation, performance or durability.

OMC reserves the right to change or improve the design of any OMC Stern Drive Product without assuming any obligation to modify any such product previously manufactured.

ALL IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE ONE (1) YEAR WARRANTY PERIOD OR SIX (6) MONTHS FOR ANY OMC STERN DRIVE PRODUCT USED FOR COMMERCIAL PURPOSES. ACCORDINGLY, ANY SUCH IMPLIED WARRANTIES INCLUDING MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, ARE DISCLAIMED IN THEIR ENTIRETY AFTER THE EXPIRATION OF THE APPROPRIATE ONE-YEAR OR SIX-MONTH WARRANTY PERIOD. OMC'S OBLIGATION UNDER THIS WARRANTY IS STRICTLY AND EXCLUSIVELY LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS, AND OMC DOES NOT ASSUME OR AUTHORIZE ANYONE TO ASSUME FOR THEM ANY OTHER OBLIGATION. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

OMC ASSUMES NO RESPONSIBILITY FOR INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO, EXPENSE FOR GASOLINE, EXPENSE OF RETURNING THE OMC STERN DRIVE PRODUCT TO AN AUTHORIZED DEALER AND EXPENSE OF RETURNING IT BACK TO THE OWNER, REMOVAL OF THE STERN DRIVE PRODUCT OR ANY PART THEREOF FROM A BOAT AND REINSTALLATION, MECHANIC'S TRAVEL TIME, IN-AND-OUT-OF-WATER CHARGES, TELEPHONE OR TELEGRAM CHARGES, TRAILERING OR TOWING CHARGES, RENTAL OF A SIMILAR MARINE PROPULSION UNIT DURING THE TIME WARRANTY SERVICE IS BEING PERFORMED, TRAVEL, LODGING, LOSS OR DAMAGE TO PERSONAL PROPERTY, LOSS OF REVENUE, LOSS OF USE OF THE OMC STERN DRIVE PRODUCT, LOSS OF TIME, OR INCONVENIENCE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

This warranty applies to all OMC Stern Drive Products sold in the United States. Any OMC Stern Drive Products sold elsewhere are warranted by the affiliated marketing company of Outboard Marine Corporation.

OMC STERN DRIVE
3145 Central Avenue
Waukegan, Illinois 60085

A Division of
OUTBOARD MARINE CORPORATION
Waukegan, Illinois 60085

*Except OMC Sail Drive

OMC Sail Drive may be taken to any authorized OMC Stern Drive, Evinrude Motors or Johnson Outboards dealer for warranty service.

OMC STERN DRIVE

A DIVISION OF OUTBOARD MARINE CORPORATION
3145 CENTRAL AVENUE • WAUKEGAN, ILLINOIS • 60085

PART NO. 981494 REV. 1 10/76

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