

E4REDCUD

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Johnson®

ENGLISH - ESPAÑOL

120/140 MODELS

Operator's Manual

How To Use This Manual

This Owner's - Operator's manual is divided into two sections:

Section 1

Operator's Manual

- Starting and Operation
- Maintenance

Section 2

Owner's Handbook

- Recommended Fuel and Lubricant
- Fuel Mixing Instructions and Break-In Procedure
- Off Season Storage and Submerged Motor
- DEALER Service and Warranty

Important Information

The Owner's Handbook, Section Two, contains information needed to prepare the owner/operator for proper product operation and safer boating. Read Section Two thoroughly before attempting to operate this motor.

Maximum Boat Horsepower



Safety Warning: Do not over-power by using a motor with a horsepower rating higher than the maximum stated on the boat's capacity plate. Doing so could result in loss of control. If boat is not equipped with capacity plate, see your DEALER.

Photographs and Illustrations

Photographs and illustrations are keyed to the text in this manual with numbers and letters.

Product References, Illustrations and Specifications

When reference is made in this manual to a brand name, number, product or specific tool, an equivalent product may be used in place of the referred to product unless specifically stated otherwise. Equivalent products which are used must meet all current Coast Guard Safety Regulations and ABYC standards to avoid hazards.

Outboard Marine Corporation reserves the right to make changes at any time, without notice, in specifications and models and also to discontinue models. The right is also reserved to change any specifications or parts at any time without incurring any obligation to equip same on models manufactured prior to date of such change. Specifications used are based on the latest product information available at the time of publication.


The continuing accuracy of this manual cannot be guaranteed.

All photographs and illustrations used in this manual may not depict actual models or equipment and are intended as representative views for reference only.

Safety

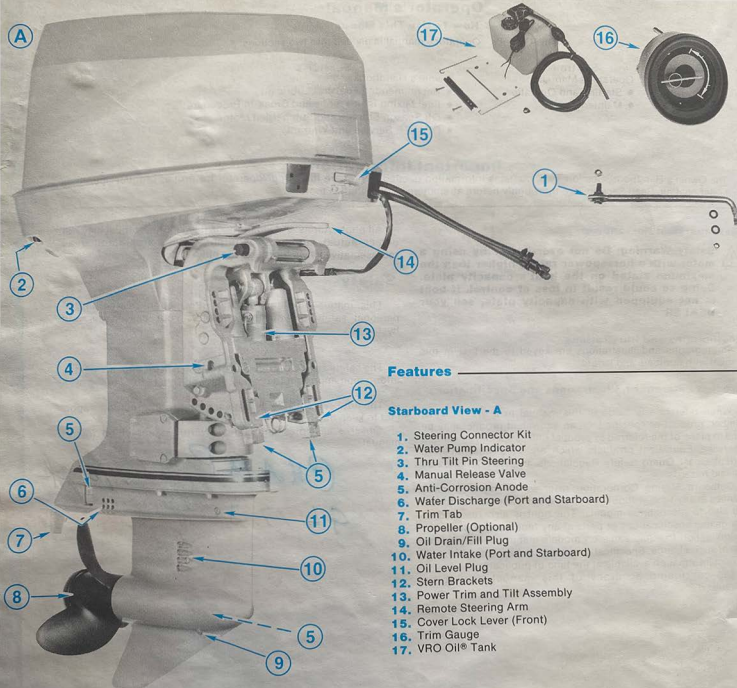
This manual contains certain information related to the personal safety of you the operator, your passengers and bystanders.

The safety symbol,  **Safety Warning:**, appears next to information important to prevent you and others from being hurt.

The note symbol,  **Note**, appears next to information important to keep machinery from being damaged.

Observe all Notes and Safety Warnings contained in this manual.

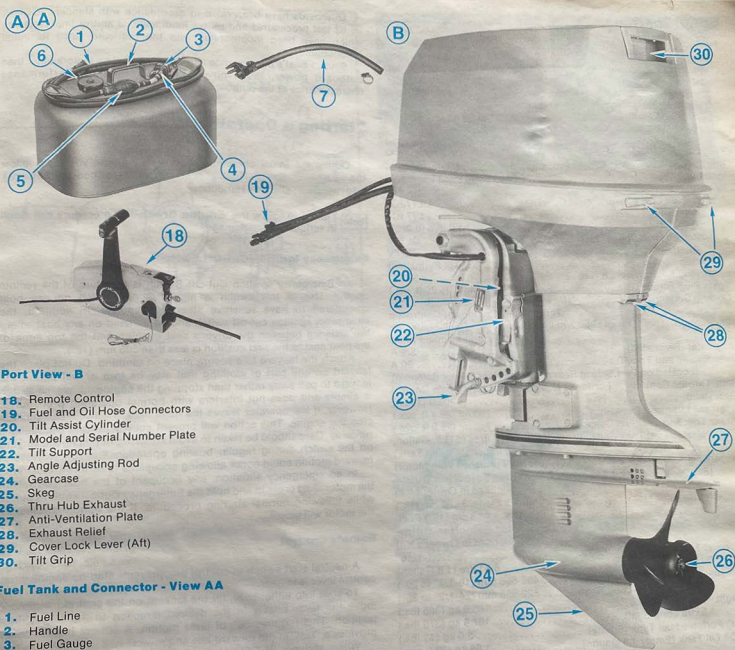
CHAMP
QL 77 Jc 4
40 hp



Features

Starboard View - A

1. Steering Connector Kit
2. Water Pump Indicator
3. Thru Tilt Pin Steering
4. Manual Release Valve
5. Anti-Corrosion Anode
6. Water Discharge (Port and Starboard)
7. Trim Tab
8. Propeller (Optional)
9. Oil Drain/Fill Plug
10. Water Intake (Port and Starboard)
11. Oil Level Plug
12. Stern Brackets
13. Power Trim and Tilt Assembly
14. Remote Steering Arm
15. Cover Lock Lever (Front)
16. Trim Gauge
17. VRO Oil® Tank



Port View - B

- 18. Remote Control
- 19. Fuel and Oil Hose Connectors
- 20. Tilt Assist Cylinder
- 21. Model and Serial Number Plate
- 22. Tilt Support
- 23. Angle Adjusting Rod
- 24. Gearcase
- 25. Skeg
- 26. Thru Hub Exhaust
- 27. Anti-Ventilation Plate
- 28. Exhaust Relief
- 29. Cover Lock Lever (Aft)
- 30. Tilt Grip

Fuel Tank and Connector - View AA

- 1. Fuel Line
- 2. Handle
- 3. Fuel Gauge
- 4. Drain Screw
- 5. Priming Bulb
- 6. Filler Cap
- 7. Fuel Hose and Connector Assembly

Specifications

Powerhead	4 Cylinder - 2 Cycle	
Bore and Stroke	88.90 x 72.59 mm (3.500" x 2.858")	
Piston Displacement	1803 cm ³ (110.0 Cubic Inches)	
*Horsepower	120 at 5500 RPM	
*Horsepower	140 at 5500 RPM	
*Power at Propellershaft According to ICOMIA 28-83	(89.5 kW) at 5500 RPM	
*Power at Propellershaft According to ICOMIA 28-83	(104.4 kW) at 5500 RPM	
Full Throttle Operating Range	5000 to 6000 RPM	
Idle Speed (In Gear With Proper Propeller)	600 to 700 RPM	
Ignition	OMC Solid State Electronic Spark Plugs	
Sustained Low Speed/Normal Operation	QL77JC4	
Alternate	L77JC4	
Gap Setting	1.0 mm (0.040")	
Sustained High Speed Operation	QL78V	
Alternate	L78V	
Gap Setting	Gap Is Permanent	
Spark Plug Socket Wrench Size	13/16"	
Spark Plug Torque	24-27 N-m (17 to 20 ft. lbs.)	
Cooling System	Water Pump - Positive and Centrifugal - Throttle and Thermostat Controlled	
Carburetor	Fixed High and Low Speed Jets - Remote Electric and Manual Primer	
Alternator (Regulated)	3/9 A	
Fuse Engine and Trim/Tilt	20 A (Located on Port Side at Rear of Engine Near Starter Solenoid)	
Shift/Throttle Control	Forward - Neutral - Reverse, Remote Control	
Gear Ratio	0.50 (13:26)	
Gearcase Lubricant Capacity	780 ml (26.4 fl. ozs.)	
Power Trim and Tilt Fluid Capacity	740 ml (25.0 fl. ozs.)	
OMC Portable Fuel Tank Capacity	22.7 Litres (6 U.S. Gallon, 5 Imperial Gallon Tank)	
Propeller U.S. Market Area	(Not Furnished With Motor) (See Propeller and Steering Connector Selection Guide Supplied in Owner's Kit)	
Propeller (Outside U.S.)	Aluminum 3 Blade, 33.02 cm (13") Dia. x 48.3 cm (19") Pitch (See Propeller and Steering Connector Selection Guide Supplied in Owner's Kit)	
Propeller Nut Socket Wrench Size	1-1/16"	
VRO® Oil Tank Capacity	6.8 Litre (1.8 Gallon)	
Transom Height - Long Shaft	495-508 mm (19-1/2" to 20") - Extra Long Shaft	622-635 mm (24-1/2" to 25")
Weight - Long Shaft	165.6 kg (365 lbs.) - Extra Long Shaft	167.8 kg (370 lbs.)
OMC Portable Fuel Tank (Empty)	5.0 kg (11 lbs.)	
VRO® Oil Tank (Empty 1.8 Gallon)	1.88 kg (78.0 ozs.)	

*Power ratings are determined after the break-in period and when an additional 4 hours minimum of wide open throttle operation has been accumulated. See **Break-In Procedure**.

Outboards have been rated in accordance with standard ICOMIA 28-83 test procedures and reflect modifications and/or improvements which have been incorporated into the outboard since its initial introduction.

Since a boat's performance can be influenced by factors other than outboard power, these power ratings reflect the performance characteristics of the outboard on a typical boat application.

Starting & Operation

During the initial operation of your new motor, you must follow the **"Engine Break-In"** procedure as described in **General Information**, Owner's Handbook.

Note Failure to follow the **"Engine Break-In"** procedure can result in serious engine damage.

Emergency Ignition Cut-Off Switch

An Emergency Ignition Cut-Off Switch is a feature of the remote control. Use of this switch is highly recommended on any boat considered to have sensitive steering response. In addition, the emergency ignition cut-off switch should be used on any boat where the distance between the driver's seat cushion and the top edge of the boat next to the seat cushion is less than 305 mm (12").

Attach the lanyard to a secure place on clothing. Do not place the lanyard on any part of clothing that may be torn or will permit the lanyard to pull away rather than stopping the engine. Using the switch is simple and does not interfere with normal operating procedures. However, if the operator leaves the helm area, the cut-off switch will stop the engine. This action will prevent your boat from becoming a runaway. Care should be taken to avoid knocking or pulling the lanyard off the switch during regular boating operation. Unexpected loss of forward motion could allow occupants to be thrown forward.

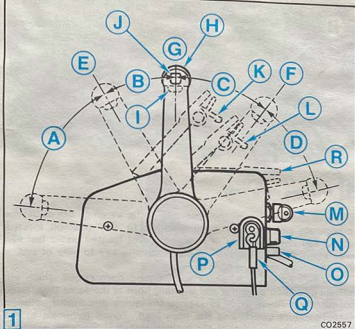
In an emergency situation, any occupant of the boat can restart the motor. Just press in and hold the Emergency Cut-off switch's button while following normal starting procedure. If the button is released, the motor will stop.

Remote Control

A neutral start switch in control box prevents starting engine when control lever is in gear.

To shift into either gear, lift the lockout on the control handle and move the lever briskly in the desired direction to the fully shifted position. This requires 30° of lever motion. A control handle detent provides a "feel" at the forward idle and reverse idle positions.

When shifting BETWEEN forward and reverse, always hesitate briefly in neutral before shifting briskly into gear. This reduces clutch dog (propeller shaft) RPM to allow easier shifting and positive clutch dog engagement.



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1 Remote Control

- A. Forward Speed Range
- B. Forward Shift Range
- C. Reverse Shift Range
- D. Reverse Speed Range
- E. Forward
- F. Reverse
- G. Neutral
- H. Control Handle
- I. Lockout
- J. Trim/Tilt Switch (Power Trim/Tilt Models)
- K. Fast Idle Lever-Start Position
- L. Latch-Fast Idle Lever
- M. Ignition/Starter Primer Switch
- N. Throttle Friction Adjustment
- O. Accessory Plug Connector
- P. Emergency Ignition Cut-Off Switch
- Q. Lanyard
- R. Fast Idle Lever-Run Position



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2 3 Manual Primer Valve - Electric Engine Primer

The manual primer valve, under the engine cover, can be set at RUN or MANUAL START position. It will stay in either position it is set. Always set the manual primer valve at RUN position for all normal operation. This allows motor to be primed at the remote control, while pushing key in.



Safety Warning: To prevent possible fire and explosion, manual primer valve lever must be in RUN position except for emergency starting. With lever in MANUAL START position and a pressurized fuel tank connected, leakage could occur through the carburetor air inlet opening.

2. RUN Position
3. MANUAL START Position

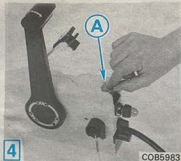
Note

Do not operate motor out of water even momentarily without use of a recommended Accessory Flush Kit. Water pump may be damaged or motor may overheat. Turn on water before starting motor.

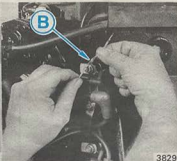
Excessive Engine Speed

The ignition system is designed to prevent engine overspeeding. The engine will begin to hesitate when engine speed becomes too high. Reduce throttle until engine runs without hesitation. Overspeeding may be caused by improper propeller, excessive wear on propeller blades, propeller ventilation or light loads.

If an overspeeding condition cannot be corrected, see your DEALER.



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Warning Horn

There is a warning horn built into the remote control (shipped with motor) or on the accessory engine wiring harness. The warning horn has **three separate sounds** which will alert the operator to the potential problems listed below.

- **Low Oil:** The horn will sound once every 20 seconds when the oil in the VRO tank drops to the reserve level (approximately 1/4 tank of oil). Avoid operating motor on oil reserve. Refill oil tank with recommended lubricant as soon as possible.

Note Failure to refill the VRO tank could result in serious engine damage. If VRO Oil Tank is run dry, the oil hose must be purged of air. Disconnect oil hose and follow the procedure in **VRO Oil Hose Installation**. When the oil hose is disconnected and reconnected to the motor, it is recommended that lubricant be mixed with the gasoline at a 100:1 ratio. See **Fuel Mixing Instructions**. Before using unmixed gasoline, check to see that the level in the oil tank has changed indicating that oil is being used.

- **No Oil Flow:** The horn will sound continuous short pulses if there is no oil flow from the VRO pump to the engine. Do not attempt to operate the motor above 1500 RPM. See your DEALER for service.

Note When the warning horn sound indicates no oil flow from the VRO pump, operation of the motor above 1500 RPM can result in serious engine damage. If it is necessary to operate above 1500 RPM to return to port, lubricant must be mixed with the gasoline at a 50:1 (2% oil) fuel/oil ratio. See **Fuel Mixture** below and follow **Fuel Mixing Instructions** for proper procedure.

Fuel Mixture 50:1 - (2% Oil)

1 part approved lubricant to 50 parts gasoline.
473 millilitres (16 fl. ozs.) of lubricant to 6 U.S. gallons, 5 imperial gallons or 22.7 litres, of gasoline.
20 millilitres of lubricant to 1 litre gasoline.

- **Overheating:** The horn will sound continuously if the engine overheats. STOP motor. See **Cooling System**.

4 Warning Horn Test

It is advisable to check the operation of the warning horn each time you operate your motor. Turn ignition key to "ON" position, insert a second key approximately one inch into slot located under fast idle lever. Horn should be activated by grounding key to side of slot. If horn does not sound, see your DEALER.

It is also advisable to check the warning horn circuit which will indicate operation of wiring and warning horn at the same time. Slide the insulating sleeve aside to expose the quick disconnect between the temperature switch and the horn lead. Touch terminals to the engine block to ground. With the ignition switch in the "ON" position, the horn should be activated when a good ground contact is made. If the horn does not sound and other electrical components are working indicating a charged battery, see your DEALER for service.

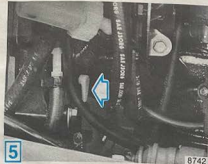
A. Grounding Slot

B. Insulating Sleeve

The following are approximate running times for a FULL VRO Oil Tank, excluding reserve (approximately 1/4 tank of oil).

Cruising (Approximately 75% Throttle)

Single Motor, 6.8 Litre (1.8 Gal.) Reservoir	11 Hours
Single Motor, 11.4 Litre (3.0 Gal.) Reservoir	19 Hours
Dual Motors, 11.4 Litre (3.0 Gal.) Reservoir	10 Hours
Single Motor, 13.2 Litre (3.5 Gal.) Reservoir	22 Hours
Dual Motors, 13.2 Litre (3.5 Gal.) Reservoir	11 Hours
Single Motor, 26.5 Litre (7.0 Gal.) Reservoir	44 Hours
Dual Motors, 26.5 Litre (7.0 Gal.) Reservoir	22 Hours



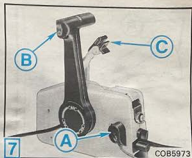
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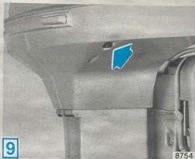
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Note Do not operate motor without the air silencer cover in place. If you do, it will unbalance the fuel calibration which may result in powerhead damage.

5 → 9 Starting Procedure

The recommended OMC portable fuel tank and fuel line are used in the following instructions.

5. Place manual primer valve in RUN position. Put motor in normal running position. Slide fuel connectors onto motor and tank couplings (primer bulb at tank) until locking lever snaps into position.
6. Holding outlet end slightly up, squeeze fuel line primer bulb several times until resistance is felt. If equipped with an electric primer pump for the boat's fuel system, activate the pump for 20 to 30 seconds.
7. **A.** Attach the Emergency Ignition Cut-Off switch lanyard to remote control and to a secure place on clothing.
B. Move control handle to NEUTRAL position.
C. Move fast idle lever up to START position. (The best start position will vary with the particular installation, use the minimum lever travel for reliable starting of your motor.)
8. Starting — Cold motor — Starting a cold motor normally requires use of the engine primer. The engine primer operates only when the engine is being cranked or is running.
 - Turn ignition key to ON position.
 - Push ignition key switch IN to activate primer.
 - Hold ignition key switch in and turn key to START position.

Release key as soon as motor starts. Do not hold starter and primer on for over 10 seconds. Let go momentarily and then try again.

Do not over prime. Excessive priming will cause engine flooding and hard starting.

To prime a cold engine when running (additional fuel for warm-up): When engine is running, push ignition key switch IN intermittently until engine warms up.

Starting — Warm motor — Follow cold motor procedure except warm motor does not normally require primer operation.

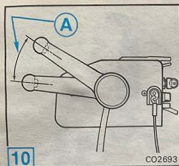
Immediately after starting, move fast idle lever toward the RUN position. Fast idle speed must be kept below 3500 RPM to avoid engine damage.

9. • Check to see that a steady discharge of water is coming out of the water pump indicator to assure proper water pump operation.

Starting — Special Situations — For special starting situations such as starting after long periods of shut-down or after running out of fuel, etc., use fuel line primer bulb or electric primer pump to fill fuel system to engine. Push starter key in and hold to prime engine while cranking.

Note Never turn key to start position when motor is running or starter may be damaged.

- If motor does not start, see **Trouble Check Chart**.



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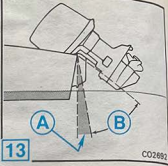
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Note To avoid possible powerhead damage, do not exceed 3500 RPM in neutral.

Operation

Move fast idle lever down to RUN position and secure latch.

Note Do not shift into FORWARD or REVERSE position unless motor is running.

Lift lock-out on control handle and move handle briskly in desired direction to the fully shifted position.

After shifting is completed, continue to move the lever slowly in the desired direction to increase speed.

Note When shifting from FORWARD to REVERSE or REVERSE to FORWARD always pause at NEUTRAL until motor is at idle speed and boat has slowed, then lift lock-out button and shift into gear.

Stopping Motor

Move control handle to NEUTRAL. Turn starter key counterclockwise to OFF position to stop motor. Always leave the key in the OFF position when motor is not running, to prevent battery from discharging. Remove key when boat is unattended.

⚠ Safety Warning: To help prevent possible fuel leakage, disconnect fuel line from motor and portable tank when boat is trailered, docked, or when motor is tilted for more than a few minutes.

Coil fuel line on top of tank when not in use. This will help protect fuel line and connector from damage and help prevent sand or dirt from entering connector.

Note Whenever engine will not be used for an extended period of time, disconnect positive (+) battery cable at battery to reduce chance of battery running down and damage caused by electrolysis.

10 Fuel Economy

The economy throttle position can affect fuel savings depending on boat load and hull design. When boat reaches top speed, slightly reduce engine speed. Make sure that the boat maintains a planing attitude when reducing engine speed. This will give a comfortable ride and help save fuel without a noticeable loss in boat speed.

A. Economy Throttle Range

11 12 13 Power Trim and Tilt Operation

Your motor's stern brackets have several trim position holes. Your motor is shipped with the angle adjusting rod in the second hole. The rod must be moved to the innermost hole for normal power trim operation.

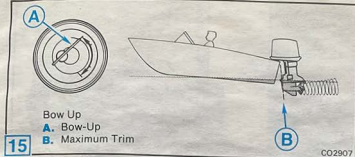
⚠ Safety Warning: Any malfunction of the power trim and tilt unit could result in a loss of shock absorber protection if an underwater obstruction is hit. Malfunction can also result in loss of reverse thrust capability.

POWER TRIM

Power Trim and Tilt feature provides the boat operator with the facility, at the helm, to change the angle of the engine's propeller in relation to the boat bottom.

The Power Trim has a range of 15° and may be operated at any boat speed or at rest. You can trim the boat while underway to improve acceleration, boat speed, and to meet changing water conditions.

To operate the Power Trim, push the Trim/Tilt switch to the desired bow position. Holding the switch in the desired position will activate the motor's trim until the switch is released or the motor reaches its maximum position.



The trim gauge indicates the bow position that is achieved by the trim angle of your motor.

Boat performance and trim position will differ depending on the type of boat, load, propeller and operating conditions. The best ride, fuel economy, performance and speed is determined by the operator's use of the Power Trim.

The effect of the maximum Bow-Up and Bow-Down positions will be relatively the same for most applications, however, the bow position that is best for your operating conditions could be at any trim setting between the maximum Bow-Up and Bow-Down positions.

The boat will be properly trimmed when the trim angle is adjusted to provide a bow position that results in the best boat performance for your particular operating conditions.

It will be necessary to utilize a speedometer and tachometer to determine boat and motor performance at the different trim positions.

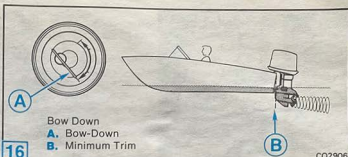
- 11. **A.** Trim Gauge
- 12. **B.** Trim/Tilt Switch
- 13. **A.** Trim Range
- B.** Tilt Range

15 BOW-UP

To move the boat's bow UP, move the Trim/Tilt switch to the UP position.

The Bow-Up position will give the best fuel economy and highest top speed. The Bow-Up position is normally used for cruising or running at full speed. In the Bow-Up position, the boat may tend to turn to the left. If this condition exists, it should be compensated for with the operator's steering or the trim tab should be adjusted, if this is your most commonly used trim position. (See **Trim Tab Adjustment**.)

When the motor is trimmed to full bow UP position you must exert a clockwise force to the steering wheel to keep the boat in a straight ahead path. In this position the boat's bow will want to raise clear of the water. Excessive bow UP trim may cause propeller ventilation resulting in propeller slippage. When operating in rough water or crossing a wake, excessive bow UP trim may result in the boat's bow raising skyward possibly ejecting the occupants.



To familiarize yourself with Power Trim, we suggest you make test runs at the various bow positions. Note the time it takes for the boat to plane, the tachometer and speedometer readings, and the ride and action of the boat.

⚠ Safety Warning: Some boat/motor/propeller combinations may encounter boat instability and/or high steering torque when operated at high speed or near the motors trim range limits (Full Bow-Up or Bow-Down Positions). Boat stability and steering torque can also vary due to changing water conditions. If any of these conditions occur, reduce throttle and/or adjust trim angle to maintain control. If you experience boat instability and/or high steering torque, see your DEALER to correct these conditions.

16 BOW-DOWN

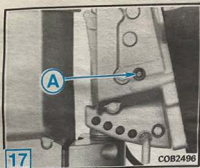
To move the boat's bow DOWN, move the Trim/Tilt switch to the DOWN position.

The Bow-Down position will give the best acceleration onto plane and the best towing power for skiing. The Bow-Down position is normally used for accelerating from a standing start or from idle speed.

In the Bow-Down position the boat may tend to turn to the right. If this condition exists, it should be compensated for with the operator's steering or the trim tab should be adjusted if this is your most commonly used trim position. (See **Trim Tab Adjustment**.)

When the motor is trimmed to full bow DOWN position you must exert a counterclockwise force to the steering wheel to keep the boat on a straight ahead path. In this position the boat's bow will want to go deeper into the water. When operating the boat at high speed, the bow of the boat plows into the water, the boat may tend to bow steer or spin about rapidly and possibly eject the occupants. If the trim unit is being trimmed to bow DOWN position while the motor is operated in reverse, the motor could suddenly change trim position when shifted to forward.

To familiarize yourself with power trim, we suggest you make test runs at various bow DOWN positions. Note the time it takes for the boat to plane, the tachometer and speedometer readings, and the ride and action of the boat.



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Note If the trim unit is being trimmed while the motor is operated in reverse, the motor could suddenly change trim position when shifted to forward.

Tilting

The angle of the motor tilt is also controlled by the Trim/Tilt switch. When the switch is held in the Bow-Up position, the motor is tilted up until the switch is released or the motor reaches the maximum tilt position.

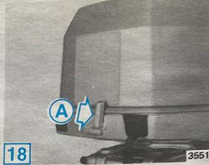
The trim gauge will show maximum Bow-Up position whenever the motor is in the tilt range which is an additional 50° beyond the trim range.

Tilting is normally used for raising the motor to obtain clearance when beaching, launching from a trailer, or mooring.

17 Manual Operation - Power Trim and Tilt

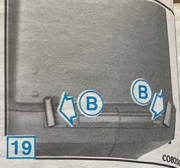
In the event of failure of the boat's electrical system or other problem, it may be necessary to raise or lower the motor manually. Turn manual release screw counterclockwise slowly ONE TURN ONLY - this will allow motor to be pushed down to the outermost trim position.

⚠ Safety Warning: Keep clear of motor when backing out manual release screw. After the motor is lowered be sure to tighten manual release screw clockwise until it stops. This will reactivate shock absorber protection and reverse thrust capability.



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The motor is now in the full bow up trim position, and must be operated in a manner suitable for this condition.

A. Manual Release Screw

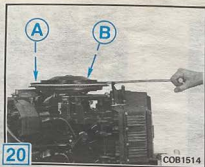
18 19 Removing Engine Cover

To remove engine cover turn front and rear locking levers 90°. Lift cover off. Reinstall cover assembly in reverse order, making certain rubber seal fits properly between upper and lower engine covers before turning locking levers.

Do not remove or install the engine cover while engine is running. The engine cover is a machinery guard. Its removal exposes the operator to moving parts. Keep hands, hair and clothing away from flywheel, starter, and air intake.

A. Front Locking Lever - Released

B. Rear Locking Lever - Released



20 Emergency Starting



Safety Warning:

- Do not use jumper cables and a booster battery to start engine. Do not charge a battery in the boat with an external charger. Fumes vented during either operation can lead to an explosion.
- When using Emergency Starting procedure, the start-in-gear protection provided by the remote control is inoperative. Make sure control handle is in neutral position to prevent sudden propulsion when engine starts. If available, someone should be at steering wheel.
- When releasing filler cap on portable tank, gasoline vapors (and possible liquid fuel if tank is full) will be released. Gasoline is extremely flammable and highly explosive under certain conditions. Do not smoke or allow open flames or spark near the boat when the cap is removed from the fuel tank.
- To prevent possible fire and explosion, manual primer valve lever must be in RUN position except for emergency starting. With lever in MANUAL START position and a pressurized fuel tank connected, leakage could occur through the carburetor air inlet opening.
- To prevent bodily contact with moving parts, do not turn flywheel by hand. Use starter cord only.
- Do not touch high voltage ignition coils or spark plug leads when motor is being started or when running. Shock can cause serious personal injury under certain conditions.

If the battery does not have sufficient charge to operate the electric starter, the motor can be started manually.

- Be sure motor is in normal running position.
- Slide fuel line connectors onto motor and tank couplings until locking lever snaps into position (PRIMER BULB AT TANK).
- Holding outlet end slightly up, squeeze fuel line primer bulb several times until resistance is felt. If equipped with an electric primer pump for the boat's fuel system, activate the pump for 20 to 30 seconds.
- Attach the lanyard to the Emergency Ignition Cut-Off Switch on the remote control.
- Move control handle to NEUTRAL position.
- Move fast idle lever to best START position.

COLD MOTOR

- Place starter key in OFF position.
- Remove engine cover. See **Removing Engine Cover**.
- If using the OMC portable 6-gallon gas tank slowly release filler cap on the tank to relieve the pressure in the tank. Close cap.
- Rotate the MANUAL PRIMER VALVE to the MANUAL START position.
- Squeeze the fuel line primer bulb once and release.
- Rotate the MANUAL PRIMER VALVE lever to the RUN position.
- Turn starter key to ON position ONLY to prevent accidental engagement of starter motor.

20. • Using the emergency starting cord, place the knot on end of cord in the notch of the pulley on top of the flywheel. Wrap cord around pulley clockwise as illustrated, making sure starter cord knot is clear of starter pinion.
- Pull forcibly on emergency starting cord to start the motor.
 - After starting, allow motor to run 2 minutes at less than 3500 RPM. Reduce motor speed by moving fast idle lever down to RUN position and secure latch. (Speeds above 3500 RPM in neutral can damage the engine.)
 - DO NOT attempt to replace engine cover after motor has started. Attach emergency ignition cutoff switch lanyard to your clothing and head to nearest boat landing for service and replacement of engine cover.

WARM MOTOR

- Follow cold motor procedure except warm motor does not normally require primer operation.
- Place FAST IDLE lever in fast idle position to avoid high RPM. If engine fails to start, repeat cold motor procedure.

If your electrical system is in operating order, the alternator should recharge your battery, if not, have the electrical system checked by your DEALER.

- A. Cord Knot
- B. Starter Pinion



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21 22 23 Trouble Check Chart

Starter Motor Will Not Operate, check for:

- Shift handle in NEUTRAL
- Battery and electrical connections

Motor Will Not Start, check for:

- Control handle in NEUTRAL and fast idle lever in START position.
- Lanyard attached to emergency ignition cut-off switch.
- Fuel in tank
- Fuel line connector properly attached
- Carburetor primed (squeeze primer bulb)
- Portable fuel tank not resting on fuel line
- Fuel line clear and not kinked
- Cold motor: Engine not primed sufficiently
- Warm motor: Engine over-primed or flooded. (Do not prime motor, raise fast idle lever and crank until cleared.)
- Fuel filter obstructed
- Water in fuel system
- Battery condition and electrical connections
- No spark:
 - Loose spark plug leads
 - Spark plugs carboned, burned or wet
 - Ignition system (see your DEALER)

- 21, 22. • Ignition electrical connectors disconnected. Remove cover screw and electrical components. Match connectors and push together.

23. • Check 20 A fuse at terminal strip on port side of motor. Always carry spare fuses. See **Specifications**

- Loose spark plugs, causing poor compression. See **Specifications** for recommended torque.
- Recheck starting instructions

Power Trim/Tilt Inoperative, check for:

- Fluid level. See **Lubrication**
- Manual release screw tightened securely
- Operation of fuse - port side of engine

Motor Will Not Idle Properly, check for:

- Damaged spark plugs (Insulator cracked)
- Improper fuel/oil mixture
- Primer in run position

Motor Loses Power, check for:

- Damaged spark plugs (Insulator cracked)
- Fuel filter partially restricted or fuel contaminated
- Obstruction at water intake. Cooling system not operating (see **Cooling System**)

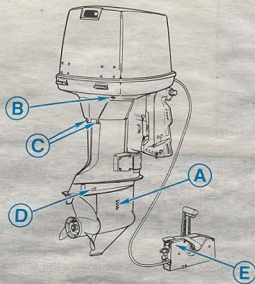
Motor Vibrates Excessively, check for:

- Bent or broken propeller
- Weeds on propeller

Motor Runs, But Makes Little or No Progress, check for:

- Bent or broken propeller
- Weeds on propeller

If this does not solve problem, then contact your DEALER.



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Cooling System

Note Never run the engine unless a steady stream of water is visible coming from the water pump indicator.

This motor is water cooled with a thermostatically and throttle controlled cooling system. Water enters the gearcase through a screened intake and is pumped to the powerhead. After the engine is warmed up, the water is discharged at the rear of the gearcase. The thermostat maintains a consistent temperature at low speeds, while pressure relief provides maximum cooling at higher speeds.

When operating motor, the water intake must be completely submerged so that it is in nonturbulent water. Observe proper transom height and boat trim.

A water pump indicator is provided and should be discharging a steady stream of water whenever the engine is running. Observe the indicator particularly when operating in weeds, mud or debris laden water. There is also an overheat warning horn built into the remote control. The warning horn will alert the operator should the powerhead overheat.

If the water pump indicator stops or becomes intermittent or the warning horn sounds, stop the engine immediately and check for a restricted water intake screen or a clogged water pump indicator. After

cleaning the screen, and/or the water pump indicator, start the engine and run at fast idle in neutral. If the indicator does not resume discharging a steady stream of water or if the horn does not stop sounding within 2 minutes, stop the engine immediately or serious powerhead damage may occur. If the indicator is discharging a steady stream of water, shift to forward and advance to 1/2 throttle (approximately 2500 RPM) to activate the throttle control cooling system.

A weak or intermittent stream from the overboard water indicator when the intake screen is not restricted, and the water pump indicator is not clogged, or recurring sounding of the overheat warning horn indicates a worn water pump or other cooling system malfunction. See your DEALER.

Retorquing the cylinder head and exhaust cover screws is recommended anytime the overheat warning horn sounds. See your DEALER.

Some water will normally be discharged at the exhaust relief outlet, but the amount varies depending on discharge water temperature and engine speed. It is not a reliable indication of proper cooling system operation.

Note For continuous operation in waters containing excessive amounts of sand or silt, we recommend an OMC Accessory Chrome Plated Water Pump Kit. See your DEALER.

- A. Water Intake
- B. Water Pump Indicator
- C. Water Quieted Exhaust Relief
- D. Water Discharge
- E. Warning Horn (Inside Control)

Shallow Water Operation

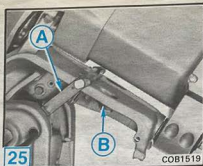
When operating in shallow waters, observe water pump indicator and proceed at slow speeds until deeper water is reached.

Note If an obstruction is hit, retard the throttle immediately and stop motor. Check motor, propeller and angle adjusting rod for possible damage.

If motor vibrates excessively after striking an underwater obstruction, it may indicate a bent or damaged propeller. Operate at slow speed. Your DEALER is equipped to check for propeller damage.

Note Operating motor with gearcase dragging on bottom will result in propeller wear. It may also cause sand to be forced into water pump which may cause damage to the pump.

When operating in very shallow waters, the motor may be tilted slightly higher than normal trim range and operated at slow speeds. (Be sure the engine's water intake is in the water at all times and water is being discharged from the water pump indicator.) The motor should be lowered immediately when back in deep water.



Impact Damage

Impact damage can occur when moving in either a forward or reverse direction. This can occur because the water is not always free of hidden hazards. For example, a high speed collision with a stump or heavy log floating low in the water can transmit damaging loads to your boat or motor. These loads must be resisted by the combined strength of the motor and boat, together with the installer's care in attaching the motor to the boat.

A low speed impact when your boat is moving backwards can transmit very high loads to the motor and its steering system. For example, this loading can occur when the boat is in the water or on a trailer and it is backed into a fixed object like a pier or garage wall. If this contact occurs in a way that the boat's movement is stopped suddenly by the motor contacting the fixed object, the motor or steering system can be damaged.

Should you hit any object, stop immediately and examine your motor for loosening of motor attaching hardware and for damage to swivel and stern brackets (clamps) and steering system parts. Examine the boat for possible structural damage. Tighten any loosened hardware and proceed slowly to shore. Before boating again, take your boat and motor to your DEALER so that it can be thoroughly inspected for possible damage.



Safety Warning: Failure to inspect for damage may:

- Result in sudden loss of steering control
- Adversely affect your boat and motor's ability to resist subsequent high speed impacts.

Dual Motor Maneuvering

When leaving or approaching the dock, or for any other close maneuvering at slow speed, start both engines. Leave the stand-by engine idling in NEUTRAL. Use the engine with the control nearest the operator to maneuver. The use of one control is very effective and more convenient. In the event that this engine stops, you can immediately go to the other engine which has been on stand-by.

Note

Stand-by engine must be running when maneuvering or water may be forced back through the underwater exhaust outlet and cause serious damage to the powerhead.

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Trailing

We recommend your motor be trailed in its normal running position. If trailer does not provide adequate road clearance, a Trail Lock is provided to secure motor in full tilt position for trailing.

Note

Do not trailer motor in a tilted position unless Trail Lock is engaged. Failure to engage Trail Lock while trailing may damage the hydraulic system.



Safety Warning: Disconnect fuel line at motor whenever motor is not being used for any length of time. (Example: when trailing or docked.)

- If portable tank is used, coil fuel line on top of tank.
- If built-in tank is used, store end of fuel line as high above top of tank as possible.

Failure to do so may result in fuel being siphoned from fuel tank into boat.

Coil fuel line on top of tank when not in use. This will help protect fuel line and connector from damage and help prevent sand or dirt from entering connector.

Note To prevent possible engine damage when trailering, secure the lower unit to boat transom or trailer.

TO ENGAGE TRAIL LOCK:

- Place motor in full TILT position. See **Tilting**.
- Pull Trail Lock down so it rests on stern brackets. A detent will hold the Trail Lock in trailering position or in stow position.
- Lower motor so that trail locks rest against stern brackets. Continue to activate "down" switch until the two trim rods are fully retracted. This can be recognized by the change of the sound from the power trim/tilt unit.

TO DISENGAGE TRAIL LOCK:

- Tilt motor to full TILT position.
- Move Trail Lock up into stow position. Position motor in full tilt position before launching.

⚠ Safety Warning: The power tilt should be used to lift and support the motor before disengaging the trail lock. Loss of oil pressure while on the trail lock could allow the engine to drop suddenly when the trail lock is disengaged.

- A.** Trail Lock - Engaged
- B.** Trail Lock - Stow Position

High Altitude Operation

The fuel calibration must be altered for operation at 900 m (3,000 feet) above sea level or higher.

See your DEALER for installation of a High Altitude Performance Kit.

To maintain performance at high altitude, it may be necessary to replace the previously selected propeller with one of less pitch.

Note If a High Altitude Performance Kit is installed, the original carburetor parts must be installed before operating below 900 m (3,000 feet) above sea level. Serious powerhead damage could result if this is not done.

Salt Water Operation

Your motor is built for operation in either fresh or salt water. Fresh water internal flushing is not normally required, however, it may be desirable after use in especially polluted or brackish water. Your local DEALER will assist you in securing the appropriate flushing device.

If motor is to remain on boat during long periods of inoperation, tilt gearcase out of water (except during freezing temperatures). When removing motor from water, allow cooling system to drain thoroughly, by placing motor in upright position. We recommend that motor exterior be rinsed with fresh water and wiped dry.

Operating in Weedy Water

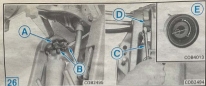
Weeds on the propeller will cause motor to vibrate. Run at reduced throttle when weeds are thick. Reverse motor periodically to clear weeds from propeller. Stop motor, clear propeller and water intake completely of weeds before resuming speed in clear water. Check water pump indicator at intervals.

Operating in Freezing Weather

In freezing temperatures, keep the gearcase submerged in the water at all times. This will avoid freezing and possible damage to the water pump or other parts of the motor. When removing the motor from the water, keep the motor in an upright position until water is completely drained from the cooling system.

Prior to operation in freezing temperatures, check gearcase lubrication. If leakage is evident, gearcase seals may need attention. See your DEALER.

Note Any leakage of water into gearcase may result in freezing and damage to gearcase when motor is removed from water.



Maintenance

26 Adjusting Trim Gauge and Sending Unit

In some cases, it may be necessary to adjust the trim sending unit to coincide with the trim gauge. To do this, proceed as follows:

- Turn ignition key to ON position.
- Raise engine, with lift switch, to maximum lift position.
- Move angle adjusting rod to number 3 hole.
- Loosen sending unit screws, slightly but snug, so sending unit can be pivoted.
- Lower engine all the way down against angle adjusting rod.
- Observe trim gauge. If needle does not show center position, adjust sending unit by pivoting it up or down with screwdriver, until gauge shows needle in center position.
- Raise engine and tighten sending unit screws. Lower engine and recheck gauge. (Repeat if necessary).
- Raise engine to remove angle adjusting rod and reinsert rod into the innermost hole.

- A. Sending Unit
- B. Mounting Screws
- C. Screwdriver
- D. Pivot Sealing Unit
- E. Trim Gauge



27 Throttle Friction Adjusting Knob - Remote Control

This knob may be adjusted so that throttle setting will not wander while you are underway.

To adjust, start engine and move control handle into throttle range. While you are underway, turn adjustment knob as required for proper friction adjustment.

The friction device is only effective in the forward throttle range.

A. Friction Adjusting Knob

Idle Speed Adjustment

The correct procedure for idle speed adjustment must be carefully performed to insure proper engine performance and remote control operation. See your DEALER.

Emergency Ignition Cut-Off Switch

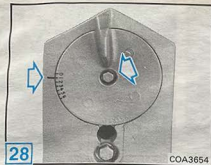


Safety Warning: The emergency ignition cut-off switch can only be effective if it is in good working condition. Observe the following:

- Lanyard must always have freedom of movement and be away from any obstructions or entanglements which could hinder its operation.

Once a month:

- Inspect switch for proper operation. With engine running, removal of the lanyard and cap must stop the engine. If engine does not stop, see your DEALER for replacement of switch.
- Inspect lanyard for cuts, fraying, worn cap, etc. Replace if in doubt.



28 Trim Tab Adjustment

⚠ Safety Warning: Improper trim tab adjustment can cause difficult steering.

An adjustable trim tab is provided to compensate for propeller torque. The adjustable trim tab allows steering effort to be balanced when turning in either direction. Your DEALER has adjusted the trim tab for average boating conditions and the propeller provided. If further adjustment is necessary, proceed as follows:

- With a firm grip on the steering wheel and weight in the boat evenly distributed, run the boat at full throttle in a straight line. Do this in an area where current and wind will not be a factor.
 - Turn the steering wheel to determine the direction that requires the least amount of steering effort.
 - Loosen trim tab screw.
 - If less steering effort is required in port turn, move the trim tab slightly to port.
 - If less steering effort is required in a starboard turn, move the trim tab slightly to starboard.
 - Retighten the trim tab screws and recheck the adjustment.
- Repeat the above procedure as necessary until the steering effort is equal in both directions.

After adjustment is complete, torque the trim tab adjusting screw to 38-44 N·m (28-32 ft. lbs.).

Twin engines follow the same procedure as a single engine except both trim tabs should be adjusted the same amount.

On high performance boats that have the motor higher than normal on the transom, the trim tab may be above the surface of the water when the motor is trimmed out for maximum speed. This will result in high steering effort in one direction and the boat will have a tendency to turn to the left.

Trimming the motor down and submerging the trim tab will restore normal steering forces.

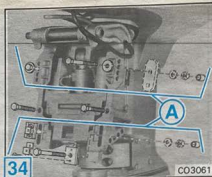
29 → 33 Removing Lower Engine Covers

During installation or maintenance it may be necessary to remove the lower engine covers. This will allow easier access to components otherwise protected by the covers.

To remove covers:

- 29, 30.** • Unscrew front and rear retaining screws
- 31, 32.** • Either side can be removed individually. There are retaining clips provided to hold the covers in place while fastening or unfastening the retaining screws.
- 33.** • Remove the wire retaining clip for the cover half you are removing.

When reassembling, make sure the cover halves are positioned on the rubber mounting pads and the front and rear halves properly fit together.



34 Adjustable Stern Brackets

The adjustable stern brackets provided with your motor allow you to position the motor on the transom to obtain the best possible performance. Proper height adjustment of the stern brackets can, depending upon boat size and weight, increase the top speed performance. If it was necessary to use the alternate location holes when mounting motor to transom, the stern brackets are no longer adjustable. Your DEALER should be consulted for the proper setting on your boat.

- After the correct propeller has been selected, test run your boat. If no propeller ventilation is evident, raise the motor one position.

Note When changing position of stern brackets, it is only necessary to remove the upper bolts; the bottom bolts need only be loosened. Secure the brackets, and test for improved performance.

- Continue to raise the motor (one position at a time) and check for improved performance. This raising and checking should be continued until propeller ventilation occurs in turns. Propeller ventilation will result in a loss of top speed and a marked increase in RPM. The final setting should be one position below the setting where the ventilation occurs.

- Check for any interference between motor and transom mounted remote steering system parts when motor is in maximum tilt position. Should the motor strike an underwater object and tilt rapidly into the boat, interference may result in part breakage or weakening.
- Check for interference between boat transom and stern brackets. Boat molding must not restrict stern brackets from full contact with boat transom. Failure to ensure full contact can result in stern brackets breaking with possible loss of motor and control of boat. Contact your DEALER or boat manufacturer for assistance, if necessary.

⚠ Safety Warning: Failure to perform the above checks may result in severance of the steering system and sudden unexpected loss of boat control.

- In most instances, the propeller selected earlier will still be correct. However, on light boats a different propeller may be necessary. A full throttle tachometer check will insure that the motor is still operating within the recommended limits. See **Propeller and Steering Connector Selection Guide**.

⚠ Safety Warning: Use all hardware shown and tighten all fasteners securely. Failure to do so can result in sudden unexpected loss of speed, steering and shaft control.

- A. Primary Locations



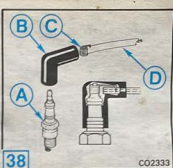
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35 36 37 Fuel Filter

Your engine is equipped with a fuel filter which is located between the motor fuel line coupling and the VRO pump. Inspect the filter at the end of the 10 hour break-in period as most dirt or impurities from a new fuel system would be present at this time. The filter should be cleaned periodically for best motor performance.

- Raise fuel filter assembly to allow for easy cleaning.
- 35.** • Unscrew cap from base by rotating cap in a counterclockwise direction.
- 36.** • Use a clean rag to clean filter base and trap. Clean screen by shaking into a clean rag.
- 37.** • Reassemble filter cap and base and place in original location.

Note It is not necessary to remove hose and clamps from filter assembly.

- Check for leaks by connecting fuel line to motor and squeezing primer bulb until definite resistance is felt in bulb.

⚠ Safety Warning: Failure to inspect your work could allow fuel leakage to go undetected. This could become a fire or explosion hazard.

38 Spark Plug Inspection and Replacement

See **Specifications** for the recommended spark plug and gap for your operating conditions.

To remove spark plug, detach rubber covered spark plug terminal (twist slightly counterclockwise and pull off). Remove spark plug for inspection or replacement as necessary.

When reinstalling spark plug, clean the spark plug seat in cylinder head. Install spark plug and gasket finger tight plus 1/4 turn with wrench. See **Specifications** for spark plug wrench size and torque.

Note Do not overtighten, or damage may result to cylinder head.





⚠ Safety Warning: Avoid abusive handling which could crack ceramic portion of spark plug. Damaged spark plugs can emit sparks which could ignite fuel vapors under the engine cover.

When reinstalling the rubber cover on the ignition coil, apply approximately 1 cc of OMC Triple-Guard® grease or equivalent inside rubber cover. This will help prevent corrosion of the spring terminal onto the ignition coil terminal. Do not apply grease inside spark plug covers.

The spring inside rubber terminal lead cover must be positioned to fit properly over spark plug terminal.

- A.** Spark Plug **B.** Cover **C.** Spring **D.** Lead

Lubrication

Types of Lubricant				Contact your DEALER for OMC Lubricants.	
OMC Triple-Guard® Grease		OMC Hi-Vis® Gearcase Lube		General Electric Versilube®	
					
A	B	C	D	E	
Tube	Grease Gun				

Frequency of Lubrication

TYPE OF USE	FREQUENCY
Fresh water	Every 60 days
Salt water	Every 30 days
Storage of 30 days or longer	Before placing in storage

1 → 8 Lubrication Points

GEARCASE

Change after first 20 hours of operation and check after 50 hours of operation.

Add lubricant if necessary.

Drain and refill every 100 hours of operation or once each season whichever occurs first.

With engine in vertical position, remove oil drain/fill and oil level plugs.

Allow lubricant to drain completely.

To refill, place tube of OMC Hi-Vis® gearcase lube or equivalent in drain/fill hole. If OMC Hi-Vis gearcase lube is not available, OMC Premium Blend gearcase lube or equivalent can be used. Fill until lubricant appears at oil level hole. See **Specifications** for gearcase capacity.

Install oil level plug before removing lubricant tube from drain/fill hole.

Drain/fill plug can now be installed without loss of lubricant. Tighten both plugs securely.

Note Recommended lubricants which have been formulated to protect against damage to bearings and gears must be used as extensive damage can result from improper lubrication.

If the proper tube or filler type can is not available:

Remove oil drain/fill and oil level plugs.

Allow lubricant to drain completely.

Reinstall drain/fill plug.

Slowly fill gearcase through oil level hole allowing trapped air to escape.

Install oil level plug.

Tighten both plugs securely.

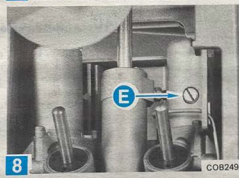
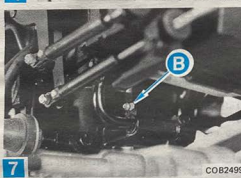
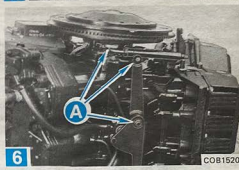
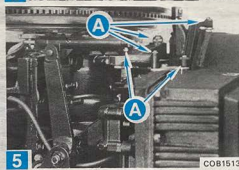
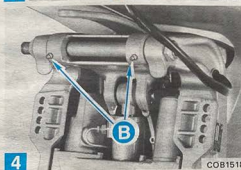
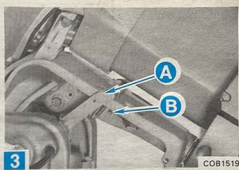
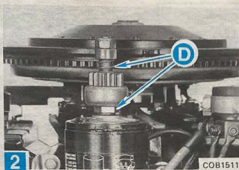
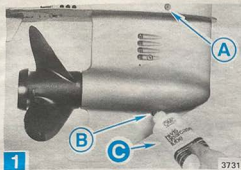
Air still trapped inside gearcase will escape after motor is operated or allowed to stand in vertical position for several hours. Recheck oil level and refill as required.

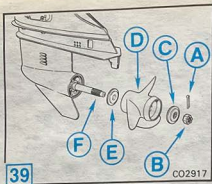
- 1** Gearcase
 - A.** Oil Level Plug
 - B.** Oil Drain/Fill Plug
- 2** Starter Pinion Shaft - Coat upper section and screw areas of shaft. Excess grease will be thrown off when starter is engaged.
- 3** Swivel Bracket Fitting and Trail Lock
- 4** Tilt Tube Shaft
- 5** Spark Advance and Carburetor Linkage, Roller (Cam Follower)
- 6** Control Shaft Bushings, Bearings and Shift Linkage
- 7** Shift Shaft
- 8** Power Trim and Tilt Oil Reservoir. With engine tilted up, remove the filler plug and check the fluid level. If necessary, add enough OMC® Power Trim/Tilt Fluid to bring the fluid level even with the bottom of fill hole when unit is at full tilt.

9 Steering System Lubrication

The installer was instructed to grease the steering cable ram during installation. Once the engine is put into use, periodic regreasing with OMC Triple-Guard Grease is required as specified in the **Frequency of Lubrication Chart**.

⚠ Safety Warning: Failure to regrease as recommended could result in steering system corrosion. Corrosion may affect steering effort making operator control difficult.





Propeller Care

Unusual or excessive vibration may indicate a bent or unbalanced propeller. Avoid or limit operation under these conditions. Carry a spare propeller and replace the damaged propeller as soon as practical. See your DEALER.



Safety Warning: Avoid accidental start up. Place remote control handle in neutral and disconnect both electrical connectors between power pack and charge coils.

39 Propeller Replacement/Installation

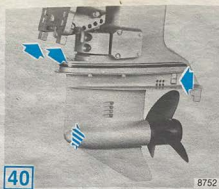
To remove propeller:

- Remove cotter pin propeller nut. See **Specifications** for propeller nut socket wrench size.
- Remove thrust bushing, spacer and propeller.

To install propeller:

- Apply OMC Triple-Guard grease to full length of propeller shaft.
- Install large propeller thrust bushing onto propeller shaft with shoulder of thrust bushing facing aft (rear).
- Install propeller onto propeller shaft.
- Propeller should seat onto thrust bushing.
- Install the spacer, engaging the propeller shaft splines.
- Install and tighten the propeller nut to a torque of 14 N·m (120 in. lbs.). Continue to tighten to align next cotter pin hole.

After propeller is installed, the propeller shaft should turn freely (engine in neutral). Install and secure cotter pin (use new pin if necessary).



- A. Cotter Pin
- B. Propeller Nut
- C. Spacer
- D. Propeller
- E. Thrust Bushing
- F. Propeller Shaft

Propeller Hub Replacement

A rubber bushing in the propeller hub absorbs shock and minimizes the chances of damaging the propeller or the outboard motor. However, if the bushing should become damaged or slips, it can be easily replaced by your DEALER or at a propeller station.

40 Anti-Corrosion Protection

Your motor is equipped with anti-corrosion zinc anodes. The anodes protect your motor from galvanic corrosion. Galvanic corrosion may occur in fresh water or salt water, however, salt water usage will accelerate corrosion.

Erosion or disintegration of the anodes indicates they are performing their function.

Periodically inspect the condition of the anodes and replace if necessary.

Replace the anodes before they are completely eroded or corrosion to motor will increase. See your DEALER for replacement anodes.

Note Never paint or cover the anode with any coating. If you do, corrosion protection from the anode will be lost.

Do not use either copper or graphite base paints on boat bottom. These types could cause harmful galvanic corrosion to the motor. Anti-fouling paints containing tin (TBTA or TBTF compound) as an active material are acceptable.



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Off Season Storage

Your warranty does not cover engine failures caused by neglect. It is important that you protect your engine with a well planned storage pattern. The off season storage of your outboard motor is important to its long life and trouble free operation. Temperature and humidity changes while in storage can cause corrosion of piston rings, cylinder walls, and bearing surfaces that are not properly protected. It is to your advantage to protect your motor as soon as possible before storage. We recommend that your DEALER prepare your motor for off season storage. Fuel system requires periodic cleaning and adjustment to maintain top performance. This is the best time to have your DEALER perform an engine tune-up.

If you desire to prepare your own engine for storage, proceed as follows:

See your DEALER for OMC 2+4® fuel conditioner and OMC Storage Fogging Oil.

- Use OMC 2+4 fuel conditioner or equivalent in your fuel mixture to stabilize the gasoline. It eliminates need for draining fuel for up to one year of storage. Add 8 ml (one ounce) of OMC 2+4 for every litre (every gallon) of gasoline. Then operate motor in fresh water for a few minutes to allow fuel mixed with OMC 2+4 to enter carburetor.

Note Do not operate motor out of water even momentarily. Water pump may be damaged or motor may overheat.

- Remove engine cover. See **Removing Engine Cover**.
- 40/50 Models - Remove rubber plugs from air silencer cover.
- Start engine.
- While engine is running, rapidly inject OMC Storage Fogging Oil or equivalent into carburetor air intakes until motor smokes excessively. See illustrations listed below.

12. 40/50 Models

60/70/75 Models - Each fogging hole located on port side of air silencer.

13. 60/75 Models

14. 70 Models

90 thru 225 Models - Air inlets located on port and starboard side of air silencer.

15. 90/110 Models (4 inlets)

16. 120/140 Models (4 inlets)

17. 150/175 Models (6 inlets)

18. 200/225 Models (6 inlets)

- Stop motor.
- 40/50 Models - Replace rubber plugs in air silencer.

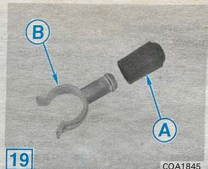
⚠ Safety Warning: To prevent accidental starting of engine, before servicing motor:

- 40 thru 75 and 120/140 Models - Disconnect electrical connector between power pack and charge coil.
 - 90/110, 150/175 and 200/225 Models - Disconnect two (2) electrical connectors between power packs and charge coils (port and starboard).
- Remove spark plugs. Inject OMC Storage Fogging Oil or equivalent into the spark plug holes. Turn engine through a number of revolutions. This will lubricate and protect internal parts of powerhead while motor is in storage.
 - Check spark plugs. Clean or replace if necessary. Refer to **Spark Plug Inspection and Replacement**.

⚠ Safety Warning: To prevent escape of liquid or vapors from tank which could be accidentally ignited, do the following:

- **Portable Fuel Tank with Gauge - Disconnect fuel line from motor and tank.**
 - **Portable Tank without Gauge - Disconnect fuel line from motor and close vent screw on filler cap.**
 - **Store tank in a well ventilated area away from heat or open flame (such as a pilot light).**
- Coil fuel line on top of portable tank when not in use. This will help protect fuel line and connector from damage and help prevent sand or dirt from entering connector.
 - Motor may be left on boat or placed on a stand. If motor is removed from boat, store the special locking type fasteners which attach the remote steering, shift, and throttle control systems to the motor to prevent their being substituted. When reinstalling motor on boat, make sure the control systems are reattached to the motor in their original positions and fasteners tightened as specified in the manufacturer's installation instructions.

⚠ Safety Warning: Failure to carefully reattach control systems with original specified hardware may result in sudden unexpected loss of control of the boat at some later time.



- 19**
- If motor is removed from boat, the VRO oil hose must be disconnected from the motor. After disconnecting the oil hose, cap the oil fitting on the motor and plug the oil hose from the VRO tank with the cap and plug provided. The cap and cap holder/plug are located on the fuel line near the VRO pump.

A. Cap

B. Cap Holder/Plug

Note Store motor in the normal running (vertical) position to ensure proper drainage of the motors cooling system.

- Remove battery and check condition. Charge if required following precautions on battery label. Clean battery thoroughly. Store in a cool, dry place and not in direct sunlight. Check water level and charge periodically during storage.
- Service fuel filter.
- Portable fuel tank - If OMC 2+4 Fuel Conditioner has not been used in fuel mix, remove fuel tank drain screw (Portable tank with gauge) and drain thoroughly. Replace drain screw securely.
- Remove propeller and have it checked by your DEALER. A slightly bent propeller blade may not be noticed on casual observation but will affect the performance of your motor. Clean the propeller shaft and lubricate with OMC Triple-Guard Grease. See **Propeller Replacement and Propeller Installation**.
- Drain and refill gearcase. Lubricate motor. See **Lubrication**.
- Touch up paint. See your DEALER.
- Clean fuel tank and inspect for rust, or leakage in metal body. Replace if needed.
- Give motor visual check and make sure:
 - screws and nuts are tight (torque as specified in service manual).
 - spark plug boots, starter solenoid terminal boot and connector sleeves are in place,
 - electrical leads are clamped in place to prevent contact with other moving motor parts,
 - deteriorated (cut, cracked, abraded) or damaged parts such as wires, coils, boots, sleeves are replaced,
 - deteriorated or damaged fuel system parts; hoses, clamps, fuel bulb, gaskets are replaced,
 - badly rusted or leaking fuel tank is replaced.
- Replace engine cover.

After Storing - Before Using

If you have properly stored your motor follow these suggestions.

- Check gearcase lubrication. If leakage is evident, gearcase seals may need attention. See your DEALER. Check lubricant level in power trim/tilt reservoir. See **Lubrication**.
- Connect spark plug leads. Reconnect electrical connectors between power packs and charge coils.
- Check water level in battery and charge. Install and connect battery.

⚠ Safety Warning: Do not use jumper cables and a booster battery to start engine. Do not charge a battery in the boat with an external charger. Fumes vented during either operation can lead to an explosion.

- It is IMPORTANT that the battery connections are correct: the (-) negative Black battery cable must be attached to the (-) negative terminal on the battery and the (+) positive Red cable must be attached to the (+) positive terminal.

Note If the cables are reversed, the charging unit will be immediately damaged. DO NOT attempt to connect or disconnect any part of the electrical circuit while the motor is running.

- Connect battery cables, making sure clamps are tight on either post to insure good contact. Apply a coat of petroleum jelly to exposed area of the battery posts and clamp connectors to retard corrosion.

High resistance in the charging circuit can seriously affect the electrical system. We recommend that you make periodic checks to insure clean, tight connections throughout the electrical system.

⚠ Safety Warning: Failure to ensure the above may result in sparks and ignite fuel vapors under the engine cover.

If motor was removed from the boat:

- Make sure the control systems are reattached to the motor in their original positions and the original specified fasteners are tightened as specified in the manufacturer's installation instructions.

⚠ Safety Warning: Failure to carefully reattach control systems with original specified hardware may result in sudden unexpected loss of control of the boat at some later time.

- 7** **8**
- If the oil hose was disconnected from the motor, the oil hose must be purged of air. See **VRO Oil Hose Installation**. Return the oil fitting cap and cap holder to their storage position.
 - 6** • If the oil hose has been disconnected and reconnected to the motor, it is recommended that lubricant be mixed with the gasoline at a 100:1 (1% oil) fuel/oil ratio, see **Fuel Mixing Instructions**. Before using unmixed gasoline, check to see that the level in the oil tank has changed, indicating that oil is being used. Refer to **Filling VRO Oil Tank** for marking oil level.

Submerged Motor

Motor Dropped Overboard

If motor is recovered from water immediately, it must be serviced within 3 hours after recovery. See your DEALER.

Since this motor is provided with needle bearings, it must be serviced within 3 hours after recovery to avoid costly repairs. Both fresh and salt water characteristically will start etching the highly machined bearing surfaces of the crankshaft and connecting rods as well as the bearings once exposed to the surrounding atmosphere.

Note If service is not readily available, the motor should be re-submerged immediately in fresh water to avoid exposure to the atmosphere. Make arrangements to have it serviced with the least possible delay.

Dealer Service

When away from home and in need of an authorized DEALER to service your OMC product, consult the local telephone directory. If no listing is available in the U.S. (except Alaska and Hawaii) call 800-255-2550.

This inspection will be performed at local DEALER rates and paid for by the owner. After the DEALER 20-hour check-up, your unit should be taken to an authorized DEALER every 6 months or 100 hours of operation, whichever occurs first.

20 Hour Check

This is important. After the first 20 hours of operation, we recommend that you return your motor to your DEALER for minor inspection and adjustment (if necessary).

20 Hour Check Includes:

- Drain, flush and refill gearcase. See **Lubrication**.
- Torque cylinder head and spark plugs
- Adjust carburetor
- Check propeller
- Check timing (where applicable) and ignition
- Adjust remote control and linkage (where applicable)

This is an opportune time to discuss with your DEALER any questions on your outboard motor which have arisen in the first 20 hours of operation, and establish a routine preventative maintenance schedule.

The 20 hour check will be performed at local DEALER rates and paid for by the owner.

Owner's Obligation and Responsibility

See your DEALER for proper maintenance and care of your outboard motor. Proper maintenance and care will assist in keeping your overall operating costs at a minimum. Normal maintenance service and replacement of service items are the responsibility of the owner and as such are not considered defects in material or workmanship within the terms of the warranty. The principal service and replacement items are described as follows:

- Engine Tune-Up: See your DEALER.
- Lubrication: Grease requirements and oil changes are listed in the Owner's-Operator's Manual.
- Fuel System Check: Fuel filters should be replaced or cleaned periodically. Carburetors need periodic adjustment. Both are necessary to obtain peak performance from the engine.
- Spark Plugs: These items are subject to wear and contamination and should be checked periodically.
- Carbon Deposits: A degree of carbon build-up is normal in the combustion chamber of any gasoline engine, depending on fuel quality and operating conditions, and should be periodically removed. For best results, follow the gasoline and oil recommendations.
- Propellers: Propellers should be serviced, straightened or replaced when necessary for maximum performance. Propellers are subject to various underwater hazards and resulting damage is the owner's responsibility.
- Water Pump Parts Wear: These parts are subject to various amounts of wear depending upon water conditions and are normal maintenance service items. Your DEALER will be able to tell you how often these parts need replacing in your area.

- Clutch Wear or Clutch Dog Wear (where applicable): These parts are subject to various amounts of wear depending upon individual operating habits and are therefore the owner's responsibility. Where applicable, refer to instructions in your Owner's-Operator's Manual on shifting.

Warranty Service

Warranty

The warranty covering this product is located at the end of this handbook. Read your warranty carefully, to understand the terms and conditions that apply to your particular area.

To make a claim under warranty, contact the authorized DEALER from whom the outboard motor was originally purchased, or the nearest authorized DEALER. Remember, your outboard motor must be delivered to an authorized DEALER within the warranty period, and all warranty work must be performed by an authorized DEALER. Proof of purchase may be required by the DEALER to substantiate any warranty claim.

Examples Of Items Not Covered By Warranty

Provisions of the Warranty Will Not Apply to:

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

Outboard motors subject to misuse, neglect, negligence, accident, or used for racing purposes.

Outboard motors 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 the use of parts or accessories which are either incompatible with the outboard motor or adversely affect its operation, performance or durability.

Outboard motors not operated or maintained in accordance with the instructions in the Owner's-Operator's Manual.

Twenty-hour check-up, service check-up, tune-up, or diagnosis.

Normal cleaning, adjusting or replacing of spark plugs in the outboard motor.

Periodic checking or adding of oil to the gearcase of the outboard motor.

Expense of returning the outboard motor to the DEALER and expense of delivering it back to the owner.

Removal of the outboard motor from a boat and reinstallation, mechanic's travel time, and in-and-out-of-water charges.

Replacement of anode(s).