
OPERATION AND MAINTENANCE MANUAL

MARINER

20 • 25 HP MODELS

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READ THIS MANUAL THOROUGHLY

If you don't understand any portion, contact your dealer for a demonstration of actual starting and operating procedures.

NOTICE

Throughout this publication, and on your outboard, DANGER, WARNINGS and CAUTIONS, accompanied by the international HAZARD Symbol , may be used to alert the installer/user to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. OBSERVE THEM CAREFULLY.

These "Safety Alerts" alone cannot eliminate the hazards that they signal. Strict compliance to these special instructions while performing the service, plus "common sense" operation, are major accident prevention measures.



DANGER

DANGER - Immediate hazards which WILL result in severe personal injury or death.



WARNING

WARNING - Hazards or unsafe practices which COULD result in severe personal injury or death.



CAUTION

CAUTION - Hazards or unsafe practices which could result in minor personal injury or product or property damage.

IMPORTANT - Indicates information or instructions that are necessary for proper operation and/or maintenance.



WARNING

The operator (driver) is responsible for the correct and safe operation of the boat, the equipment aboard and the safety of all occupants aboard. We strongly recommend that the operator read this Operation

and Maintenance Manual and thoroughly understand the operational instructions for the outboard and all related accessories before the boat is used.



WARNING

The following advantages and disadvantages of an EMERGENCY STOP SWITCH (lanyard type) should be considered before electing to use, or not to use, such a switch.

ADVANTAGES: The purpose of an EMERGENCY STOP SWITCH is to stop the engine when the operator leaves his control station, either accidentally by falling into the boat, or by falling or being ejected overboard. This is most likely in certain types of boats such as low sided bass boats, high performance boats and light sensitive handling, fishing boats operated by hand-tiller. It is also likely as a result of poor operating practices such as sitting on the back of the seat at planing speeds, standing at planing speeds, operating at high speeds in shallow or obstacle infested waters, drinking and driving, or daring, high speed boat maneuvers.

DISADVANTAGES: Inadvertent activation of the switch is also a possibility. This could cause any or all of the following potentially hazardous situations:

- Loss of balance and falling forward of unstable boat passengers - a particular concern in bow rider type boats.
- Loss of power and directional control in heavy seas, strong current or high winds.
- Loss of control when docking.

As we cannot possibly know of and advise the boating public of ALL conceivable **boat/motor** types and/or poor operating practices, the final decision of whether to use an **EMERGENCY STOP SWITCH** rests with you, the **owner/driver**.

We strongly recommend that other occupants be instructed on proper starting and operating procedures should they be required to operate the outboard and boat in an emergency.



WARNING

A **SECURITY LINE** that is long enough to allow the outboard to disengage from the transom but too short to permit the outboard to submerge and stop running could cause the outboard to rebound into the boat and **injure** the occupants.

An effective **SECURITY LINE** should be of a working strength approximately five (5) times the weight of the outboard motor.

- The **SECURITY LINE** should be **SHORT enough** and affixed in a manner to prevent the outboard from rising up and disengaging from the transom - OR -

- The **SECURITY LINE** should be **LONG enough** and affixed in a manner to permit the outboard to submerge behind the boat and thus stop running.



WARNING

It is difficult for a person standing or floating in the water to move clear if they see a powerboat heading toward them, even at slow speed. Shift the unit to neutral and shut off engine when your boat is near people in the water.

SERIOUS INJURY IS LIKELY IF A PERSON IN THE WATER IS STRUCK BY A MOVING BOAT, GEAR HOUSING, PROPELLER, OR ACCESSORY RIGIDLY ATTACHED TO YOUR BOAT OR OUTBOARD.



WARNING

The use of accessories not manufactured or sold by Mercury Marine is not recommended for use with your outboard. If your outboard or outboard operating system is equipped with an accessory not manufactured by Mercury Marine, be sure to read the Operation and Maintenance Manual for that accessory before operation. If you haven't been supplied with such a manual, contact your dealer or the manufacturer of the accessory to secure the applicable manual.



WARNING

USE CARE when transporting fuel container, whether in a boat or car. **DO NOT** fill fuel container to maximum capacity. Gasoline will expand considerably as it warms up and can build up pressure in the fuel container. This can cause fuel leakage and a potential fire hazard.

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The description and specifications contained herein were in effect at the time this guide was approved for printing. Mercury Marine, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, to change specifications, designs, methods or procedures without notice and without incurring obligation.

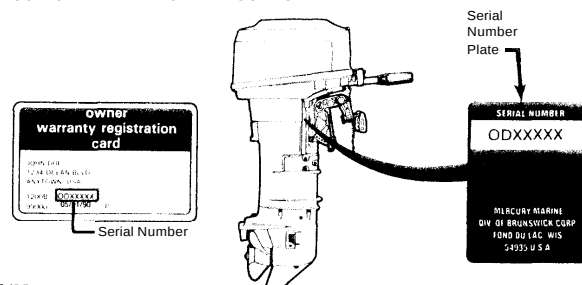
Mercury Marine, Fond du Lac, Wisconsin U.S.A.

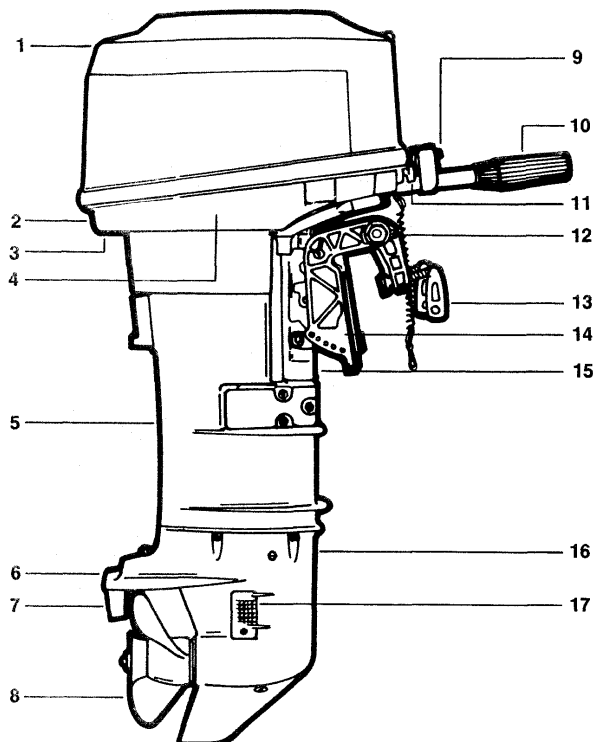
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OUTBOARD SERIAL NUMBER LOCATION





Electric Start with Tiller Handle Shown

- | | |
|----------------------------|------------------------------|
| 1. Top Cowl | 10. Tiller Handle |
| 2. Cowl Latch | 11. Primer/Fast Idle Knob |
| 3. "Tell-Tale" Outlet | 12. Safety Clip |
| 4. Bottom Cowl | 13. Clamp Screw (2) |
| 5. Drive Shaft Housing | 14. Clamp Bracket (2) |
| 6. Anti-Ventilation Plate | 15. Swivel Bracket |
| 7. Trim Tab | 16. Gear Housing Assembly |
| 8. Propeller | 17. Water Intake (Starboard) |
| 9. Electric Starter Button | |

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SPECIFICATIONS

	20	25
Horsepower	20	25
Propshaft Kilowatts ¹	14.8	18.6
Full Throttle RPM Range	4500-5500	5000-6000
Idle Speed	600-700 RPM (in Gear)	
Piston Displacement	24.4 Cu. In. (400cc)	
Bore	2.56 (65mm)	
Stroke	2.36 (60mm)	
Recommended Spark Plug	NGK BUHW or AC-V40FFM or Champion L76V [Use Champion QL78V Where Radio Frequency Interference (RFI) Suppression is Required]	
Spark Advance	25° BTDC @ WOT	
Recommended Gasoline	Automotive Leaded or Unleaded (Lead Free) Gasoline	
Recommended Oil	Quicksilver 2-Cycle Outboard Oil	
Gasoline/Oil Ratio	50:1 (Including Break-In)	
Fuel Tank Capacity:		
• U.S. Gallons	6.6	
• Imperial Gallons	5.5	
• Liters	25	
Battery Rating - Electric Start Models	Minimum Reserve Capacity Rating of 35 Minutes and Cold Cranking Amperage of 180 Amperes	
Standard Propeller	3 Blade Aluminum (10-3/8" Dia. x 13" Pitch)	
Gear Ratio	2.25:1	
Transom Height	Short Shaft = 15" (38cm) Long Shaft = 20" (51cm)	

¹Measured at the propshaft in accordance with ICOMIA 28.

IMPORTANT: Fasteners (screws and nuts) used in the manufacture of your outboard motor are METRIC. (A few exceptions are: propeller shaft nut and spark plugs, which are 13/16", and tilt tube nuts, which are 1-1/4".)

COMBINATION TOOL

A "Combination Tool" is provided with the outboard motor (stored in the "Owner's Literature Packet").

This handy tool incorporates a 21mm (13/16") hex socket (fits spark plugs and propeller nut) and a 10mm hex socket (fits 10mm fasteners, such as the rewind starter mounting bolts). The tool handle

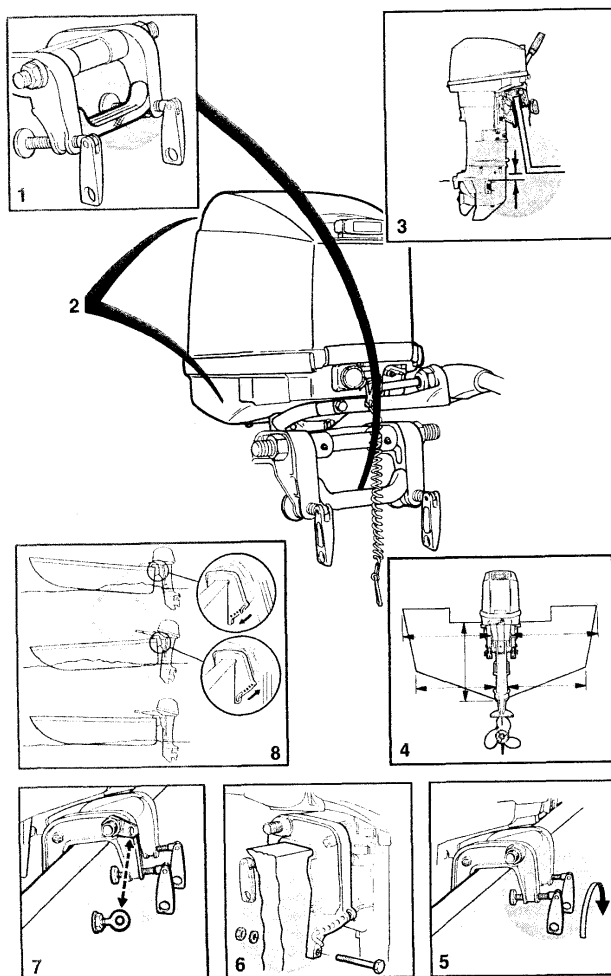
also incorporates a standard tip (straight) screwdriver blade.

SPARE STARTER ROPE

A spare starter rope also is supplied with the motor (stored in the "Owner's Literature Packet"). The rope may be used for a replacement in the rewind starter assembly or as an emergency starter rope in event that the rewind starter is inoperable.

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MOTOR INSTALLATION

WARNING

DO NOT OVERPOWER - Most boats are rated and certified for the maximum horsepower capabilities of the boat. Refer to the boat "Certification Plate" for the maximum horsepower limit. If in doubt, contact your dealer.

LIFT HANDLE

CAUTION

After outboard removal, DO NOT turn outboard upside down or lay on its side. Water could enter powerhead causing damage to internal engine components.

IMPORTANT: Motor MUST BE in NEUTRAL (which locks the reverse hooks over the tilt lock pin) before lifting or carrying the motor with the lift handle.

1 The lift handle is located at the front of the motor between the clamp brackets.

2 "Finger grip wells" are located at the top rear and along both sides of the bottom cowl.

TRANSOM HEIGHT

3 Proper transom height is important for best boating performance. The gear housing anti-ventilation plate should be parallel to the boat bottom and at least 1" (25mm) below boat bottom.

MOUNTING MOTOR ON TRANSOM

WARNING

Before operating, motor(s) MUST BE SECURED to boat transom with two 5/16" (7.9mm) diameter bolts and clamp screws tightened securely as shown. Installation must be water tight and clamp screws and mounting bolts checked occasionally for tightness on the transom. Failure to fasten motor to

transom with mounting bolts and clamp screws, may result in damage to boat and/or loss of motor and possible injury to occupants of boat.

Centerline

4 Center motor on boat transom.

Securing Motor

5 Tighten clamp screws securely

6 Drill through transom and bolt motor clamp brackets to transom with bolts nuts and washers provided.

7 Refer to Security Line Statement, Page 2.

IMPORTANT: Periodically check clamp screws and transom mounting bolts to ensure that motor is secure on transom

TILTING MOTOR

IMPORTANT: To manually tilt motor the motor MUST BE shifted into FORWARD gear. DO NOT use tiller handle for tilting motor. To tilt motor, grasp top rear of cowl and tilt motor forward.

Tilt Pin (Angle) Adjustment

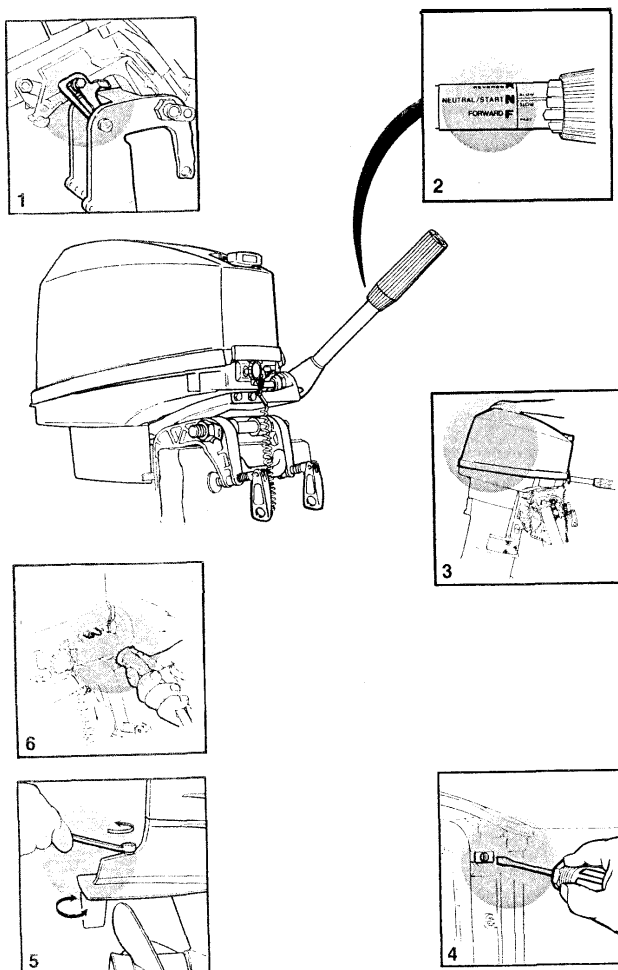
8 Tilt angle of the lower unit has a distinct effect on performance and handling. Adjust by changing location of tilt pin until boat rides level.

IMPORTANT: Propeller shaft tilt will affect boat performance. With the motor tilted in, propeller force will make the boat want to go into a right hand turn. The situation reverses when the lower unit is tilted out well past vertical. The operator must resist this force to keep the boat on a straight course. Refer to TRIM TAB ADJUSTMENT.

IMPORTANT: DO NOT operate motor with tilt pin removed.

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MOTOR INSTALLATION (Continued)

Tilt Lever

- 1 Locks motor in a fully tilted position.



CAUTION

Engine must not be run in full tilt lock position, as water pickup in lower unit would be out of the water, and water pump and/or engine would be damaged.

DO NOT use tilt lever when **TRAILERING** boat/motor (or during HIGH SPEED and/or ROUGH WATER operation of a boat that is powered by a larger, main power motor) UNLESS lower unit is supported with a block of wood. Refer to **TRAILERING BOAT/MOTOR**.

To tilt motor up/out:

- 2 Shift motor into FORWARD gear

- 3 Grasp motor "finger grip wells" at rear of top cowl and lift (tilt) motor to full up position. Tilt lever will automatically engage and lock the motor in tilted up/out position.

To disengage tilt:

Tilt motor as far as possible, pull tilt lever toward transom and lower motor to normal operating position.

CO-PILOT ADJUSTMENT

- 4 Proper co-pilot adjustment will keep motor on a fixed course (during NORMAL operation) while allowing easy manual steering control

Turn adjusting screw clockwise to increase friction or counterclockwise to decrease friction

IMPORTANT: The trim tab is made of a special alloy to protect motor housings

from galvanic corrosion. DO NOT paint or place protective coating on the trim tab.

TRIM TAB ADJUSTMENT

- 5 The trim tab will help to offset steering pull caused by propeller torque at high speeds or extreme tilt angles. If boat pulls to the left, loosen cap screw and rotate trailing edge of trim tab to the left (as viewed from behind motor). If boat pulls to the right, rotate trim tab to right. Tighten cap screw.

BATTERY AND ELECTRICAL ACCESSORIES

Manual start alternator models are equipped with a 60 watt alternator



CAUTION

Failure to observe correct polarity when connecting battery leads to battery will result in damage to the charging system on electric starting models.

IMPORTANT: Secure battery in a favorable position in the boat.

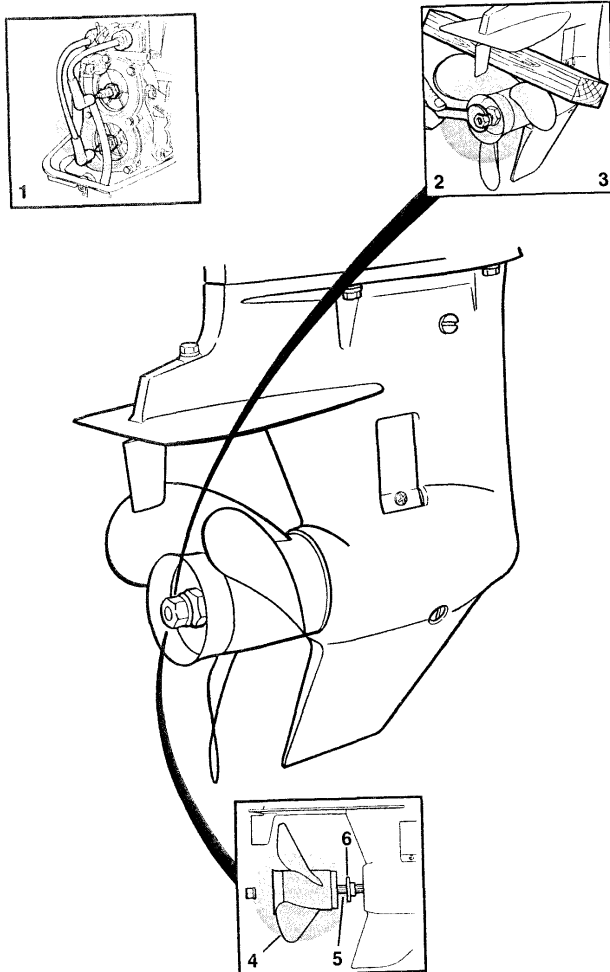
Any accessories, such as horns, lights, etc., should be properly fused and installed with connections attached directly to battery terminals

MOUNTING FUEL TANK AND CONNECTING FUEL LINES

Secure fuel tank in a convenient location
Connect fuel line to tank. Insert connector and twist 1/8-turn to lock.

Arrange fuel line so that it does not become twisted, kinked, pinched or stretched.

- 6 Connect fuel line to outboard



PROPELLERS

PROPELLER SELECTION

The propeller supplied with your motor provides the best overall performance under average operating conditions.

Alternative propellers are available for specific boating requirements. Consult your Authorized Dealer for recommendations.

PROPELLER REMOVAL

A WARNING

Before attempting to remove or install propeller, remove spark plug leads from spark plugs to prevent engine from starting accidentally.

1 Remove top cowl (see COWL REMOVAL AND INSTALLATION) and disconnect spark plug leads.

2 Place wood block between propeller blade and anti-ventilation plate to prevent rotation.

3 Turn propeller shaft nut counter-clockwise to remove nut (use "Combination Tool" supplied or 13/16" wrench).

4 Slide propeller and splined thrust hub off propeller shaft.

PROPELLER REPAIR

Some damaged propellers can be repaired. Consult your Authorized Dealer.

PROPELLER INSTALLATION

IMPORTANT: Periodically check propeller nut for tightness during boating season.

5 Apply a liberal coat of one of the following Quicksilver lubricants to the propeller shaft; Special Lubricant 101, 2-4-C Marine Lubricant.

IMPORTANT: The cupped washer attached to the thrust hub prevents backward installation of the hub. The cupped washer **MUST REMAIN IN PLACE.**

6 Slide splined thrust hub onto propeller shaft with thrust hub "shoulder" toward year housing.

Slide propeller onto shaft and install propeller shaft nut.

Place a wood block between propeller blade and anti-ventilation plate to prevent rotation.

Turn propeller shaft nut clockwise. Using "Combination Tool" supplied or 13/16" wrench, **TIGHTEN NUT SECURELY.**

Reconnect spark plug leads and install top cowl.

CONDITIONS AFFECTING OPERATION

WEIGHT DISTRIBUTION

Positioning of weight (passengers and gear) inside the boat has the following effects:

A Shifting weight to rear (stern)

- Generally increases speed and engine RPM
- At extremes, can cause boat to porpoise
- Causes bow to bounce in choppy water
- Increases danger of the following-wave splashing into boat when coming off plane

B. Shifting weight to front (bow)

- Improves ease of planing off
- Improves rough water ride
- At extremes, can cause boat to veer back and forth (bow steer).

BOTTOM OF BOAT

To maintain maximum speed the following conditions of the boat bottom should be observed:

- Clean, free of barnacles and marine growth.
- Free of distortion, nearly flat where it contacts the water.
- Straight and smooth, fore and aft.

FUEL RECOMMENDATIONS

Any leaded or unleaded (lead-free) gasoline, that will satisfactorily operate an automobile engine is suitable for use in these model outboard motors.

However, gasolines containing alcohol, either methyl alcohol (methanol) or ethyl (ethanol) may cause increased:

- Corrosion of metal parts.
- Deterioration of elastomer and plastic parts.
- Fuel permeation through flexible fuel lines
- Wear and damage of internal engine parts.
- Starting and operating difficulties.

Some of these adverse effects are due to the tendency of gasolines containing alcohol to absorb moisture from the air, resulting in a phase of water and alcohol separating from the gasoline in the fuel tank.

The adverse affects of alcohol are more severe with methyl alcohol (methanol) and arc worsu with increasing alcohol content.

⚠ WARNING
FIRE AND EXPLOSION HAZARD: Fuel leakage from any part of the fuel system can be a fire and explosion hazard which can cause serious bodily injury or death. Careful periodic inspection of the entire fuel system is mandatory, particularly after storage. All fuel components including fuel tanks, whether plastic, metal or fiberglass, fuel lines, primer bulbs, fittings, fuel filters and carburetors should be inspected for leakage, softening, hardening, swelling or corrosion. Any sign of leakage or deterioration necessitates replacement before further engine operation.

Because of the possible adverse effects of alcohol in gasoline, it is recommended that only alcohol-free gasoline be used where possible. If only **alcohol-containing** fuel is available, or if the presence of alcohol is unknown, then increased inspection frequency for leaks and abnormalities is required.

FUEL RECOMMENDATIONS (Continued)

⚠ WARNING

USE CARE when transporting fuel container, whether in a boat or car. DO NOT fill fuel container to maximum capacity. Gasoline will expand considerably as it warms up and can build up pressure in the fuel container. This can cause fuel leakage and a potential fire hazard.

OIL RECOMMENDATIONS

⚠ CAUTION

The use of other than recommended gasoline and Quicksilver 2-Cycle Outboard Oil or an acceptable BIA TC-W oil may cause piston scoring, bearing failure or both. DO NOT, under any circumstances, use multi-grade or other highly detergent automobile oils or oils which contain metallic additives.

Mix recommended gasoline with Quicksilver 2-Cycle Outboard Oil in ratios shown in the following chart. In an emergency, if this is not available, substitute a high quality 2-cycle oil that is intended for outboard use and meets BIA rating TC-W, shown on oil container. Use the oil manufacturer's recommended gasoline-oil mixture as shown on the label (NOT TO EXCEED 50:1 RATIO).

MIXING INSTRUCTIONS

⚠ WARNING

Observe fire prevention rules, particularly NO SMOKING. Mix fuel outdoors or in well ventilated location.

IMPORTANT: Always use fresh gasoline. Gasoline which is kept in tank too long will form gum and varnish deposits which may cause trouble.

Mix fuel directly into remote tank. Pour small, equal amounts of gasoline and oil into tank. Mix thoroughly, then add remaining oil and gasoline. Mix again. Keep fuel clean and mix each batch of fuel exactly the same way.

IMPORTANT: Use recommended amount of 2-cycle oil. Too much or too little oil can cause performance problems, as well as serious engine damage.

MOTOR BREAK-IN PROCEDURE

⚠ CAUTION

Follow break-in procedure carefully.

A. Mix gasoline and oil at normal 50 ratio mixture

B. Operate new motor at varied throttle settings for the first hour (one hour).

IMPORTANT: Avoid both wide-open throttle operation and prolonged idling during first hour.

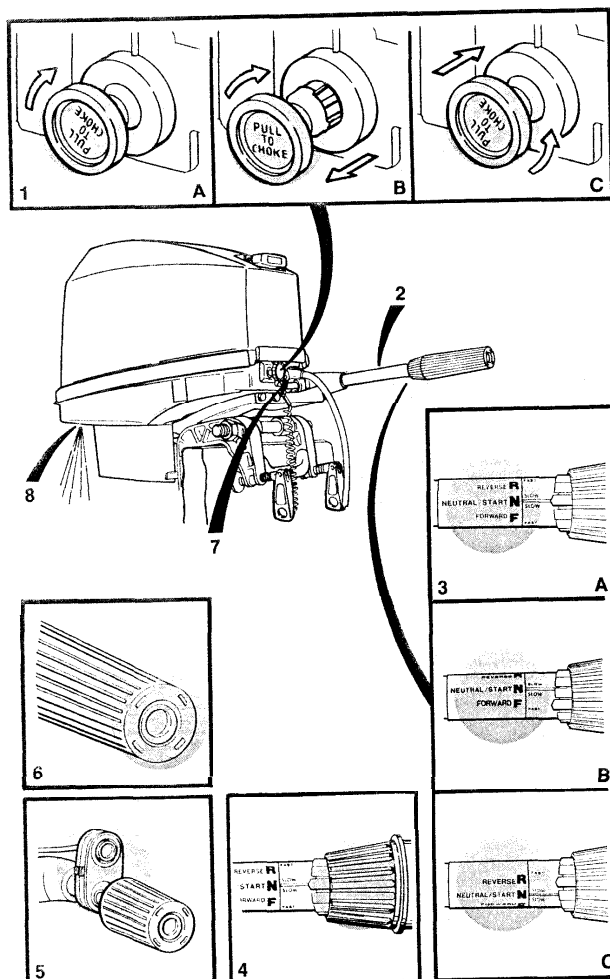
C. After first hour (one hour) of operation motor is ready for normal operation and may be run at any speed

⚠ CAUTION

DO NOT EXCEED the full throttle RPM range. See SPECIFICATIONS for RPM range.

NORMAL 50:1 FUEL MIXTURE

Type of Oil	U.S. Measure	Imperial Measure	Metric Measure
Quicksilver 2-Cycle Outboard Oil	16 U.S. oz. to each 6 gallons of gasoline	15 Imp. oz. to each 5 Imp. gallons of gasoline	400cc to each 20 liters of gasoline
Other Acceptable BIA TC-W Oils	Use at Manufacturer's Recommendations DO NOT EXCEED 50:1		



MOTOR CONTROLS

1 PRIMER/FAST IDLE KNOB

A ROTATE KNOB - Clockwise (to stop) when starting engine or to increase idle speed.

B PULL KNOB COMPLETELY OUT - (After rotating fully clockwise) to inject fuel into manifold for fast, easy starting when engine is cold.

C PUSH KNOB COMPLETELY IN - After engine starts. As engine warms up, rotate knob counterclockwise to return to normal idle speed.

2 TILLER HANDLE - Provides a means to steer boat, shift gears, and control engine speed on manually operated-motors.

3 SHIFTING POSITIONS

A NEUTRAL - Felt by detent in twist grip. The decal aligns with arrow on handle.

B FORWARD - Rotate twist grip counterclockwise. The decal indicates boat direction.

C REVERSE - Rotate twist grip clockwise. The decal indicates boat direction.

4 THROTTLE FRICTION KNOB - Adjusts twist grip friction to hold throttle at desired boat speed. Turn knob in either direction to increase friction.

5 TILLER HANDLE MOUNTED ELECTRIC START BUTTON - Used to start engine.

6 STOP BUTTON - Used to stop motor

7 EMERGENCY STOP SWITCH - Refer to page 1 for explanation. The lanyard, when used with the emergency stop switch and connected to the driver, will stop the engine if the driver no longer has access to the tiller handle.

8 WATER PUMP OPERATION (No Thermostat)

Normal water pump operation is indicated by a steady, "Tell-Tale" stream of water issuing from a small hole at rear of bottom cowl while the motor is running and remain steady during the entire operation of the engine.

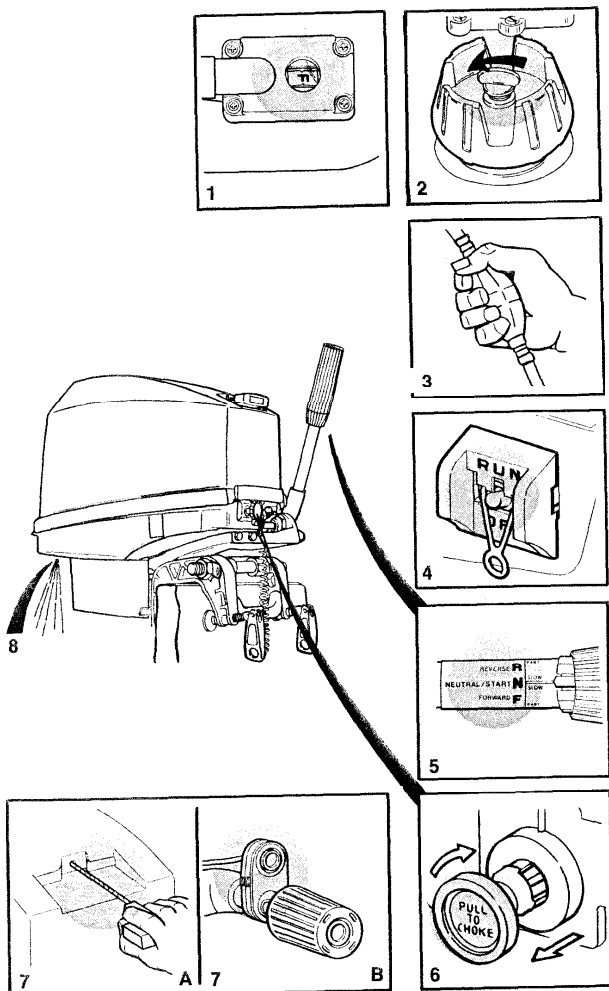
Water Pump Operation (Thermostat)

IMPORTANT: On models which are equipped with a thermostat (OPTIONAL ACCESSORY) in the cooling system, a "Tell-Tale" stream may not be visible until the engine reaches normal operating temperature and the thermostat opens (5 to 45 seconds, depending upon engine RPM and water temperature). The "Tell-Tale" may become intermittent while running as the thermostat opens and closes.

Operation with a defective water pump or obstruction in the cooling system will cause overheating and severe damage. Refer motor to Authorized Service facilities.

NOTICE: If your outboard will be operated primarily in cold water areas [normal water temperature BELOW 50° F (10° C)] and/or areas where extreme day-to-day air temperature variations of more than 30° F (17° C) are common, we recommend installation of a thermostat (OPTIONAL ACCESSORY) in the engine cooling system.

A thermostat controlled cooling system maintains a constant, higher engine operating temperature, thus providing smoother engine operation, particularly at slower operating speeds. See an Authorized Servicing Dealer for this accessory.

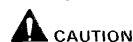


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OPERATION MODELS WITH TILLER HANDLE

BEFORE STARTING



CAUTION
This motor is water cooled. DO NOT operate motor out-of-water. Serious damage to motor could result from overheating.

DO NOT attempt to shift motor into **REVERSE** gear **WHEN ENGINE IS NOT RUNNING**. Damage to the shift mechanism could result.

OPERATOR and PASSENGERS SHOULD BE SEATED WHENEVER ATTEMPTING to START the MOTOR.

Before attempting to start motor, **MAKE CERTAIN** that motor is shifted into **NEUTRAL** and that area around boat is clear (to get underway).

- 1** Check fuel tank for sufficient fuel and that tank is secure in boat
- 2** Open air vent on fuel tank cap
- 3** Squeeze fuel primer bulb until it is firm
- 4** Check that emergency stop switch is in **RUN** position.

STARTING

IMPORTANT: Manual starting motors are equipped with a rewind starter "lock-out" mechanism -- motor **MUST BE** in **NEUTRAL**, or twist grip in **SLOW** position, in order to start motor.

ELECTRIC starting motors are equipped with a starter "cut-out" switch -- the control handle twist grip or the remote control handle **MUST BE** in **NEUTRAL** position in order to start the engine.

- 5** Twist grip to **NEUTRAL (N)** position.
- 6** If engine is cold, rotate Primer/Fast Idle Knob clockwise (to stop) and pull knob full out and push full in 3 times, leaving knob completely out. When restarting warm engine, rotate knob to full clockwise position. Do not pull out knob.

7A On manual start models, pull Starter Rope Handle slowly until engaged, then vigorously. Allow rope to rewind slowly. Repeat until engine starts.

7B On electric start models, press **STARTER BUTTON** - as soon as engine starts, release button.



CAUTION
DO NOT operate starter motor for longer than 30 seconds or starter motor may be damaged. Allow at least 2 minutes between starting attempts.

AFTER STARTING

As soon as engine starts, push Primer/Fast Idle Knob completely in. As engine warms-up, turn knob slowly counterclockwise to stop (idle position).

8 WATER PUMP OPERATION (No Thermostat)

Normal water pump operation is indicated by a steady, "Tell-Tale" stream of water issuing from a small hole at rear of bottom cowl while the engine is running and remain steady during the entire operation of the engine.

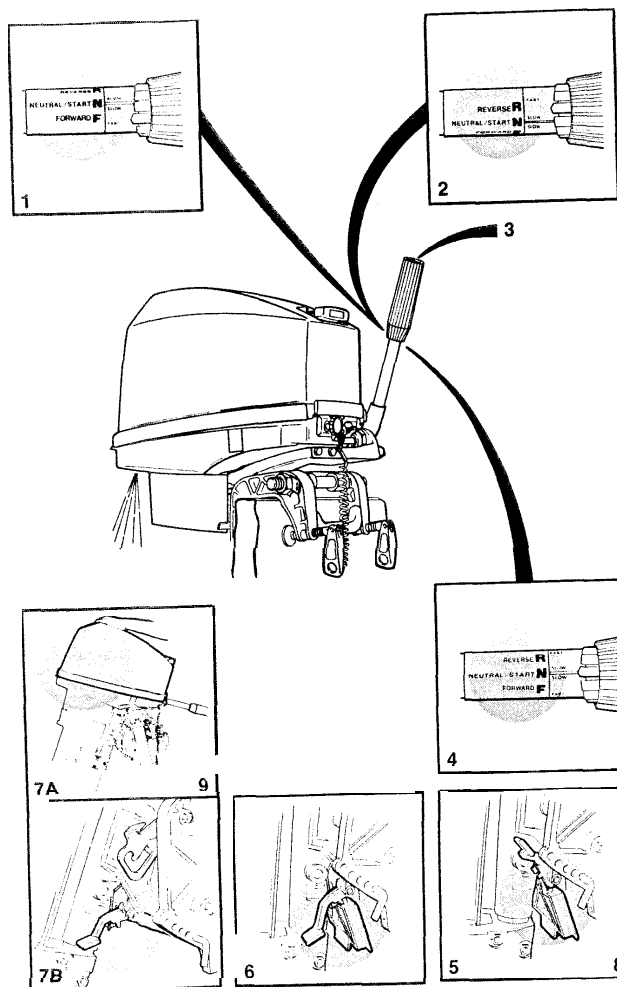
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Operation with a defective water pump or obstruction in the cooling system will cause overheating and severe damage. Refer motor to Authorized Service facilities.

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OPERATION MODELS WITH TILLER HANDLE (Continued)

SHIFTING GEARS

CAUTION
Primer/Fast Idle Knob must be rotated completely counterclockwise BEFORE shifting. Shift gears with a firm, quick motion to avoid "gear chatter".

1 FORWARD GEAR - engaged by counterclockwise rotation of twist grip. Continued rotation increases speed.

During operation, the Primer/Fast Idle Knob can be adjusted to set an idle speed for trolling, etc. Turning clockwise increases idle speed. Turning counterclockwise decreases idle speed.

CAUTION
Exercise extreme care when operating in REVERSE GEAR. DO NOT operate motor at high speeds when in REVERSE.

2 REVERSE GEAR - engaged by clockwise rotation of twist grip. Continued rotation increases speed.

STOPPING

3 Press Stop Button at end of twist grip and hold until motor stops.

IMPORTANT: In an emergency the motor can be stopped at any speed, in or out of gear. For normal stopping, idle motor and shift to NEUTRAL before pressing STOP BUTTON.

SHALLOW WATER TROLL TILLER HANDLE MODELS ONLY

Tiller handle models are equipped with a shallow water "Troll" feature that can be engaged when operating in shallow water. Engagement of the troll feature, in effect, tilts the motor outward an additional 6 tilt pin holes.

ENGAGING SHALLOW WATER TROLL

4 Return twist grip to neutral position.

5 Troll lever is located on starboard (right) side of motor behind clamp bracket.

6 Push troll lever downward to troll position.

IMPORTANT: Troll lever disengages reverse lock so motor can be tilted up/out manually.

7A Grasp motor "finger grip wells" at rear of top cowl.

7B Lift (tilt) motor up to engage shallow water "Troll".

IMPORTANT: Reverse lock is disengaged. Do Not operate motor in reverse.

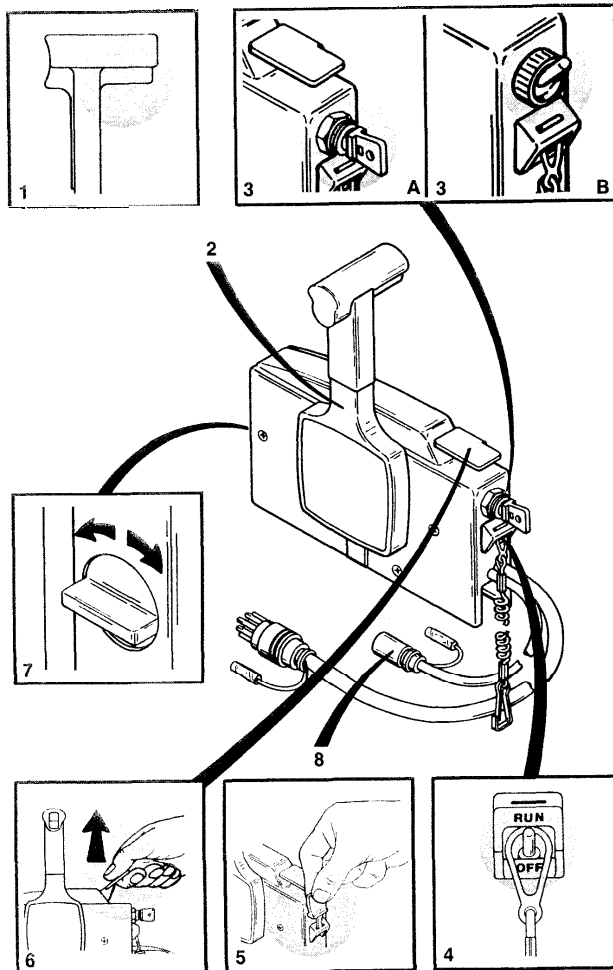
DISENGAGING SHALLOW WATER TROLL

8 Release troll lever by raising upward.

9 Tilt motor up/out slightly, then lower it to normal operating position.

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QUICKSILVER SIDE MOUNT REMOTE CONTROL COMPONENTS

1 Neutral Lock Bar - prevents accidental shift and throttle engagement. Bar must be squeezed before control handle can be moved, from NEUTRAL.

2 Control Handle - controls forward, reverse motion and engine speed.

3A Ignition/Choke Switch (Electric Start Models) - turns engine OFF and ON, actuates electric starter motor, actuates carburetor choke.

3B RUN-OFF Toggle Switch (Manual Start Models) - turns engine ON and OFF. Used to stop engine under normal conditions (non-emergency situations).

4 Emergency Stop Switch - Refer to page 1 for explanation. The lanyard cord/clip, when used with the emergency stop switch **MUST BE** connected to boat driver. Should driver be unable to reach steering wheel or remote control, the lanyard cord/clip will be pulled from emergency stop switch and the engine will shut OFF. This emergency

stop switch **SHOULD NOT BE USED** as normal engine shut-off.

IMPORTANT: The Emergency Stop Switch can be repositioned to RUN with or without lanyard **cord/clip** so that engine can be restarted.

5 Engine can be restarted with or without lanyard cord/clip installed by simply pushing switch up to run position. If necessary push switch down with key to reinstall clip.

6 FAST IDLE LEVER - Allows engine throttle advancement, without shifting gears, to assist engine starting.

7 THROTTLE FRICTION Adjustment Knob - Adjusts control handle friction so that boat speed can be set and driver does not have to hold handle. Turn knob clockwise to increase friction. **DO NOT** thread knob all the way out.

8 Tachometer Receptacle - Wiring harness connector for tachometer.

OPERATION-MANUAL START MODELS **WITH** REMOTE CONTROL



WARNING

OPERATOR and PASSENGERS **SHOULD** BE SEATED WHENEVER ATTEMPTING to START the MOTOR.



CAUTION

DO NOT attempt to shift motor into REVERSE gear WHEN ENGINE IS NOT RUNNING. Damage to the shift mechanism could result.



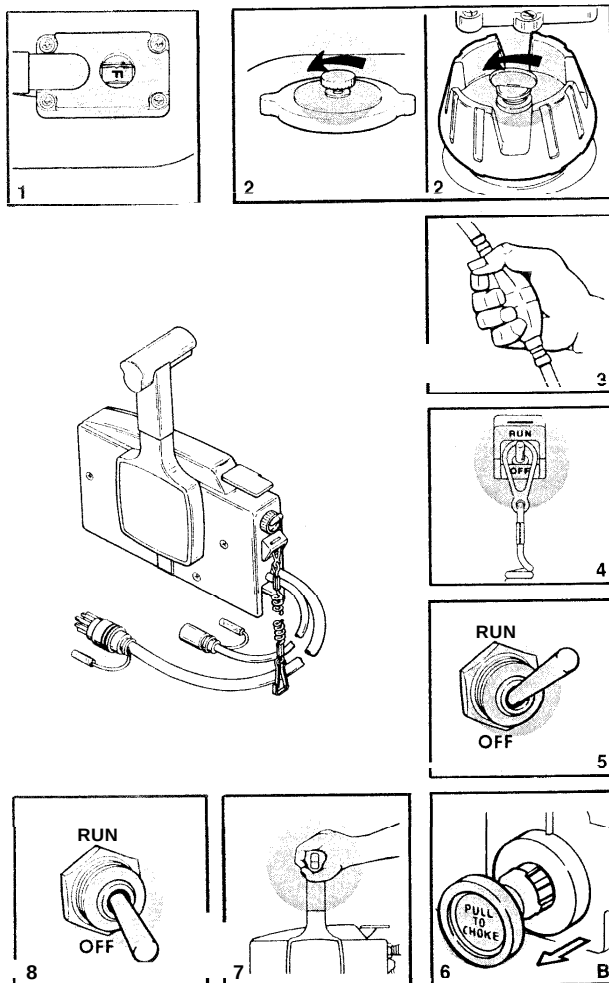
CAUTION

This motor is water cooled. **DO NOT** operate motor out-of-water. Serious damage to motor could result from overheating.



CAUTION

Before attempting to start motor, **MAKE CERTAIN** that motor is shifted into **NEUTRAL** and that area around boat is clear (to get underway).



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OPERATION-MANUAL START MODELS WITH REMOTE CONTROL (Continued)

BEFORE STARTING

1 Check fuel tank for sufficient fuel and that tank is secure in boat.

2 Open air vent on fuel tank cap.

3 Squeeze fuel primer bulb until it is firm.

4 Place control handle in NEUTRAL. Check that emergency stop switch is in RUN position.

STARTING

5 Check to be sure RUN-OFF Toggle Switch is in RUN Position.

6 If engine is cold, rotate Primer/Fast Idle Knob clockwise (to stop) and pull knob full out and push full in 3 times, leaving knob completely out. When restarting warm engine, rotate knob to full clockwise position. Do not pull out knob.

Pull starter handle slowly until engaged, then vigorously. Allow rope to rewind slowly. Repeat until motor starts.

AFTER STARTING

As soon as engine starts, push Primer/Fast Idle Knob completely in. As engine warms-

up, turn knob slowly counterclockwise to stop (idle position).

Check water pump operation as outlined in MOTOR CONTROLS on page 15.

THROTTLE/SHIFTING GEARS

7 Squeezing Neutral Lock Bar and pushing control handle forward engages the FORWARD GEAR. Pushing handle further forward increases motor speed.



CAUTION

Exercise extreme care when operating in REVERSE GEAR. DO NOT operate motor at high speeds in REVERSE.

Squeezing Neutral Lock Bar and pulling back on control handle engages REVERSE GEAR.

STOPPING

8 Shift to NEUTRAL and push RUN-OFF Toggle Switch down to the OFF position.

IMPORTANT: In an emergency the motor can be stopped at any speed, in or out of gear. For normal operation, idle motor and shift to NEUTRAL before turning key OFF.

OPERATION-ELECTRIC START MODELS WITH REMOTE CONTROL



CAUTION
OPERATOR and PASSENGERS SHOULD BE SEATED WHENEVER ATTEMPTING to START the MOTOR.

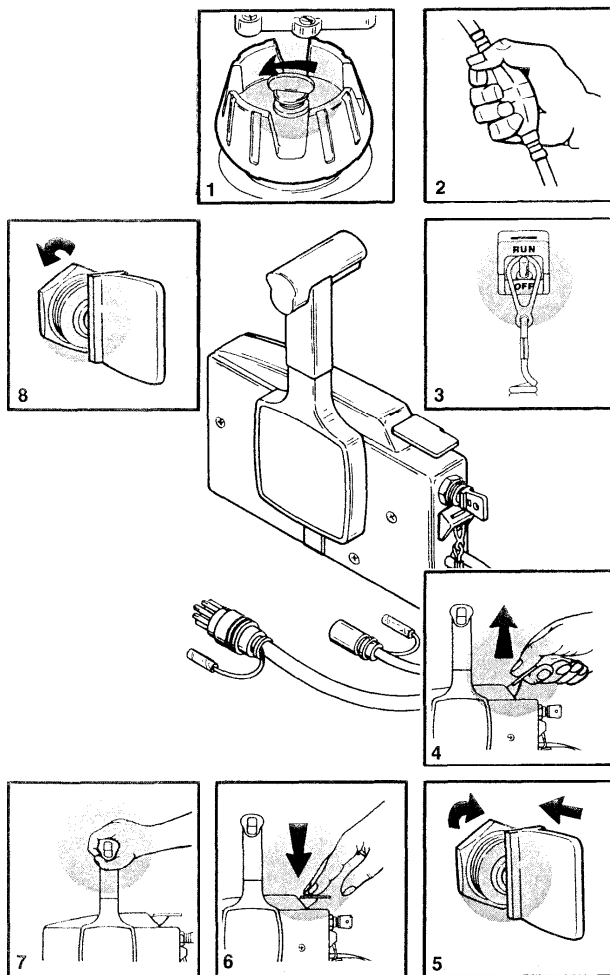
Before attempting to start motor. MAKE CERTAIN that motor is shifted

into NEUTRAL and that area around boat is clear (to get underway).

IMPORTANT: Remote control **must** be equipped with a starter "cut-out" switch -- remote control handle **MUST** BE in NEUTRAL position in order to operate the starter.

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OPERATION (Continued) ELECTRIC START MODELS WITH REMOTE CONTROL

BEFORE STARTING

Check fuel tank for sufficient fuel and that tank is secure in boat.

- 1 Open air vent on fuel tank cap.
- 2 Squeeze fuel primer bulb until it is firm.
- 3 Place control handle in NEUTRAL. Check that emergency stop switch is in RUN position.



CAUTION

DO NOT operate starter motor for longer than 30 seconds or starter motor may be damaged. Allow at least 2 minutes between starting attempts.

IMPORTANT: Starter circuit is protected by SFE 20 AMP fuse a port side of engine. If starter fails to operate, check for blown fuse. BEFORE replacing fuse locate and correct cause for overload.

STARTING COLD MOTOR

- 4 Lift up on Fast Idle Lever

IMPORTANT: With Fast Idle Lever in up position, control handle CANNOT be moved into FORWARD or REVERSE GEAR.

- 5 Turn key clockwise past RUN position to START and actuate choke by pressing in on key.

As soon as motor starts, allow key to return to RUN position and release choke. If motor falters, push in on key to actuate choke again.

- 6 After warm-up, return Fast Idle Lever to full down position.

STARTING WARM MOTOR

Turn key clockwise past RUN position to START

As soon as motor starts allow key to return to RUN position. If motor falters push in on key to actuate choke

NOTE: If motor fails to start, follow STARTING COLD MOTOR Procedure

Water Pump Operation (No Thermostat)
Normal water pump operation is indicated by a steady, "Tell-Tale" stream of water issuing from a small hole at rear of bottom cowl while the motor is running and remain steady during the entire operation of the engine

Water Pump Operation (Thermostat)

IMPORTANT: On models which are equipped with a thermostat (OPTIONAL ACCESSORY) in the cooling system, a "Tell-Tale" stream may not be visible until the engine reaches normal operating temperature and the thermostat opens (5 to 45 seconds, depending upon engine RPM and water temperature). The "Tell-Tale" may become intermittent while running as the thermostat opens and closes.

Operation with a defective water pump or obstruction in the cooling system will cause overheating and severe damage. Refer motor to Authorized Service facilities

THROTTLE/SHIFTING GEARS

- 7 Squeezing Neutral Lock Bar and pushing control handle forward engages the FORWARD GEAR. Pushing handle further forward increases motor speed



CAUTION

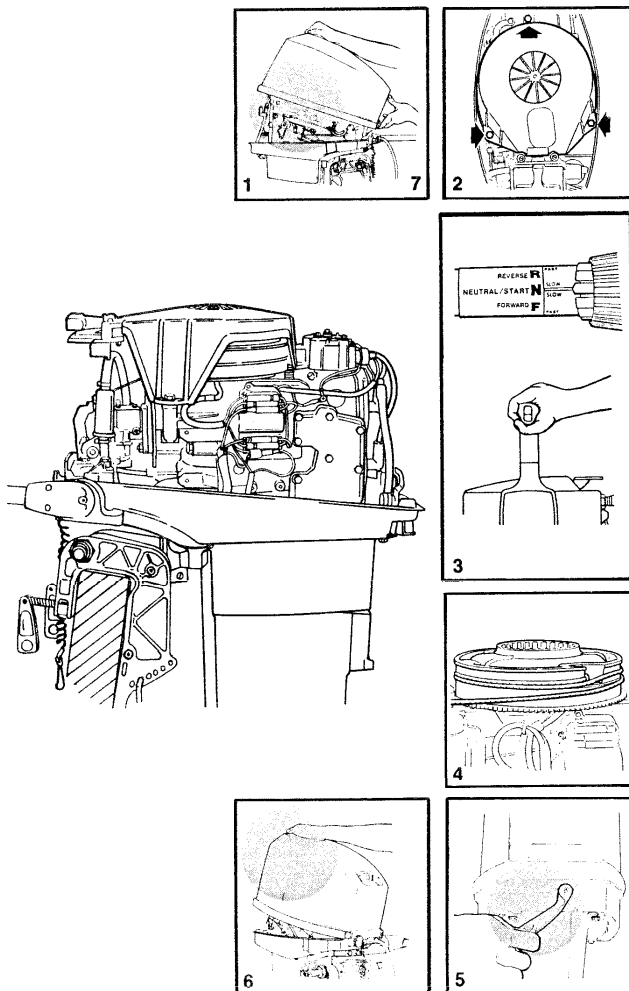
Exercise extreme care when operating in REVERSE GEAR. DO NOT operate motor at high speeds in REVERSE.

Squeezing Neutral Lock Bar and pulling back on control handle engages REVERSE GEAR

STOPPING

- 8 Shift to NEUTRAL and turn key counter-clockwise to OFF position

IMPORTANT: In an emergency the motor can be stopped at any speed, in or out of gear. For normal operation, idle motor and shift to NEUTRAL before turning key OFF.



EMERGENCY OPERATION

If rewind starter becomes inoperative, the motor can be cranked (utilizing spare starter rope supplied) in the following manner.

1 Remove top cowl (refer to COWL REMOVAL AND INSTALLATION).

2 Remove 3 bolts which secure rewind starter assembly to engine. Lift rewind starter from engine.

3 Shift outboard or remote control into neutral.

⚠ WARNING

When using emergency starter rope to start outboard, the start-in-gear protection provided by the rewind starter or remote control is inoperative. Make sure to shift outboard or position remote control handle into neutral before starting outboard to

prevent outboard from starting in gear. Sudden unexpected acceleration can cause serious injury or death.

4 Tie knot in end of spare rope. Hook rope knot in flywheel notch and wind rope CLOCKWISE around flywheel at least 2 turns

Observe preliminary motor starting steps as outlined in OPERATION procedures and pull rope to start motor. Repeat, if motor has not started

⚠ WARNING

Care must be taken when using emergency starting procedure. DO NOT attempt to replace rewind starter or cowl after engine has started. Stay clear of flywheel. DO NOT WEAR loose clothing when operating under these conditions.

COWL REMOVAL and INSTALLATION

DO NOT ATTEMPT TO REMOVE OR INSTALL COWL WHILE MOTOR IS RUNNING.

REMOVAL

STOP MOTOR

5 Push down to disengage cowl latch at rear of motor

6 Lift up on rear of cowl and tilt forward to disengage cowl hook at front of motor

7 Lift cowl off.

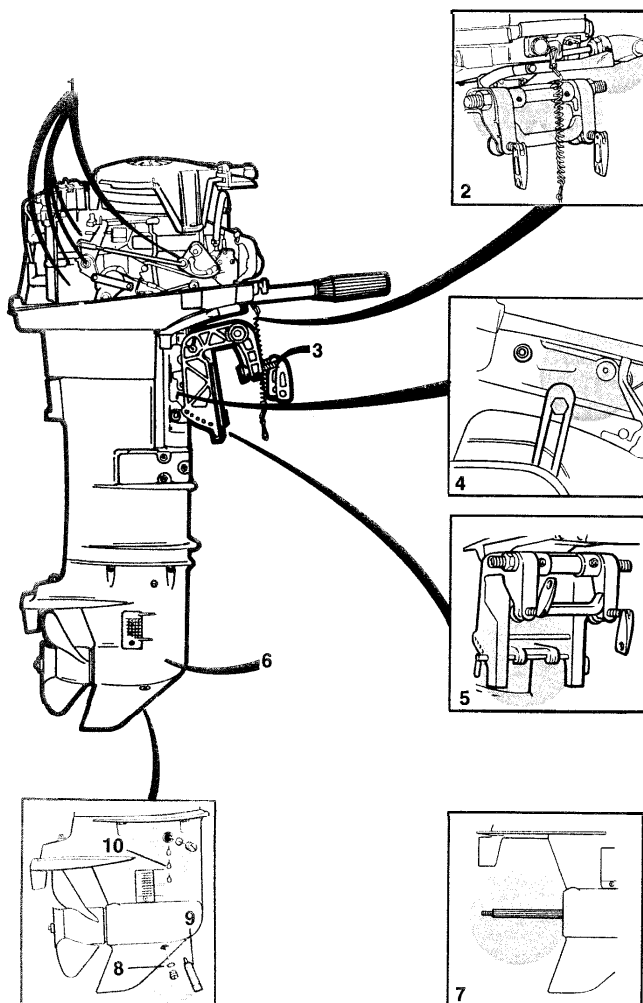
INSTALLATION

Position cowl over motor.

Lift up on rear of cowl and tilt it forward slightly to engage front hook

Lower cowl into position and engage rear latch

Push latch up to secure cowl



LUBRICATION GUIDE

ITEM	DESCRIPTION	TYPE OF LUBRICANT OR MAINTENANCE	FRESH WATER FREQUENCY	SALT WATER FREQUENCY
1	Throttle/Shift Linkage (All Pivot Points)	A	Every 60 days	Every 30 days
2	Tilt Tube/Control Handle Pivot	A	Every 60 days	Every 30 days
3	Clamp Screws	A	Every 60 days	Every 30 days
4	Swivel Bracket/ Swivel Pin	A	Every 60 days	Every 30 days
5	Reverse Lock Lever	A	Every 60 days	Every 30 days
6	Gear Housing	B	After 1st 10 days, then every 30 days	After 1st 10 days, then every 30 days
7	Propeller Shaft	A	Once a season	Every 60 days

Type of Lubricants

A = Quicksilver 2-4-C Marine Lubricant

B = Quicksilver Gear Lube

GEAR HOUSING LUBRICATION



CAUTION

Have gear housing checked by your local service dealer if any of the following are found:

Water drains from filler hole.

Metal particles are present on magnetic fill plug.

NOTE: Presence of a small amount of fine metal particles (resembling powder) indicates normal wear.

Lubricant appears milky brown.

Large amounts of lubricant must be added to fill gear housing

Lubricate gear housing as follows:

IMPORTANT: DO NOT use automotive lubricant in gear housing. Use only Quicksilver Gear Lube.

8 Remove fill plug and washer.

9 Insert lubricant tube into filler hole

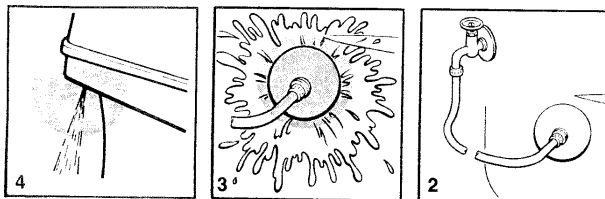
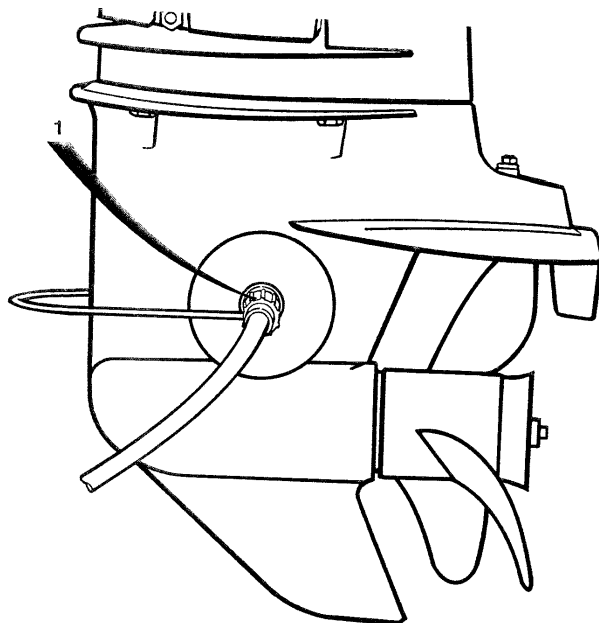
IMPORTANT: NEVER add lubricant to gear housing without first removing vent screw.

10 Remove vent screw and washer.

Add lubricant to gear housing until excess flows from vent hole.

Replace vent screw and washer

Remove lubricant tube and install fill plug and washer.



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INSPECTION AND MAINTENANCE

Inspect motor often, and at regular intervals, to help maintain its top operating performance, and correct potential problems before they occur. The entire motor should be checked carefully, including all accessible engine parts.

Check for loose, damaged or missing parts. Tighten or replace as required.

Lubricate and check gear housing oil level per LUBRICATION GUIDE.

Service spark plugs. Check plug leads and electrical leads for damage.

Inspect fuel lines for damage. Service fuel filters.

Remove and inspect propeller. If badly nicked, bent or cracked, refer to Authorized Service Facilities. (Refer to PROPELLER - INSTALLATION.)

Repair nicks and corrosion damage on finish. Use Quicksilver spray paints - see your Dealer.

Inspect trim tab. Replace if 50% of tab has been eroded away.

IMPORTANT: DO NOT apply paint or protective coatings to trim tab.

Check that remote control harness is connected and control is correctly adjusted.

FLUSHING MOTOR COOLING SYSTEM



CAUTION

When flushing, be certain the area around propeller is clear, and no one is standing nearby. To avoid possible injury, remove the propeller.

To prevent silt and/or salt buildup in cooling system, flush with fresh water periodically.



CAUTION

DO NOT overrev. RUN at slower speeds only.

With motor running at Idle speed, continue flushing until water becomes clear (3 to 5 minutes for salt water units).

1 Install Quicksilver Flushing Attachment (or equivalent) over water intake openings.

2 Connect hose between flushing attachment and water tap.

3 With motor in normal operating position, open water tap and adjust flow so that some water leaks from around cups.

4 Shift motor to NEUTRAL and start. Check that water is running from "Tell-Tale".

5 Stop motor, turn-off water and remove flushing attachment

IMPORTANT: Keep motor in upright position until all water has drained out. Water left trapped in motor could cause engine damage.

6 Clean motor surfaces and wipe with Quicksilver Corrosion and Rust Preventive Type II to protect finish

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IGNITION MAINTENANCE



CAUTION

DO NOT touch or disconnect any ignition system parts while engine is running, as high voltage is present.

If electrical/ignition system is not operating, DO NOT attempt to repair, but refer to your authorized service facility.

SPARK PLUGS

Periodic inspection, cleaning and/or replacement of spark plugs will enhance motor performance. Always replace spark plugs with type specified in SPECIFICATIONS.

Replace spark plugs as follows:

Remove cowl. (Refer to COWL REMOVAL AND INSTALLATION.)

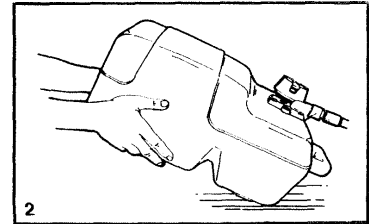
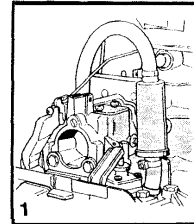
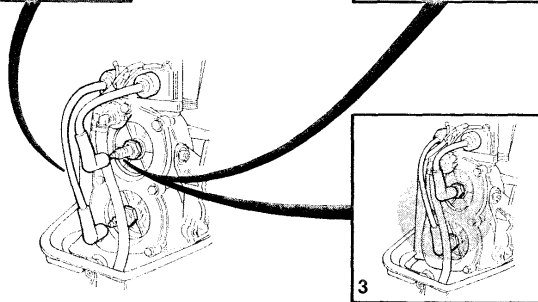
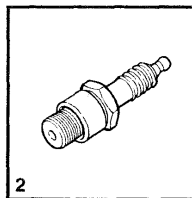
1 Disconnect spark plug leads and use "Combination Tool" supplied, or 13/16" wrench, to remove spark plugs.

2 Check that gaskets are in place and install new plugs.

Thread spark plugs in by hand until finger-tight. Use "Tool" or wrench to tighten an additional 1/4 turn. DO NOT OVERTIGHTEN.

3 Reconnect spark plug leads to correct plugs.

Inspect spark plug leads for damage - replace as necessary.



CLEANING FUEL FILTERS



WARNING

Be careful when cleaning fuel filter elements; gasoline is extremely flammable and highly explosive under certain conditions. Always stop the engine and DO NOT smoke or allow open flames in the area while cleaning fuel filter elements.

Loosen screws and remove fuel pickup tube with gauge and float.

Clean filter by rinsing in clean gasoline.

Reinstall on fuel tank.

1 If engine fuel filter appears to be contaminated, remove and replace.

Prime fuel system and check for fuel leaks after replacing filter.

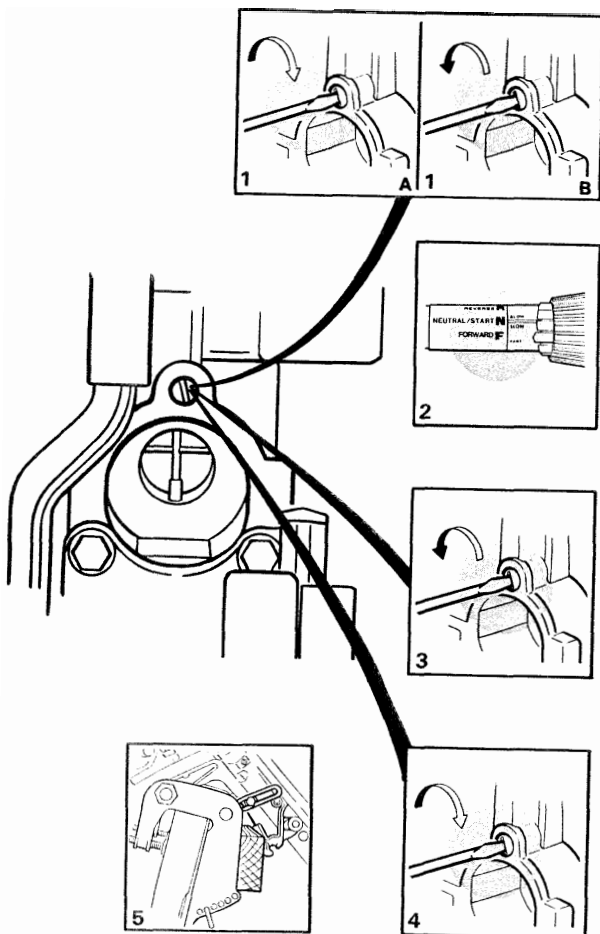
FUEL TANK PICKUP FILTER

Disconnect fuel line from tank.

FUEL RESERVE (6.6 Gallon Polyethylene Tank Only)

The 6.6 gallon polyethylene tank incorporates a fuel reserve of approximately 1 gallon.

2 To utilize fuel reserve, tip tank toward fuel pickup and allow reserve fuel to flow into fuel pickup chamber.



CARBURETOR ADJUSTMENTS

The carburetor has been calibrated and re-set at factory to provide best performance under normal conditions. However, extreme changes in weather and/or elevation may necessitate further carburetor adjustments.

IMPORTANT: To maintain peak engine performance when operating at HIGHER ELEVATIONS, it will be necessary to install a LEANER fixed high speed jet. (See your authorized service facility).

LOW SPEED MIXTURE

1 Pre-set low speed mixture screw as follows:

A Lightly tighten screw - turn clockwise.

B Back-out screw 2 turns counter-clockwise.

Start engine - Allow to run at IDLE for several minutes.

2 With engine at IDLE, shift to FORWARD GEAR.

3 Turn screw counterclockwise until engine starts to "load-up" or fire unevenly (TOO RICH).

4 Slowly turn screw clockwise until engine fires evenly and RPM increases.

Continue turning clockwise until RPM decreases and engine misfires (TOO LEAN).

Set low speed mixture screw at point midway between TOO RICH and TOO LEAN. When in doubt, set slightly RICH rather than TOO LEAN.

TRAILERING BOAT/MOTOR

When trailering or transporting the boat/motor, it is recommended that motor remain in normal operating position, with steering friction co-pilot tightened enough to hold forward direction.



CAUTION

Tilt lock mechanism is NOT intended to support motor during trailering. Damage to boat or motor could occur if additional support is not used.

5 If adequate road clearance presents a problem, either remove the motor from the transom and store securely, or place motor in full tilt-up position (see MOTOR INSTALLATION - TILT LEVER) and place a suitable block of wood between swivel bracket and clamp brackets to support motor. MAKE CERTAIN that block is positioned to provide adequate clearance for the reverse lock hooks and/or "troll" bracket, then, disengage tilt lever and lower motor to rest on block.