IMPORTANT OWNER IDENTIFICATION and REGISTRATION INFORMATION

It is vitally important that your selling dealer fills out the Warranty Registration Card completely and mails it to the factory immediately upon sale of the new product. It identifies name and address of the original purchaser, product model and serial number, date of sale, type of use and selling dealer's code, his name and address. The dealer also certifies that you are the original purchaser and user of the product.

Mercury Marine warranty covers only the Mercury Outboard Motor and Quicksilver Accessories. It does not extend to the boat, trailer, associated equipment or accessories other than Quicksilver.

It is recommended that warranty services be performed by the authorized Mercury dealer from whom you purchased the product, because of the dealer's continued and personal interest in you.

Upon receipt of the Warranty Registration Card at the factory, you (the original owner) will be issued a plastic Owner Warranty Registration MERCARD® which is your only valid registration identification and must be presented to the servicing dealer should warranty service be required. Warranty claims will not be accepted without presentation of this MERCARD. Read copy carefully on front and back of sample, below.

A temporary Owner Warranty Registration MERCARD will be presented to you when you purchase the product. It is valid only for 30 days from date of sale while your plastic MERCARD is being processed. Should your product need service during this period, present this temporary MERCARD to the dealer. He will attach it to your warranty claim form.

If your new MERCARD is not received within 30 days from date of new motor sale, please contact your selling Mercury dealer. This program is in effect only in the United States, Canada, Australia and some countries in Europe.

The product warranty is not effective until the product is registered at the factory. See the Warranty and Information on the outside and inside back covers of this manual.

NOTICE: Registration lists must be maintained by factory and dealer on marine products sold in the United States, should notification under FEDERAL BOAT SAFETY ACT be required.

Welcome: We congratulate you on the purchase of your outboard motor.

You have selected one of the finest products that money can buy and, with proper maintenance, you will enjoy countless days of carefree boating pleasure. For this reason, we ask that you read this manual thoroughly.

We are sincerely interested in your complete satisfaction; therefore, to protect your investment, we call your attention to the inside front and back covers of this manual which explain registration of your engine and our warranty.

Should a difficulty arise, we suggest that you follow the steps outlined in this manual by contacting your dealer or the location for your area shown on the inside of the back cover. Our dealers and personnel are dedicated to serve you; however, if satisfaction is not obtained, please contact this office.

We thank you for purchasing our product and hope that your boating will be pleasant.

Customer Relations Department

The descriptions 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, or to change specifications or designs, without notice and without incurring obligation.

Mercury Marine, Fond du Lac, Wisconsin, USA

Litho in U.S.A.  

Page 1
NOTICE
Throughout this publication, DANGERS, WARNINGS and CAUTIONS, outlined in a border and 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 when performing the service, plus "common sense" operation, are major accident prevention measures.

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.

DEALER'S RESPONSIBILITIES
In general, a dealer's responsibility to the customer is to make sure that the boat has the correct power and is properly equipped. The dealer should help familiarize the customer with the on-board equipment and explain operation of the equipment and boat/motor.

Prior to delivery, the dealer should make certain that the product and equipment are operational, that the proper propeller is installed and that oil, fuel, gas tank and lubrication recommendations are understood.

The dealer also should check for correct carburetor adjustment and remote control and steering function, that instrumentation is operational and that water for cooling is circulating properly.

On a trial run, the dealer should test for maximum engine RPM as listed in "Specifications", following, for proper operation of all equipment, that steering effort and direction is checked and that all necessary adjustments for maximum efficiency have been made.

OPERATOR'S RESPONSIBILITIES

⚠️WARNING
The following advantages and disadvantages of an EMERGENCY STOP SWITCH (lanyard type) should be considered before electing to install and 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 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 handle, tiler. 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 obstacles 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 install and use an EMERGENCY STOP SWITCH, rests with you, the owner/driver.
**REPLACEMENT PARTS**

When performing normal maintenance or repairs on your outboard, it is recommended that only Quicksilver Replacement Parts be used.

To be sure that you use only correct components for your outboard, order your parts through an Authorized Servicing Dealer.

**SERVICE/PARTS INQUIRIES**

All inquiries, concerning service to the product or Quicksilver replacement parts or accessories, first should be directed to your authorized dealer from whom you purchased the product.

If, however, your dealer is unable to assist, he may recommend that you contact the parts or service manager at your Regional Service Center (listed on the inside back cover of this manual).

**LUBRICANTS**

For Lubricants, Sealers, Paints, Etc.
See Your Authorized Servicing Dealer.

---

**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 engine and all related accessories before the boat is used.

Boating Safety and Seamanship courses are periodically offered by the following National, State and Provincial Organizations:

- Coast Guard Auxiliary
- Power Squadrons
- Red Cross
- State or Provincial Agencies that are charged with water safety enforcement.

We strongly recommend that all powerboat operators attend one of these courses.

It is the operator’s responsibility to perform all safety checks and to ensure that all lubrication and maintenance instructions are complied with for safe operation.

It also is the operator’s responsibility to return the unit to the local dealer for a periodic checkup.

Proper maintenance and care of your outboard motor will assure a minimum number of problems and, subsequently, will keep your overall operating expenses at a minimum.

**WARNING**

It is very difficult for a person standing or floating in the water to take evasive action should he see a powerboat heading in his direction even at a slow speed. Therefore, it is strongly recommended that when your boat is in the immediate vicinity of people in the water, the unit be shifted to neutral and the engine be shut off.

SERIOUS INJURY IS LIKELY IF CONTACT IS MADE WITH A PERSON IN THE WATER BY A MOVING BOAT, GEAR HOUS-ING, PROPELLER, OR ANY SOLID DEVICE RIGIDLY AT-TACHED TO A BOAT OR GEAR HOUSING.
# TABLE of CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifications</td>
<td>8</td>
</tr>
<tr>
<td>General Information</td>
<td>9</td>
</tr>
<tr>
<td>Marine Operating Symbols</td>
<td>10</td>
</tr>
<tr>
<td>Directional References</td>
<td>11</td>
</tr>
<tr>
<td>Serial Number</td>
<td>11</td>
</tr>
<tr>
<td>Periodic Checkup</td>
<td>11</td>
</tr>
<tr>
<td>Write a Letter of Explanation</td>
<td>11</td>
</tr>
<tr>
<td>Service Recommendations</td>
<td>12</td>
</tr>
<tr>
<td>Motor and Boat Insurance</td>
<td>12</td>
</tr>
<tr>
<td>Stolen Motor</td>
<td>12</td>
</tr>
<tr>
<td>Motor Installation</td>
<td>12</td>
</tr>
<tr>
<td>Transom Height</td>
<td>12</td>
</tr>
<tr>
<td>Mounting Motor on Transom</td>
<td>13</td>
</tr>
<tr>
<td>Tilt Lock Pin</td>
<td>13</td>
</tr>
<tr>
<td>Tilt Angle Adjustment</td>
<td>13</td>
</tr>
<tr>
<td>Tilt Lever</td>
<td>13</td>
</tr>
<tr>
<td>Adjusting Co-Pilot</td>
<td>14</td>
</tr>
<tr>
<td>Battery Cable Routing - Merc 9.8E and 7.5E</td>
<td>15</td>
</tr>
<tr>
<td>Electrical Accessories Connections</td>
<td>15</td>
</tr>
<tr>
<td>Trailering Boat/Motor</td>
<td>15</td>
</tr>
<tr>
<td>Removing Motor from Boat</td>
<td>16</td>
</tr>
<tr>
<td>Propeller Recommendations</td>
<td>16</td>
</tr>
<tr>
<td>Propellers</td>
<td>16</td>
</tr>
<tr>
<td>Removing Propeller</td>
<td>16</td>
</tr>
<tr>
<td>Installing Propeller</td>
<td>17</td>
</tr>
<tr>
<td>Ventilation/Prop Slip</td>
<td>17</td>
</tr>
<tr>
<td>Fuel Mixture and Fuel System</td>
<td>17</td>
</tr>
<tr>
<td>Installing Fuel Tank</td>
<td>17</td>
</tr>
<tr>
<td>Gasoline Recommendations</td>
<td>18</td>
</tr>
<tr>
<td>Oil Recommendations</td>
<td>18</td>
</tr>
<tr>
<td>Fuel Mixture</td>
<td>19</td>
</tr>
<tr>
<td>Correct Fuel Mixing Procedure</td>
<td>19</td>
</tr>
<tr>
<td>Motor Operation</td>
<td>20</td>
</tr>
<tr>
<td>Twist Grip Throttle</td>
<td>20</td>
</tr>
<tr>
<td>Shifting Gears</td>
<td>21</td>
</tr>
<tr>
<td>Water Pump Operation</td>
<td>21</td>
</tr>
<tr>
<td>Break-In Procedure</td>
<td>22</td>
</tr>
<tr>
<td>Starting Procedure - Manual</td>
<td>22</td>
</tr>
<tr>
<td>Starting Procedure - Electric</td>
<td>24</td>
</tr>
<tr>
<td>Operation without Battery (Electric Starting Models)</td>
<td>25</td>
</tr>
<tr>
<td>Stopping Procedure</td>
<td>26</td>
</tr>
<tr>
<td>Shallow Water Troll</td>
<td>26</td>
</tr>
<tr>
<td>Engaging Shallow Water Troll</td>
<td>26</td>
</tr>
<tr>
<td>Disengaging Shallow Water Troll</td>
<td>26</td>
</tr>
<tr>
<td>Operation in Salt Water</td>
<td>26</td>
</tr>
<tr>
<td>Attention Required following Operation in Salt Water</td>
<td>27</td>
</tr>
<tr>
<td>or Silt</td>
<td></td>
</tr>
<tr>
<td>Don'ts</td>
<td>28</td>
</tr>
<tr>
<td>Adjustments and Maintenance</td>
<td>28</td>
</tr>
<tr>
<td>Periodic Inspection</td>
<td>28</td>
</tr>
<tr>
<td>Removing Top Cowl</td>
<td>29</td>
</tr>
<tr>
<td>Carburetor</td>
<td>29</td>
</tr>
<tr>
<td>Low Speed Mixture Adjustment</td>
<td>30</td>
</tr>
<tr>
<td>Idle Speed Adjustment</td>
<td>30</td>
</tr>
<tr>
<td>Servicing Fuel Tank Filter</td>
<td>31</td>
</tr>
<tr>
<td>Servicing Carburetor Fuel Filter/Screen</td>
<td>31</td>
</tr>
<tr>
<td>Gear Housing Lubrication</td>
<td>32</td>
</tr>
<tr>
<td>Lubrication Chart</td>
<td>33</td>
</tr>
<tr>
<td>Ignition Maintenance</td>
<td>34</td>
</tr>
<tr>
<td>Servicing Spark Plug(s)</td>
<td>34</td>
</tr>
<tr>
<td>Attention Required following Complete Submersion</td>
<td>34</td>
</tr>
<tr>
<td>Preparation for Storage</td>
<td>35</td>
</tr>
<tr>
<td>Battery Maintenance and Storage</td>
<td>36</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>37</td>
</tr>
</tbody>
</table>
### SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>Merc 9.8</th>
<th>Merc 7.5</th>
<th>Merc 4.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crankshaft Horsepower¹</td>
<td>9.8</td>
<td>7.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Propshaft Kilowatts²</td>
<td>(6.2)</td>
<td>(4.8)</td>
<td>(2.5)</td>
</tr>
<tr>
<td>Piston Displacement</td>
<td>11 Cu. In. (179cc)</td>
<td>5.5 Cu. In. (90cc)</td>
<td></td>
</tr>
<tr>
<td>Bore</td>
<td>2.00&quot; (50.8mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>1-3/4&quot; (44.5mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Throttle RPM Range</td>
<td>5000-6000</td>
<td>4500-5500</td>
<td></td>
</tr>
<tr>
<td>Idle Speed (in Gear)</td>
<td>550-750 RPM</td>
<td>700-900 RPM</td>
<td></td>
</tr>
</tbody>
</table>

#### Recommended Spark Plugs
- **Merc 9.8 and Merc 7.5:** NGK B9HS-10 or AC-M40FX or Champion L77J4 (use Champion QL-77J4 where Radio Frequency Interference (RFI) Suppression is required)
- **Merc 4.5:** NGK BUHW-2 or AC-V40FK or Champion L-76V (use Champion QL-76V where Radio Frequency Interference (RFI) Suppression is required)

#### Spark Plug Gap
- .040" (1mm) N.A.

#### Recommended Point Gap
- N.A. .020" (.50mm)

#### Recommended Gasoline
- Automotive Regular (Lead Free or Low Lead Preferred)

#### Recommended Oil
- Quicksilver Formula 50-D 2-Cycle Outboard Lubricant

#### Gasoline/Oil Ratio
- 50:1

#### Fuel Tank Capacity
- U.S. Gallons: 3
- Imperial Gallons: 2-1/2
- Liters: 11-1/4

#### Battery Rating - Electric Start Models
- 32 Ampere Hour - Minimum
- Minimum Reserve Starting Capacity - 35 Minutes

#### Transom Height
- Short Shaft = 15" (38cm)
- Long Shaft = 20" (51cm)

---

¹ Horsepower is measured on run-in engines at the crankshaft, technically, in accordance with BIA 310-77.
² Measured at the propshaft, in accordance with ICOMIA 28.
N.A. = Not Applicable

---

**Figure 1. Merc 7.5 (Merc 7.5 Shown - Merc 9.8 Typical)**

1 - Starter Handle
2 - Top Cowl
3 - Bottom Cowl
4 - Stop Button
5 - Bottom Cowl
6 - "Tell-Tale" Outlet
7 - Tilt Lock Pin
8 - Drive Shaft Housing
9 - Anti-Ventilation Plate
10 - Quicksilver Propeller
11 - Troll Set
12 - Twist Grip Throttle
13 - Steering Handle
14 - Choke Knob
15 - Clamp Bracket (2)
16 - Carrying Handle
17 - Clamp Screw (2)
18 - Gear Housing

**Figure 2. Merc 4.5**

1 - Starter Handle
2 - Top Cowl
3 - Shift Lever
4 - Stop Button
5 - Bottom Cowl
6 - "Tell-Tale" Outlet
7 - Tilt Lock Pin
8 - Drive Shaft Housing
9 - Anti-Ventilation Plate
10 - Quicksilver Propeller
11 - Troll Set
12 - Twist Grip Throttle
13 - Steering Handle
14 - Choke Knob
15 - Clamp Bracket (2)
16 - Carrying Handle
17 - Clamp Screw (2)
18 - Gear Housing
GENERAL INFORMATION

MARINE OPERATING SYMBOLS

The following international MARINE OPERATING SYMBOLS are used in this publication. The SYMBOLS appear at appropriate places in the copy text.

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>NAME</th>
<th>SYMBOL</th>
<th>NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BATTERY</td>
<td></td>
<td>OIL</td>
</tr>
<tr>
<td></td>
<td>CHOKE</td>
<td></td>
<td>PORTABLE FUEL TANK</td>
</tr>
<tr>
<td></td>
<td>FUEL/OIL MIX</td>
<td></td>
<td>SHALLOW WATER DRIVE</td>
</tr>
<tr>
<td></td>
<td>THROTTLE CONTROL</td>
<td></td>
<td>START</td>
</tr>
<tr>
<td></td>
<td>FUEL</td>
<td></td>
<td>STOP</td>
</tr>
<tr>
<td></td>
<td>GEAR-OIL LEVEL</td>
<td></td>
<td>TILT</td>
</tr>
<tr>
<td></td>
<td>LUBRICATE WITH GREASE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>←→</td>
<td>FORWARD-NEUTRAL-REVERSE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DIRECTIONAL REFERENCES

Front of boat is bow; rear is stern. Any directional references given are when viewing boat from stern, looking toward bow. (Left is port; right is starboard.)

SERIAL NUMBER

The serial number (stamped into serial number plate on swivel bracket) is the manufacturer's key to numerous engineering details which apply to your motor. When corresponding with the manufacturer or dealer about service, always specify model and serial number.

Record Serial Number Here (_____________)

PERIODIC CHECKUP

After 20 hours, an inspection should be performed by an Authorized Dealer at local rates and paid for by the owner. After the 20-hour check, your outboard should be taken to an Authorized Dealer every six months or 100 hours of operation -- or at least once each year -- for lube change, tuneup, etc.

To find the Authorized Service facilities in your locality, or when traveling, refer to the classified pages in the local telephone directory under "Outboard Motors".

WRITE a LETTER of EXPLANATION

When writing to the factory, include the following:
1. Model number and serial number.
2. Date purchased and dealer from whom purchased.
4. Propeller pitch and number of blades (or part number).
5. Normal use and approximate gross load.
6. Number of hours motor has been operated.
7. Details of trouble experienced.
8. Dates of previous correspondence.

No Motor Is To Be Shipped to the Factory without Specific Written Authorization. All Shipping Charges Must Be Prepaid.
SERVICE RECOMMENDATIONS

This publication includes operating and service instructions for your outboard motor. The owner is advised not to attempt repairs which are not specifically covered in this book. Other repairs, particularly those which require disassembly or replacement of internal parts, should be done only by Authorized Service facilities which have the necessary factory-designed tools and equipment, plus the knowledge and experience required to do the job correctly and economically.

MOTOR and BOAT INSURANCE

See your local insurance agent for motor and boat protection which covers damage, theft, liability for property damage and personal injury to others.

STOLEN MOTOR

If your motor is stolen, immediately advise the proper authorities and the manufacturer of the MODEL and SERIAL NUMBER. A “Stolen Motors” list is distributed to dealers and to participating law enforcement agencies as an aid to recover stolen motors.

MOTOR INSTALLATION

TRANSOM HEIGHT

Your outboard motor is designed to provide optimum performance when mounted at a recommended transom height (see “Specifications”, preceding). If the transom is too high, the propeller may operate too close to the surface and pull air in, with resultant loss of thrust (particularly when计划 on or in turns). If the transom is too low, a performance loss is created by excessive lower unit drag and spray and, also, underwater clearance may present a problem.

Conventional installations generally locate the engine with the propeller shaft parallel to the boat bottom and with underside of anti-ventilation plate on gear housing directly in line with boat bottom. (Figure 3)

MOUNTING MOTOR on TRANSOM

WARNING

Before operating the motor, it MUST BE PROPERLY SECURED to the boat transom. Failure to adhere to the motor mounting instructions, following, may result in loss of the motor, damage to boat and/or motor and injury to occupants of the boat.

Center motor on boat transom at recommended transom height (see “Transom Height”, preceding) and secure motor to transom with clamp screws. To avoid damage to transom and to prevent clamp screws from working loose during operation, make certain that clamp screws are tightened securely and equally.

To provide additional motor security, installation of an appropriate safety chain/rope IS RECOMMENDED. Secure one end of the safety chain/rope to the motor and affix the other end securely to the transom.

IMPORTANT: During the season, a periodic check of the clamp screws and the safety chain/rope is recommended to ensure that the motor remains secure on the transom.

TILT LOCK PIN

Position of the tilt lock pin thru the clamp brackets determines the tilt angle of the motor (refer to “Tilt Angle Adjustment”, following). The pin also serves as a reverse lock catch that prevents the motor from tilting up/out of the water when the motor is in reverse gear or neutral. DO NOT operate motor with tilt lock pin removed.

TILT ANGLE ADJUSTMENT

IMPORTANT: To manually tilt the motor (lower unit), the motor MUST BE shifted into forward gear.

DO NOT use tiller handle assembly for tilting the motor. To tilt the motor, grasp the rear of the top cowl and tilt the motor forward.

Holes are provided in the clamp bracket to permit changing location of tilt lock pin for proper adjustment of tilt angle. Adjust tilt angle so that boat rides level. (Figure 3)

TILT LEVER

IMPORTANT: Motor must be in “Forward” gear in order to tilt up/out manually. To tilt motor, lift the motor via the “finger well” at the rear of the top cowl. DO NOT use tiller handle for tilting the motor, as damage to the tiller handle could result.
**CAUTION**

If your outboard motor is used as auxiliary power, ALWAYS MAKE CERTAIN that the motor is tilted up and out of the water and properly supported BEFORE operating the boat under main power. Failure to do so could result in damage to the auxiliary motor and/or boat.

Motor can be locked in tilt-up position by pulling tilt stop lever (Figure 4) with motor fully tilted.

![Figure 4. Tilt Lever (Merc 9.8 Shown)](image)

**CAUTION**

Engine must not be operated in full tilt lock position, as water pickup in lower unit will 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 “Trailer- ing Boat/Motor”, following).

**ADJUSTING CO-PILOT**

The co-pilot provides friction control in the steering mechanism. Recommended adjustment is such that the motor will remain in a fixed-course position (during normal operation) without need of manual control, yet will not be too tight to allow free and easy steering. Adjustment is attained by means of hexagon head screw in top face of swivel bracket. (Figure 5) Tighten the screw to increase friction; loosen to decrease friction.

![Figure 5. Co-Pilot Adjustment and Troll Lever (Merc 9.8 Shown)](image)

**BATTERY CABLE ROUTING**

(Merc 9.8E and 7.5E)

**CAUTION**

Failure to observe correct polarity, when connecting battery leads to battery, will result in destruction of the rectifier on electric starting models.

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

When installing/mounting a Merc 7.5 or 9.8 ELECTRIC START motor on a boat, the battery cable (electrical harness from engine) must be carefully routed and positioned to prevent chafing or pinching that could result in a short circuit.

Routing is especially important on sailboat applications where the motor is down in a "well" and particularly if the battery cable must be brought up and out of the "well" at a severe angle. In these cases, it may be necessary to place a loop in the cable to provide sufficient cable slack or insulate the cable to prevent chafing against the motor cowling.

**ELECTRICAL ACCESSORIES CONNECTIONS**

Any accessories, such as horns, running lights, etc, should be installed with electrical connections attached directly to the battery terminals via the screws on the battery lugs.

**TRAILERING BOAT/MOTOR**

When trailering or transporting the boat/motor, we recommend that the motor remain in the normal operating position, with co-pilot sufficiently tightened to hold motor in forward direction.

If adequate road clearance presents a problem, either remove the motor from the transom (see "Removing Motor from Boat", following) and store securely or
place motor in full tilt-up position (see "MOTOR INSTALLATION - Tilt Lever", preceding) and wedge a block of wood between swivel bracket and clamp brackets to support motor.

While the tilt lock mechanism, by itself, may support the motor during trailer- ing, IT IS NOT intended for this purpose, and damage to the mechanism and/or motor could result.

REMOVING MOTOR from BOAT

When removing, keep motor in an upright position, resting on its skeg, until all water has drained from the gear housing. If motor is placed on its side while water remains trapped in the gear housing, some water may enter the cylinders through the exhaust ports and cause internal damage.

PROPELLER RECOMMENDATIONS

PROPELLERS

Your outboard motor is equipped with a Quicksilver propeller which will give best overall performance under varying conditions of motor RPM, boat type, speed and load. See your dealer’s listing for Quicksilver propellers available. For removal and installation instructions, refer to the following paragraphs. Using an improper propeller can cause serious damage to your outboard.

WARNING

When installing or removing propeller, place a block of wood between the anti-ventilation plate and propeller to prevent accidental motor starting and to protect the hands from propeller blades while removing the propeller nut.

REMOVING PROPELLER

1. Place a flat block of wood between anti-ventilation plate and propeller.
2. Remove propeller shaft nut and splined washer. (Figure 6)
3. Slide propeller and collar off shaft.

INSTALLING PROPELLER

IMPORTANT: To assure that the propeller remains secure on the shaft during the season, periodically check propeller shaft nut for tightness.

1. To aid in future removal of the propeller, liberally coat the propeller shaft spline with one of the following Quicksilver lubricants:
   - Special Lubricant 101
   - 24-C Multi-Lube
   - Perfect Seal
2. Slide collar and propeller onto shaft.
3. Place splined washer and nut (Figure 6) on end of propeller shaft and, with wood block still in place, tighten nut securely.

VENTILATION/PROP SLIP

Ventilation, which is evident when the motor speeds up but boat speed is reduced, is caused by one of the following:

1. Propeller operating too close to the water surface.
2. Transom too high.
3. Tilt angle adjusted so that lower unit is too high.
4. Boat riding stern-high because of improper loading. (Figure 3)
5. Propeller fouled by weeds, rope, etc.
6. Damaged or broken propeller blades. Broken blade usually is indicated by excessive vibration.
7. Propeller safety clutch slipping because of damage.

FUEL MIXTURE and FUEL SYSTEM

INSTALLING FUEL TANK

1. Connect fuel line to motor by inserting twist connector into receptacle in bottom cowl (Figure 8) and lock by pushing inward and turning ¾-turn clockwise.
2. Place fuel tank (Figure 7) in the most favorable and secure position in the boat.
3. Arrange the fuel line so that it cannot become pinched, kinked, sharply bent or stretched during operation of the motor. Check with motor in extreme left and right turn positions.
GASOLINE RECOMMENDATIONS

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.

Any gasoline, that will satisfactorily operate an automobile engine, is suitable for use in your outboard motor. While the use of REGULAR LEADED gasoline is entirely satisfactory (and most commonly available), LEAD FREE or LOW LEAD regular gasolines are PREFERRED, as they generally provide an “extra margin” of spark plug life.

AUSTRALIA: Any gasoline, that is satisfactory in automobiles, is recommended for use in your outboard motor. In areas where AUTOMOTIVE REGULAR quality is doubtful or is not available, the use of PREMIUM or SUPER grades of gasoline is recommended. Major brands of pre-mixed fuels now are available in SUPER or PREMIUM grade fuel, blended under quality-controlled supervision for correct and consistent fuel mixture.

CAUTION
DO NOT USE white gasolines or fuels intended for stoves and lanterns. Use of improper gasolines and/oils can cause serious damage to your outboard motor.

OIL RECOMMENDATIONS
Mix recommended gasoline with Quicksilver Formula 50-D 2-Cycle Outboard Lubricant in ratio shown in the following chart. In emergency, if Formula 50-D 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. BIA rating TC-W is the Boating Industry Association’s designation for approved, 2-cycle water-cooled outboard oils. Use at oil manufacturer’s recommended gasoline-oil mixture as shown on the label (NOT TO EXCEED 50:1 RATIO).

CAUTION
The use of other than recommended gasoline and 50-D or an acceptable 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.

FUEL MIXTURE

A 50:1 gasoline-oil ratio is recommended for “break-in” and all normal operation of your outboard motor. (See chart, following.)

FUEL MIXTURE (50:1 RATIO)

<table>
<thead>
<tr>
<th></th>
<th>U.S. Measure</th>
<th>Imperial Measure</th>
<th>Metric Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula 50-D</td>
<td>16 U.S. oz. oil to each 8 gallons of gasoline</td>
<td>15 imp. oz. oil to each 5 imp. gallons gasoline</td>
<td>355ml (400cc) oil to each 20 l. of gasoline</td>
</tr>
<tr>
<td>Other Acceptable Oils Use at oil manufacturer’s recommended gasoline/oil ratio, not to exceed 50:1.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IMPORTANT: Using less than the recommended proportion of oil may result in very serious motor damage from lack of sufficient lubrication. Using more than the recommendations will cause spark plug fouling, erratic carburation, excessive smoking and faster-than-normal carbon accumulation.

rection in fuel mixing procedure

CAUTION
Observe fire prevention rules, particularly the matter of smoking. Mix fuel outdoors or at least in a well-ventilated location.

Figure 7. Fuel Tank
Mix fuel directly and accurately in remote tank. Pour small, equal amounts of gasoline and oil into remote tank. (Figure 7) Mix thoroughly, then add balance of oil and gasoline and mix again. Cleanliness, too, is important in mixing fuel. Be consistent; prepare each batch of fuel exactly the same as previous amounts (to avoid readjustment of carburetor idle mixture screw).

**IMPORTANT:** Always use fresh gasoline. Gasoline forms gum and varnish deposits and, when kept in a tank for a length of time, may cause trouble.

**MOTOR OPERATION**

**NOTICE:** Merc 7.5/9.8 Models ONLY: If your motor will be operated primarily in cold water areas [normal water temperature BELOW 50°F (10°C)] and/or areas where extreme day-to-day temperature variations of 20°F to 40°F (-6°C to 5°C) are common, we recommend installation of a thermostat (OPTIONAL ACCESSORY for Merc 7.5/9.8 models) 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.

**CAUTION**

This outboard motor is a water cooled engine. DO NOT operate motor out-of-water, or serious damage to the water pump and/or engine may occur from overheating.

**IMPORTANT:** Before attempting to start and operate the motor, the operator first should be familiar with the use of the basic motor controls: "Twist Grip Throttle" and "Shifting Gears", following.

**TWIST GRIP THROTTLE**

Ring on twist grip throttle has three settings: "Fast", "Start" and "Shift Range". (Figure 10) The end of twist grip has a friction device ("Troll Set") to hold throttle at a desired boat speed. (Figure 10) To set desired speed, select the throttle setting by rotating the twist grip, then turn "Troll Set" clockwise. In an EMERGENCY, even though the "Troll Set" has been set to maintain a constant speed, the twist grip still can be turned manually to over-ride the setting without releasing the "Troll Set".

**SHIFTING GEARS**

**IMPORTANT:** To shift gears, twist grip (Figure 10) must be set on "Shift Range". DO NOT attempt to shift motor into "Reverse" gear when engine is not running, or damage to the shift mechanism could result.

Gear positions are FORWARD (toward front), NEUTRAL (vertical, as shown in Figure 12) and REVERSE (toward rear).

**CAUTION**

When shift lever is in "Neutral" or "Reverse" position, lower unit is locked in normal operating position. Shock load of impact could cause transom breakage, particularly when boat is backing up. Proceed cautiously when in reverse motion and be careful of underwater obstructions. Do not accelerate motor to high RPM.

**WATER PUMP OPERATION**

**IMPORTANT:** On Merc 9.8/7.5 models which are equipped with a thermostat (OPTIONAL ACCESSORY) in the cooling system (Figure 11), a "tell-tale" stream is NOT visible until the engine reaches normal operating temperature and the thermostat opens (5 to 45 seconds, depending upon engine RPM and water temperature).

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. (Figures 1 and 2)

If the "tell-tale" is intermittent or absent during operation (frequent visual check), STOP MOTOR IMMEDIATELY, and

- Check gear housing water intake for possible restriction (weeds, mud, etc).
- Check "tell-tale" hose for possible restriction (use a piece of wire).
- Merc 9.8/7.5 models equipped with optional thermostat: Check thermostat/thermostat housing for possible restriction and/or thermostat malfunction. (Figure 11)

If no restriction is evident, a malfunction has occurred at some other point within the cooling system, possibly the water pump itself.

Operation with a defective water pump or obstruction in the cooling system will cause overheating and severe damage. Refer motor to Authorized Service facilities.
BREAK-IN PROCEDURE
Mix gasoline and oil in a 50:1 ratio as recommended previously.

⚠️ CAUTION
Follow break-in procedure carefully.

Operate a new motor at varied throttle settings for the first hour (one hour). AVOID both wide-open-throttle operation and prolonged idle in cold water areas during this period.

After the first hour (one hour) of operation, the motor is ready for normal operation and may be run at any speed. DO NOT EXCEED the full throttle RPM range listed in “Specifications”, preceding.

STARTING PROCEDURE - MANUAL

⚠️ WARNING
Be sure that boat is tied to a dock securely or that there is adequate space in front and behind the boat. Check throttle and shift for smooth operation (in case boat moves unexpectedly).

⚠️ WARNING
Be sure that outboard is in “Neutral” gear before attempting to start (manually or electrically). If outboard starts while in gear, occupants may be thrown from boat.

1. Be sure that fuel tank contains a sufficient amount of fuel mixture and is properly secured in boat.
2. Connect fuel line to motor by inserting twist connector into receptacle in bottom cowl. To lock, push inward and twist ¼-turn clockwise. (Figure 8)
3. Open air vent screw on fuel tank cap. (Figure 7)
4. Prime fuel system by squeezing primer bulb on fuel line. (Figure 9) When fully primed, bulb will feel firm.
5. Shift into neutral.
6. Rotate twist grip throttle to “Start” position. (Figure 10)
7. If engine is cold, pull out the choke knob (Figure 8) to place choke in “On” position (on Merc 4.5, set choke in closed position as indicated by arrow). Use of choke is not necessary, if engine is warm.

IMPORTANT: Starter is automatic rewind type. Proper operating technique will add many hours of life to starter rope and to starter internal mechanism. Grasp handle firmly and pull outward slowly until engagement of ratchet mechanism can be felt. Then continue outward pull with a full, vigorous stroke. Do not release handle at end of stroke and allow it to snap back. Retain grip on handle and allow rope to rewind slowly. Ratchet release mechanism is designed so that starter cannot engage during rewind.

⚠️ CAUTION
Merc 7.5 and 9.8 models are equipped with “start-in-gear” protection (rewind starter cannot be operated when motor is in gear). To prevent damage to rewind starter assembly, MAKE CERTAIN that motor is shifted to neutral before attempting to operate rewind starter.

a - Twist Connector
b - Manual Choke

Figure 8. Twist Connector and Manual Choke

Figure 9. Priming Fuel System

8. With shift lever in neutral, pull starter handle.
9. As soon as motor starts, place choke in “Off” position. Should a cold motor falter after starting, quickly move choke “On” and “Off” several times until motor runs steady. (Figure 8)
10. IMMEDIATELY check for “tell-tale”, as described in “Water Pump Operation”, preceding.
STARTING PROCEDURE - ELECTRIC

Merc 9.6E and 7.5E

1. Connect battery leads to correct terminals on battery. Red lead of harness attaches to positive (+) post of battery and black lead to negative (-) post of battery. Use grease to prevent corrosion of terminals.
2. Be sure that fuel tank contains a sufficient amount of fuel mixture and that tank is properly secured in boat.
3. Connect fuel line to motor by inserting twist connector into receptacle in bottom cowl. Lock by pushing inward and twisting 1/4-turn clockwise. (Figure 8)
4. Open air vent screw on fuel tank cap. (Figure 7)
5. Prime carburetor and fuel system by squeezing primer bulb on fuel line. When fully primed, bulb will feel firm. (Figure 9)
6. Shift into neutral.
7. Rotate twist grip throttle to "Start" position. (Figure 10)

IMPORTANT: Avoid use of choke during normal operation, or if motor is warm.

8. Pull out the choke knob to place choke in "On" position.

IMPORTANT: The starter motor is not designed for continuous operation, and serious damage may result if operated continuously for more than 30 seconds. Pause and allow the starter motor to cool off for 2 minutes.

9. With shift lever in neutral, press electric start button (Figure 12) to actuate electric starter. As soon as motor starts to run, release button and push choke knob in.
10. If motor should falter, actuate manual choke.
11. IMMEDIATELY check for "tell-tale", as described in "Water Pump Operation", preceding.
12. Before shifting into gear, retard twist grip to "Shift Range".

OPERATION WITHOUT BATTERY
(Electric Starting Models)

WARNING

Battery leads MUST BE taped off (insulated) or positioned in a manner that prevents a completed circuit between the leads.

If desired (or in an emergency), electric starting models can be started and operated without a battery (either disconnected or removed). If the motor will be operated for extended periods, however, we recommend disconnecting both yellow/red alternator leads from the rectifier (insulate or position leads to prevent a completed circuit between leads) as a precaution against rectifier damage. (Figure 11)
STOPPING PROCEDURE

Stop motor by shifting into neutral and depressing "Stop" button, as shown in Figure 12. Hold "Stop" button down until motor has stopped running completely. Close air vent screw on fuel tank cap.

WARNING

If motor will not be operated for a period of time, if it is to be removed from the boat, or if it is to be tilted up, prevent spillage from carburetor throat and bowl and gum formations in carburetor during storage by stopping as follows:
1. Disconnect the fuel line.
2. Allow motor to run at idling speed until it stops of its own accord, indicating the carburetor has run dry.

SHALLOW WATER TROLL

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

Engaging Shallow Water Troll
1. Retard twist grip throttle to "Shift Range" (Figure 10) and shift into "Forward" gear. (Figure 12)
2. Raise troll lever (Figure 5) upward to "Troll" position.
   IMPORTANT: Motor must be in "Forward" gear in order to tilt up/out manually.
3. Tilt motor up/out manually to engage shallow water "Troll".

Disengaging Shallow Water Troll
1. Release troll lever (Figure 5) by moving it left, then downward.
2. Tilt motor up/out slightly, then lower it to normal operation position.

OPERATION in SALT WATER

IMPORTANT: For motors operated in salt water, an accessory zinc anode (P/N 85824A3) can be installed to protect the aluminum drive from the damaging effects of galvanic corrosion (see your Authorized Dealer).

Prior to operation in salt water, remove cowl and spray entire powerhead with Quicksilver Corrosion and Rust Preventive Type II or equivalent.

ATTENTION REQUIRED following OPERATION in SALT WATER or SILT - FLUSHING

Even though the interior surfaces of this outboard motor are treated to resist corrosion, there still is a possibility of a mechanical buildup of salt or silt deposits which no form of protective coating can prevent and which can be eliminated only by occasional flushing with fresh water.

1. With motor in an upright position, flush cooling system by removing plug marked "FLUSH" (Figures 13 and 14) and washer.
2. Thread flushing device into hole and attach hose coupling with hose.
3. Turn on water but DO NOT operate outboard while flushing. Water flow is strong enough to flush with water pressure provided from water tap. DO NOT use full water pressure.
4. Continue flushing until water being discharged becomes clear (3 to 5 minutes for salt water units).

IMPORTANT: While and after flushing, keep motor in upright position until all water has drained from gear housing to prevent water from entering the powerhead via drive shaft housing and exhaust ports.

5. Clean the motor thoroughly, then spray or wipe Quicksilver Corrosion and Rust Preventive Type II (or equivalent) on the motor to protect the finish of all parts.
6. Refer to "ADJUSTMENTS/MAINTENANCE - Lubrication Chart", following, and lubricate motor components as outlined.

Figure 13. Flush Plug - Merc 9.8/7.5

Figure 14. Flush Plug - Merc 4.5
DON'TS
1. Don’t operate motor out-of-water; or water pump impeller will be damaged.
2. Don’t operate motor with tilt lock pin removed.
3. Don’t try to shift gears unless twist grip throttle is in "Shift Range" position.
4. Don’t ease gears into engagement. A firm, quick shift is recommended.
5. Don’t force gears into engagement.
6. Don’t tilt motor up with steering handle.

ADJUSTMENTS and MAINTENANCE

PERIODIC INSPECTION

WARNING
In the interest of personal safety and to provide responsible product service, the appropriate service procedure(s), following, should be read completely BEFORE beginning any type of maintenance/repair. This practice will acquaint you with the overall scope of a specific service, particularly any "Cautions" and/or "Safety Warnings".

Conduct a periodic, systematic inspection and correct potential problems BEFORE they can cause inconvenience or mechanical damage. Inspection interval is based on average operating conditions in utility service. Under severe conditions, the inspection interval should be shortened. Inspection includes:
1. Clean entire unit thoroughly, including all accessible powerhead parts.
2. Check entire unit for loose, damaged or missing parts. Tighten or replace as required.
3. Lubricate gear housing and other points as instructed, following.
4. Service spark plug(s) as explained, following. Inspect spark plug lead(s) and electrical leads for damage or deterioration.
5. Inspect fuel lines for damage or deterioration and service fuel filters as indicated, following.
6. Remove propeller and inspect. Trim nicks and burrs with a file, being careful not to remove more metal than absolutely necessary. Inspect for cracks, damage or bent condition. If condition is doubtful, refer to Authorized Service facilities for inspection. (Refer to "Installing Propeller", preceding.)

7. Inspect the finish for damage or corrosion. Thoroughly clean damaged or corroded areas and apply matching paint (Quicksilver Spray Paints - see your Authorized Dealer).

REMOVING TOP COWL

MERC 9.8-7.5: Remove top cowl by pushing cowl release lever on rear of bottom cowl and lifting cowl off (up and forward). (Figure 15)

MERC 4.5: Pull the two latch pin levers outward from side of bottom cowl (Figure 16) and lift top cowl off (up and forward). Avoid operation of motor with cowling removed.

CARBURETOR

The carburetor on your outboard motor has been calibrated and pre-set at the factory to provide maximum performance under normal operating conditions.

The carburetor is equipped with a fixed high speed jet and normally no adjustments are required, other than maintaining the proper low speed mixture and/or idle speed recommended. However, extreme changes in weather (temperature and humidity) and/or elevation may necessitate further carburetor readjustment.
IMPORTANT: To maintain peak motor performance when operating at higher elevations, it will be necessary to install a leaner fixed high speed jet. (See your Authorized Service facility for selection of the proper high speed jet.)

NOTE: Low speed mixture and idle speed cannot be adjusted effectively while in “Neutral”, or motor will sputter and stop when shifted to “Forward” because of “no load” condition while adjusting.

Low Speed Mixture Adjustment

The carburetor is provided with a low speed mixture screw (Figure 17) that is turned COUNTERCLOCKWISE for LEANER mixture, COUNTERCLOCKWISE for RICHER mixture. If motor cannot be started, turn low speed mixture screw inward (clockwise) until it seats lightly, then back out 1½-turns. (Turning tight will damage needle and seat.) This approximate setting will permit starting. As soon as motor starts, allow for warmup (run for several minutes), throttle back to idle for about one minute to allow RPM to stabilize, then make final adjustment as follows:

1. With motor running at slow speed (600-1200 RPM) while in forward gear, turn low speed mixture screw counterclockwise until motor starts to “load up” or fire unevenly from over-rich mixture.
2. Slowly turn low speed mixture screw clockwise until cylinders fire evenly and motor picks up speed.
3. Continue turning clockwise until too lean a mixture is obtained, and motor slows down and misfires.
4. Set low speed mixture screw halfway between rich and lean.
5. DO NOT adjust leaner than necessary to attain reasonably smooth idling.

When in doubt, set mixture slightly rich rather than too lean.

Idle Speed Adjustment

With engine running, retard twist-grip throttle to lowest idle setting in “Forward” gear and adjust idle speed screw (Figure 17) to obtain recommended engine idle speed (see “Specifications”, preceding).

Figure 17. Throttle-Shift Linkage and Carburetor Adjustment - Merc 9.8/7.5

SERVICING FUEL TANK FILTER

1. Remove fuel pickup tube from fuel tank. (Figure 18)
2. Clean filter/screen by rinsing in clean lead-free gasoline or kerosene. (See "Safety Warning" below.)

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.

SERVICING CARBURATOR FUEL FILTER/SCREEN

Carburetor fuel filter/screen is more than adequate to take care of all requirements under normal use. If, after all other checks, fuel filter/screen obviously is the cause of the trouble, clean or replace the fuel filter/screen, as necessary. (Figure 19)
Figure 19. Carburetor Fuel Screen
- Merc 9.8/7.5

NOTE: Carburetor filter/screen for Merc 4.5 model is located under strainer cover on top of carburetor.

GEAR HOUSING LUBRICATION

⚠️ CAUTION ⚠️

If any water drains from the filler hole, if lubricant appears milky brown, or if large amounts of lubricant must be added to fill the gear housing, it should be checked promptly by your local servicing dealer.

Periodically lubricate (see "Lubrication Chart", following) the gear housing assembly with Quicksilver Super-Duty Outboard Gear Lubricant, as follows:

**IMPORTANT: DO NOT use automotive grease in the gear housing assembly. Use only Quicksilver Super-Duty Gear Lubricant.**

1. Remove lubricant fill screw and washer from gear housing. (Figure 20)

2. Insert lubricant tube into fill hole, then remove lubricant vent screw and washer.

3. Fill gear housing with lubricant until excess starts to flow out of lubricant vent screw hole.

4. Replace lubricant vent screw and washer.

5. Remove lubricant tube from fill hole and install fill screw and washer.

**LUBRICATION CHART**

<table>
<thead>
<tr>
<th>Fig.</th>
<th>Description</th>
<th>Type Lubricant</th>
<th>Fresh Water Frequency</th>
<th>Salt Water Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Gear Housing</td>
<td>Quicksilver Super-Duty Lubricant</td>
<td>After 1st 10 Days, then Each 30 Days</td>
<td>Same as Fresh Water</td>
</tr>
<tr>
<td>4</td>
<td>Swivel Bracket and Swivel Pin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Tilt Tube Fittings</td>
<td>Quicksilver 2-4-C or Multipurpose Lubricant</td>
<td>Every 60 Days</td>
<td>Every 30 Days</td>
</tr>
<tr>
<td>17</td>
<td>Throttle-Shift Linkage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Reverse Lock Lever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>Clamp Screws</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Propeller Shaft</td>
<td>Quicksilver: Special Lub. 101, 2-4-C Multi-Lube, Perfect Seal</td>
<td>Once in Season</td>
<td>Every 60 Days</td>
</tr>
</tbody>
</table>
IGNITION MAINTENANCE

⚠️ WARNING ⚠️

DO NOT touch or disconnect any ignition system parts while engine is running or while battery cables are connected. DO NOT remove spark plug connectors and hold them in your hand to check for spark while engine is running, as high voltage is present.

If electrical system is not operating, do not attempt to fix it yourself, but refer to your nearest Authorized Service facility.

SERVICING SPARK PLUG(S)

Operation with wrong type and/or worn-out spark plug(s) will be reflected in deteriorating engine performance; i.e., hard starting, misfire, lack of normal power, etc. If these symptoms are encountered, replace spark plug(s) as follows.

(Refer to “Specifications”, preceding.)

1. Remove top cowl, as described previously.
2. Disconnect spark plug lead(s) and remove spark plug(s).
3. Install new spark plug(s). Be sure that gaskets are in good condition.
4. Start threads one or two turns with fingers to avoid danger of cross-threading.
5. Seat plug finger-tight on gasket; an additional ¼-turn with a wrench generally will be sufficient to tighten. Do not over-tighten, as insulator may crack, or threads may strip.
6. Connect spark plug lead(s). Be sure that each lead is connected to its respective spark plug.
7. Inspect high tension lead(s). If insulation is damaged or deteriorated, install new high tension lead.

ATTENTION REQUIRED following COMPLETE SUBMERSION

In an effort to deter serious internal engine damage and avoid expensive engine repairs, a motor, that has been submerged, requires IMMEDIATE service upon recovery.

1. Wash entire motor with clean, fresh water to remove mud, silt, weeds, salt, etc.
2. Remove the spark plug(s) and purge the engine and carburetor of as much water as possible (“crank” engine with spark plug hole(s) facing downward).

3. If compressed air is available, “blow-dry” the engine internally and externally.
4. Pour a liberal amount of Quicksilver Engine Cleaner or Quicksilver Formula 50-D 2-Cycle Outboard Lubricant into the engine via the carburetor and spark plug hole(s).
5. Manually “crank” engine to distribute the lubricant within the engine, then drain excess lubricant from engine.
6. Reinstall spark plug(s) and high tension lead(s).

IMPORTANT: If it appears that the engine DID NOT take in any foreign material (mud, sand, weeds, etc) and “cranks” freely, the engine should be started. If there is evidence that foreign material had entered the engine, the engine should be disassembled and cleaned (take motor to an Authorized Dealer for service).

7. Start engine and operate at low RPM for a minimum of 5 minutes, then run engine at varied throttle settings for an additional 15-20 minutes. (Normal operation will continue the drying-out process, displacing remaining moisture and providing internal lubrication.)
8. If engine performance still indicates engine trouble, take motor to an Authorized Dealer for further service.

PREPARATION for STORAGE

Flush cooling system (refer to "MOTOR OPERATION - Attention Required following Operation in Salt Water or Silt - Flushing", preceding).

1. Disconnect fuel line from motor and allow motor to run at idling speed until it stops of its own accord, indicating that the carburetor has run dry.
2. Lubricate gear housing assembly and remove spark plug(s).
3. Apply Quicksilver Storage Seal into the spark plug hole(s), allowing time for some of the oil to drain into the crankcase via the transfer ports. Operate the starter vigorously to distribute oil around the inside of the crankcase and cylinder(s). Reinstall spark plug(s).
4. Clean the motor thoroughly, including all accessible powerhead parts, and spray with Quicksilver Corrosion and Rust Preventive Type II or equivalent. Install cowl and apply a thin film of clean, fresh motor oil to all painted surfaces.
5. Remove propeller and lubricate propeller shaft spline (refer to “Installing Propeller”, preceding) then, reinstall propeller.
IMPORTANT: When storing outboard motor, be sure that all water is drained from the gear housing (thru the propeller hub). Trapped water may freeze and expand, thus cracking the gear housing and/or water pump housing. Also, to prevent any possibility of getting water inside the engine (via the exhaust ports), ALWAYS store the motor with the “top end” (engine) positioned higher than the the “bottom end” (gear housing).

BATTERY MAINTENANCE and STORAGE

A strong battery must be maintained for electric starting models. Check battery condition periodically and maintain an electrolyte level that covers the plates, but not over 3/16” (4.8mm) above perforated baffles (add distilled water as necessary).

Make sure that battery and battery leads are kept clean and properly secured.

All lead acid batteries have an inherent self-discharge characteristic when not in use. When storing a battery, adhere to the following procedure:

1. Remove battery as soon as possible and remove all grease, sulfate and dirt from top surface.
2. Cover plates with distilled water, but not over 3/16” (4.8mm) above perforated baffles.
3. Cover terminal bolts with grease.
4. Store battery in a COOL, DRY place in a dry carton or box.

**CAUTION**

A discharged battery can be damaged by freezing.

5. Remove battery from storage every 45 days. Check water level and place on charge for 16 hours at 2 amperes. DO NOT fast charge.

*NOTE: Larger batteries (over 32 ampere-hour rating) generally will accept a higher charging rate. Follow battery manufacturer instructions.*

6. When replacing battery in service, remove excess grease from terminals (leaving small amount on), recharge as necessary and reinstall in your equipment.

If unable to have above performed by your local dealer, contact your local automotive garage.

TROUBLESHOOTING

IMPORTANT: The following chart is intended as a guide to aid in finding and correcting minor outboard motor malfunctions, should they occur. Possible causes are listed in order of probability and, even though some may appear to be quite obvious, these same causes often are overlooked when a problem occurs. If a problem cannot be located and corrected with the aid of the guide, see your Authorized Dealer for further service. For manual start engines, disregard references to electric starting.

**WARNING**

Before attempting any checks or repairs, battery cables on electric start model MUST BE REMOVED from battery to prevent possible personal injury or damage to equipment.

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Possible Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Engine will not start</strong></td>
<td>1. Fuel tank empty</td>
<td>1. Fill tank with clean, fresh fuel.</td>
</tr>
<tr>
<td></td>
<td>2. Clogged fuel filter(s)</td>
<td>2. Clean or replace fuel filter(s).</td>
</tr>
<tr>
<td></td>
<td>4. Fuel system shutoff valve closed (if so equipped)</td>
<td>4. Open valve.</td>
</tr>
<tr>
<td></td>
<td>5. Engine is cold or flooded</td>
<td>5. See &quot;Engine Starting Procedures&quot;, preceding in manual.</td>
</tr>
<tr>
<td></td>
<td>6. Weak or low capacity battery</td>
<td>6. Check condition of battery; use battery of recommended capacity.</td>
</tr>
<tr>
<td></td>
<td>7. Loose or corroded battery connections</td>
<td>7. Tighten cables on battery. Clean battery terminals.</td>
</tr>
<tr>
<td></td>
<td>8. Stale or contaminated fuel</td>
<td>8. Fill tank with clean, fresh fuel.</td>
</tr>
<tr>
<td></td>
<td>11. Poor connections or damaged ignition wiring</td>
<td>11. Check wires for wear or breaks and tighten all loosen connections. Replace worn or broken wires.</td>
</tr>
<tr>
<td><strong>B. Poor idling or engine misses while idling</strong></td>
<td>1. Fouled spark plugs</td>
<td>1. See &quot;Servicing Spark Plugs&quot;, preceding in manual.</td>
</tr>
<tr>
<td></td>
<td>2. Fuel system obstruction</td>
<td>2. Check for pinched or kinked fuel line or other obstructions in fuel system.</td>
</tr>
<tr>
<td></td>
<td>3. Stale or contaminated fuel</td>
<td>3. Fill tank with clean, fresh fuel.</td>
</tr>
<tr>
<td></td>
<td>4. Throttle shutter(s) not closing completely</td>
<td>4. See Authorized Servicing Dealer for proper throttle adjustment.</td>
</tr>
<tr>
<td>Trouble</td>
<td>Possible Cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>C. Engine misfires at high speeds</td>
<td>5. Defective ignition component</td>
<td>5. See Authorized Servicing Dealer for repair.</td>
</tr>
<tr>
<td></td>
<td>6. Reed valve open or broken</td>
<td>6. See Authorized Servicing Dealer for repair.</td>
</tr>
<tr>
<td></td>
<td>2. Stale or contaminated fuel</td>
<td>2. Fill tank with clean, fresh fuel.</td>
</tr>
<tr>
<td></td>
<td>4. Poor connections or damaged ignition wiring</td>
<td>4. Check wires for wear or breaks and tighten all loose connections. Replace worn or broken wires.</td>
</tr>
<tr>
<td></td>
<td>1. Corroded or loose battery terminals</td>
<td>1. Clean and tighten battery terminals.</td>
</tr>
<tr>
<td></td>
<td>2. Low electrolyte level</td>
<td>2. Fill battery to recommended level.</td>
</tr>
<tr>
<td></td>
<td>3. Worn out or inefficient battery</td>
<td>3. Replace battery with one of recommended capacity.</td>
</tr>
<tr>
<td></td>
<td>4. Excessive use of electrical accessories</td>
<td>4. Use battery of recommended capacity.</td>
</tr>
<tr>
<td></td>
<td>5. Defective rectifier</td>
<td>5. See Authorized Servicing Dealer for repair.</td>
</tr>
<tr>
<td></td>
<td>1. Exhaust being drawn into propeller.</td>
<td>1. Check for excessive gap between propeller and gearcase, or check for missing diffuser ring.</td>
</tr>
<tr>
<td></td>
<td>2. Weeds or other foreign material tangled on gear housing.</td>
<td>2. Remove weeds and clean lower unit.</td>
</tr>
<tr>
<td></td>
<td>3. Slipping propeller hub.</td>
<td>3. Have propeller repaired or replaced.</td>
</tr>
<tr>
<td></td>
<td>4. Tilt angle not correctly adjusted.</td>
<td>4. Adjust tilt angle to achieve most efficient operation.</td>
</tr>
<tr>
<td></td>
<td>5. Propeller damaged.</td>
<td>5. Have propeller repaired or replaced.</td>
</tr>
<tr>
<td></td>
<td>6. Propeller of wrong pitch.</td>
<td>6. Install propeller with higher pitch.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Possible Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Battery will not hold charge (electrode start model)</td>
<td>6. Propeller of wrong pitch or diameter</td>
<td>6. Install correct propeller to operate outboard at its recommended RPM range.</td>
</tr>
<tr>
<td></td>
<td>7. Transom height too high or too low</td>
<td>7. Have outboard adjusted to proper transom height.</td>
</tr>
<tr>
<td></td>
<td>2. Engine overloaded (cannot attain recommended RPM)</td>
<td>2. See &quot;F&quot;, &quot;Motor speed slower than normal&quot;, preceding in chart.</td>
</tr>
</tbody>
</table>