IMPORTANT OWNER IDENTIFICATION and REGISTRATION INFORMATION

The Mariner Outboard Motor Warranty is not effective until the product is registered at the factory. For further warranty and registration information read the following information and see “International Warranty” on the back cover of this manual.

It is vitally important that your selling dealer fill out the Mariner Outboard Registration Card (shown at right) completely and mail the copies designated “Factory Copy” and “Distributor Copy” to the Mariner Area Office or Distributor in your area immediately upon your purchase of a new Mariner Outboard Motor. It identifies your name and address, the product model and serial number, date of sale, type of use and selling dealer’s name, address and code number. The dealer also certifies that you are the original purchaser and user of the product.

A copy of the Mariner Outboard Registration Card designated “Customer Copy” will be given to you by your dealer immediately upon your purchase of a new Mariner Outboard Motor. It is the only valid registration identification card that you will receive, unless you are informed otherwise by your dealer. (See Note Below) Should your Mariner Outboard Motor require warranty service, present your copy of the Mariner Outboard Registration Card to the servicing dealer. Warranty service will not be performed by the dealer unless the registration card is presented by you at the time the service is requested.

NOTE: In some countries, Mercury Marine will issue the original owner a permanent Mariner Owner Registration Card within forty-five (45) days after receipt of the “Factory Copy” of the Mariner Outboard Registration Card. (Ask your dealer for further details).

IMPORTANT: Read this manual carefully and thoroughly, particularly SAFETY WARNING, CAUTION and important information in bold type.
TO THE OWNER

We congratulate you on your purchase of a Mariner product and welcome you to the ever-growing family of Mariner owners. You have selected one of the Marine Industry's finest products.

Proper maintenance, care and operation of your Mariner product is necessary to help ensure your complete satisfaction and continued boating pleasure. For this reason, we ask that you read this manual thoroughly.

We especially call your attention to the inside front and back covers of this manual. A thorough understanding of the Mariner registration procedures and our warranty will protect your investment and help to avoid any misunderstanding.

All of our Mariner dealers and employees are trained to serve you and are dedicated to your satisfaction. If you should experience a problem with your motor we ask that you, first, contact your dealer for assistance. If your dealer is unable to help you or you are not satisfied with action taken by your dealer, contact the Mariner Area Office or Distributor closest to you.

Thank you for purchasing our product and may you always experience the best that boating has to offer.

MARINER - Customer Relations Department.

For best results, we recommend use of genuine Mariner or Quicksilver parts & accessories.

This owner's publication includes operation and service instructions. If disassembly or replacement, particularly of internal parts, is required, the owner is advised to see an Authorized Mariner Service facility and not to attempt the repair work himself.

When writing a letter to Mariner, 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.

The description and specifications contained herein were in effect at the time this guide was approved for printing. Mariner, 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.
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NOTICE

The following special information will alert you to possible dangers and to important information in this manual. Observe them carefully. “Safety Warnings” and “Cautions” (see below) alone do not eliminate the dangers that they signal. Your close attention to implement them, plus “common sense” operation are major accident prevention measures.

SAFETY WARNING
Failure to follow a “Safety Warning” may result in bodily injury.

CAUTION
Non-compliance with a “Caution” instruction may result in failure or damage to the product and/or equipment.

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

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 will assure a minimum number of problems and, subsequently, will keep your overall operating expenses at a minimum.

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.
## SPECIFICATIONS

<table>
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<th>MARINER MODEL</th>
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<tr>
<td>Bore</td>
<td>8</td>
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<tr>
<td>Stroke</td>
<td>50 mm (1.97 in.)</td>
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<tr>
<td>Displacement</td>
<td>42 mm (1.65 in.)</td>
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<td>Spark Plug</td>
<td>164 cc (10 cu. in.)</td>
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<td>Spark Plug Gap</td>
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<td>Spark Plug Conversion</td>
<td>0.5 - 0.6 mm (0.019 - 0.024 in.)</td>
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<td>Operating RPM Range</td>
<td>Champion L-82/AC S41F</td>
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<tr>
<td>Fuel Tank Capacity</td>
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<tr>
<td>Fuel Mixture Ratio</td>
<td>14 Liters (3.7 U.S. Gal.)</td>
</tr>
<tr>
<td></td>
<td>50:1</td>
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</tbody>
</table>
1. Top Cowl
2. Bottom Cowl
3. Shift Handle
4. Starter Handle
5. Throttle Grip
6. Tilt Lock
7. Clamp Bracket
8. Clamp Screw Handle
9. Upper Unit
10. Lower Unit
11. Steering Handle
12. Steer Adjustment Wing Nut
13. Tilt Pin
14. Tilt Stop Lever
15. Swivel Bracket
16. Water Outlet
17. Anti-Cavitation Plate
18. Propeller Cap
19. Propeller
OPERATION

MOUNTING THE MOTOR

Adjust Height

It may be necessary to use a block of wood to raise the motor to the correct height. Figure 2 shows the correct measurement (from the anti-cavitation plate to the water surface) on a round bottom boat.

Fig. 2. Round bottom boat.

Figure 3 shows the correct measurement (from anti-cavitation plate to bottom of boat) on a flat bottom boat.

Fig. 3. Flat bottom boat.

IMPORTANT: If using a block of wood, it must be securely fastened to the center of the boat transom.

Fig. 2: 5 CM (2 In.) or More

Fig. 3: 3 to 4 CM (1 to 1-1/2 In.)
Position at Center

**SAFETY WARNING**
If engine is not securely clamped on the transom during operation, it may cause damage to the boat and injury to occupants.

Position motor exactly in the center of the boat transom (figure 4). Securely clamp the bracket to the transom by tightening clamp screw handles.

**IMPORTANT**: While cruising, check clamp screw handles periodically to make sure they remain tight.

Fig. 4. Centered on transom.

1. Center Line of Boat

Safety Rope

Use a safety rope or chain to prevent loss of your motor if clamp screws become loose. Thread rope or chain through one of the holes in the clamp handles (figure 1) and attach it to the hull.

Tilt Angle Pin Position/Adjustment

Motor mounting angle can be adjusted by moving the tilt angle pin (figure 5) to any one of four holes in the clamp bracket. The tilt angle position you select will depend on transom angle or load aboard the boat. Select tilt angle pin position which will make anti-cavitation plate of the motor parallel to the water surface. See figure 6.

**SAFETY WARNING**
If engine is at an incorrect angle it may cause hazardous operation of the boat.

In “1” tilt angle pin position is incorrect, causing front of boat to “plow.” To correct this condition, move tilt pin away from the transom.

In “2” tilt angle pin position is also incorrect, causing rear of the boat to “squat.” To correct this condition, move tilt pin toward the transom.

In “3” tilt angle pin position is correct and maximum performance is ensured.
Fig. 5. Tilt angle pin.

1. Steering Friction Screw
2. Tilt Angle Pin

Fig. 6. Tilt angle positions.

PROPELLER SELECTION

The correct propeller for your Mariner Outboard Motor must be purchased from your Mariner Outboard dealer, to allow motor to operate within correct wide open throttle RPM range (4500 - 5500 rpm) and develop maximum horsepower. The correct propeller to use depends on boat length and load, and application. Your Mariner Outboard dealer will assist you in the selection procedure.
GASOLINE AND LUBRICATING OIL RECOMMENDATIONS

CAUTION
The use of other than recommended gasoline and Formula 50 or 50-D or an acceptable oil may cause piston scoring, bearing failure or both. DO NOT, under any circumstances, use multigrade or other highly detergent automobile oils or oils which contain metallic additives.

Oil

Mix recommended gasoline with Formula 50-D Outboard Motor Oil at the ratio shown in the following charts. When Formula 50-D Oil is not available, substitute a high quality 2-cycle oil that is intended for use in outboard motors and meets the 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 these oils at the oil manufacturer’s recommended gasoline-oil mixture (not to exceed 50:1).

Break-In Procedure and Fuel Mixture

CAUTION
Follow break-in procedure carefully.

Mix gasoline and oil during the 5 hour break-in period at a 25:1 ratio, as shown in the following chart. Operate a new motor at 1/2 throttle (2500-3500 RPM) for two (2) hours. After two (2) hours, the motor may be run at any speed, although sustained operation at idle or full throttle should be avoided for an additional three (3) hours.

Gasoline

Regular Leaded, Premium, Low Lead and Lead-Free Automotive Gasolines with a minimum pump posted octane rating of 70 (Research) are satisfactory and recommended for use in these models.

Some fuel distributors pre-mix gasoline and oil for 2-cycle engines. Such fuels, if known to be of recommended octane rating and quality are acceptable. If in doubt, mix your own using applicable fuel mixture ratio following.
### Break-In Gasoline/Oil Mixture (25:1)

<table>
<thead>
<tr>
<th>Gallons of Gasoline</th>
<th>Ounces of Oil to Be Added</th>
<th>Liters of Gasoline</th>
<th>Milliliters of Oil to Be Added</th>
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</tr>
<tr>
<td>6</td>
<td>32</td>
<td>24</td>
<td>960</td>
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</tbody>
</table>

After break-in, use a 50:1 gasoline-oil ratio.

### Correct Fuel Mixing Procedure

**SAFETY WARNING**

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

**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 carburetion, excessive smoking and faster-than-normal carbon accumulation.
IMPORTANT: Always use fresh gasoline. Gasoline forms gum and varnish deposits and, when kept in storage for a length of time, may cause trouble.

Mix fuel directly and accurately in remote tank. Pour 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: In countries outside of the U.S.A. and Canada, consult a Mariner Outboard Distributor or Dealer for a recommended gasoline. The words, “Premium” and “Regular,” have different significance in different countries.

IMPORTANT: Repair and/or replacement of damaged parts which occur from the use of incorrect fuels, oils and mixtures thereof, are the responsibility of the owner.

INSTALLING FUEL TANK

SAFETY WARNING

Use CARE when transporting fuel tank(s), whether in a boat or car. DO NOT fill fuel tank(s) to maximum capacity. Cool gasoline expands considerably, due to higher outside temperatures, and builds up pressure in the fuel tank. This can cause fuel leakage and a potential fire hazard. Close vent screw to prevent spillage.

Fig. 7. Fuel tank.

1. Connect fuel line to fuel tank by inserting twist connector into fuel receptacle (figure 7) and lock by turning 1/8-turn clockwise.

2. Place fuel tank (figure 7) in the most favorable position in 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.
STARTING PROCEDURE

IMPORTANT: Be sure fuel tank contains a sufficient amount of fuel mixture and is properly secured in boat and that fuel line is connected to fuel tank.

Fig. 8. Fuel line connection.

1. Loosen air vent screw (located on fuel tank cap) two or three turns to allow air into the fuel tank (figure 7).

2. Connect fuel line connection (on end of fuel line coming from tank) to engine fuel connection (attached to front of bottom cowl (figure 8).

3. Feed fuel from fuel tank to carburetor by repeatedly squeezing and releasing the primer valve until it becomes hard (figure 9).

Fig. 9. Primer valve.

SAFETY WARNING
Be sure that boat is tied to a dock securely or that there is adequate clear space in front of and behind the boat prior to starting engine.
SAFETY WARNING
Be sure that outboard is in "Neutral" gear before attempting to start. If outboard starts while in gear, occupants may be thrown from boat.

CAUTION
DO NOT operate motor out-of-water, as water pump will be damaged.

4. If engine is warm, open throttle slightly. If engine is cold, align "START" on throttle handle decal with raised mark on steering handle (see figure 10). After engine is started, return throttle to lowest position.

CAUTION
DO NOT attempt to start engine with throttle set above "START" position. See "Step 4" preceding.

5. If engine is cold, operate choke by pulling out choke knob (figure 10). If engine is warm, do not pull out choke knob.

Fig. 10. Choke knob and starter handle.

1. Choke Knob
2. Starter Handle
3. Raised Mark
4. START
6. Be sure shift handle is in "NEUTRAL" position (figure 1). A safety device prevents manual starter engagement unless shift handle is in "NEUTRAL" position.

7. Hold top cowl firmly with one hand while SLOWLY pulling starter handle (figure 10) with other hand until mechanism engages. Finish pull with a strong, fast stroke to start engine. If you wish to stop the engine at this time for any reason, close throttle and press the stop button (figure 11).

**CAUTION**

Check water outlet (figure 1) to be sure water is flowing from it. If no water flows out during operation, the engine will overheat and be damaged.
STOPPING

The engine should not be stopped quickly during full throttle operation. First, reduce engine speed. Allow engine to cool by operating at idling speed for a few minutes. Stop by pushing stop button (figure 11).

FAULTY STARTER

SAFETY WARNING
Care must be exercised when using emergency starting procedure. DO NOT attempt to replace the cowling or rewind assembly after the motor starts. Stay clear of the flywheel. Loose clothing SHOULD NOT BE WORN by anyone near the motor when operating under these conditions. Proceed to the nearest boat landing for service.

1. Remove top cowl.

2. Disconnect neutral start safety device from rewind assembly (figure 12).

3. Remove three bolts which secure rewind assembly to cylinder block.

4. Place gear shift lever in “NEUTRAL” gear position.

5. Wind starter rope two or three turns in a clockwise direction around pulley on top of flywheel, and give it a strong pull to start engine.
Fig. 12. Emergency starting.

1. Bolts (3)
2. Neutral Start Safety Device
3. Rewind Assembly

WARMING UP

After engine has been started, allow it to warm up for a minimum of three minutes so that all moving parts receive sufficient lubrication. Failure to warm engine will shorten engine life. During warm up, gear shift handle should be in neutral position and throttle in slow position.

CAUTION
Check water outlet (figure 1) to be sure water is flowing from it. If no water flows out during operation, the engine will overheat and be damaged.

BREAK-IN

The break-in procedure is necessary to allow moving parts to wear into a good clearance between adjacent surfaces.

Break-in Period
10 hours.

Fuel (gasoline/oil mixing ratio)
25:1

IMPORTANT: See “Gasoline and Lubricating Oil Recommendations,” check “Table of Contents” for page number.
Speed

For the first five minutes, operate engine at slowest possible cruising speed. After five minutes, slowly increase speed to half throttle. Operate at half throttle for the first two hours. For the last eight hours, keep throttle at 1/2 to 3/4 open. Throttle may be opened to "FAST" for about one minute out of every ten minutes of operation.

To tilt the engine, move shift lever to Neutral. Grasp rear of top cowl with one hand, and push the tilt lever (figure 13) downward with the other. Tilt motor to desired angle. Move shift handle to Forward and proceed to cruise.

CAUTION
Check water outlet (figure 1) to be sure water is flowing from it. If no water flows out during operation, the engine will overheat and be damaged.

To lower engine, move shift lever to Neutral. Grasp rear of top cowl with right hand and pull engine upward. With left hand, pull shallow water/tilt support lever (figure 5) toward boat while lowering engine to tilt angle pin.

SHALLOW WATER CRUISING

For shallow water cruising, the engine can be manually tilted to one of three positions ranging from 26° to 50°.
Steering Adjustment

**SAFETY WARNING**
Do not tighten steering so tight that it cannot be overcome in an emergency.

Tightness of steering handle movement can be adjusted by turning steering friction screw (figure 5). To restrict movement, turn screw clockwise. To ease movement, turn screw counterclockwise.

FORWARD AND REVERSE

**SAFETY WARNING**
Before changing to opposite direction, be sure to reduce engine speed to SLOW. If not, water may enter boat or control may be lost. When backing boat, never open throttle more than 1/2 open.

Reduce engine speed to idle. Operate shift control smoothly, but quickly in desired direction.

Gear positions are "FORWARD" (toward front), "NEUTRAL" (vertical, as shown in figure 1) and "REVERSE" (toward rear).

TILT-UP AND MOORING

If engine will not be run for some time, or if boat is moored in shallow water, engine should be tilted up. This protects the propeller and lower unit against damage from rocks or corrosion.

To tilt engine, push tilt lever downward (figure 13). Grasp rear of top cowl and tilt engine.

To lower engine, grasp rear of top cowl with right hand and pull engine upward. With left hand, pull shallow water/tilt support lever (figure 14) toward boat while lowering engine to tilt angle pin.

Fig. 13. Tilt lever.
Fig. 14. Tilt support lever.

1. Shallow Water/Tilt Support Lever

CAUTION
Be sure to keep power unit higher than the propeller.
See figure 15.

Fig. 15. Correct and incorrect tilt.

1. Incorrect  2. Correct
AFTER OPERATION

Removal Preparations

Drain carburetor by allowing engine to run, at idle speed, with fuel line disconnected from bottom cowl connector until it stops indicating the carburetor has run dry. Close air screw on fuel tank. Untie safety rope.

Removal and Carrying

Loosen clamp screw handles, and remove motor from the boat. Hold motor upright while resting lower unit on the ground and allow water to drain from lower unit. While carrying the motor be careful not to damage the propeller. Also be careful to hold motor so that power unit is higher than propeller.

Cleaning

When motor has been used in salt or polluted water, it should be thoroughly cleaned with fresh water. The cooling system should be flushed by operating the engine in fresh water for three minutes or by removing the plug in the lower unit marked WASH (figure 16). Install water flush plug in lower unit. Connect a hose to water flush plug and turn on water. Do not operate outboard while flushing. Fresh water will be flushed through water passages, flushing out salt and dirt. Clean exterior by thoroughly washing with fresh water.

IMPORTANT: When engine is being flushed, be sure water is flowing from water outlet (figure 1). If not, cooling system is plugged or faulty.

Fig. 16. Lower unit wash plug.
INSPECTION AND SERVICE

DAILY INSPECTION

Check following items before each period of operation.

Fuel
Before starting motor, be sure fuel tank is full. The fuel ratio must be 50:1 mixture of gasoline and oil (during break-in the mixture is a 25:1 ratio).

SAFETY WARNING
Do not fill fuel tank completely full. Gasoline will expand as it warms, causing leakage and a fire hazard if there is no room for expansion.

Fuel Line Connections
Check fuel line connections from fuel tank to motor receptacle for leaks. Check fuel line connection at the carburetor for leaks. Make sure fuel line is firmly inserted into connectors.

Propeller
Before mounting motor to the boat, check propeller blades to be sure they are not bent or broken.

Propeller Nut
Check propeller nut for tightness and cotter pin for damage. Be sure nut is tight. If it should come off during operation the propeller will also come off.

Spark Plug
Keep spark plugs clean and properly gapped. A fouled or incorrectly gapped spark plug can be the cause of serious engine problems. Make sure spark plug wire connections are tight.

PERIODIC INSPECTION

After Operation
Check propeller for damage.
Clean exterior of engine.

Every 30 Hours
Take out each spark plug and clean it thoroughly, removing all carbon. Adjust spark plug gap to 0.5 - 0.6 mm (0.019 - 0.024 in.). Check fuel line for fuel leaks, damage or air bubbles. Clean fuel tank, fuel filter and bowl.

Every 50 Hours
Add oil to lower unit. Retighten all bolts and nuts. Clean the fuel strainer in the fuel tank.

Every 100 Hours (By your Mariner dealer)
Adjust trolling speed and idling speed on carburetor, and check for smooth acceleration. Check starter rope for damage or signs of breaking. Check condition of breaker contact points. Smooth point surfaces, and adjust gap to 0.25 - 0.45 mm (0.010 - 0.018 in.).
ADJUSTMENTS

Carburetor Adjustment

SAFETY WARNING
When engine is uncovered, be extremely careful not to touch moving parts, hot areas, and high voltage ignition wires.

1. Engine should be fully warmed up before an adjustment is made. Move throttle handle to lowest position. Remove engine top cowl.

2. Turn idle mixture screw in until lightly seated, then back out 1 to 1-1/2 turns (figure 17). With outboard in gear, slowly turn idle mixture screw in and out, and leave it where the engine runs best.

3. In gear idle RPM should be 650 ± 50 rpm. Idling speed (RPM) can be adjusted by turning throttle stop screw (figure 17).

IMPORTANT: Do not adjust carburetor unnecessarily.

Fig. 17. Carburetor adjustments.

1. Idle Mixture Screw
2. Throttle Stop Screw

LUBRICATION POINTS (See figure 18)

PARTS REPLACEMENT
Spark Plug Replacement

SAFETY WARNING
- Do not crank the engine while holding spark plug cap. You will receive a high voltage shock.

Remove top cowl and remove spark plug cap from spark plug. Using a 21 mm (13/16 in.) socket wrench and drive handle remove spark plug by turning counterclockwise. When installing a spark plug be sure to engage threads properly and tighten firmly.
1. Choke Wire Water Resistant Grease
   Every 100 Hours
2. Shift Arm Water Resistant Grease
   Every 100 Hours
3. Clamp Screws Water Resistant Grease
   Every 30 Hours
4. Lower Unit High Quality Gear Lubricant
   Recommended by Your Mariner Dealer. Replace After First 20 Hours. Check Level and Fill Every 50 Hours. Replace Every 100 Hours.
5. Steering Handle Shaft Water Resistant Grease Every 100 Hours
6. Swivel Bracket Water Resistant Grease
   Every 100 Hours
7. Propeller Shaft Perfect Seal or Water Resistant Grease Every 20 Hours
Propeller and/or Drive Pin Replacement

SAFETY WARNING
Disconnect spark plug ignition wires when working with the propeller to avoid accidental starting.

If the propeller hits an obstacle under water, the drive pin is designed to break, allowing propeller shaft to turn without turning the propeller. This helps protect the propeller and other parts from damage. Always use genuine Quicksilver replacement parts. Two drive pins and two cotter pins are carried in a holder at the inside rear of the bottom cowl.

Using pliers, straighten the cotter pin and remove (figure 19). Remove propeller nut. Pull propeller straight off propeller shaft. Remove drive pin (figure 20).

Fig. 19. Propeller cotter pin.
1. Cotter Pin
2. Propeller Nut
Installation

Coat propeller shaft with Perfect Seal or good quality water resistant grease. Insert drive pin into hole in propeller shaft (figure 20). Align groove inside propeller hub with drive pin and slide propeller onto propeller shaft. Install nut, and tighten securely until cotter pin hole in propeller nut aligns with cotter pin hole in propeller shaft, insert cotter pin, and spread ends to secure.

CAUTION

Operating the engine with a loose propeller nut will cause the drive pin groove in the propeller and/or drive pin hole in propeller shaft to wear excessively. Check propeller for looseness by trying to move it forward and backward on propeller shaft. If movement is detected, remove cotter pin and tighten propeller nut until no movement is detected. Continue to tighten (not loosen) propeller nut until the cotter pin hole aligns with hole in propeller shaft. Install cotter pin and spread ends to secure.

GEAR OIL REPLACEMENT

Draining Oil

SAFETY WARNING

Disconnect spark plug ignition wires before working near propeller to avoid accidental starting.

Place an empty container under the lower unit and remove lower “OIL” plug (figure 21), using a slot-head screwdriver.
Remove upper “OIL LEVEL” plug (figure 21). Crank the engine a few times to turn the gears and remove all oil. (Gear shift handle must be in neutral.)

Refilling with Oil
Feed a high quality lower unit lubricant, recommended by your Mariner Outboard dealer, into the lower “OIL” hole.

When oil begins to flow out of the upper “OIL LEVEL” hole, install upper plug and tighten. Install lower plug and tighten.

Fig. 21. Lower Unit Oil Plug

OFF SEASON STORAGE
Before storing your motor until the next boating season, it should be shop-serviced by your nearest Mariner Outboard dealer. Perform following checks and services yourself.

Draining Fuel
Drain carburetor by allowing engine to run, at idle speed, with fuel line disconnected from bottom cowl connector until it stops indicating the carburetor has run dry. Fill fuel tank with proper gas-oil mixture. Keeping the fuel tank full during storage is a rust preventive measure. Before using the engine next season replace fuel with a fresh gas-oil mixture.

Cleaning Outside
Thoroughly clean exterior with fresh water, dry, and apply a light film of oil.

Cleaning Inside
Remove spark plugs, feed a good quality 2-cycle motor oil into the cylinders and crank engine a few times to spread the oil evenly throughout the cylinders. During the storage season, crank the engine once a month, with spark plugs out.

Propeller and Propeller Shaft

SAFETY WARNING
Be sure to disconnect spark plug ignition wires from spark plugs before working with propeller, to avoid accidental starting.
Remove propeller and coat propeller shaft with Perfect Seal or good quality water resistant grease.

**SUBMERGED ENGINE**

If your engine was accidentally submerged it must be completely overhauled as soon as possible. If it is not, severe rust and corrosion will develop throughout the engine. If your engine has been submerged, take the following preventive measures. Remove engine from water as quickly as possible. Wash thoroughly with fresh water to remove all salt, mud, and seaweed. Remove spark plugs and drain all water from cylinders. Feed engine oil into each cylinder through the spark plug hole and crank engine several times to spread oil to cylinder walls. Have the engine overhauled by your Mariner Outboard dealer as soon as possible.

**HOW TO START A FLOODED ENGINE**

**CAUTION**
As soon as engine starts, be prepared to reduce throttle setting. Use the throttle to maintain lowest possible RPM while excess fuel is burned from engine.

1. Move choke knob to open position. (Inward on manual start models or toggle switch down on electric start models.)

2. Disconnect fuel line connector from bottom cowl fuel connector (figure 10).

3. Place shift handle (figure 12) in "NEUTRAL" position on manual start models or place remote control in "NEUTRAL" position and turn key switch to "ON" position on remote control/electric start models.

4. Place throttle at wide-open (FAST) position.

5. Hold top cowl firmly with one hand while SLOWLY pulling starter handle (figure 12) with other hand until mechanism engages. Finish pull with a strong, fast stroke to start engine. Repeat as necessary until engine starts.

6. Reduce throttle setting to maintain lowest possible RPM while excess fuel is burned from engine.

7. Reconnect fuel line connector to bottom cowl connector.

**IMPORTANT:** If engine fails to start using preceding procedure, install new spark plugs (see "Servicing Spark Plugs") and repeat Steps 1 thru 6. If engine still fails to start, take it to your Authorized Servicing Dealer.
**TROUBLESHOOTING**

Engine troubles can be prevented by periodic inspection and service. Most troubles are caused by improper handling and lack of inspection and care. This troubleshooting guide will help you to determine the cause of trouble. If the trouble seems difficult to repair, take the engine to your Mariner Outboard dealer for service.

<table>
<thead>
<tr>
<th>The Engine Starts but Stalls during Cruising.</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuel system</strong></td>
<td></td>
</tr>
<tr>
<td>Fuel tank is almost empty</td>
<td>Refill tank.</td>
</tr>
<tr>
<td>Fuel tank is full of fuel</td>
<td></td>
</tr>
<tr>
<td>Fuel contains water</td>
<td>Replace fuel.</td>
</tr>
<tr>
<td>Fuel filter(s) or line is clogged</td>
<td>Clean.</td>
</tr>
<tr>
<td>Air vent screw is not loosened</td>
<td>Loosen 2 or 3 turns.</td>
</tr>
<tr>
<td>Choke still on</td>
<td>Push it back.</td>
</tr>
<tr>
<td>Idling speed is too low</td>
<td>Tighten throttle stop screw a little.</td>
</tr>
<tr>
<td>Carburetor is clogged</td>
<td>Have it shop-serviced.</td>
</tr>
<tr>
<td>Fuel line or connectors leak</td>
<td>Repair leaks or replace fuel line.</td>
</tr>
<tr>
<td><strong>Electrical system</strong></td>
<td></td>
</tr>
<tr>
<td>Spark is irregular</td>
<td></td>
</tr>
<tr>
<td>Engine stop switch wire is faulty</td>
<td>Have it shop-serviced.</td>
</tr>
<tr>
<td>High-tension wire is faulty</td>
<td></td>
</tr>
<tr>
<td>Ignition coil or condenser is faulty</td>
<td></td>
</tr>
<tr>
<td>Breaker points are dirty, roughened or not adjusted correctly</td>
<td></td>
</tr>
<tr>
<td>Spark plug is faulty</td>
<td>Replace spark plug.</td>
</tr>
<tr>
<td><strong>Engine overheats.</strong></td>
<td></td>
</tr>
<tr>
<td>Fuel mixing ratio is incorrect</td>
<td>Replace fuel.</td>
</tr>
<tr>
<td>Spark plug is incorrect in heat range</td>
<td>Install correct spark plugs.</td>
</tr>
<tr>
<td>Ignition timing is incorrect</td>
<td></td>
</tr>
<tr>
<td>Cooling water pick-up is clogged</td>
<td>Have it shop-serviced.</td>
</tr>
<tr>
<td>Carbon collects excessively in engine</td>
<td></td>
</tr>
<tr>
<td>Piston rings are stuck</td>
<td></td>
</tr>
<tr>
<td>Spark is good</td>
<td>Check fuel system.</td>
</tr>
<tr>
<td>The Engine does not Start</td>
<td>Remedy</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Fuel system</strong></td>
<td></td>
</tr>
<tr>
<td>Fuel does not flow to carburetor.</td>
<td>Refill tank.</td>
</tr>
<tr>
<td>Fuel level low</td>
<td>Open 2 or 3 turns.</td>
</tr>
<tr>
<td>Air vent screw is closed</td>
<td>Connect securely.</td>
</tr>
<tr>
<td>Fuel line connector is loose</td>
<td>Clean.</td>
</tr>
<tr>
<td>Fuel tank pick up or engine fuel filter is clogged</td>
<td></td>
</tr>
<tr>
<td><strong>Fuel flow to carburetor.</strong></td>
<td>Have it shop serviced.</td>
</tr>
<tr>
<td>Carburetor is clogged</td>
<td></td>
</tr>
<tr>
<td>Carburetor feeds too much fuel</td>
<td>Have it shop serviced.</td>
</tr>
<tr>
<td><strong>Electrical system</strong></td>
<td></td>
</tr>
<tr>
<td>Spark is produced.</td>
<td></td>
</tr>
<tr>
<td>Spark is weak</td>
<td></td>
</tr>
<tr>
<td>Spark plug is faulty</td>
<td>Replace</td>
</tr>
<tr>
<td>Spark gap is too narrow</td>
<td>Adjust to specification.</td>
</tr>
<tr>
<td>Not pulling starter rope fast enough</td>
<td>Pull it faster.</td>
</tr>
<tr>
<td>Flywheel magneto is faulty</td>
<td>Have it shop-serviced.</td>
</tr>
<tr>
<td>Spark is good</td>
<td>Re-check fuel system.</td>
</tr>
<tr>
<td>Spark plug is dirty</td>
<td>Clean.</td>
</tr>
<tr>
<td>Spark gap is too narrow</td>
<td>Adjust to specification.</td>
</tr>
<tr>
<td>Spark plug is damaged</td>
<td>Replace.</td>
</tr>
<tr>
<td>Spark plug is faulty</td>
<td></td>
</tr>
<tr>
<td>Spark gap is too narrow</td>
<td></td>
</tr>
<tr>
<td>Spark is damaged</td>
<td></td>
</tr>
<tr>
<td>No spark is produced.</td>
<td></td>
</tr>
<tr>
<td>Flywheel magneto is faulty</td>
<td>Have it shop-serviced.</td>
</tr>
<tr>
<td>Ignition coil is faulty</td>
<td></td>
</tr>
<tr>
<td>Stop switch wire is faulty</td>
<td></td>
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</tbody>
</table>
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.

The following are trademarks of Brunswick Corporation:

MERCURY MARINE  MARINER  QUICKSILVER
INTERNATIONAL WARRANTY

I. We warrant each new Mariner Outboard Motor and accessories attached, thereto, (hereafter referred to as “Product”) manufactured by us to be free from defects in material and workmanship. This warranty shall remain in effect for a period of one (1) year from date of purchase.

II. Since this warranty applies to defects in material and workmanship, it does not apply to normal worn parts, adjustments, tuneups or to damage caused by: 1) Neglect, lack of maintenance, accident, abnormal operation or improper installation or service; 2) Use of an accessory or part not manufactured or sold by Mercury Marine; 3) Operation with fuels, oils, lubricants, or fuel/oil mixtures which are not recommended for use with the Product; 4) Participating in or preparing for racing or other competitive activity or operating with a racing type lower unit; or 5) Alteration or removal of parts.

III. Reasonable access must be provided to the product for warranty service. This warranty will not apply to: 1) Haul-out, launch, towing and storage charges; telephone or rental charges of any type, inconvenience or loss of time or income; or 2) Removal and/or replacement of boat partitions or material because of boat design for necessary access to the Product.

IV. Claim shall be made under this warranty by delivering the Product for inspection to a Mariner Outboard Dealer authorized to service the Product. If purchaser cannot deliver Product to such authorized dealer, he may give notice in writing to the Mercury Marine Area Office or Distributor. The Mariner Area Office or Distributor shall then arrange for the inspection and repair, provided such service is covered under this warranty. Purchaser shall pay for all related transportation charges and/or travel time. If the service is not covered by this warranty, purchaser shall pay for all related labor and material and any other expenses associated with that service. Any Product or parts shipped by purchaser for inspection or repair must be shipped with transporation charges prepaid.

Purchaser must provide "proof of purchase" and substantiate "date of purchase" by presenting the "Customer Copy" of the "Mariner Outboard Registration Card" or the plastic "Owner’s Warranty Registration Card" to the dealer authorized to service the product. If either of these items is not available, purchaser must provide a copy of the original Bill of Sale (Sales Contract) for the product to be serviced. Warranty Claims will not be accepted until adequate "proof of purchase" and "date of purchase" is presented by purchaser.

V. Our obligation under this Warranty shall be limited to repairing a defective part or at our option replacing such part or parts as shall be necessary to remedy any malfunction resulting from defects in material or workmanship as covered by this warranty. We reserve the right to improve the design of any Product without assuming any obligation to modify any Product previously manufactured.

VI. All incidental and/or consequential damages are excluded from this warranty. Implied warranties are limited to the life of this warranty.

VII. This warranty is in lieu of all other warranties, expressed or implied, and may not be modified or extended by anyone, except that any qualification or restriction contained herein which is prohibited by any law where the Product is sold and such qualification or restriction only, is null and void. All other qualifications and restrictions of this warranty remain in full force and effect.

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

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