### **Outboard Care**

To keep your outboard in the best operating condition, it is important that your outboard receive the periodic inspections and maintenance listed in the Inspection and Maintenance Schedule. We urge you to keep it maintained properly to ensure the safety of you and your passengers, and retain its dependability.

#### **WARNING**

Neglected inspection and maintenance service of your outboard or attempting to perform maintenance or repair on your outboard if you are not familiar with the correct service and safety procedures could cause personal injury, death, or product failure.

Record maintenance performed in Maintenance Log at the back of this book. Save all maintenance work orders and receipts.

SELECTING REPLACEMENT PARTS FOR YOUR OUTBOARD

We recommend using original Mercury Precision or Quicksilver replacement parts and Genuine Lubricants.

#### **WARNING**

Using a replacement part that is inferior to the original part could result in personal injury, death, or product failure.

### **EPA Regulations**

All new outboards manufactured by Mercury Marine are certified to the United States Environmental Protection Agency, as conforming to the requirements of the regulations for the control of air pollution from new outboard motors. This certification is contingent on certain adjustments being set to factory standards. For this reason, the factory procedure for servicing the product must be strictly followed and, wherever practicable, returned to the original intent of the design. Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine spark ignition (SI) engine repair establishment or individual.

# EPA Emissions

#### EMISSION CERTIFICATION LABEL

An emission certification label, showing emission levels and engine specifications directly related to emissions, is placed on the engine at time of manufacture.



- a Idle speed
- **b** Engine horsepower
- c Piston displacement
- d Date of manufacture
- e Valve clearance (if applicable)

- f Family number
- g Maximum emission output for the engine family
- h Timing specification
- i Recommended spark plug and gap

#### OWNER RESPONSIBILITY

The owner/operator is required to have routine engine maintenance performed to maintain emission levels within prescribed certification standards.

The owner/operator is not to modify the engine in any manner that would alter the horsepower or allow emissions levels to exceed their predetermined factory specifications.

### Inspection And Maintenance Schedule BEFORE EACH USE

- Check engine oil level. See Fuel & Oil Checking and Adding Engine Oil.
- Check that lanyard stop switch stops the engine.
- Visually inspect the fuel system for deterioration or leaks.
- Check outboard for tightness on transom.

- Check steering system for binding or loose components.
- Remote Control Models Visually check steering link rod fasteners for proper tightness. See **Steering Link Rod Fasteners**.
- Check propeller blades for damage.

#### AFTER EACH USE

- Flush out the outboard cooling system if operating in salt or polluted water. See **Flushing the Cooling System**.
- Wash off all salt deposits and flush out the exhaust outlet of the propeller and gearcase with fresh water if operating in salt water.

# EVERY 100 HOURS OF USE OR ONCE YEARLY, WHICHEVER OCCURS FIRST

- Lubricate all lubrication points. Lubricate more frequently when used in salt water. See Lubrication Points.
- Change engine oil and replace the oil filter. The oil should be changed more often when the engine is operated under adverse conditions such as extended trolling. See **Changing Engine Oil**.
- Replace spark plugs at first 100 hours or first year. After that, inspect spark plugs every 100 hours or once yearly. Replace spark plugs as needed. See **Spark Plug Inspection and Replacement**.
- Inspect thermostat visually for corrosion and broken spring. Make sure thermostat closes completely at room temperature.<sup>1</sup>
- Check fuel line filter for contaminants. See Fuel System.
- Check corrosion control anodes. Check more frequently when used in salt water. See **Corrosion Control Anode**.
- Check and adjust valve clearance, if necessary.<sup>1.</sup>
- Drain and replace gearcase lubricant. See Gearcase Lubrication.
- Check power tilt fluid. See Checking Power Tilt Fluid.
- Lubricate splines on the driveshaft.<sup>1.</sup>
- Remote control models Check control cable adjustments. <sup>1.</sup>
- Inspect timing belt. See **Timing Belt Inspection**.
- Check tightness of bolts, nuts, and other fasteners.

#### EVERY 300 HOURS OF USE OR THREE YEARS

• Replace water pump impeller (more often if overheating occurs or reduced water pressure is noted).<sup>1</sup>

#### **BEFORE PERIODS OF STORAGE**

- Refer to Storage procedure. See Storage section.
- <sup>1.</sup> These items should be serviced by an authorized dealer.

### Flushing The Cooling System

Flush the internal water passages of the outboard with fresh water after each use in salt, polluted, or muddy water. This will help prevent a buildup of deposits from clogging the internal water passages.

Use a Mercury Precision or Quicksilver accessory (or equivalent) flushing attachment.

IMPORTANT: The engine must be run during flushing in order to open the thermostat and circulate water through the water passages.

### WARNING

To avoid possible injury when flushing, remove the propeller. Refer to Propeller Replacement, following.

1. Remove propeller. Refer to **Propeller Replacement**. Install the flushing attachment so the rubber cups fit tightly over the cooling water intake.



2. Attach a water hose to the flushing attachment. Turn on the water and adjust the flow so water is leaking around the rubber cups to ensure the engine receives an adequate supply of cooling water.



3. Start the engine and run it at idle speed in neutral shift position. **IMPORTANT: Do not run engine above idle when flushing.** 

 Adjust water flow (if necessary) so excess water continues leaking out from around the rubber cups to ensure the engine is receiving an adequate supply of cooling water.



- 5. Check for a steady stream of water flowing out of the water pump indicator hole. Continue flushing the outboard for 3 to 5 minutes, carefully monitoring water supply at all times.
- 6. Stop the engine, turn off the water, and remove the flushing attachment. Reinstall the propeller.

### Top Cowl Removal And Installation REMOVAL

1. Pull out the front cowl latch.



- 2. Lift front of cowl to clear front latch and push toward the rear to clear rear hook.
- 3. Lift top cowl to remove.

#### INSTALLATION

- 1. Lower top cowl into position over engine.
- 2. Move the cowl toward the rear to align rear hook. After rear hook has engaged, move cowl toward front and push down front of cowl.
- 3. Push in latch to secure top cowl.

### **Battery Inspection**

The battery should be inspected at periodic intervals to ensure proper engine starting capability.

IMPORTANT: Read the safety and maintenance instructions which accompany your battery.

- 1. Turn off the engine before servicing the battery.
- 2. Add water as necessary to keep the battery full.
- 3. Make sure the battery is secure against movement.
- 4. Battery cable terminals should be clean, tight, and correctly installed. Positive to positive and negative to negative.
- 5. Make sure the battery is equipped with a nonconductive shield to prevent accidental shorting of battery terminals.

#### **Exterior Care**

Your outboard is protected with a durable baked enamel finish. Clean and wax often using marine cleaners and waxes.

### Fuel System

### **WARNING**

Avoid serious injury or death from gasoline fire or explosion. Carefully follow all fuel system service instructions. Always stop the engine and do not smoke or allow open flames or sparks in the area while servicing any part of the fuel system.

Before servicing any part of the fuel system, stop engine and disconnect the battery. Drain the fuel system completely. Use an approved container to collect and store fuel. Wipe up any spillage immediately. Material used to contain spillage must be disposed of in an approved receptacle. Any fuel system service must be performed in a well ventilated area. Inspect any completed service work for sign of fuel leakage.

#### FUEL LINE INSPECTION

Visually inspect the fuel line and primer bulb for cracks, swelling, leaks, hardness, or other signs of deterioration or damage. If any of these conditions are found, the fuel line or primer bulb must be replaced.

#### FUEL LINE FILTER

Inspect the fuel line filter. If the filter appears to be contaminated, remove and replace.



IMPORTANT: Visually inspect for fuel leakage from the filter connections

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by squeezing the primer bulb until firm, forcing fuel into the filter.

#### Steering Link Rod Fasteners

IMPORTANT: The steering link rod that connects the steering cable to the engine must be fastened using the steering link rod fastening hardware supplied with the engine. Never replace the steering link fastening hardware with common bolts and nuts (non-locking) as they will work loose and vibrate off freeing the link rod to disengage.

#### **WARNING**

Disengagement of a steering link rod can result in the boat taking a full, sudden, sharp turn. This potentially violent action can cause occupants to be thrown overboard exposing them to serious injury or death.

Assemble steering link rod to steering cable with washer under the nylon insert locknut. Tighten locknut until it seats, then back nut off 1/4 turn.

Assemble steering link rod to engine with bolt, washers, spacer and locknut. Tighten the bolt/nylon insert locknut to the specified torque.



- a Bolt
- b Washer (3)
- c Spacer
- d Nylon insert locknut
- e Steering link bracket (engine)
- f Steering link
- g Nylon insert locknut (tighten and back off 1/4 turn)

Description	Nm	lb. in.	lb. ft.
Nylon insert locknut	27.1		20

#### **Corrosion Control Anode**

Your outboard has a corrosion control anode installed to the gearcase. An anode helps protect the outboard against galvanic corrosion by sacrificing its metal to be slowly corroded instead of the outboard metals.

The anode requires periodic inspection especially in salt water which will accelerate the erosion. To maintain this corrosion protection, always replace the anode before it is completely eroded. Never paint or apply a protective coating on the anode as this will reduce effectiveness of the anode.



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#### **Propeller Replacement**

#### **WARNING**

If the propeller shaft is rotated while the engine is in gear, there is the possibility that the engine will crank over and start. To prevent this type of accidental engine starting and possible serious injury caused from being struck by a rotating propeller, always shift outboard to neutral position and remove spark plug leads when you are servicing the propeller.

1. Remove the spark plug lead to prevent engine from starting.



2. Move gear shift lever into neutral (N).



- 3. Straighten and remove cotter pin.
- 4. Place a block of wood between gearcase and propeller to hold propeller and remove propeller nut.
- 5. Pull propeller straight off shaft. If propeller is seized to the shaft and cannot be removed, have the propeller removed by an authorized dealer.

IMPORTANT: To prevent the propeller hub from corroding and seizing to the propeller shaft (especially in salt water), always apply a coat of the recommended lubricant to the entire propeller shaft at the recommended maintenance intervals and also each time the propeller is removed.

6. Coat the propeller shaft with Quicksilver or Mercury Precision Lubricants Anti-Corrosion Grease or 2-4-C.



7. Install front thrust washer, propeller, rear thrust hub, and propeller nut onto the shaft.

8. Place a block of wood between gearcase and propeller to prevent rotation and tighten propeller nut. Secure propeller nut to the shaft with cotter pin.



#### Fuse Replacement - Electric Start Models

#### IMPORTANT: Always carry spare 20 AMP fuses.

The electric starting circuit is protected from overload by a 20 AMP fuse. If the fuse is blown try to locate and correct the cause of the overload. If the cause is not found, the fuse may blow again.



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a - Spare fuse

b - Circuit protecting fuse

1. Open the fuse holder and look at the silver colored band inside the fuse. If band is broken, replace the fuse. Replace fuse with a new fuse with the same rating.



Identifying a blown fuse

a - Good fuse

**b** - Blown fuse

### Spark Plug Inspection And Replacement

### **WARNING**

Avoid serious injury or death from fire or explosion caused by damaged spark plug boots. Damaged spark plug boots can emit sparks. Sparks can ignite fuel vapors under the engine cowl. To avoid damaging spark plug boots, do not use any sharp object or metal tool such as pliers, screwdriver, etc. to remove spark plug boots.

1. Remove the spark plug boots. Twist the rubber boots slightly and pull off.



2. Remove the spark plugs to inspect. Replace spark plug if electrode is worn or the insulator is rough, cracked, broken, blistered or fouled.



3. Set the spark plug gap to specification.



Spark	Plug

Spark plug gap 1.0 mm (0.040 in.)

4. Before installing spark plugs, clean off any dirt on the spark plug seats. Install plugs finger tight, and then tighten 1/4 turn or torque to specifications.

Description	Nm	lb. in.	lb. ft.
Spark plug	27		20

### **Timing Belt Inspection**

- 1. Inspect the timing belt and have it replaced by an authorized dealer if any of the following conditions are found.
  - a. Cracks in the back of the belt or in the base of the belt teeth.
  - b. Excessive wear at the roots of the cogs.
  - c. Rubber portion swollen by oil.
  - d. Belt surfaces roughened.
  - e. Signs of wear on edges or outer surfaces of belt.



#### Changing Engine Oil ENGINE OIL CAPACITY

Engine oil capacity is approximately 800 ml (27 fl. oz.).

#### OIL CHANGING PROCEDURE

- 1. Lock the outboard in the full tilt up position.
- 2. Position outboard so the drain hole is facing downward.
- 3. Remove drain plug and drain engine oil into an appropriate container.

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To avoid internal engine damage, do not use a crankcase oil pump when changing the oil.

- 4. After the initial oil has been drained, temporarily reinstall the drain plug. Disengage the tilt lock and lower the outboard. Wait a minute to allow the remaining oil that was trapped in the engine to return to the drain. Return outboard to the full tilt position and drain the remaining oil.
- 5. Lubricate the seal on the drain plug with oil and reinstall.



#### OIL FILLING

IMPORTANT: Do not overfill. Be sure that the outboard is upright (not tilted) when checking oil.

1. Remove the oil fill cap and refill with 800 ml (27.0 fl. oz.) of oil. Reinstall the oil fill cap.



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2. Idle engine for five minutes and check for leaks. Stop engine and check oil level on dipstick. Add oil if necessary.

### **Lubrication Points**

- Lubricate the following with Quicksilver or Mercury Precision Lubricants 2-4-C or Special Lubricant 101.
  - Swivel Bracket Lubricate fitting.
  - Transom Clamp Screws Lubricate threads.
  - Tilt Tube Lubricate fittings.



a - Tilt tube grease fitting

**b** - Swivel bracket grease fitting

c - Transom clamp screws

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 Lubricate the throttle and shift cables, moving components, pivot locations and shift detent.



a - Throttle/shift cables b - Shift detent

• Steering Cable Grease Fitting (If Equipped) - Rotate steering wheel to fully retract the steering cable end into the outboard tilt tube. Lubricate through fitting.



- a Steering cable grease fitting
- **b** Steering cable end

#### **WARNING**

The end of the steering cable must be fully retracted into the outboard tilt tube before adding lubricant. Adding lubricant to steering cable when fully extended could cause steering cable to become hydraulically locked. A hydraulically locked steering cable will cause loss of steering control, possibly resulting in serious injury or death.

- 2. Lubricate the following with Light Weight Oil.
  - Steering Link Rod Pivot Points Lubricate points.



- a Steering link rod pivot points
- 3. Lubricate the following with Quicksilver or Mercury Precision Lubricants Anti-Corrosion Grease or 2-4-C.
  - Propeller Shaft Refer to Propeller Replacement for removal and installation of the propeller. Coat the entire propeller shaft with lubricant to prevent the propeller hub from corroding to the shaft.



#### **Gearcase Lubrication**

When adding or changing gearcase lubricant, visually check for the presence of water in the lubricant. If water is present, it may have settled to the bottom and will drain out prior to the lubricant, or it may be mixed with the lubricant, giving it a milky colored appearance. If water is noticed, have the gearcase checked by your dealer. Water in the lubricant may result in premature bearing failure or, in freezing temperatures, will turn to ice and damage the gearcase.

Remove the fill/drain plug and examine the lubricant draining from the gearcase for metal particles. A small amount of metal filings or fine metal particles indicates normal gear wear. An excessive amount of metal filings or larger particles (chips) may indicate abnormal gear wear and should be checked by an authorized dealer.

#### DRAINING GEARCASE

- 1. Place outboard in a vertical operating position.
- 2. Place drain pan below outboard.
- 3. Remove fill/drain plug and vent plug and drain lubricant.



#### GEARCASE LUBRICANT CAPACITY

Standard model gearcase: Approximately 320 ml (10.8 fl. oz.). Bigfoot model gearcase: Approximately 370 ml (12.5 fl. oz.).

#### GEARCASE LUBRICANT RECOMMENDATION

Mercury or Quicksilver Premium or High Performance Gear Lubricant.

#### CHECKING LUBRICANT LEVEL AND REFILLING GEARCASE

- 1. Place outboard in a vertical operating position.
- 2. Remove vent plug from vent hole.

3. Place lubricant tube into the fill hole and add lubricant until it appears at the vent hole.



#### IMPORTANT: Replace sealing washers if damaged.

- 4. Stop adding lubricant. Install the vent plug and sealing washer before removing the lubricant tube.
- 5. Remove lubricant tube and reinstall cleaned fill/drain plug and sealing washer.



### **Checking Power Tilt Fluid**

1. Tilt outboard to the full up position and engage the tilt lock lever.



 Remove fill cap and check fluid level. The fluid level should be even with the bottom of the fill hole. Add Quicksilver or Mercury Precision Lubricants Power Trim & Steering Fluid. If not available, use automotive (ATF) automatic transmission fluid.



#### Submerged Outboard

A submerged outboard will require service within a few hours by an authorized dealer once the outboard is recovered from the water. This immediate attention by a servicing dealer is necessary once the engine is exposed to the atmosphere to minimize internal corrosion damage to the engine.