INSTALLATION MANUAL
75/90/115 OPTIMAX

Important Information

Before starting engine for the first time, prime the oil injection pump. Procedure on page 16.

**CAUTION**

Prevent possible engine damage, Prime the oil injection pump before starting engine for the first time.

Required Fuel

Do not use pre-mixed gas and oil in this engine. Use a clean and fresh recommended gasoline during engine break-in and after engine break-in.

Recommended Oil

Mercury or Quicksilver Optimax/DFI 2-Cycle engine oil is recommended for your engine. If Optimax/DFI 2-Cycle engine oil is not available, we recommend using Mercury or Quicksilver TC-W3 Premium Plus 2-Cycle Oil. Severe engine damage may result from use of an inferior oil.

Avoiding Fuel Flow Restrictions

IMPORTANT: Adding components to the fuel supply system as in filters, valves, fittings, etc. may restrict the fuel flow and could cause engine stalling at low speed, and/or a lean fuel condition at high RPM, that could cause engine damage.

Electric Fuel Pump

If an electric fuel pump is used, the fuel pressure must not exceed 4 psig at the engine. If necessary, install a pressure regulator to regulate the pressure.
Boat Horsepower Capacity

<table>
<thead>
<tr>
<th>U.S. COAST GUARD CAPACITY</th>
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<tr>
<td>MAXIMUM HORSEPOWER</td>
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<tr>
<td>MAXIMUM PERSON CAPACITY</td>
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<tr>
<td>(POUNDS)</td>
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<tr>
<td>MAXIMUM WEIGHT CAPACITY</td>
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Do not overpower or overload the boat. Most boats will carry a required capacity plate indicating the maximum acceptable power and load as determined by the manufacturer following certain federal guidelines. If in doubt, contact your dealer or the boat manufacturer.

**WARNING**

Using an outboard that exceeds the maximum horsepower limit of a boat can: 1. cause loss of boat control 2. place too much weight at the transom, altering the designed flotation characteristics of the boat or 3. cause the boat to break apart, particularly around the transom area. Overpowering a boat can result in serious injury, death, or boat damage.

Start in Gear Protection

The remote control connected to the outboard must be equipped with a start-in-gear protection device. This prevents the engine from starting in gear.

**WARNING**

Avoid serious injury or death from a sudden unexpected acceleration when starting your engine. The design of this outboard requires that the remote control used with it must have a built in start-in-gear protection device.

Selecting Accessories For The Outboard

Genuine Quicksilver Parts and Accessories have been specifically designed and tested for this outboard.

Some accessories not manufactured or sold by Quicksilver are not designed to be safely used with this outboard or outboard operating system. Acquire and read the Installation, Operation, and Maintenance manuals for all selected accessories.

Fuel Tank Installation

**PORTABLE FUEL TANK**

Select a suitable location in boat within engine fuel line length limitations and secure tank in place.

**PERMANENT FUEL TANK**

These should be installed in accordance with industry and federal safety standards which include recommendations applicable to grounding, anti-siphon protection, ventilation, etc.
Installation Specifications

**a** – Transom Opening – Minimum
Single Engine (Remote) – 33-3/8 in. (848 mm)
Dual Engines – 59-3/4 in. (1518 mm)

**b** – Engine Center Line For Dual Engine
26 in. (660mm) Minimum

**Lifting Outboard**

Use Flywheel Puller/Lifting Eye (91-83164M).
Steering Cable

STARBOARD SIDE ROUTED CABLE

1. Lubricate O-ring seal and entire cable end.

2. Insert steering cable into tilt tube.

3. Torque nut to 35 lb. ft. (47.5 N·m).
1. Install steering link rod per illustration.

重要：连接转向电缆到发动机的转向连接杆必须使用特殊螺栓（“a” - 部件编号10-849838）和自锁螺母（“b” & “c” - 部件编号11-34863）。这些螺母绝对不能用普通的螺母（非锁定）替换，因为它们会松动和振动，使连接杆脱开。

警告：转向连接杆的脱开可能导致船只突然、急剧地转向。这种潜在的暴力行为可能导致船上人员被甩到船外，造成严重伤害或死亡。
Determining Recommended Outboard Mounting Height

**NOTE:** Add 5 in. (127mm) for XL models to the listed outboard mounting height.

**IMPORTANT NOTICE TO INSTALLER**

1. The outboard should be mounted high enough on the transom so that the exhaust relief hole will stay at least 1 in. (25.4 mm) above the water line when the engine is running at idle speed. Having the exhaust relief hole above the water line will prevent exhaust restriction. Exhaust restriction will result in poor performance at idle.

2. However, keep in mind that the mounting height (e) of the outboard must not exceed 25 in. (635 mm) for L models, 30 in. (762 mm) for XL models. Mounting the outboard higher may cause damage to the gear case components.

**a.** This solid line is recommended to determine the outboard mounting height.

**b.** These broken lines represent the extremes of known successful outboard mounting height dimensions.

**c.** This line may be preferred to determine outboard mounting height dimension, if maximum speed is the only objective.

**d.** This line may be preferred to determine outboard mounting height dimension for dual outboard installation.

**e.** Outboard mounting height (height of outboard transom brackets from bottom of boat transom). For heights over 22 in. (560mm), a propeller, that is designed for surfacing operation is usually preferred.
Installing Outboard

1. Use transom drilling fixture (91-98234A2) or attach (tape) engine mounting template (located in this manual) to boat transom.

2. Mark and drill four 17/32 in. (13.5mm) mounting holes.

3. Refer to “Determining Recommended Outboard Motor Mounting Height,” preceding and install outboard to the nearest recommended mounting height.

4. Fasten outboard with provided mounting hardware shown.

   - a - 1/2 in. Diameter Bolts (4)
   - b - Flat Washers (4)
   - c - Locknuts (4)
   - d - Flat Washers (4)
   - e - Marine Sealer - Apply to Shanks of Bolts, Not Threads
Electrical, Fuel Hose, and Control Cables

IMPORTANT: Warning Horn Requirement – The remote control or key switch assembly must be wired with a warning horn. This warning horn is used with the engine warning system.

Front Cover Assembly

REMOVAL

Pull up the cowl seal and remove the cover from the bottom cowl.

![Diagram of front cover assembly removal]

a - Screws (2)
b - Cover

INSTALLATION

IMPORTANT: Sufficient slack must exist in engine wiring harness, battery cables, fuel hose, and routed between clamp and engine attachment point, to relieve stress and prevent hoses from being kinked or pinched.

1. Route the fuel hose, wiring and cables through the front cover opening.
2. Route flush hose (if equipped) through front cover opening.
3. Place the neoprene wrap around the wiring, hoses, and control cables as shown. Reinstall the cover and cowl seal.

![Diagram of front cover assembly installation]

a - Neoprene Wrap
b - Screws (2)
c - Cover
d - Flush Hose (if equipped)
Remote Wiring Harness

1. Connect wiring. Push the retainer over the ends of the connectors. This will hold the connectors together. Place the harness connection and retainer into the cable holder located in the bottom cowl has shown.

**a** - Power Trim Connections  
**b** - Wire Connection For Analog Water Temp Gauge – Not Supported by this Engine  
**c** - Connection For Non SmartCraft Analog Trim Gauge  
**d** - Retainer – Push Over Connector Ends  
**e** - Cable Holder
Battery Cable Connections

SINGLE OUTBOARD

- a - Red Sleeve (Positive)
- b - Black Sleeve (Negative)
- c - Starting Battery

DUAL OUTBOARDS

Connect a common ground cable (wire size same as engine battery cables) between negative (–) terminals on starting batteries.

- d - Ground Cable (Same Wire Size As Engine Battery Cable) – Connect Between Negative (–) Terminals
Fuel Hose Connection

PORTABLE FUEL TANK
Select a suitable location in boat within engine fuel line length limitations and secure tank in place.

PERMANENT FUEL TANK
These should be installed in accordance with industry and federal safety standards which include recommendations applicable to grounding, anti-siphon protection, ventilation, etc.

FUEL HOSE SIZE
Minimum fuel line inside diameter (I.D.) is 5/16 in. (8mm), with separate fuel line/fuel tank pickup for each engine.

FUEL HOSE CONNECTION
Fasten remote fuel hose to fitting with hose clamp.

Water Pressure Tubing Connection (Models without SmartCraft Water PSI Gauge)
Make the water pressure gauge hose connection to this tubing as shown.

a - Fuel Hose
b - Hose Clamp – Secure Remote Fuel Hose
c - Water Pressure Tubing (Gray Color)
d - Water Pressure Tube – Insert into Coupler, Pull on Tube to Verify That it is Locked
e - Coupler (859747) – Push In on End of Coupler to Disconnect Plug or Tubing
f - Plug (if equipped) – Remove when Making Coupler Connection
g - Barb Hose Fitting (859731) Provided with Outboard – Install this fitting into Coupler, if a Rubber Hose Connection is Required
Shift Cable Installation

Install cables into the remote control following the instructions provided with the remote control.

**NOTE:** Install the shift cable to the engine first. The shift cable is the first cable to move when the remote control handle is moved out of neutral.

1. Position remote control into neutral.

2. Shift outboard into neutral.

3. Measure the distance (a) between pin and center of barrel pocket.

**a** - Distance Between Pin And Center of Barrel Pocket

**b** - Pin

**c** - Barrel Pocket
4. Push in on the shift cable end (d) until resistance is felt. Adjust the cable barrel (e) to attain distance (a) taken in Step 3.

5. Place cable barrel into pocket. Fasten cable with locknut and flat washer.

6. Check shift cable adjustments as follows:
   a. Shift remote control into forward. The propeller shaft should be locked in gear. If not, adjust the barrel closer to the cable end.
   b. Shift remote control into neutral. The propeller shaft should turn freely without drag. If not, adjust the barrel away from the cable end. Repeat steps a and b.
   c. Shift remote control into reverse while turning propeller. The propeller shaft should be locked in gear. If not, adjust the barrel away from the cable end. Repeat steps a thru c.
   d. Shift remote control back to neutral. The propeller shaft should turn freely without drag. If not, adjust the barrel closer to the cable end. Repeat steps a thru d.

\[ \text{d - Shift Cable End} \]
\[ \text{e - Cable Barrel} \]
\[ \text{f - Place Barrel Into Barrel Pocket} \]
\[ \text{g - Locknut – Tighten locknut then back off locknut 1/4 turn.} \]
\[ \text{h - Flat Washer} \]
Throttle Cable Installation

Install cables into the remote control following the instructions provided with the remote control.

1. Position remote control into neutral.

2. Install throttle cable to the throttle arm with washer and locknut.

3. Adjust the cable barrel so that the installed throttle cable will hold the throttle arm against the idle stop.

4. Place cable barrel into retainer.

5. Lock the retainer and cables in place with the cable latch.

Diagram:

- a - Flat Washer
- b - Locknut – Tighten locknut then back off locknut 1/4 turn
- c - Barrel Retainer
- d - Cable Barrel
- e - Cable Latch
Filling Fuel System

**NOTE:** For initial start of a new engine or for an engine that ran out of fuel, or was drained of fuel, the fuel system should to be filled as follows:

- Squeeze the fuel line primer bulb until it feels firm.
- Turn the ignition key switch to the ON position for three seconds. This operates the electric fuel pump.
- Turn the ignition key switch back to the OFF position, and squeeze the primer bulb again until it feels firm. Turn the ignition key switch to the “ON” position again for three seconds. Continue this procedure until the fuel line primer bulb stays firm.

Filling The Oil Injection Tank

**NOTE:** The oil tank capacity is 5 qt. (4.72 liters).

1. Open the cowl cap. Turn the oil fill cap to the left and remove.

2. Use the chain on the fill cap to check oil level. First ball marker (a) is 1 quart (.94 liters) low and second ball marker (b) is 2 quart (1.89 liters) low.

3. Slowly fill the oil tank with the specified oil. Do **Not** overfill — add only enough oil to bring the oil level up to the bottom of the fill neck (a).

4. Install oil filler cap and re-tighten. Reinstall the cowl cap.
Priming the Oil Injection Pump

**Before starting engine for the first time,** prime the oil injection pump. Priming will remove any air that may be in the pump, oil supply hose, or internal passages.

![Diagram of Oil Injection Pump and Oil Supply Hose]

a - Oil Injection Pump  
b - Oil Supply Hose

**CAUTION**
To prevent damage to the fuel pumps, fill the engine fuel system with fuel. Otherwise the fuel pumps will run without fuel during the priming process.

Prime the oil injection pump as follows:

1. Fill the engine fuel system with fuel. Connect fuel hose and squeeze primer bulb until it feels firm.

2. Turn the ignition key switch to the “ON” position.

3. Within the first 10 seconds after the key switch has been turned on, move the remote control handle from neutral into forward gear 3 to 5 times. This will automatically start the priming process.

**NOTE:** It may take a few minutes for the pump to complete the priming process.
Propeller Installation

**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.

**IMPORTANT:** Propellers used on this product require the Mercury Marine Flo-Torq III type hub 835257A9 or equivalent.

Flo-Torq III Drive Hub Propellers

Flo-Torq III

- a - Forward Thrust Hub
- b - Replaceable Drive Sleeve
- c - Rear Thrust Hub
- d - Propeller Nut Retainer
- e - Propeller Nut

4. Tighten propeller nut to 55 lb-ft (75 Nm). Bend tabs against nut.

**a** - Propeller Nut - Torque To 55 lb-ft (75 Nm)
**b** - Bend Tabs Into Grooves
Trim-In Stop Adjustment

Some outboard boats, particularly some bass boats, are built with a greater than normal transom angle which will allow the outboard to be trimmed further “in” or “under”. This greater trim “under” capability is desirable to improve acceleration, reduce the angle and time spend in a bow high boat attitude during planing off, and in some cases, may be necessary to plane off a boat with aft live wells, given the variety of available propellers and height range of engine installations.

However, once on plane, the engine should be trimmed to a more intermediate position to avoid a bow-down planing condition called “plowing”. Plowing can cause “bow steering” or “over steering” and inefficiently consumes horsepower. In this condition, if attempting a turn or encountering a diagonal, moderate wake, a more abrupt turn than intended may result.

In rare circumstances, the owner may decide to limit the trim under. This can be accomplished by purchasing a stainless steel tilt pin (P/N 17-49930A1) and inserting it through whatever pin hole is desired. The non-stainless steel shipping bolt should not be used in this application other than on a temporary basis.

![WARNING]

Avoid possible serious injury or death. Adjust outboard to an intermediate trim position as soon as boat is on plane to avoid possible ejection due to boat spin-out. Do not attempt to turn boat when engine is trimmed extremely under or in.

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![Diagram]

a - Tilt Pin