Service Manual Outline

Notice

Throughout this publication, “Dangers”, “Warnings” and “Cautions” (accompanied by the International HAZARD Symbol ⚠) are used to alert the mechanic 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

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

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

Notice to Users of This Manual

This service manual has been written and published by the Service Department of Mercury Marine to aid our dealers’ mechanics and company service personnel when servicing the products described herein.

It is assumed that these personnel are familiar with the servicing procedures of these products, or like or similar products manufactured and marketed by Mercury Marine, that they have been trained in the recommended servicing procedures of these products which includes the use of mechanics’ common hand tools and the special Mercury Marine or recommended tools from other suppliers.

We could not possibly know of and advise the service trade of all conceivable procedures by which a service might be performed and of the possible hazards and/or results of each method. We have not undertaken any such wide evaluation. Therefore, anyone who uses a service procedure and/or tool, which is not recommended by the manufacturer, first must completely satisfy himself that neither his nor the products safety will be endangered by the service procedure selected.

All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of publication. As required, revisions to this manual will be sent to all dealers contracted by us to sell and/or service these products.

It should be kept in mind, while working on the product, that the electrical system and ignition system are capable of violent and damaging short circuits or severe electrical shocks. When performing any work where electrical terminals could possibly be grounded or touched by the mechanic, the battery cables should be disconnected at the battery.

Any time the intake or exhaust openings are exposed during service they should be covered to protect against accidental entrance of foreign material which could enter the cylinders and cause extensive internal damage when the engine is started.

It is important to note, during any maintenance procedure replacement fasteners must have the same measurements and strength as those removed. Numbers on the heads of the metric bolts and on the surfaces of metric nuts indicate their strength. American bolts use radial lines for this purpose, while most American nuts do not have strength markings. Mismatched or incorrect fasteners can result in damage or malfunction, or possibly personal injury. Therefore, fasteners removed should be saved for reuse in the same locations whenever possible. Where the fasteners are not satisfactory for re-use, care should be taken to select a replacement that matches the original.

Cleanliness and Care of Outboard Motor

A marine power product is a combination of many machined, honed, polished and lapped surfaces with tolerances that are measured in the ten thousands of an inch./mm. When any product component is serviced, care and cleanliness are important. Throughout this manual, it should be understood that proper cleaning, and protection of machined surfaces and friction areas is a part of the repair procedure. This is considered standard shop practice even if not specifically stated.

Whenever components are removed for service, they should be retained in order. At the time of installation, they should be installed in the same locations and with the same mating surfaces as when removed.

Personnel should not work on or under an outboard which is suspended. Outboards should be attached to work stands, or lowered to ground as soon as possible.

We reserve the right to make changes to this manual without prior notification.

Refer to dealer service bulletins for other pertinent information concerning the products described in this manual.

IMPORTANT INFORMATION

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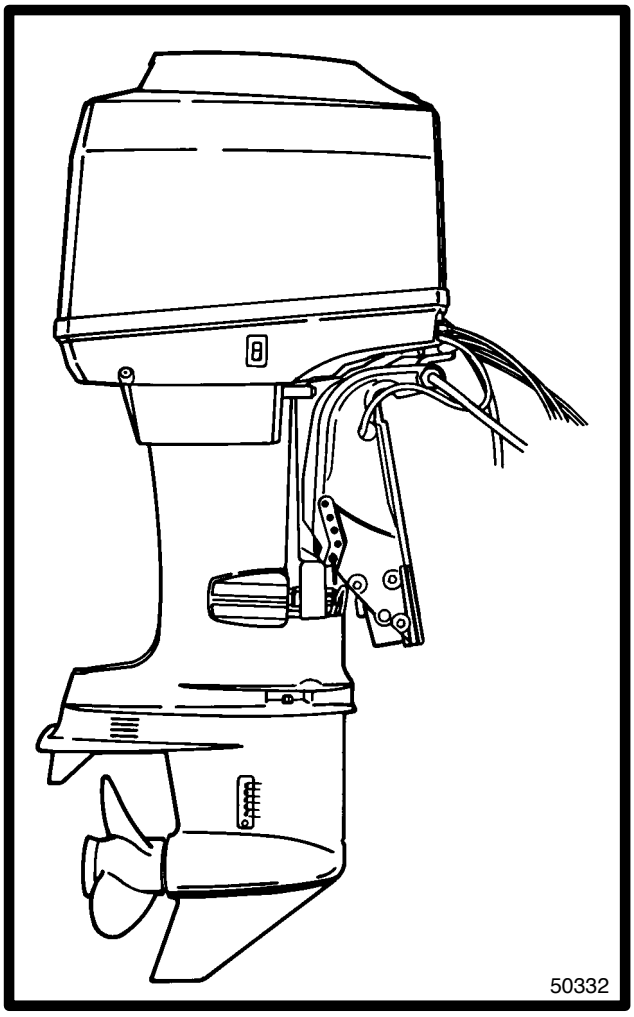

GENERAL INFORMATION and SPECIFICATIONS

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Propeller Information

For in-depth information on marine propellers and boat performance - written by marine engineers - see your Authorized Dealer for the illustrated “What You Should Know About Quicksilver Propellers and Boat Performance Information” (Part No. 90-86144).

How to Use this Manual

The manual is divided into SECTIONS (shown, right) which represents major components and systems.

Some SECTIONS are further divided into PARTS. Each PART has a title page. A “Table of Contents” for the particular PART is printed on the back of the title page.

SECTIONS and PARTS are listed on the “Service Manual Outline” sheet which immediately follows the cover of this book.

Section	Section Heading
1	Important Information
2	Electrical and Ignition
3	Fuel System and Carburetion
4	Powerhead
5	Mid-Section
6	Lower Unit
7	Outboard Installation/Attachments
8	Oil Injection System

General Specifications

Model	40
Horsepower	40
Engine Type	4 Cylinder, In-Line, Two-Stroke
Full Throttle RPM Range	5000-5500
Idle RPM Range (in Forward Gear)	600-700
Piston Displacement	44 cu. in. (721cc)
Cylinder Bore Standard	2.565 in. (65.151mm)
Stroke	2.125 in. (53.975mm)
Ignition Type	Thunderbolt Capacitor Discharge
Firing Order	1-3-2-4
Recommended Spark Plug	NGK BUHW-2
Gear Selection	Forward - Neutral - Reverse
Gear Ratio	2:1
Gear Housing Lubricant Capacity	12.5 fl. oz. (370ml)
Outboard Weight (ELPTO)	192 lbs. (87kg)
Carburetion	2 Carburetors, Center Bowl
Recommended Gasoline	Any leaded or unleaded (lead-free) gasoline, with a minimum posted octane rating of 86 (research octane number 90)
Remote Fuel Tank Capacity: - U.S. Gallons - Imperial Gallons - Liters	 6.6 5.5 25
Recommended Oil	Quicksilver 2-Cycle Outboard Oil
Gasoline/Oil Ratio	50:1
Oil Tank Capacity*	0.935 gal. (3.54 Liters)
Maximum Operation at Full Throttle*	7 Hours
Oil Remaining when Warning Buzzer Sounds*	7.5 fl. oz.
Approximate Running Time Remaining at Wide Open Throttle when Buzzer Sounds*	30 Minutes
Recommended Battery Rating	Minimum Reserve Capacity rating of 100 Minutes and Cold Cranking Amperage of 350 Amperes

*Specification for Oil Injected Model

Propeller Selection

1. Select a propeller that will allow the engine to operate at or near the top of the recommended full throttle RPM range (listed in “Specifications,” preceding) with a normal load. Maximum engine speed (RPM) for propeller selection exists when boat speed is maximum and trim is minimum for that speed. (High RPM, caused by an excessive trim angle, should not be used in determining correct propeller.) Normally, there is a 150-350 RPM change between propeller pitches.
2. If full throttle operation is below the recommended range, the propeller MUST BE changed to a lower pitch to prevent loss of performance and possible engine damage.
3. For better acceleration, such as is needed in water skiing, propping up to 500 RPM above the recommended range is advised. Continuous operation above the recommended maximum RPM, however, is not permissible.
4. After initial propeller installation, the following common conditions may require that the propeller be changed to a lower pitch:
   a. Warmer weather and great humidity will cause an RPM loss.
   b. Operating in a higher elevation causes an RPM loss.
   c. Operating with a damaged propeller or a dirty boat bottom or gear housing will cause an RPM loss.
   d. Operation with an increased load (additional passengers, equipment, pulling skiers, etc.).

Propeller Installation

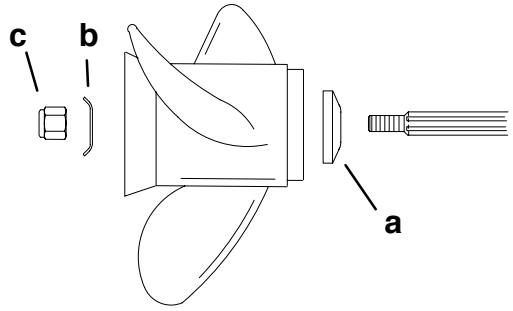
⚠ WARNING

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.

Coat the propeller shaft with Quicksilver Anti-Corrosion Grease or 2-4-C Marine Lubricant with Teflon.

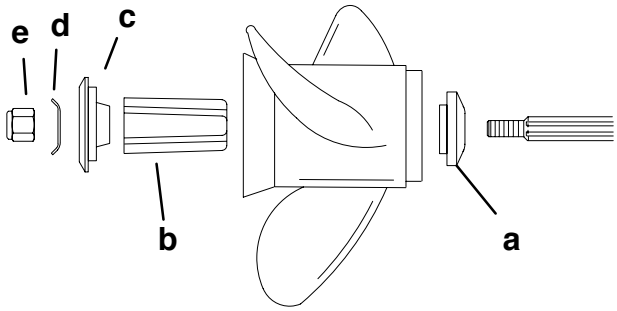
IMPORTANT: To prevent the propeller hub from corroding and seizing to the propeller shaft, especially in salt water, always apply a coat of the recommended lubricant to the entire propeller shaft at the recommended maintenance intervals and also each time the propeller is removed.

Flo-Torq I Drive Hub Propellers



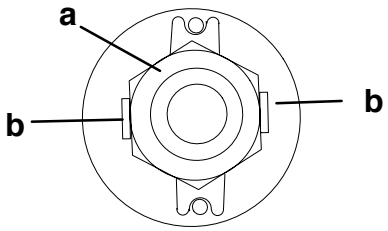
a - Forward Thrust Hub
b - Propeller Nut Retainer
c - Propeller Nut

Flo-Torq II Drive Hub Propellers



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

1. Tighten propeller nut to 55 lb.ft. (75 N·m). Bend tabs against nut.



a - Propeller Nut - Torque To 55 lb. ft. (75 N·m)
b - Bend Tabs Against Nut

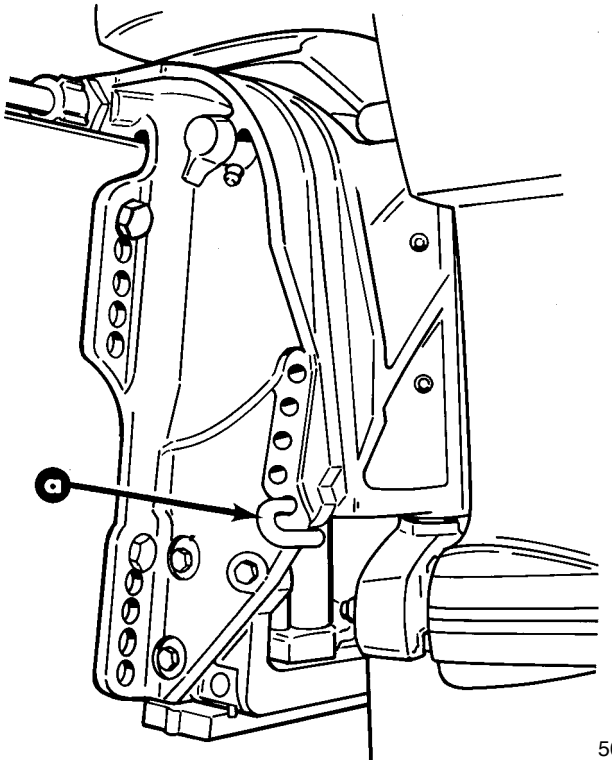
Trim “In” Angle Adjustment

⚠ WARNING

Operating some boats with outboard trimmed to the full “in” trim angle [not using trim adjustment bolt (a)] at planing speed will cause undesirable and/or unsafe steering conditions. Each boat must be water tested for handling characteristics after outboard installation and after any trim adjustments.

IMPORTANT: Some boat/outboard combinations, that do not use the trim adjustment pin (a) and are trimmed to the full “in” trim angle, will not experience any undesirable and/or unsafe steering conditions during planing speed. Thus, not using trim adjustment pin may be desired. However, some boats with outboard trimmed to the full “In” trim angle at planing speeds will cause undesirable and/or unsafe steering conditions. If these steering conditions are experienced, under no circumstances should the outboard be operated without the trim adjustment pin and without the pin adjusted in the proper holes to prevent unsafe handling characteristics.

Water test the boat not using the trim adjustment pin. If undesirable and/or unsafe steering conditions are experienced (boat runs with nose down), install trim adjustment pin in proper hole to prevent unsafe handling characteristics.



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Power Trim System (Models with Power Trim)

General Information

The power trim system is filled at the manufacturer and is ready for use.

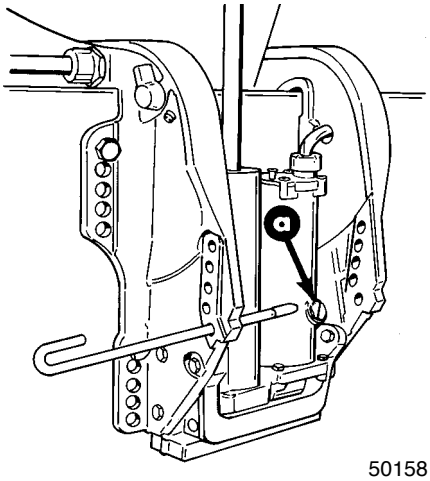
Trim outboard through entire trailering range several times to remove any air from the system.

The trim system is pressurized and is not externally vented.

The outboard can be raised or lowered manually by loosening the manual release valve 2 to 3 turns counterclockwise.

The trim “out” angle of this outboard is not adjustable. The trim system has an internal valve which will automatically stop the outward trim travel at 200 when engine RPM is approximately 2000 RPM or higher; outboard also has to be in water and in gear.

The outboard can be operated beyond the 200 trim limit for operating outboard in shallow water if engine RPM is kept below approximately 2000 RPM.



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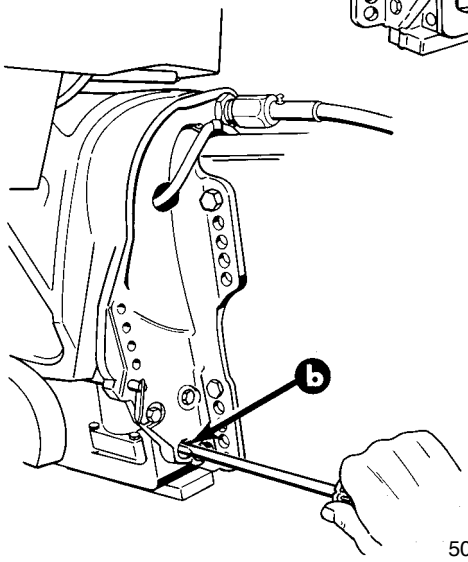

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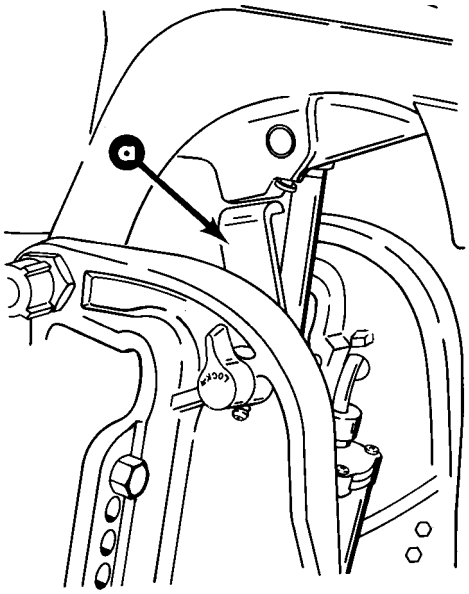
a - Fill Screw (System is Pressurized, DO NOT Open Unless Outboard is Tilted to Full Up Position)
b - Manual Tilt Release Valve Location

Checking Trim System Fluid Level

IMPORTANT: This trim system is pressurized. Remove fill screw when outboard is trimmed to the full "up" position. Retighten fill screw securely.

1. Trim outboard to full "up" position. Engage tilt lock level (a). Trim system fluid can only be checked when outboard is in this position.



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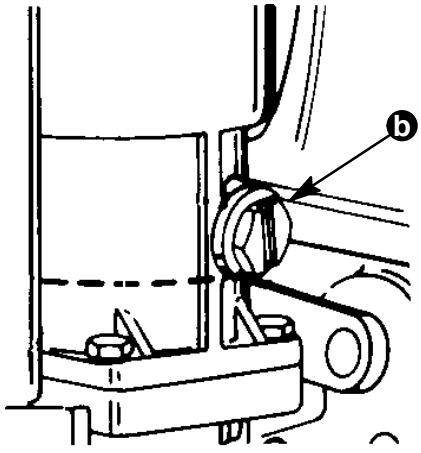
2. Remove fill screw and check fluid level. Fluid level should be to bottom of threads in fill hole (b).
3. If necessary, add Quicksilver Power Trim & Steering Fluid or; Automatic Transmission Fluid (ATF) Type F, FA or Dexron 11 fluid to trim system.
4. Reinstall fill screw.



Trimming (Models with Power Trim)

NOTE: *Because varying hull designs react differently in various degrees of rough water, it is recommended to experiment with trim positions to determine whether trimming up or down will improve the ride in rough water.*

When trimming your outboard from a mid-trim position (trim tab in neutral straight fore-and-aft position), you can expect the following results:

Trimming Outboard "Out" ("Up") Characteristics

⚠ WARNING

Excessive trim "out" also may reduce the stability of some high speed hulls. To correct instability at high speed, reduce the power GRADUALLY and trim the outboard "In" slightly before resuming high speed operation. (Rapid reduction in power will cause a sudden change of steering torque and may cause additional momentary boat instability.)

1. Will lift bow of boat, generally increasing top speed.
2. Transfers steering torque harder to left on standard or slightly elevated transom installation (single outboard).
3. Increases clearance over submerged objects.
4. In excess, can cause porpoising and/or ventilation.
5. If trimmed out beyond the water pickup, reduced water supply can cause serious overheating.

Trimming Outboard "In" ("Down") Characteristics

⚠ WARNING

Excessive speed at minimum trim "in" may cause undesirable and/or unsafe steering conditions. Each boat should be tested for handling characteristics after any adjustment is made to the trim angle (trim adjustment pin relocation).

1. Will help planing off, particularly with a heavy load.
2. Usually improves ride in choppy water.