



**MERCURY**<sup>®</sup>



**Outboard  
Operation  
Maintenance  
Warranty  
Installation  
Manual**

8M0100515 1214 eng

75/90/115/115 Pro XS/125 OptiMax and 80 Jet

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**Declaration of Conformity – For Recreational Craft Propulsion Engines with the Requirements of Directive 94/25/EC as amended by Directive 2003/44/EC**

**Name of engine manufacturer:** Mercury Marine  
**Address:** W6250 W. Pioneer Road, P.O. Box 1939  
**Town:** Fond du Lac, WI      **Post Code:** 54936-1939      **Country:** USA

**Name of Authorized Representative:** Brunswick Marine in EMEA Inc.  
**Address:** Parc Industriel de Petit-Rechain  
**Town:** Verviers      **Post Code:** B-4800      **Country:** Belgium

**Name of Notified Body for exhaust emission assessment:** Det Norske Veritas AS  
**Address:** Veritasveien 1  
**Town:** Hovik      **Post Code:** 1322      **Country:** Norway      **ID Number:** 0575

**Name of Notified Body for noise emission assessment:** Det Norske Veritas AS  
**Address:** Veritasveien 1  
**Town:** Hovik      **Post Code:** 1322      **Country:** Norway      **ID Number:** 0575

**Conformity assessment module used for exhaust emissions:**       B+C     B+D     B+E     B+F     G     H

**Conformity assessment module used for noise emissions:**       A     Aa     G     H

**Other Community Directives applied: Safety of Machinery Directive 2006/42/EC; Electromagnetic Compatibility Directive 2004/108/EC**

**Description of Engines and Essential Requirements**

Engine Type	Fuel Type	Combustion Cycle
<input checked="" type="checkbox"/> Outboard engine	<input checked="" type="checkbox"/> Petrol	<input checked="" type="checkbox"/> 2 stroke

**Identification of Engines Covered by This Declaration of Conformity**

Name of engine family	Unique engine identification number(s) or engine family code(s): starting serial number	Module H Certificate
1.5L OptiMax 75, 90, 115, 115 Pro XS, 125 hp, 80 Jet	0B228000	RCD-H-2 Rev 4
2.5L OptiMax 135, 150, 150 Pro XS, 175 hp	0B228000	RCD-H-2 Rev 4
3.0L OptiMax 200, 200 Pro XS, 225, 250 hp	0B228000	RCD-H-2 Rev 4

Essential requirements	Standards	Other normative document/ method	Technical file	Please specify in more detail (* = mandatory standard)
<b>Annex 1.B—Exhaust Emissions</b>				
B.1 Engine identification	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
B.2 Exhaust emission requirements	<input checked="" type="checkbox"/> *	<input type="checkbox"/>	<input type="checkbox"/>	* EN ISO 8178-1:1996
B.3 Durability	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
B.4 Owner's manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ISO 8665: 2006
<b>Annex 1.C—Noise Emissions</b>				
C.1 Noise emission levels	<input checked="" type="checkbox"/> *	<input type="checkbox"/>	<input type="checkbox"/>	EN ISO 14509
C.2 Owner's manual	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Owner's manual

This declaration of conformity is issued under the sole responsibility of the manufacturer. I declare on behalf of the engine manufacturer that the engines mentioned preceding complies with all applicable essential requirements in the way specified.

**Name / function:**

John Pfeifer, President,  
Mercury Marine

**Date and place of issue:**

November 28, 2014  
Fond du Lac, Wisconsin, USA

**Welcome**

You have selected one of the finest outboards available. It incorporates numerous design features to ensure operating ease and durability.

With proper care and maintenance, you will enjoy using this product for many boating seasons. To ensure maximum performance and carefree use, we ask that you thoroughly read this manual.

The Operation, Maintenance and Warranty Manual contains specific instructions for using and maintaining your product. We suggest that this manual remain with the product for ready reference whenever you are on the water.

Thank you for purchasing one of our products. We sincerely hope your boating will be pleasant!

Mercury Marine

**EPA Emissions Regulations**

Outboards sold by Mercury Marine in the United States 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 engine repair establishment or individual.

Engines are labeled with an emission control information decal as permanent evidence of EPA certification.

**▲ WARNING**

**The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.**

## Warranty Message

The product you have purchased comes with a limited warranty from Mercury Marine. The terms of the warranty are set forth in the **Warranty Information** section of this manual. The warranty statement contains a description of what is covered, what is not covered, the duration of coverage, how to best obtain warranty coverage, important disclaimers and limitations of damages, and other related information. Please review this information.

The description and specifications contained herein were in effect at the time this manual was approved for printing. Mercury Marine, whose policy is one of continued improvement, reserves the right to discontinue models at any time, and to change specifications, designs, methods, or procedures without notice and without incurring obligation.

Mercury Marine, Fond du Lac, Wisconsin, U.S.A.

## Mercury Premier Service

Mercury Marine evaluates the service performance of its dealers and assigns its highest rating of Mercury Premier to those demonstrating an exceptional commitment to service.

### Earning a Mercury Premier Service rating means a dealer:

- Achieves a high 12-month service Customer Satisfaction Index (CSI) score for warranty service.
- Possesses all of the necessary service tools, test equipment, manuals, and parts books.
- Employs at least one certified or master technician.
- Provides timely service for all Mercury Marine customers.
- Offers extended service hours and mobile service, when appropriate.
- Uses, displays, and stocks an adequate inventory of genuine Mercury Precision Parts.
- Offers a clean, neat shop with well-organized tools and service literature.

## Copyright and Trademark Information

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# WARRANTY INFORMATION

## Warranty Registration United States and Canada

To be eligible for warranty coverage, the product must be registered with Mercury Marine.

At the time of sale, the selling dealer should complete the warranty registration and immediately submit it to Mercury Marine via MercNET, e-mail, or mail. Upon receipt of this warranty registration, Mercury Marine will record the registration.

A copy of the warranty registration should be provided to you by your selling dealer.

**NOTE:** *Registration lists must be maintained by Mercury Marine and any dealer of Mercury Marine products sold in the United States, should a safety recall notification under the Federal Safety Act be required.*

You may change your registered address at any time, including at time of warranty claim, by calling Mercury Marine or sending a letter or fax with your name, old address, new address, and engine serial number to Mercury Marine's warranty registration department. Your dealer can also process this change of information.

Mercury Marine  
Attn: Warranty Registration Department  
W6250 Pioneer Road  
P.O. Box 1939  
Fond du Lac, WI 54936-1939  
920-929-5054  
Fax +1 920 907 6663

## OUTSIDE UNITED STATES AND CANADA

For products purchased outside the United States and Canada, contact the distributor in your country, or the Marine Power Service Center closest to you.

## Transfer of Warranty United States and Canada

The limited warranty is transferable to a subsequent purchaser, but only for the remainder of the unused portion of the limited warranty. This will not apply to products used for commercial applications.

To transfer the warranty to the subsequent owner, send or fax a copy of the bill of sale or purchase agreement, new owner's name, address, and engine serial number to Mercury Marine's warranty registration department. In the United States and Canada, mail to:

Mercury Marine  
Attn: Warranty Registration Department  
W6250 Pioneer Road  
P.O. Box 1939  
Fond du Lac, WI 54936-1939  
920-929-5054  
Fax +1 920 907 6663

# WARRANTY INFORMATION

Upon processing the transfer of warranty, Mercury Marine will record the new owner's information.

There is no charge for this service.

## **OUTSIDE THE UNITED STATES AND CANADA**

For products purchased outside the United States and Canada, contact the distributor in your country, or the Marine Power Service Center closest to you.

## **Transfer of Mercury Product Protection (Extended Service Coverage) Plan United States and Canada**

The remaining coverage period of the Product Protection Plan is transferable to the subsequent purchaser of the engine within thirty (30) days from the date of sale. Contracts not transferred within thirty (30) days of the subsequent purchase will no longer be valid and the product will no longer be eligible for coverage under the terms of the contract.

To transfer the plan to the subsequent owner, contact Mercury Product Protection or an authorized dealer to receive a Request for Transfer form. Submit to Mercury Product Protection a receipt/bill of sale, a completed Request of Transfer form, and a check payable to Mercury Marine in the amount of \$50.00 (per engine) to cover the transfer fee.

Plan coverage is not transferable from one product to another product or for noneligible applications.

The certified preowned engine plans are not transferable.

For help or assistance, contact Mercury Product Protection Department at 1-888-427-5373 from 7:30 a.m. to 4:30 p.m. CST, Monday–Friday or e-mail [mpp\\_support@mercmarine.com](mailto:mpp_support@mercmarine.com).

## **Mercury Jet Products Limited Warranty**

### **UNITED STATES AND CANADA**

*Outside the United States and Canada - Check with your local distributor.*

### **WHAT IS COVERED**

Mercury Marine warrants its new Jet products to be free of defects in material and workmanship during the period described below.

# WARRANTY INFORMATION

## DURATION OF COVERAGE

This Limited Warranty provides coverage for one (1) year from either the date the product is first sold, or the date on which the product is first put into service, whichever occurs first. The repair or replacement of parts, or the performance of service under this warranty, does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred from one recreational use customer to a subsequent recreational use customer upon proper reregistration of the product. Unexpired warranty coverage cannot be transferred either to or from a commercial use customer. Commercial use is defined as any work or employment related use of the product, or any use of the product which generates income, for any part of the warranty period, even if the product is only occasionally used for such purposes. Warranty coverage may be terminated for used repossessed product; or product purchased at auction, from a salvage yard, or from an insurance company.

## CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE

Warranty coverage is available only to retail customers that purchase from a dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified predelivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Routine maintenance outlined in the Operation and Maintenance Manual must be timely performed in order to maintain warranty coverage. Mercury Marine reserves the right to make warranty coverage contingent upon proof of proper maintenance.

## WHAT MERCURY WILL DO

Mercury's sole and exclusive obligation under this warranty is limited to, at our option, repairing a defective part, replacing such part or parts with new or Mercury Marine certified remanufactured parts, or refunding the purchase price of the Mercury product. Mercury reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

# WARRANTY INFORMATION

## HOW TO OBTAIN WARRANTY COVERAGE

The customer must provide Mercury with a reasonable opportunity to repair, and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Mercury dealer authorized to service the product. If purchaser cannot deliver the product to such a dealer, written notice must be given to Mercury. We will then arrange for the inspection and any covered repair. Purchaser, in that case, shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related labor and material, and any other expenses associated with that service. Purchaser shall not, unless requested by Mercury, ship the product or parts of the product directly to Mercury. The warranty registration card is the only valid registration identification and must be presented to the dealer at the time warranty service is requested in order to obtain coverage.

## WHAT IS NOT COVERED

This limited warranty does not cover routine maintenance items, tune ups, adjustments, normal wear and tear, damage caused by abuse, abnormal use, use of a propeller or gear ratio that does not allow the engine to run in its recommended wide-open throttle RPM range (see the Operation and Maintenance Manual), operation of the product in a manner inconsistent with the recommended operation/duty cycle section of the Operation and Maintenance Manual, neglect, accident, submersion, improper installation (proper installation specifications and techniques are set forth in the installation instructions for the product), improper service, use of an accessory or part not manufactured or sold by us, jet pump impellers and wear rings or liners, operation with fuels, oils, or lubricants which are not suitable for use with the product (see the Operation and Maintenance Manual), alteration or removal of parts, water entering the engine through the fuel intake, air intake, or exhaust system, or damage to the product from insufficient cooling water caused by blockage of the cooling system by a foreign body, or running the engine out of water. Use of the product for racing or other competitive activity, or operating with racing modifications, at any point, even by a prior owner of the product, voids the warranty.

Expenses related to haul-out, launch, towing, storage, telephone, rental, inconvenience, slip fees, insurance coverage, loan payments, loss of time, loss of income, or any other type of incidental or consequential damages are not covered by this warranty. Also, expenses associated with the removal and/or replacement of boat partitions or material caused by boat design for access to the product are not covered by this warranty.

No individual or entity, including Mercury Marine authorized dealers, has been given authority by Mercury Marine to make any affirmation, representation, or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against Mercury Marine.

# WARRANTY INFORMATION

For additional information regarding events and circumstances covered by this warranty, and those that are not, see the Warranty Coverage section of the Operation and Maintenance Manual, incorporated by reference into this warranty.

## DISCLAIMERS AND LIMITATIONS

**THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/COUNTRIES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS, AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.**

## 3 Year Limited Warranty Against Corrosion

**WHAT IS COVERED:** Mercury Marine warrants that each new Mercury, Mariner, Mercury Racing, Sport-Jet, M<sup>2</sup> Jet Drive, Tracker by Mercury Marine Outboard, Mercury MerCruiser Inboard or Sterndrive Engine (Product) will not be rendered inoperative as a direct result of corrosion for the period of time described below.

**DURATION OF COVERAGE:** This limited corrosion warranty provides coverage for three (3) years from either the date the product is first sold, or the date on which the product is first put into service, whichever occurs first. The repair or replacement of parts, or the performance of service under this warranty, does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred to subsequent (noncommercial use) purchaser upon proper reregistration of the product.

**CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE:** Warranty coverage is available only to retail customers that purchase from a Dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified predelivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Corrosion prevention devices specified in the Operation and Maintenance Manual must be in use on the boat, and routine maintenance outlined in the Operation and Maintenance Manual must be timely performed (including, without limitation, the replacement of sacrificial anodes, use of specified lubricants, and touch-up of nicks and scratches) in order to maintain warranty coverage. Mercury Marine reserves the right to make warranty coverage contingent upon proof of proper maintenance.

# WARRANTY INFORMATION

**WHAT MERCURY WILL DO:** Mercury's sole and exclusive obligation under this warranty is limited to, at our option, repairing a corroded part, replacing such part or parts with new or Mercury Marine certified remanufactured parts, or refunding the purchase price of the Mercury product. Mercury reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

**HOW TO OBTAIN WARRANTY COVERAGE:** The customer must provide Mercury with a reasonable opportunity to repair, and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Mercury dealer authorized to service the product. If purchaser cannot deliver the product to such a dealer, written notice must be given to Mercury. We will then arrange for the inspection and any covered repair. Purchaser, in that case, shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related labor and material, and any other expenses associated with that service. Purchaser shall not, unless requested by Mercury, ship the product or parts of the product directly to Mercury. Proof of registered ownership must be presented to the dealer at the time warranty service is requested in order to obtain coverage.

**WHAT IS NOT COVERED:** This limited warranty does not cover electrical system corrosion; corrosion resulting from damage, corrosion which causes purely cosmetic damage, abuse, or improper service; corrosion to accessories, instruments, steering systems; corrosion to factory installed jet drive unit; damage due to marine growth; product sold with less than a one year limited Product warranty; replacement parts (parts purchased by customer); products used in a commercial application. Commercial use is defined as any work or employment related use of the product, or any use of the product which generates income, for any part of the warranty period, even if the product is only occasionally used for such purposes.

Corrosion damage caused by stray electrical currents (onshore power connections, nearby boats, submerged metal) is not covered by this corrosion warranty and should be protected against by the use of a corrosion protection system, such as the Mercury Precision Parts or Quicksilver MerCathode system and/or Galvanic Isolator. Corrosion damage caused by improper application of copper base antifouling paints is also not covered by this limited warranty. If antifouling protection is required, Tri-Butyl-Tin-Adipate (TBTA) base antifouling paints are recommended on Outboard and MerCruiser boating applications. In areas where TBTA base paints are prohibited by law, copper base paints can be used on the hull and transom. Do not apply paint to the outboard or MerCruiser product. In addition, care must be taken to avoid an electrical interconnection between the warranted product and the paint. For MerCruiser product, an unpainted gap of at least 38 mm (1.5 in.) should be left around the transom assembly. Refer to the Operation and Maintenance Manual for additional details.



# WARRANTY INFORMATION

For additional information regarding events and circumstances covered by this warranty, and those that are not, see the Warranty Coverage section of the Operation and Maintenance Manual, incorporated by reference into this warranty.

## **DISCLAIMERS AND LIMITATIONS:**

**THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/COUNTRIES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.**

## **Warranty Coverage and Exclusions**

The purpose of this section is to help eliminate some of the more common misunderstandings regarding warranty coverage. The following information explains some of the types of services that are not covered by warranty. The provisions set forth following have been incorporated by reference into the Three Year Limited Warranty Against Corrosion Failure, the International Limited Outboard Warranty, and the United States and Canada Limited Outboard Warranty.

Keep in mind that warranty covers repairs that are needed within the warranty period because of defects in material and workmanship. Installation errors, accidents, normal wear, and a variety of other causes that affect the product are not covered.

Warranty is limited to defects in material or workmanship, but only when the consumer sale is made in the country to which distribution is authorized by us. Should you have any questions concerning warranty coverage, contact your authorized dealer. They will be pleased to answer any questions that you may have.

## **GENERAL EXCLUSIONS FROM WARRANTY**

1. Minor adjustments and tune-ups, including checking, cleaning, or adjusting spark plugs, ignition components, carburetor settings, filters, belts, controls, and checking lubrication made in connection with normal services.
2. Factory installed jet drive units - Specific parts excluded from the warranty are: the jet drive impeller and jet drive liner damaged by impact or wear, and water damaged driveshaft bearings as a result of improper maintenance.

# WARRANTY INFORMATION

3. Damage caused by neglect, lack of maintenance, accident, abnormal operation, or improper installation or service.
4. Haul-out, launch, towing charges, removal and/or replacement of boat partitions or material because of boat design for necessary access to the product, all related transportation charges and/or travel time, etc. Reasonable access must be provided to the product for warranty service. Customer must deliver product to an authorized dealer.
5. Additional service work requested by customer other than that necessary to satisfy the warranty obligation.
6. Labor performed by other than an authorized dealer may be covered only under the following circumstances: when performed on emergency basis (providing there are no authorized dealers in the area who can perform the work required or have no facilities to haul-out, etc., and prior factory approval has been given to have the work performed at this facility).
7. All incidental and/or consequential damages (storage charges, telephone or rental charges of any type, inconvenience or loss of time or income) are the owner's responsibility.
8. Use of other than Mercury Precision or Quicksilver parts when making warranty repairs.
9. Oils, lubricants, or fluids changed as a matter of normal maintenance is customer's responsibility unless loss or contamination of same is caused by product failure that would be eligible for warranty consideration.
10. Participating in or preparing for racing or other competitive activity or operating with a racing type lower unit.
11. Engine noise does not necessarily indicate a serious engine problem. If diagnosis indicates a serious internal engine condition which could result in a failure, condition responsible for noise should be corrected under the warranty.
12. Lower unit and/or propeller damage caused by striking a submerged object is considered a marine hazard.
13. Water entering engine through the fuel intake, air intake, or exhaust system or submersion.
14. Failure of any parts caused by lack of cooling water, which results from starting motor out of water, foreign material blocking inlet holes, motor being mounted too high, or trimmed too far out.
15. Use of fuels and lubricants which are not suitable for use with or on the product. Refer to the **Maintenance** section.
16. Our limited warranty does not apply to any damage to our products caused by the installation or use of parts and accessories which are not manufactured or sold by us. Failures which are not related to the use of those parts or accessories are covered under warranty if they otherwise meet the terms of the limited warranty for that product.

# WARRANTY INFORMATION

## U.S. EPA Emissions Limited Warranty

Consistent with the obligations created by 40 CFR Part 1045, Subpart B, Mercury Marine provides a five year or 175 hours of engine use warranty, whichever occurs first, to the retail customer, that the engine is designed, built, and equipped so as to conform at the time of sale with applicable regulations under section 213 of the Clean Air Act, and that the engine is free from defects in materials and workmanship that cause the engine to fail to conform with applicable regulations. This emission-related warranty covers all the components listed in the **Emission Control System Components**.

## Emission Control System Components

The EPA and California emission-related warranty covers all the following list of components:

### COMPONENTS OF THE EMISSIONS CONTROL SYSTEM:

1. Fuel metering system
  - a. Carburetor and internal parts (and/or pressure regulator or fuel injection system)
  - b. Cold start enrichment system
  - c. Intake valves
2. Air induction system
  - a. Intake manifold
  - b. Turbocharger or supercharger systems (where applicable)
3. Ignition system
  - a. Spark plugs
  - b. Magneto or electronic ignition system
  - c. Spark advance/retard system
  - d. Ignition coil and/or control module
  - e. Ignition wires
4. Lubrication system (4-Stroke engines excluded)
  - a. Oil pump and internal parts
  - b. Oil injectors
  - c. Oil meter
5. Exhaust system
  - a. Exhaust manifold
  - b. Exhaust valves
6. Miscellaneous items used in above systems
  - a. Hoses, clamps, fittings, tubing, sealing gaskets or devices, and mounting hardware
  - b. Pulleys, belts, and idlers
  - c. Vacuum, temperature, check and time sensitive valves and switches

# WARRANTY INFORMATION

## d. Electronic controls

The emission-related warranty does not cover components whose failure would not increase an engine's emissions on any regulated pollutant.

## California Emissions Limited Warranty

The California Air Resources Board has promulgated air emission regulations for outboard engines. The regulations apply to all outboard engines sold to retail consumers in California, and which were manufactured for the 2001 model year and later. Mercury Marine, in compliance with those regulations, provides this limited warranty for the emission control systems (see the components listed in the **Emission Control System Components**), and further warrants that the outboard engine was designed, built, and equipped to conform with all applicable regulations adopted by the California Air Resources Board pursuant to its authority in Chapters 1 and 2, Part 5, Division 26 of the Health and Safety Code. For information regarding the limited warranty for the nonemission-related components of the outboard, please see the limited warranty statement for your outboard.

**WHAT IS COVERED:** Mercury Marine warrants the components of the emissions control systems (see the components listed in the **Emission Control System Components**) of its new, 2001 model year and later outboards, sold by a California dealer to retail customers residing in California, to be free from defects in material or workmanship, that cause the failure of a warranted part to be identical in all material respects to that part as described in the application of Mercury Marine for certification from the California Air Resources Board, for the period of time, and under the conditions, identified below. The cost to diagnose a warranty failure is covered under the warranty (if the warranty claim is approved). Damage to other engine components caused by the failure of a warranted part will also be repaired under warranty.

**DURATION OF COVERAGE:** This limited warranty provides coverage for the components of the emissions control systems of new, 2001 model year and later outboards, sold to retail customers in California for four (4) years from either the date the product is first sold, or first put into service, whichever occurs first, or the accumulation of 250 hours of engine operation (as determined by the engine's hour meter, if any). Emission-related normal maintenance items such as spark plugs and filters, that are on the warranted parts list, are warranted up to their first required replacement interval only. Refer to **Emission Control System Components and Maintenance Schedule**. The repair or replacement of parts, or the performance of service under this warranty, does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred to a subsequent purchaser. (See instructions on transfer of warranty.)

# WARRANTY INFORMATION

**HOW TO OBTAIN WARRANTY COVERAGE:** The customer must provide Mercury with a reasonable opportunity to repair and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Mercury dealer authorized to service the product. If purchaser cannot deliver the product to such a dealer, please notify Mercury Marine and Mercury will then arrange for the inspection and any covered repair. Purchaser, in that case, shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related labor and material, and any other expenses associated with that service. Purchaser shall not, unless requested by Mercury, ship the product or parts of the product directly to Mercury.

**WHAT MERCURY WILL DO:** Mercury Marine's sole and exclusive obligation under this warranty is limited to, at our expense and at our option, repairing or replacing defective parts with new or Mercury Marine certified remanufactured parts, or refunding the purchase price of the Mercury product. Mercury reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

**WHAT IS NOT COVERED:** This limited warranty does not cover routine maintenance items, tune-ups, adjustments, normal wear and tear, damage caused by abuse, abnormal use, use of a propeller or gear ratio that does not allow the engine to run in its recommended wide-open throttle RPM range (see **General Information - Specifications**), operation of the product in a manner inconsistent with the recommended operation procedures, neglect, accident, submersion, improper installation (proper installation specifications and techniques are set forth in the installation instructions for the product), improper service, jet pump impellers and liners, operation with fuels, oils, or lubricants which are not suitable for use with the product (see **Fuel and Oil**), alteration or removal of parts.

Expenses related to haul-out, launch, towing, storage, telephone, rental, inconvenience, slip fees, insurance coverage, loan payments, loss of time, loss of income, or any other type of incidental or consequential damages are not covered by this warranty. Also, expenses associated with the removal and/or replacement of boat partitions or material caused by boat design for access to the product are not covered by this warranty.

Nonwarranty maintenance, replacement, or repair of emission control devices and systems may be performed by any marine engine repair establishment or individual. The use of non-Mercury parts for nonwarranty maintenance or repairs will not be grounds for disallowing other warranty work. The use of add-on (as defined at section 1900 (b)(1) and (b)(10) of Title 13 of the California Code of Regulations) or modified parts not exempted by the California Air Resources Board may be grounds for disallowing a warranty claim, at the discretion of Mercury Marine. Failures of warranted parts caused by the use of a nonexempted add-on or modified part will not be covered.

# WARRANTY INFORMATION

## DISCLAIMERS AND LIMITATIONS

THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/COUNTRIES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.

If you have any questions regarding your warranty rights and responsibilities, you should contact Mercury Marine at 1-920-929-5040.

## California Air Resources Board Explanation of Your California Emission Control Warranty Statement

**YOUR WARRANTY RIGHTS AND OBLIGATIONS:** The California Air Resources Board is pleased to explain the emission control system warranty on your 2014–2015 model year outboard engine. In California, new outboard engines must be designed, built, and equipped to meet the State's stringent anti-smog standards. Mercury Marine must warrant the emission control system on your outboard engine for the periods of time listed below, provided there has been no abuse, neglect, or improper maintenance of your outboard engine.

Your emission control system may include parts such as the carburetor or fuel injection system, the ignition system, and catalytic converter. Also included may be hoses, belts, connectors, and other emission-related assemblies.

Where a warrantable condition exists, Mercury Marine will repair your outboard engine at no cost to you, including diagnosis, parts, and labor.

**MANUFACTURER'S WARRANTY COVERAGE:** Select emission control parts from model year 2001 and later outboard engines are warranted for four (4) years, or for 250 hours of use, whichever first occurs. However, warranty coverage based on the hourly period is only permitted for outboard engines and personal watercraft equipped with hour meters as defined in s 2441(a)(13) or their equivalent. If any emission-related part on your engine is defective under warranty, the part will be repaired or replaced by Mercury Marine.

**OWNER'S WARRANTY RESPONSIBILITIES:** As the outboard engine owner, you are responsible for the performance of the required maintenance listed in the **Maintenance** section. Mercury Marine recommends that you retain all receipts covering maintenance on your outboard engine, but Mercury Marine cannot deny warranty solely for the lack of receipts or your failure to ensure the performance of all scheduled maintenance.

# WARRANTY INFORMATION

As the outboard engine owner, you should, however, be aware that Mercury Marine may deny you warranty coverage if your outboard engine or a part has failed due to abuse, neglect, improper maintenance, or unapproved modifications.

You are responsible for presenting your outboard to a Mercury dealer authorized to service the product as soon as a problem exists. The warranty repairs will be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact Mercury Marine at 1-920-929-5040.

## Emission Certification Star Label




Outboards are labeled on the cowl with one of the following star labels.

**The symbol for a cleaner marine engine means:**

**Cleaner air and water** - for a healthier lifestyle and environment.

**Better fuel economy** - burns up to 30–40 percent less gas and oil than conventional carbureted two-stroke engines, saving money and resources.

**Longer emission warranty** - protects consumer for worry-free operation.

 <p>22531</p>	<p><b>One Star - Low Emission</b></p> <p>The One Star label identifies engines that meet the Air Resources Board's 2001 exhaust emissions standards. Engines meeting these standards have 75% lower emissions than conventional carbureted two-stroke engines. These engines are equivalent to the U.S. EPA's 2006 standards for marine engines.</p>
 <p>42537</p>	<p><b>Two Stars - Very Low Emission</b></p> <p>The Two Star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2004 exhaust emissions standards. Engines meeting these standards have 20% lower emissions than One Star - Low Emission engines.</p>
 <p>42538</p>	<p><b>Three Stars - Ultra Low Emission</b></p> <p>The Three Star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2008 exhaust emissions standards or the Sterndrive and Inboard marine engine 2003-2008 exhaust emission standards. Engines meeting these standards have 65% lower emissions than One Star - Low Emission engines.</p>

# WARRANTY INFORMATION



## Four Stars - Super Ultra Low Emission

The Four Star label identifies engines that meet the Air Resources Board's Sterndrive and Inboard marine engine 2009 exhaust emission standards. Personal Watercraft and Outboard marine engines may also comply with these standards. Engines meeting these standards have 90% lower emissions than One Star - Low Emission engines.

## Warranty Policy—Australia and New Zealand

### MERCURY/MARINER OUTBOARD LIMITED WARRANTY—AUSTRALIA AND NEW ZEALAND POLICY

This limited warranty is given by Marine Power International Pty Ltd ACN 003 100 007 of 41–71 Bessemer Drive, Dandenong South, Victoria 3175 Australia (telephone (61) (3) 9791 5822) e-mail: [merc\\_info@mercmarine.com](mailto:merc_info@mercmarine.com).

#### What is Covered

Mercury Marine warrants its new products to be free of defects in material and workmanship during the period described following. The benefits to the consumer given by the warranty are in addition to other rights and remedies of the consumer under a law in relation to the goods or services to which the warranty relates.

#### Guarantees Under Australian Consumer Law

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

#### Warranty Period for Recreational Use

This Limited Warranty provides coverage for three (3) years from the date the product is first sold to a recreational use retail purchaser, or the date on which the product is first put into service, whichever occurs first. Unexpired warranty coverage can be transferred to a subsequent recreational use customer upon proper registration of the product.

#### Warranty Period for Commercial Use

Commercial users of these products receive warranty coverage under this Limited Warranty of one (1) year from the date of first retail sale, or one (1) year from the date on which the product was first put into service, whichever occurs first. Commercial use is defined as any work or employment related use of the product, or any use of the product which generates income, for any part of the warranty period, even if the product is only occasionally used for such purposes. Unexpired warranty coverage cannot be transferred either to or from a commercial use customer.



# WARRANTY INFORMATION

## **Conditions That Must Be Met to Obtain Warranty Coverage**

Warranty coverage under this Limited Warranty is available only to retail customers that purchase from a Dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified predelivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Inaccurate warranty registration information regarding recreational use, or subsequent change of use from recreational to commercial (unless properly registered) may void the warranty at the sole discretion of Mercury Marine. Routine maintenance outlined in the Operation and Maintenance Manual must be timely performed in order to maintain warranty coverage. Mercury Marine reserves the right to make warranty coverage contingent upon proof of proper maintenance.

## **What Mercury Will Do**

Mercury Marine's sole and exclusive obligation under this Limited Warranty is limited to, at our option, repairing a defective part, replacing such part or parts with new or Mercury Marine certified remanufactured parts, or refunding the purchase price of the Mercury Marine product. Mercury Marine reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

## **How to Obtain Warranty Coverage Under This Limited Warranty**

The customer must provide Mercury Marine with a reasonable opportunity to repair and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Mercury Marine dealer authorized to service the product. A list of dealers and their contact details is available at [www.mercurymarine.com.au](http://www.mercurymarine.com.au). If the purchaser cannot deliver the product to such a dealer, written notice must be given to Mercury Marine at the address shown above. Mercury Marine will then arrange for the inspection and any covered repair. This Limited Warranty will not cover the purchaser for all related transportation charges and travel time. If the service provided is not covered by this limited warranty, the purchaser shall pay for all related labor and material and any other expenses associated with that service, provided that a consumer will not be obligated to pay where the service has been carried out to remedy a failure of an acceptable quality guarantee which is binding on Mercury Marine under the Australian Consumer Law. The purchaser shall not, unless requested by Mercury Marine, ship the product or parts of the product directly to Mercury Marine. Proof of registered ownership must be presented to the dealer at the time warranty service is requested in order to obtain coverage under this Limited Warranty.

# WARRANTY INFORMATION

## **What is Not Covered**

This limited warranty does not cover routine maintenance items, tune-ups, adjustments, normal wear and tear, faded paint, damage caused by abuse, abnormal use, use of a propeller or gear ratio that does not allow the engine to run in its recommended wide-open throttle RPM range (see the Operation and Maintenance Manual), operation of the product in a manner inconsistent with the recommended operation/duty cycle section of the Operation and Maintenance Manual, neglect, accident, submersion, improper installation (proper installation specifications and techniques are set forth in the installation instructions for the product), improper service, use of an accessory or part not manufactured or sold by us, jet pump impellers and liners, operation with fuels, oils or lubricants that are not suitable for use with the product (see the Operation and Maintenance Manual), alteration or removal of parts, water entering the engine through the fuel intake, air intake or exhaust system, or damage to the product from insufficient cooling water caused by blockage of the cooling system by a foreign body, running the engine out of water, mounting the engine too high on the transom, or running the boat with the engine trimmed out too far. Use of the product for racing or other competitive activity, or operating with a racing type lower unit, at any point, even by a prior owner of the product, voids the warranty.

Expenses related to haul-out, launch, towing, storage, telephone, rental, inconvenience, slip fees, insurance coverage, loan payments, loss of time, loss of income, or any other type of incidental or consequential damages are not covered by this Limited Warranty. Also, expenses associated with the removal and/or replacement of boat partitions or material caused by boat design for access to the product are not covered by this warranty.

No individual or entity, including Mercury Marine authorized dealers, has been given authority by Mercury Marine to make any affirmation, representation or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against Mercury Marine. For additional information regarding events and circumstances covered by this warranty, and those that are not, see the Warranty Coverage section of the Operation and Maintenance Manual, incorporated by reference into this warranty.

## **Expense of Claiming This Limited Warranty**

This Limited Warranty does not cover any expenses you may incur claiming the warranty.

# WARRANTY INFORMATION

## DISCLAIMERS AND LIMITATIONS:

**EXCEPT FOR APPLICABLE GUARANTEES AND OTHER RIGHTS AND REMEDIES THAT A CONSUMER MAY HAVE UNDER THE AUSTRALIAN CONSUMER LAW OR OTHER LAW IN RELATION TO WHICH THE PRODUCTS RELATE, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS LIMITED WARRANTY.**

## TRANSFER OF WARRANTY—AUSTRALIA AND NEW ZEALAND POLICY

The limited warranty is transferable to a subsequent purchaser, but only for the remainder of the unused portion of the limited warranty. This will not apply to products used for commercial applications.

To transfer the warranty to the subsequent owner, send or fax a copy of the Bill of Sale or Purchase Agreement, new owner's name, address, and hull identification number (HIN) to Mercury Marine's Warranty Registration Department. In Australia and New Zealand, mail to:

Mercury Marine  
Attn: Warranty Registration Department  
Brunswick Asia Pacific Group  
Private Bag 1420  
Dandenong South, Victoria 3164  
Australia

Upon processing the transfer of warranty, Mercury Marine will send registration verification to the new owner of the product by mail. There is no charge for this service.

You may change your address at any time, including at the time of the warranty claim, by calling Mercury Marine or sending a letter or fax with your name, old address, new address, and hull identification number (HIN) to Mercury Marine's Warranty Registration Department.

# WARRANTY INFORMATION

## Global Warranty Charts Outboard and Jets

### UNITED STATES WARRANTY CHARTS—OUTBOARD AND JET

Product	Standard Limited Warranty	Standard Limited Corrosion Warranty
FourStroke (2.5–350 hp including Verado, Pro FourStroke and Jet outboards)	3 years	3 years
OptiMax (75–250 hp including Pro XS and Jet outboards)	3 years	3 years
OptiMax Jet drive (200 and 250 hp)	1 year	3 years

Racing Product (Recreation use only)	Standard Limited Warranty	Standard Limited Corrosion Warranty
OptiMax (250 XS)	2 years	3 years
OptiMax (300 XS)	2 years	3 years
Verado (400R)	2 years	3 years

#### Outside the United States

For product purchased outside the United States, contact the distributor in your country, or the authorized Marine Power Service Center closest to you.

### CANADA WARRANTY CHARTS—OUTBOARD AND JET

Product	Standard Limited Warranty	Standard Limited Corrosion Warranty
2-Stroke carbureted (50 - 90 hp)	1 year	3 years
2-Stroke EFI (150 hp)	2 years	3 years
2-Stroke carbureted (V6)	2 years	3 years
FourStroke (2.5 - 300 hp including Verado, Pro FourStroke and jet outboards)	3 years	3 years
OptiMax (75 - 250 hp including Pro XS and jet outboards )	3 years	3 years
OptiMax jet drive (200 and 250 hp)	1 year	3 years

# WARRANTY INFORMATION

Racing Product (Recreation use only)	Standard Limited Warranty	Standard Limited Corrosion Warranty
OptiMax (250 XS)	2 years	3 years
OptiMax (225 Sport XS)	2 years	3 years
OptiMax (300 XS)	2 years	3 years
Verado (350 SCi)	2 years	3 years

## Outside of Canada

For product purchased outside of Canada, contact the distributor in your country, or the authorized Marine Power Service Center or dealer closest to you.

## AUSTRALIA AND NEW ZEALAND WARRANTY CHARTS—OUTBOARD AND JET

Products	Standard Limited Warranty	Standard Limited Corrosion Warranty	Light Commercial
All outboard	3 years	3 years	Contact the Marine Power Service Center closest to you

## Outside of Australia and New Zealand

For product purchased outside of Australia and New Zealand, contact the distributor in your country, or the Marine Power Service Center closest to you.

## SOUTH PACIFIC WARRANTY CHART—OUTBOARD AND JET

Products	Standard Limited Warranty	Standard Limited Corrosion Warranty	Light Commercial
All outboard	2 years	3 years	Contact the Marine Power Service Center closest to you

## Outside of South Pacific

For product purchased outside of the South Pacific region, contact the distributor in your country, or the Marine Power Service Center closest to you.

# WARRANTY INFORMATION

## ASIA WARRANTY CHARTS—OUTBOARD AND JET

Product (Recreational only)	Standard Limited Warranty	Standard Limited Corrosion Warranty	Commercial Application
2-Stroke	1 year	3 years	Contact the Marine Power Service Center closest to you
FourStroke	1 year	3 years	
OptiMax	1 year	3 years	
Verado	1 year	3 years	

Racing Product (Recreational only)	Standard Limited Warranty	Standard Limited Corrosion Warranty	Commercial Application
Verado 350 SCi	1 year	3 years	None

### Outside of Asia

For product purchased outside of the Asian region, contact the distributor in your country, or the Marine Power Service Center closest to you.

## EUROPE AND THE CONFEDERATION OF INDEPENDENT STATES (CIS) WARRANTY CHARTS—OUTBOARD AND JET

Product (Recreational only)	Standard Limited Warranty	Standard Limited Corrosion Warranty	Commercial Application
2-Stroke	2 years	3 years	Contact the Marine Power Service Center closest to you
FourStroke	2 years	3 years	
OptiMax (including Pro XS)	3 years	3 years	
Verado (including Pro)	3 years	3 years	

# WARRANTY INFORMATION

<b>Racing Product (Recreational only)</b>	<b>Standard Limited Warranty</b>	<b>Standard Limited Corrosion Warranty</b>	<b>Commercial Application</b>
Verado 350 SCi	2 years	3 years	Contact the Marine Power Service Center closest to you

## **Outside Europe and CIS**

For products purchased outside of Europe and CIS regions, contact the distributor in your country, or the Marine Power Service Center closest to you.

## **MIDDLE-EAST AND AFRICA (EXCLUDING SOUTH AFRICA) WARRANTY CHARTS—OUTBOARD AND JET**

<b>Product (Recreational only)</b>	<b>Standard Limited Warranty</b>	<b>Standard Limited Corrosion Warranty</b>	<b>Commercial Application</b>
2-Stroke	1 year	3 years	Contact the Marine Power Service Center closest to you
FourStroke	2 years	3 years	
OptiMax (including Pro XS)	3 years	3 years	
Verado (including Pro)	3 years	3 years	

<b>Racing Product (Recreational only)</b>	<b>Standard Limited Warranty</b>	<b>Standard Limited Corrosion Warranty</b>
Verado 350 SCi	2 years	3 years

## **Outside Middle-East and Africa**

For products purchased outside of the Middle-East and Africa regions, contact the distributor in your country, or the Marine Power Service Center closest to you.

# WARRANTY INFORMATION

## SOUTH AFRICA WARRANTY CHARTS—OUTBOARD AND JET

Product (Recreational only)	Standard Limited Warranty	Standard Limited Corrosion Warranty	Commercial Application
2-Stroke	2 years	3 years	Contact the Marine Power Service Center closest to you
FourStroke	2 years	3 years	
OptiMax (including Pro XS)	3 years	3 years	
Verado (including Pro)	3 years	3 years	

Racing Product (Recreational only)	Standard Limited Warranty	Standard Limited Corrosion Warranty
Verado 350 SCi	2 years	3 years

### Outside South Africa

For products purchased outside of the South Africa region, contact the distributor in your country, or the Marine Power Service Center closest to you.



# GENERAL INFORMATION

## Boater's Responsibilities

The operator (driver) is responsible for the correct and safe operation of the boat and the safety of its occupants and general public. It is strongly recommended that each operator read and understand this entire manual before operating the outboard.

Be sure that at least one additional person onboard is instructed in the basics of starting and operating the outboard and boat handling in case the driver is unable to operate the boat.

## Before Operating Your Outboard

Read this manual carefully. Learn how to operate your outboard properly. If you have any questions, contact your dealer.

Safety and operating information that is practiced, along with using good common sense, can help prevent personal injury and product damage.

This manual as well as safety labels posted on the outboard use the following safety alerts to draw your attention to special safety instructions that should be followed.

### DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

### WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

### CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

### NOTICE

Indicates a situation which, if not avoided, could result in engine or major component failure.

## Boat Horsepower Capacity

### WARNING

Exceeding the boat's maximum horsepower rating can cause serious injury or death. Overpowering the boat can affect boat control and flotation characteristics or break the transom. Do not install an engine that exceeds the boat's maximum power rating.

# GENERAL INFORMATION

Do not overpower or overload your 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.

U.S. COAST GUARD CAPACITY	
MAXIMUM HORSEPOWER	XXX
MAXIMUM PERSON CAPACITY (POUNDS)	XXX
MAXIMUM WEIGHT CAPACITY	XXX

26777

## High-Speed and High-Performance Boat Operation

If your outboard is to be used on a high-speed or high-performance boat with which you are unfamiliar, we recommend that you do not operate it at its high speed capability without first requesting an initial orientation and familiarization demonstration ride with your dealer or an operator experienced with your boat/outboard combination. For additional information, obtain a copy of our **Hi-Performance Boat Operation** booklet from your dealer, distributor, or Mercury Marine.

## Propeller Selection

The propeller on your outboard is one of the most important components in the propulsion system. An improper propeller choice can significantly affect the performance of your boat and could result in damage to the outboard engine.

When choosing a propeller, a full selection of aluminum and stainless steel propellers specifically designed for your outboard are available through Mercury Marine. To view the entire product offering and find the correct propeller that is best suited for your application, visit [www.mercmarinepropellers.com](http://www.mercmarinepropellers.com) or see your local authorized Mercury dealer.

## SELECTING THE CORRECT PROPELLER

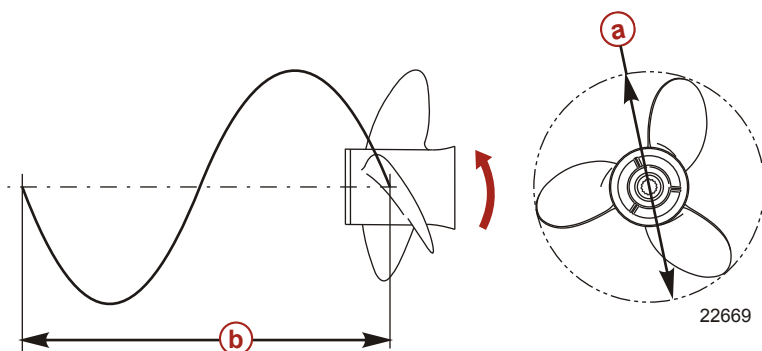
An accurate tachometer for measuring engine speed is important in choosing the correct propeller.

Choose a propeller for your boating application that will allow the engine to operate within the specified full throttle operating range. When operating the boat at full throttle under normal load conditions, the engine RPM should be in the upper half of the recommended full throttle RPM range. Refer to **Specifications**. If engine RPM is above that range, select a propeller of increased pitch in order to reduce engine RPM. If engine RPM is below the recommended range, select a propeller of reduced pitch to increase engine RPM.

# GENERAL INFORMATION

**IMPORTANT: To ensure proper fit, and performance, Mercury Marine recommends the use of Mercury or Quicksilver branded propellers and mounting hardware.**

Propellers are designated by the diameter, pitch, number of blades, and material. The diameter and pitch are stamped (cast) into the side or the end of the propeller hub. The first number represents the diameter of the propeller and the second number represents the pitch. For example, 14x19 represents a propeller with a 14 inch diameter and 19 inches of pitch.



- a** - Diameter
- b** - Pitch - Travel during one revolution

The following are some propeller basics that will help you determine the correct propeller for your boating application.

**Diameter** - The diameter is the distance across the imaginary circle that is made when the propeller rotates. The correct diameter for each propeller has been predetermined for the design of your outboard. However, when more than one diameter is available for the same pitch, use a larger diameter for heavy boat applications and a smaller diameter for lighter applications.

**Pitch** - The pitch is the theoretical distance, in inches, that a propeller travels forward during one revolution. Pitch can be thought of similar to gears in a car. The lower the gear, the faster the car will accelerate, but with lower overall top speed. Likewise, a lower pitch propeller will accelerate quickly, but top-end speed will be reduced. The higher the propeller pitch the faster the boat will usually go; though typically slowing acceleration.

**Determining the correct pitch size** - First, check the full throttle RPM under normal load condition. If the full throttle RPM is within the recommended range, select a replacement or upgrade propeller with the same pitch as the current propeller.

- Adding 1 inch of pitch will reduce the full throttle RPM by 150 to 200
- Subtracting 1 inch of pitch will increase full throttle RPM by 150 to 200

# GENERAL INFORMATION

- Upgrading from a 3-blade propeller to a 4-blade propeller will generally decrease full throttle RPM by 50 to 100

**IMPORTANT: Avoid damage to the engine. Never use a propeller that allows the engine to exceed the recommended full throttle RPM range when under normal full throttle operation.**

## PROPELLER MATERIAL

Most propellers manufactured by Mercury Marine are made from either aluminum or stainless steel. Aluminum is suitable for general purpose use and is standard equipment on many new boats. Stainless steel is over five times more durable than aluminum and typically provides performance gains in acceleration and top end speed due to design efficiencies. Stainless steel propellers also come in a larger variety of sizes and styles that allow you to dial in the ultimate performance for your boat.

## 3 BLADE VS. 4 BLADE

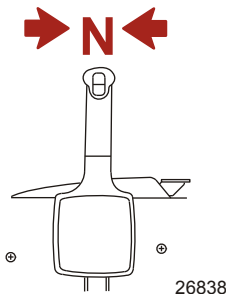
Available in many sizes of both aluminum and stainless, 3 and 4-blade propellers have unique performance characteristics. In general, 3-blade propellers offer good all around performance and higher top speed than 4-blade propellers. However, 4-blade propellers are usually faster to plane and more efficient at cruising speeds, but lack the top end speed of a 3-blade propeller.

## Outboard Remote Control Models

The remote control connected to your outboard must be equipped with a start in neutral only protection device. This prevents the engine from starting when the shift is actuated in any position other than neutral.

### WARNING

**Starting the engine with the drive in gear can cause serious injury or death. Never operate a boat that does not have a neutral-safety-protection device.**



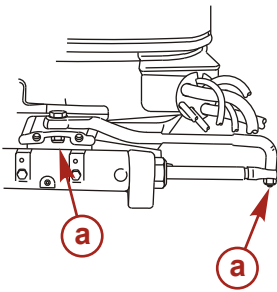
# GENERAL INFORMATION

## Remote Steering Notice

The steering link rod that connects the steering cable to the engine must be fastened utilizing self-locking nuts. These self-locking nuts must never be replaced with common nuts (nonlocking) as they will work loose and vibrate off, freeing the link rod to disengage.

### ⚠ WARNING

Improper fasteners or improper installation procedures can result in loosening or disengagement of the steering link rod. This can cause a sudden, unexpected loss of boat control, resulting in serious injury or death due to occupants being thrown within or out of the boat. Always use required components and follow instructions and torque procedures.



**a** - Self-locking nuts

27740

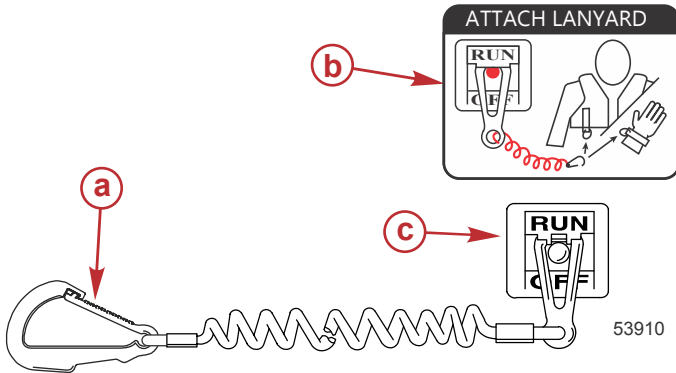
## Lanyard Stop Switch

The purpose of a lanyard stop switch is to turn off the engine when the operator moves far enough away from the operator's position (as in accidental ejection from the operator's position) to activate the switch. Tiller handle outboards and some remote control units are equipped with a lanyard stop switch. A lanyard stop switch can be installed as an accessory - generally on the dashboard or side adjacent to the operator's position.

A decal near the lanyard stop switch is a visual reminder for the operator to attach the lanyard to their personal flotation device (PFD) or wrist.

# GENERAL INFORMATION

The lanyard cord is usually 122–152 cm (4–5 feet) in length when stretched out, with an element on one end made to be inserted into the switch and a clip on the other end for attaching to the operator's PFD or wrist. The lanyard is coiled to make its at-rest condition as short as possible to minimize the likelihood of lanyard entanglement with nearby objects. Its stretched-out length is made to minimize the likelihood of accidental activation should the operator choose to move around in an area close to the normal operator's position. If it is desired to have a shorter lanyard, wrap the lanyard around the operator's wrist or leg, or tie a knot in the lanyard.



- a - Lanyard cord clip
- b - Lanyard decal
- c - Lanyard stop switch

Read the following Safety Information before proceeding.

**Important Safety Information:** The purpose of a lanyard stop switch is to stop the engine when the operator moves far enough away from the operator's position to activate the switch. This would occur if the operator accidentally falls overboard or moves within the boat a sufficient distance from the operator's position. Falling overboard and accidental ejections are more likely to occur in certain types of boats such as low sided inflatables, bass boats, high performance boats, and light, sensitive handling fishing boats operated by a hand tiller. Falling overboard and accidental ejections are also likely to occur as a result of poor operating practices such as sitting on the back of the seat or gunwale at planing speeds, standing at planing speeds, sitting on elevated fishing boat decks, operating at planing speeds in shallow or obstacle infested waters, releasing your grip on a steering wheel or tiller handle that is pulling in one direction, drinking alcohol or consuming drugs, or daring high speed boat maneuvers.

# GENERAL INFORMATION

While activation of the lanyard stop switch will stop the engine immediately, a boat will continue to coast for some distance depending upon the velocity and degree of any turn at shut down. However, the boat will not complete a full circle. While the boat is coasting, it can cause injury to anyone in the boat's path as seriously as the boat would when under power.

We strongly recommend that other occupants be instructed on proper starting and operating procedures should they be required to operate the engine in an emergency (if the operator is accidentally ejected).

## **⚠ WARNING**

**If the operator falls out of the boat, stop the engine immediately to reduce the possibility of serious injury or death from being struck by the boat. Always properly connect the operator to the stop switch using a lanyard.**

## **⚠ WARNING**

**Avoid serious injury or death from deceleration forces resulting from accidental or unintended stop switch activation. The boat operator should never leave the operator's station without first disconnecting the stop switch lanyard from the operator.**

Accidental or unintended activation of the switch during normal operation is also a possibility. This could cause any, or all, of the following potentially hazardous situations:

- Occupants could be thrown forward due to unexpected loss of forward motion - a particular concern for passengers in the front of the boat who could be ejected over the bow and possibly struck by the gearcase or propeller.
- Loss of power and directional control in heavy seas, strong current, or high winds.
- Loss of control when docking.

## **KEEP THE LANYARD STOP SWITCH AND LANYARD CORD IN GOOD OPERATING CONDITION**

Before each use, check to ensure the lanyard stop switch works properly. Start the engine and stop it by pulling the lanyard cord. If the engine does not stop, have the switch repaired before operating the boat.

Before each use, visually inspect the lanyard cord to ensure it is in good working condition and that there are no breaks, cuts, or wear to the cord. Check that the clips on the ends of the cord are in good condition. Replace any damaged or worn lanyard cords.

# GENERAL INFORMATION

## Protecting People in the Water

### WHILE YOU ARE CRUISING

It is very difficult for a person standing or floating in the water to take quick action to avoid a boat heading in his/her direction, even at slow speed.



Always slow down and exercise extreme caution any time you are boating in an area where there might be people in the water.

Whenever a boat is moving (coasting) and the outboard gear shift is in neutral position, there is sufficient force by the water on the propeller to cause the propeller to rotate. This neutral propeller rotation can cause serious injury.

### WHILE THE BOAT IS STATIONARY

#### **▲ WARNING**

**A spinning propeller, a moving boat, or any solid device attached to the boat can cause serious injury or death to swimmers. Stop the engine immediately whenever anyone in the water is near your boat.**

Shift the outboard into neutral and shut off the engine before allowing people to swim or be in the water near your boat.

## Passenger Safety Message - Pontoon Boats and Deck Boats

Whenever the boat is in motion, observe the location of all passengers. Do not allow any passengers to stand or use seats other than those designated for traveling faster than idle speed. A sudden reduction in boat speed, such as plunging into a large wave or wake, a sudden throttle reduction, or a sharp change of boat direction, could throw them over the front of the boat. Falling over the front of the boat between the two pontoons will position them to be run over by the outboard.

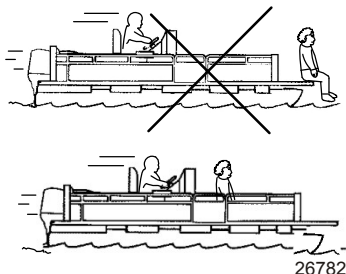
### BOATS HAVING AN OPEN FRONT DECK

No one should ever be on the deck in front of the fence while the boat is in motion. Keep all passengers behind the front fence or enclosure.



# GENERAL INFORMATION

Persons on the front deck could easily be thrown overboard or persons dangling their feet over the front edge could get their legs caught by a wave and pulled into the water.



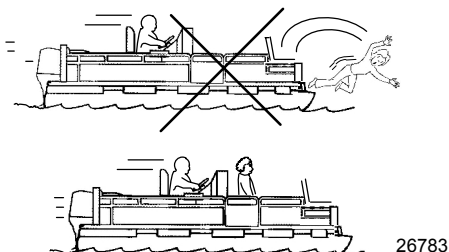
## ⚠ WARNING

**Sitting or standing in an area of the boat not designed for passengers at speeds above idle can cause serious injury or death. Stay back from the front end of deck boats or raised platforms and remain seated while the boat is in motion.**

### BOATS WITH FRONT MOUNTED, RAISED PEDESTAL FISHING SEATS

Elevated fishing seats are not intended for use when the boat is traveling faster than idle or trolling speed. Sit only in seats designated for traveling at faster speeds.

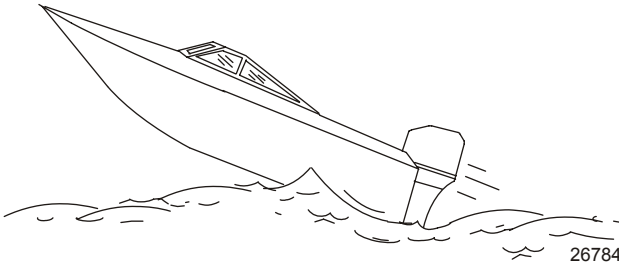
Any unexpected, sudden reduction in boat speed could result in the elevated passenger falling over the front of the boat.



# GENERAL INFORMATION

## Wave and Wake Jumping

Operating recreational boats over waves and wake is a natural part of boating. However, when this activity is done with sufficient speed to force the boat hull partially or completely out of the water, certain hazards arise, particularly when the boat enters the water.



The primary concern is the boat changing direction while in the midst of the jump. In such case, the landing may cause the boat to veer violently in a new direction. Such a sharp change in direction can cause occupants to be thrown out of their seats, or out of the boat.

### **⚠ WARNING**

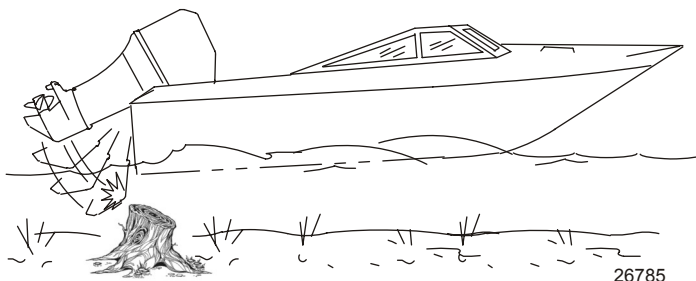
**Wave or wake jumping can cause serious injury or death from occupants being thrown within or out of the boat. Avoid wave or wake jumping whenever possible.**

There is another less common hazardous result from allowing your boat to launch off a wave or wake. If the bow of your boat pitches down far enough while airborne, upon water contact it may penetrate under the water surface and submarine for an instant. This will bring the boat to a nearly instantaneous stop and can send the occupants flying forward. The boat may also steer sharply to one side.

# GENERAL INFORMATION

## Impact with Underwater Hazards

Reduce speed and proceed with caution whenever you drive a boat in shallow water areas, or in areas where you suspect underwater obstacles may exist which could be struck by the outboard or the boat bottom. **The most important thing you can do to help reduce injury or impact damage from striking a floating or underwater object is to control the boat speed. Under these conditions, boat speed should be kept to a minimum planing speed of 24 to 40 km/h (15 to 25 mph).**



Striking a floating or underwater object could result in an infinite number of situations. Some of these situations could result in the following:

- Part of the outboard or the entire outboard could break loose and fly into the boat.
- The boat could move suddenly in a new direction. Such a sharp change in direction can cause occupants to be thrown out of their seats or out of the boat.
- A rapid reduction in speed. This will cause occupants to be thrown forward, or even out of the boat.
- Impact damage to the outboard and/or boat.

Keep in mind, the most important thing you can do to help reduce injury or impact damage during an impact is control the boat speed. Boat speed should be kept to a minimum planing speed when driving in waters known to have underwater obstacles.

After striking a submerged object, stop the engine as soon as possible and inspect it for any broken or loose parts. If damage is present or suspected, the outboard should be taken to an authorized dealer for a thorough inspection and necessary repair.

The boat should also be checked for any hull fractures, transom fractures, or water leaks.

Operating a damaged outboard could cause additional damage to other parts of the outboard, or could affect control of the boat. If continued running is necessary, do so at greatly reduced speeds.

# GENERAL INFORMATION

## **⚠ WARNING**

Operating a boat or engine with impact damage can result in product damage, serious injury, or death. If the vessel experiences any form of impact, have an authorized Mercury Marine dealer inspect and repair the vessel or power package.

## **Exhaust Emissions**

### **BE ALERT TO CARBON MONOXIDE POISONING**

Carbon monoxide (CO) is a deadly gas that is present in the exhaust fumes of all internal combustion engines, including the engines that propel boats, and the generators that power boat accessories. By itself, CO is odorless, colorless, and tasteless, but if you can smell or taste engine exhaust, you are inhaling CO.

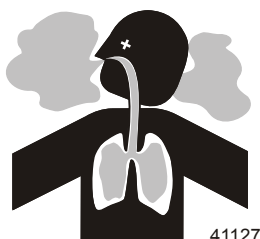
Early symptoms of carbon monoxide poisoning, which are similar to the symptoms of seasickness and intoxication, include headache, dizziness, drowsiness, and nausea.

## **⚠ WARNING**

Inhaling engine exhaust gases can result in carbon monoxide poisoning, which can lead to unconsciousness, brain damage, or death. Avoid exposure to carbon monoxide.

Stay clear from exhaust areas when engine is running. Keep the boat well-ventilated while at rest or underway.

### **STAY CLEAR OF EXHAUST AREAS**



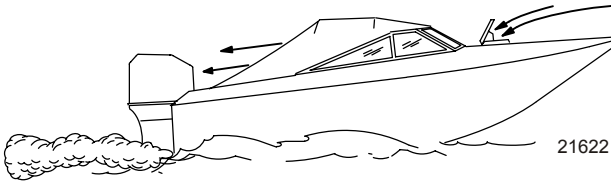
Engine exhaust gases contain harmful carbon monoxide. Avoid areas of concentrated engine exhaust gases. When engines are running, keep swimmers away from the boat, and do not sit, lie, or stand on swim platforms or boarding ladders. While underway, do not allow passengers to be positioned immediately behind the boat (platform dragging, teak/body surfing). This dangerous practice not only places a person in an area of high engine exhaust concentration, but also subjects them to the possibility of injury from the boat propeller.

# GENERAL INFORMATION

## GOOD VENTILATION

Ventilate the passenger area, open side curtains or forward hatches to remove fumes.

Example of desired air flow through the boat:

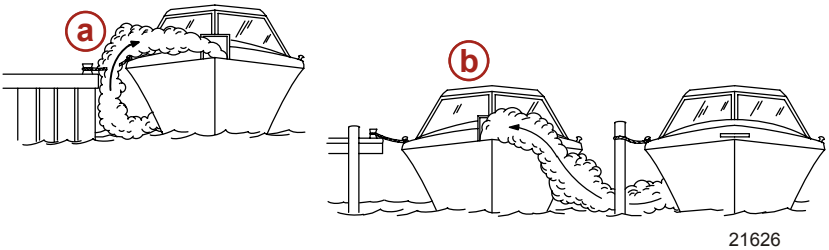


## POOR VENTILATION

Under certain running and/or wind conditions, permanently enclosed or canvas enclosed cabins or cockpits with insufficient ventilation may draw in carbon monoxide. Install one or more carbon monoxide detectors in your boat.

Although the occurrence is rare, on a very calm day, swimmers and passengers in an open area of a stationary boat that contains, or is near, a running engine may be exposed to a hazardous level of carbon monoxide.

1. Examples of poor ventilation while the boat is stationary:



- a** - Operating the engine when the boat is moored in a confined space
- b** - Mooring close to another boat that has its engine operating

2. Examples of poor ventilation while the boat is moving:



- a** - Operating the boat with the trim angle of the bow too high
- b** - Operating the boat with no forward hatches open (station wagon effect)

# GENERAL INFORMATION

## Selecting Accessories for Your Outboard

Genuine Mercury Precision or Quicksilver Accessories have been specifically designed and tested for your outboard. These accessories are available from Mercury Marine dealers.

**IMPORTANT: Check with your dealer before installing accessories. The misuse of approved accessories or the use of nonapproved accessories can damage the product.**

Some accessories not manufactured or sold by Mercury Marine are not designed to be safely used with your outboard or outboard operating system. Read the installation, operation and maintenance manuals for all your selected accessories.

Refer to **Outboard Installation - Accessories Mounted to the Transom Clamp Bracket** for important information on mounting accessories to the transom clamp bracket.

## Safe Boating Recommendations

To safely enjoy the waterways, familiarize yourself with local and all other governmental boating regulations and restrictions and consider the following suggestions.

### **Know and obey all nautical rules and laws of the waterways.**

- We recommend that all powerboat operators complete a boating safety course. In the U.S., the U.S. Coast Guard Auxiliary, the Power Squadron, the Red Cross, and your state or provincial boating law enforcement agency provide courses. For more information in the U.S., call the Boat U.S. Foundation at 1-800-336-BOAT (2628).

### **Perform safety checks and required maintenance.**

- Follow a regular schedule and ensure that all repairs are properly made.

### **Check safety equipment onboard.**

- Here are some suggestions of the types of safety equipment to carry when boating:
  - Approved fire extinguishers
  - Signal devices: flashlight, rockets or flares, flag, and whistle or horn
  - Tools necessary for minor repairs
  - Anchor and extra anchor line
  - Manual bilge pump and extra drain plugs
  - Drinking water
  - Radio
  - Paddle or oar
  - Spare propeller, thrust hubs, and an appropriate wrench

# GENERAL INFORMATION

- First aid kit and instructions
- Waterproof storage containers
- Spare operating equipment, batteries, bulbs, and fuses
- Compass and map or chart of the area
- Personal flotation device (one per person onboard)

**Watch for signs of weather change and avoid foul weather and rough-sea boating.**

**Tell someone where you are going and when you expect to return.**

**Passenger boarding.**

- Stop the engine whenever passengers are boarding, unloading, or are near the back (stern) of the boat. Shifting the drive unit into neutral is not sufficient.

**Use personal flotation devices.**

- Federal law requires that there be a U.S. Coast Guard-approved life jacket (personal flotation device), correctly sized and readily accessible for every person onboard, plus a throwable cushion or ring. We strongly advise that everyone wear a life jacket at all times while in the boat.

**Prepare other boat operators.**

- Instruct at least one person onboard in the basics of starting and operating the engine and boat handling in case the driver becomes disabled or falls overboard.

**Do not overload your boat.**

- Most boats are rated and certified for maximum load (weight) capacities (refer to your boat's capacity plate). Know your boat's operating and loading limitations. Know if your boat will float if it is full of water. When in doubt, contact your authorized Mercury Marine dealer or the boat manufacturer.

**Ensure that everyone in the boat is properly seated.**

- Do not allow anyone to sit or ride on any part of the boat that was not intended for such use. This includes the backs of seats, gunwales, transom, bow, decks, raised fishing seats, and any rotating fishing seat. Passengers should not sit or ride anywhere that sudden unexpected acceleration, sudden stopping, unexpected loss of boat control, or sudden boat movement could cause a person to be thrown overboard or into the boat. Ensure that all passengers have a proper seat and are in it before any boat movement.

**Never operate a boat while under the influence of alcohol or drugs. It is the law.**

- Alcohol or drugs can impair your judgment and greatly reduce your ability to react quickly.

**Know your boating area and avoid hazardous locations.**

# GENERAL INFORMATION

## Be alert.

- The operator of the boat is responsible by law to maintain a proper lookout by sight and hearing. The operator must have an unobstructed view particularly to the front. No passengers, load, or fishing seats should block the operator's view when the boat is above idle or planing transition speed. Watch out for others, the water, and your wake.

## Never drive your boat directly behind a water skier.

- Your boat traveling at 40 km/h (25 mph) will overtake a fallen skier who is 61 m (200 ft) in front of you in five seconds.

## Watch fallen skiers.

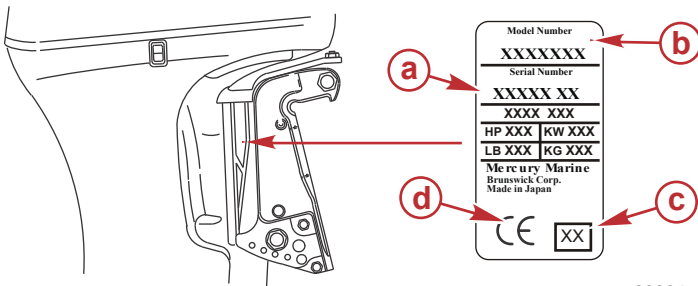
- When using your boat for waterskiing or similar activities, always keep a fallen or down skier on the operator's side of the boat while returning to attend to the skier. The operator should always have the down skier in sight and never back up to the skier or anyone in the water.

## Report accidents.

- Boat operators are required by law to file a boating accident report with their state boating law enforcement agency when their boat is involved in certain boating accidents. A boating accident must be reported if 1) there is loss of life or probable loss of life, 2) there is personal injury requiring medical treatment beyond first aid, 3) there is damage to boats or other property where the damage value exceeds \$500.00, or 4) there is complete loss of the boat. Seek further assistance from local law enforcement.

## Recording Serial Number

It is important to record this number for future reference. The serial number is located on the outboard as shown.



23884

- a** - Serial number
- b** - Model designation
- c** - Year manufactured
- d** - Certified Europe Insignia (as applicable)



# GENERAL INFORMATION

## Specifications

Models	75	90	115/115 Pro XS	125
Horsepower	75	90	115	125
Kilowatts	55.2	66.2	84.6	91.3
Full throttle RPM range	5000–5750 RPM			
Idle speed in forward gear	625–675 RPM			
Number of cylinders	3			
Piston displacement	1523.5 cc (92.9 in <sup>3</sup> )			
Cylinder bore	92.11 mm (3.63 in.)			
Piston stroke	76.2 mm (3.0 in.)			
Recommended spark plug	IZFR5J			
Spark plug gap	0.80 mm (0.030 in.)			
Gear ratio	2.33:1		2.07:1	
Recommended gasoline	Refer to <b>Fuel and Oil</b>			
Recommended oil	Refer to <b>Fuel and Oil</b>			
Oil tank capacity	4.72 liter (5 US qt)			
Gearcase lubricant capacity	665 ml (22.5 fl oz)			
Battery rating*	1000 marine cranking amps (MCA) or 800 cold cranking amps (CCA)			
Charging system output	60 A			
Emission control system	Electronic engine control (EC)			

# GENERAL INFORMATION

Models	75	90	115/115 Pro XS	125
Sound at drivers ear (ICOMIA 39-94) dBA	82.0			

\*Battery manufacturers may rate and test their batteries to different standards. MCA, CCA, Ah, and reserve capacity (RC) are the ratings recognized by Mercury Marine. Manufacturers that use standards different than these, such as equivalent MCA, do not meet Mercury Marine battery requirements.

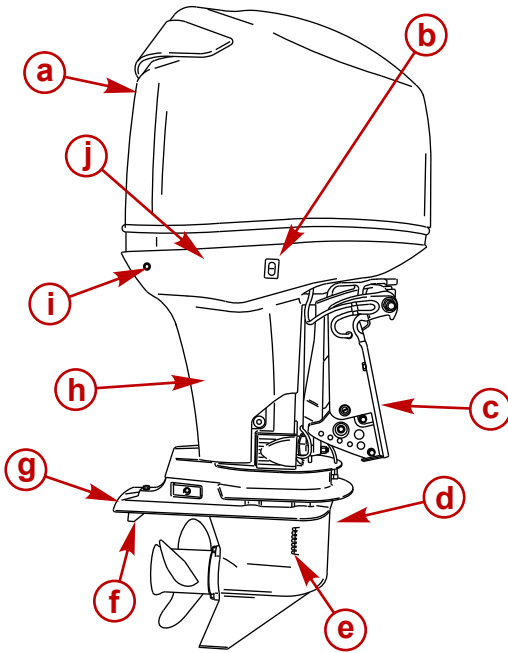
## 80 Jet OptiMax Specifications

Models	80
Horsepower	80
Kilowatts	58.8
Full throttle RPM range	5000–5750 RPM
Idle speed in forward gear	625–675 RPM
Number of cylinders	3
Piston displacement	1523.5 cc (92.9 in <sup>3</sup> )
Cylinder bore	92.11 mm (3.63 in.)
Piston stroke	76.2 mm (3.0 in.)
Recommended spark plug	IZFR5J
Spark plug gap	0.80 mm (0.030 in.)
Recommended gasoline	Refer to <b>Fuel and Oil</b>
Recommended oil	Refer to <b>Fuel and Oil</b>
Oil tank capacity	4.72 liters (5 US qt)
Battery rating*	1000 marine cranking amps (MCA) or 800 cold cranking amps (CCA)
Charging system output	60 A
Emission control system	Electronic engine control (EC)

\*Battery manufacturers may rate and test their batteries to different standards. MCA, CCA, Ah, and reserve capacity (RC) are the ratings recognized by Mercury Marine. Manufacturers that use standards different than these, such as equivalent MCA, do not meet Mercury Marine battery requirements.

# GENERAL INFORMATION

## Component Identification

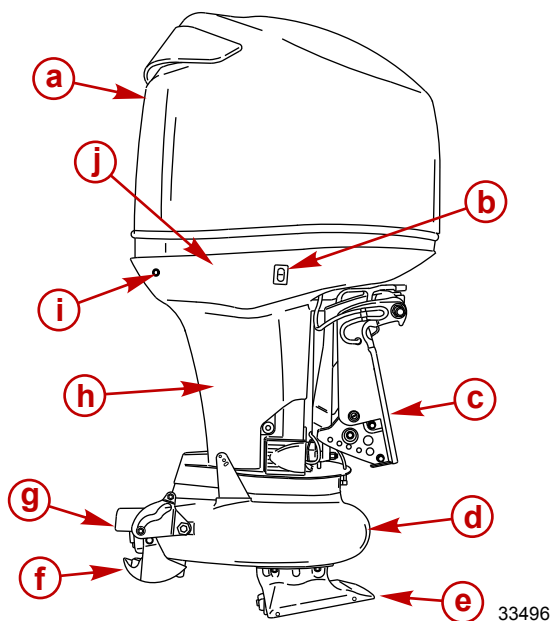


- a** - Top cowl
- b** - Auxiliary tilt switch
- c** - Transom brackets
- d** - Gearcase
- e** - Cooling water intake holes
- f** - Trim tab
- g** - Anti-ventilation plate
- h** - Driveshaft housing
- i** - Water pump indicator hole
- j** - Bottom cowl

29461

# GENERAL INFORMATION

## Component Identification

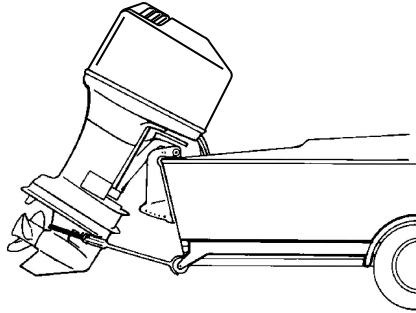


- a** - Top cowl
- b** - Auxiliary tilt switch
- c** - Transom brackets
- d** - Jet drive housing
- e** - Water intake housing
- f** - Reverse gate
- g** - Water outlet nozzle
- h** - Driveshaft housing
- i** - Water pump indicator hole
- j** - Bottom cowl

# TRANSPORTING

## Trailing Boat/Outboard

Trail your boat with the outboard tilted down in a vertical operating position. If additional ground clearance is required, the outboard should be tilted up using an accessory outboard support device. Refer to your local dealer for recommendations. Additional clearance may be required for railroad crossings, driveways, and trailer bouncing.



28419

**IMPORTANT: Do not rely on the power trim/tilt system or tilt support lever to maintain proper ground clearance for trailering. The outboard tilt support lever is not intended to support the outboard for trailering.**

Shift the outboard to forward gear. This prevents the propeller from spinning freely.

# FUEL AND OIL

## Fuel Recommendations

**IMPORTANT: Use of improper gasoline can damage your engine. Engine damage resulting from the use of improper gasoline is considered misuse of the engine, and damage caused thereby will not be covered under the limited warranty.**

### FUEL RATINGS

Mercury Marine engines will operate satisfactorily when using a major brand of unleaded gasoline meeting the following specifications:

**USA and Canada** - having a posted pump octane rating of 87 (R+M)/2 minimum. Premium gasoline (92 [R+M]/2 octane) is also acceptable. Do not use leaded gasoline.

**Outside USA and Canada** - having a posted pump octane rating of 90 RON minimum. Premium gasoline (98 RON) is also acceptable. If unleaded gasoline is not available, use a major brand of leaded gasoline.

### USING REFORMULATED (OXYGENATED) GASOLINES (USA ONLY)

This type of gasoline is required in certain areas of the USA. The two types of oxygenates used in these fuels are alcohol (ethanol) or ether (MTBE or ETBE). If ethanol is the oxygenate that is used in the gasoline in your area, refer to **Gasolines Containing Alcohol**.

These reformulated gasolines are acceptable for use in your Mercury Marine engine.

### GASOLINES CONTAINING ALCOHOL

If the gasoline in your area contains either methanol (methyl alcohol) or ethanol (ethyl alcohol), you should be aware of certain adverse effects that can occur. These adverse effects are more severe with methanol. Increasing the percentage of alcohol in the fuel can also worsen these adverse effects.

Some of these adverse effects are caused because the alcohol in the gasoline can absorb moisture from the air, resulting in a separation of the water/alcohol from the gasoline in the fuel tank.

The fuel system components on your Mercury Marine engine will withstand up to 10% alcohol content in the gasoline. We do not know what percentage your boat's fuel system will withstand. Contact your boat manufacturer for specific recommendations on the boat's fuel system components (fuel tanks, fuel lines, and fittings). Be aware that gasolines containing alcohol may cause increased:

- Corrosion of metal parts
- Deterioration of rubber or plastic parts
- Fuel permeation through rubber fuel lines
- Starting and operating difficulties

# FUEL AND OIL

## ⚠ WARNING

Fuel leakage is a fire or explosion hazard, which can cause serious injury or death. Periodically inspect all fuel system components for leaks, softening, hardening, swelling, or corrosion, particularly after storage. Any sign of leakage or deterioration requires replacement before further engine operation.

Because of possible adverse effects of alcohol in gasoline, it is recommended that only alcohol-free gasoline be used where possible. If only fuel containing alcohol is available, or if the presence of alcohol is unknown, increased inspection frequency for leaks and abnormalities is required.

**IMPORTANT:** When operating a Mercury Marine engine on gasoline containing alcohol, storage of gasoline in the fuel tank for long periods should be avoided. Long periods of storage, common to boats, create unique problems. In cars, alcohol-blend fuels normally are consumed before they can absorb enough moisture to cause trouble, but boats often sit idle long enough for phase separation to take place. In addition, internal corrosion may take place during storage if alcohol has washed protective oil films from internal components.

## Fuel Requirements

Do not use premixed gas and oil in this engine. The engine automatically receives extra oil during engine break-in. Use a fresh supply of the recommended gasoline during engine break-in and after engine break-in.

## Fuel Additives

To minimize carbon deposit buildup in the engine, it is recommended to add Mercury or Quicksilver Quickstor fuel stabilizer additive to the engine's fuel at each tank fill throughout the boating season. Use additive as directed on container.

## Avoiding Fuel Flow Restriction

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

## Low Permeation Fuel Hose Requirement

Required for outboards manufactured for sale, sold, or offered for sale in the United States.

- The Environmental Protection Agency (EPA) requires that any outboard manufactured after January 1, 2009, must use low permeation fuel hose for the primary fuel hose connecting the fuel tank to the outboard.
- Low permeation hose is USCG Type B1-15 or Type A1-15, defined as not exceeding 15/gm<sup>2</sup>/24 h with CE 10 fuel at 23 °C as specified in SAE J 1527 - marine fuel hose.

# FUEL AND OIL

## EPA Pressurized Portable Fuel Tank Requirements

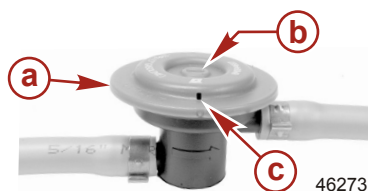
The Environmental Protection Agency (EPA) requires portable fuel systems that are produced after January 1, 2011, for use with outboard engines to remain fully sealed (pressurized) up to 34.4 kPa (5.0 psi). These tanks may contain the following:

- An air inlet that opens to allow air to enter as the fuel is drawn out of the tank.
- An air outlet that opens (vents) to the atmosphere if pressure exceeds 34.4 kPa (5.0 psi).

## Fuel Demand Valve (FDV) Requirement

Whenever a pressurized fuel tank is used, a fuel demand valve is required to be installed in the fuel hose between the fuel tank and primer bulb. The fuel demand valve prevents pressurized fuel from entering the engine and causing a fuel system overflow or possible fuel spillage.

The fuel demand valve has a manual release. The manual release can be used (pushed in) to open (bypass) the valve in case of a fuel blockage in the valve.



- a - Fuel demand valve - installed in the fuel hose between the fuel tank and primer bulb
- b - Manual release
- c - Vent/water drain holes

## Mercury Marine's Pressurized Portable Fuel Tank

Mercury Marine has created a new portable pressurized fuel tank that meets the preceding EPA requirements. These fuel tanks are available as an accessory or are provided with certain portable outboard models.

### SPECIAL FEATURES OF THE PORTABLE FUEL TANK

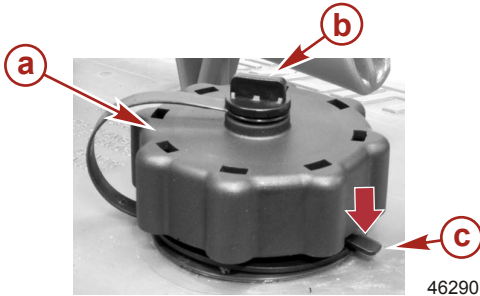
- The fuel tank has a two-way valve which allows air to enter the tank as the fuel is drawn to the engine, and also opens to vent to the atmosphere if internal pressure in the tank exceeds 34.4 kPa (5.0 psi). A hissing noise may be heard as the tank vents to the atmosphere. This is normal.
- The fuel tank includes a fuel demand valve that prevents pressurized fuel from entering the engine and causing a fuel system overflow or possible fuel spillage.
- When installing the fuel tank cap, turn the cap to the right until you hear a click. This signals that the fuel cap is fully seated. A built-in device prevents overtightening.
- The fuel tank has a manual vent screw which should be closed for transportation and open for operation and cap removal.



# FUEL AND OIL

Since sealed fuel tanks are not vented, they will expand and contract as the fuel expands and contracts during heating and cooling cycles of the outside air. This is normal.

## REMOVING THE FUEL CAP



- a - Fuel cap
- b - Manual vent screw
- c - Tab lock

**IMPORTANT:** Contents may be under pressure. Rotate the fuel cap 1/4 turn to relieve pressure before opening.

1. Open the manual vent screw on top of the fuel cap.
2. Turn the fuel cap until it contacts the tab lock.
3. Press down on the tab lock. Rotate the fuel cap 1/4 turn to relieve the pressure.
4. Press down on the tab lock again and remove the cap.

## DIRECTIONS FOR USING THE PRESSURIZED PORTABLE FUEL TANK

1. When installing the fuel tank cap, turn the cap to the right until you hear a click. This signals that the fuel cap is fully seated. A built-in device prevents overtightening.
2. Open the manual vent screw on top of the cap for operation and cap removal. Close the manual vent screw for transportation.
3. For fuel hoses that have quick disconnects, disconnect the fuel line from the engine or fuel tank when not in use.
4. Follow **Filling Fuel Tank** instructions for fueling.

## Oil Recommendation

<b>Recommended Oil</b>	<b>OptiMax Oil or Premium Plus 2-Cycle TCW 3 Outboard Oil</b>
------------------------	---

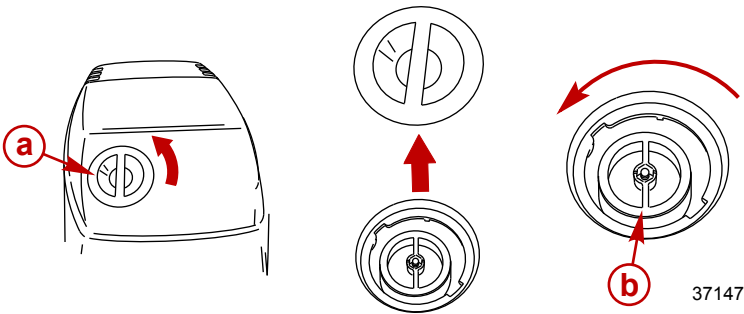
Mercury OptiMax/DFI or Quicksilver DFI 2-Cycle Engine Oil is recommended for your engine. If Mercury OptiMax/DFI or Quicksilver DFI 2-Cycle Engine Oil is not available, we recommend using Mercury or Quicksilver TC-W3 Premium Plus 2-Cycle Oil. Severe engine damage may result from use of an inferior oil.

# FUEL AND OIL

Mercury Racing 2-Stroke Oil is recommended for OptiMax engines that are used in applications of extreme loads associated with commercial, work, or extended periods of high RPM. The added lubrication and protection properties with Mercury Racing 2-Stroke oil, maximizes engine horsepower while protecting against heat, reduces wear and carbon deposit build-up.

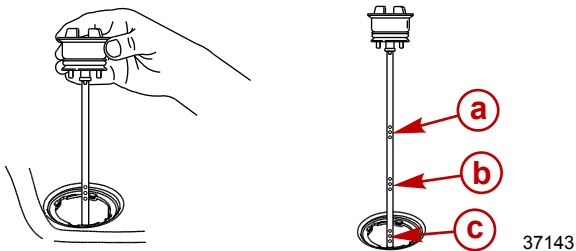
## Filling Oil Injection System

1. Place the outboard in a vertical operating position.
2. Remove the cowl cover.
3. Remove the oil filler cap.



- a** - Cowl cover
- b** - Oil filler cap

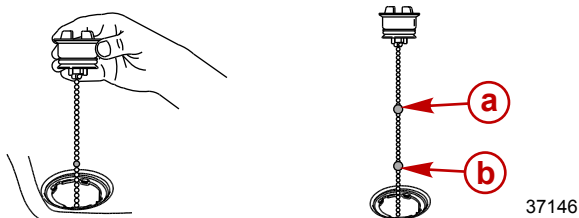
4. Oil filler caps with a dipstick - Check the oil level on the dipstick. The first set of holes indicates 0.94 liters (1 US qt) low. The second set of holes indicates 1.89 liters (2 US qt) low. The third set of holes indicates 2.83 liters (3 US qt) low.



- a** - Add 0.94 liters (1 US qt)
- b** - Add 1.89 liters (2 US qt)
- c** - Add 2.83 liters (3 US qt)

# FUEL AND OIL

5. Oil filler caps with a chain - Check the oil level on the chain. The first ball marker indicates 0.94 liters (1 US qt) low. The second ball marker indicates 1.89 liters (2 US qt) low.

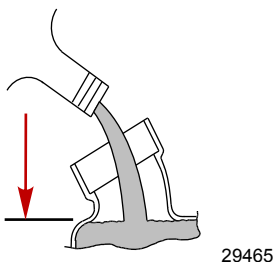


**a** - Add 0.94 liters (1 US qt)

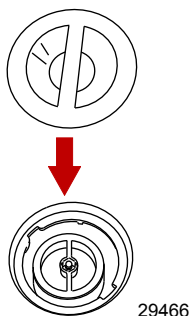
**b** - Add 1.89 liters (2 US qt)

6. 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.

	Capacity	Fluid Type
Oil tank	4.72 liters (5 US qt)	OptiMax/DFI 2-Cycle Engine Oil



7. Install the oil filler cap and tighten securely. Install the cowl cover.



# FUEL AND OIL

## Filling Fuel Tank

### WARNING

**Avoid serious injury or death from a gasoline fire or explosion. Use caution when filling fuel tanks. Always stop the engine and do not smoke or allow open flames or sparks in the area while filling fuel tanks.**

Fill the fuel tanks outdoors away from heat, sparks, and open flames.

Remove the portable fuel tanks from the boat to refill them.

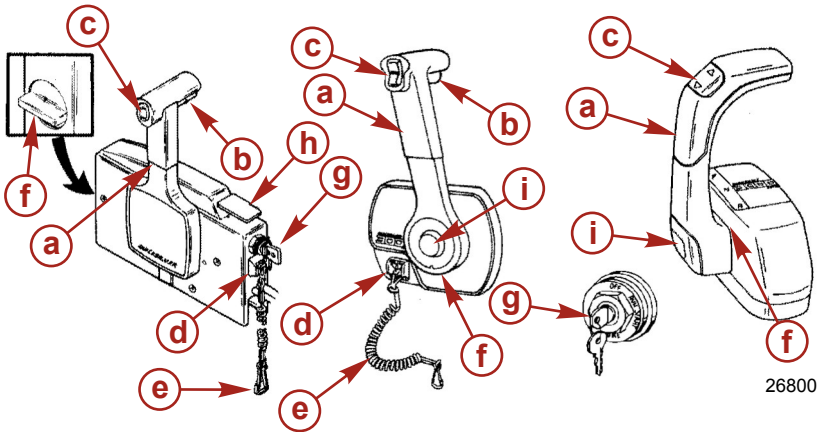
Always stop the engine before filling the tanks.

Do not completely fill the fuel tanks. Leave approximately 10% of the tank volume unfilled. Fuel will expand in volume as its temperature rises and can leak under pressure if the tank is completely filled.

# FEATURES AND CONTROLS

## Remote Control Features

Your boat may be equipped with one of the Mercury Precision or Quicksilver remote controls shown. If not, consult your dealer for a description of the functions and operations of the remote control.



- a** - Control handle – forward, neutral, reverse
- b** - Neutral release lever
- c** - Trim/tilt switch (if equipped) – Refer to **Features and Controls – Power Trim and Tilt**
- d** - Lanyard stop switch – Refer to **General Information – Lanyard Stop Switch**
- e** - Lanyard – Refer to **General Information – Lanyard Stop Switch**
- f** - Throttle friction adjustment – Console controls require cover removal for adjustment
- g** - Ignition key switch – "OFF," "ON," "START"
- h** - Fast idle lever – Refer to **Operation – Starting the Engine**
- i** - Throttle only button – Refer to **Operation – Starting the Engine**

## Warning System

### WARNING HORN SIGNALS

When the key switch is turned to the "ON" position, the horn will turn on for a moment as a test to indicate the horn is working.

There are two types of warning horns to alert the operator of an active problem within the engine's operating system.

# FEATURES AND CONTROLS

1. **Continuous six second beep:** Indicates a critical engine condition. Depending on the condition, the Engine Guardian system may engage and protect the engine by limiting power. You should return to port immediately and contact your servicing dealer.
2. **Intermittent short beeps for six seconds:** Indicates a noncritical engine condition. This condition does not require immediate attention. You may continue using your boat, however, depending on the nature of the problem, the engine's power may be limited by the Engine Guardian system (see **Engine Guardian System** following) to protect the engine. You should contact your servicing dealer at your earliest convenience.

It is important to note that in either of the above scenarios, the horn will only sound one time. If you key the engine off and restart it, the horn will sound again, one time, if the fault is still present. For visual display of the specific engine functions and additional engine data, refer to **SmartCraft Product** information, following.

A few of the noncritical conditions indicated by the intermittent short beeps for six seconds can be corrected by the operator. These operator correctable conditions are as follows:

- Water in the engine mounted fuel filter. Refer to **Maintenance – Water Separating Fuel Filter**.
- Cooling system (water pressure or engine temperature) problem. Stop the engine and check the water intake holes in the lower unit for obstruction.
- Low engine oil level. Refer to **Fuel and Oil – Checking and Adding Engine Oil**.

## ENGINE GUARDIAN SYSTEM

The Engine Guardian system monitors the critical sensors on the engine for any early indications of problems. Engine Guardian is functional whenever your engine is operating, so you never have to be concerned about whether or not you are protected. The system will respond to a problem by sounding the warning horn for six seconds and/or reducing engine power in order to provide engine protection.

If Engine Guardian has been activated, reduce the engine speed. The problem will need to be identified and corrected. The system must be reset before the engine will operate at higher speeds. Moving the throttle lever back to the idle position will reset the Engine Guardian system. If the Engine Guardian system has determined the reset has not corrected the problem, Engine Guardian will remain activated, limiting the throttle. The problem must be identified and corrected before Engine Guardian will allow the engine to reach a normal operating RPM.

# FEATURES AND CONTROLS

## OVERSPEED REV LIMIT

The overspeed rev limit is set at an RPM greater than the operating range. In the event that the engine is operated at an RPM greater than or equal to the overspeed limit, the PCM does not allow the engine to maintain the power requested by the operator. Refer to **Specifications** to determine this engine's RPM limit.

Upon reaching the beginning of the rev limit, Engine Guardian will cut-out the ignition to specific cylinders. If the operator does not reduce engine speed, Engine Guardian will cut-out the ignition to all the cylinders. There is no audible warning while Engine Guardian overspeed limit is active.

To reset the Engine Guardian protection:

1. Completely reduce the throttle for three seconds.
2. Engage the throttle. If the engine does not respond, repeat step one.

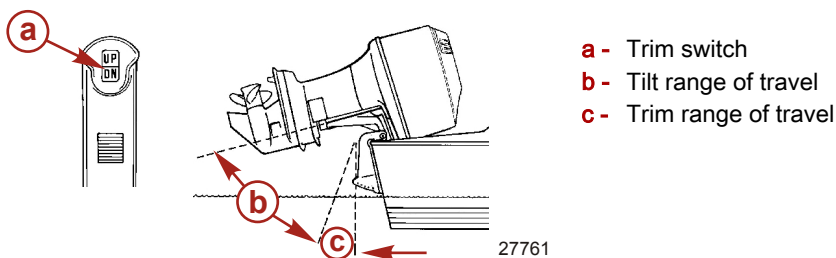
## SMARTCRAFT PRODUCT

A Mercury SmartCraft System instrument package can be purchased for this outboard. A few of the functions the instrument package will display are engine RPM, coolant temperature, battery voltage, fuel consumption, and engine operating hours.

The SmartCraft instrument package will also aid in Engine Guardian diagnostics. The SmartCraft instrument package will display critical engine alarm data and potential problems.

## Power Trim and Tilt

Your outboard has a trim/tilt control called power trim. This enables the operator to easily adjust the position of the outboard by pressing the trim switch. Moving the outboard in closer to the boat transom is called trimming in or down. Moving the outboard further away from the boat transom is called trimming out or up. The term trim generally refers to the adjustment of the outboard within the first 20° range of travel. This is the range used while operating your boat on plane. The term tilt is generally used when referring to adjusting the outboard further up out of the water. With the engine turned off, the outboard can be tilted out of the water. At low idle speed, the outboard can also be tilted up past the trim range to permit, for example, shallow water operation.



# FEATURES AND CONTROLS

## POWER TRIM OPERATION

**NOTE:** *When traveling at slow speeds, a slight drop in engine RPM may be noticed on occasion when engaging power trim. This condition is normal and has no adverse affect on the outboard.*

With most boats, operating around the middle of the trim range will give satisfactory results. However, to take full advantage of the trimming capability there may be times when you choose to trim your outboard all the way in or out. Along with an improvement in some performance aspects comes a greater responsibility for the operator, and this is being aware of some potential control hazards.

The most significant control hazard is a pull or torque that can be felt on the steering wheel or tiller handle. This steering torque results from the outboard being trimmed so that the propeller shaft is not parallel to the water surface.

### WARNING

**Trimming the outboard beyond a neutral steering condition may result in a pull on the steering wheel or tiller handle and loss of boat control. Maintain control of the boat if trimming beyond a neutral steering condition.**

Consider the following lists carefully.

1. Trimming in or down can:
  - Lower the bow.
  - Result in quicker planing off, especially with a heavy load or a stern heavy boat.
  - Generally improve the ride in choppy water.
  - Increase steering torque or pull to the right (with the normal right-hand rotation propeller).
  - In excess, can lower the bow of some boats to a point where they begin to plow with their bow in the water while on plane. This can result in an unexpected turn in either direction (called bow steering or oversteering) if any turn is attempted, or if a significant wave is encountered.

### WARNING

**Operating the boat at high speeds with the outboard trimmed too far under can create excessive bow steer, resulting in the operator losing control of the boat. Install the trim limit pin in a position that prevents excessive trim under and operate the boat in a safe manner.**

- In rare circumstances, the owner may decide to limit the trim in. This can be accomplished by purchasing a stainless steel tilt pin from your dealer and inserting it in whatever adjustment hole in the transom brackets is desired. The nonstainless steel shipping bolt should not be used in this application.
2. Trimming out or up can:



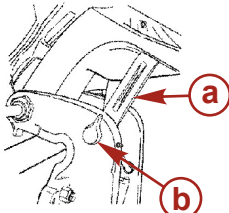
# FEATURES AND CONTROLS

- Lift the bow higher out of the water.
- Generally increase top speed.
- Increase clearance over submerged objects or a shallow bottom.
- Increase steering torque or pull to the left at a normal installation height (with the normal right-hand rotation propeller).
- In excess, can cause boat porpoising (bouncing) or propeller ventilation.
- Cause engine overheating if any cooling water intake holes are above the waterline.

## TILTING OPERATION

To tilt the outboard, shut off the engine and press the trim/tilt switch or auxiliary tilt switch to the up position. The outboard will tilt up until the switch is released or it reaches its maximum tilt position.

1. Engage the tilt support lever by rotating the knob to bring the support lever upward.
2. Lower the outboard to rest on the tilt support lever.
3. Disengage the tilt support lever by raising the outboard off the support lever and rotating the lever down. Lower the outboard.



- a - Tilt support lever
- b - Knob

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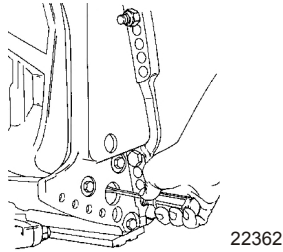
## MANUAL TILTING

If the outboard cannot be tilted using the power trim/tilt switch, the outboard can be manually tilted.

**NOTE:** *The manual tilt release valve must be tightened before operating the outboard to prevent the outboard from tilting up during reverse operation.*

# FEATURES AND CONTROLS

Turn out the manual tilt release valve three turns counterclockwise. This allows manual tilting of the outboard. Tilt the outboard to the desired position and tighten the manual tilt release valve.



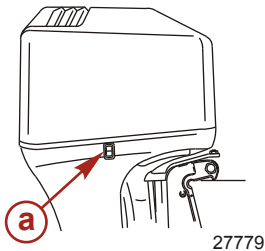
## SHALLOW WATER OPERATION

When operating your boat in shallow water, you can tilt the outboard beyond the maximum trim range to prevent hitting bottom.

1. Reduce the engine speed below 2000 RPM.
2. Tilt the outboard up. Make sure all the water intake holes stay submerged at all times.
3. Operate the engine at slow speed only. If engine speed exceeds 2000 RPM, the outboard will automatically return down to the maximum trim range.

## AUXILIARY TILT SWITCH

The auxiliary tilt switch can be used to tilt the outboard up or down using the power trim system.

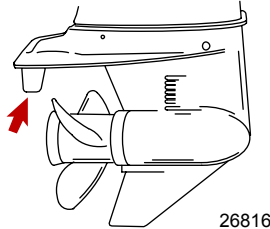


**a** - Auxiliary tilt switch

# FEATURES AND CONTROLS

## Trim Tab Adjustment

Propeller steering torque will cause your boat to pull in one direction. This steering torque is a normal thing that results from your outboard not being trimmed so the propeller shaft is parallel to the water surface. The trim tab can help compensate for this steering torque in many cases and can be adjusted within limits to reduce any unequal steering effort.



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**NOTE:** Trim tab adjustment will have little effect reducing steering torque if the outboard is installed with the anti-ventilation plate approximately 50 mm (2 inches) or more above the boat bottom.

Operate your boat at normal cruising speed, trimmed to the desired position. Turn your boat left and right and note the direction the boat turns more easily.

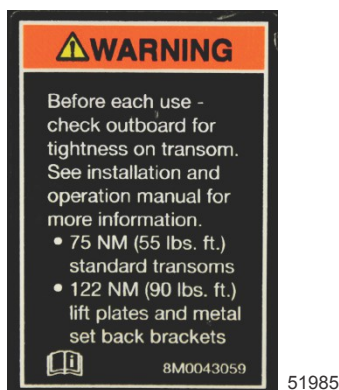
If adjustment is necessary, loosen trim tab bolt and make small adjustments at a time. If the boat turns more easily to the left, move the trailing edge of trim tab to the left. If the boat turns more easily to the right, move the trailing edge of trim tab to the right. Tighten bolt and retest.

# OPERATION

## Important Information

### IMPORTANT DAILY INSPECTION BEFORE EACH USE

Any outboard mounted on the boat must have the mounting hardware inspected and checked to ensure that the hardware has not become loose. A decal on the transom bracket reminds the owner to check the fasteners securing the outboard to the transom before each use.



Decal on the transom bracket

### BEFORE STARTING THE ENGINE

#### NOTICE

Lack of oil pressure in the system can cause severe internal engine damage during start-up. Prime the oil injection pump on new or rebuilt engines or after performing maintenance on the oiling system.

Refer to **Priming the Oil Injection Pump** for instructions.

### FUEL REQUIREMENTS

Do not use premixed gas and oil in this engine. The engine automatically receives extra oil during engine break-in. Use a fresh supply of the recommended gasoline during engine break-in and after engine break-in.

### OIL RECOMMENDATION

<b>Recommended Oil</b>	<b>OptiMax Oil or Premium Plus 2-Cycle TC-W3 Outboard Oil</b>
------------------------	---

OptiMax Oil or Premium Plus TC-W3 is a higher grade oil that provides increased lubrication and extra resistance to carbon buildup when used with good or varying grades of gasoline.

**IMPORTANT:** Oil must be NMMA certified TC-W3 2-Cycle oil.

# OPERATION

Periodically consult with your dealer to get the latest gasoline and oil recommendations. If Mercury Precision or Quicksilver 2-Cycle Outboard Oil is not available, substitute another brand of 2-Cycle outboard oil that is NMMA Certified TC-W3. The use of an inferior 2-Cycle outboard oil can reduce engine durability. Damage from use of inferior oil may not be covered under the limited warranty.

## Prestarting Check List

- Operator knows safe navigation, boating, and operating procedures.
- An approved personal flotation device of suitable size for each person aboard and readily accessible. It is the law.
- A ring-type life buoy or buoyant cushion designed to be thrown to a person in the water.
- Know the boat's maximum load capacity. Look at the boat capacity plate.
- Fuel supply OK.
- Oil supply (oil injection) OK.
- Arrange passengers and load in the boat so the weight is distributed evenly and everyone is seated in a proper seat.
- Tell someone where you are going and when you expect to return.
- It is illegal to operate a boat while under the influence of alcohol or drugs.
- Know the waters and area you will be boating; tides, currents, sand bars, rocks, and other hazards.
- Make the inspection checks listed in **Maintenance - Inspection and Maintenance Schedule**.

## Operating in Freezing Temperatures

When using your outboard or having your outboard moored in freezing or near freezing temperatures, keep the outboard tilted down at all times so the gearcase is submerged. This prevents the trapped water in the gearcase from freezing and causing possible damage to the water pump and other components.

If there is a chance of ice forming on the water, the outboard should be removed and drained completely of water. If ice should form at the water level inside the outboard driveshaft housing, it will block water flow to the engine causing possible damage.

## Operating in Saltwater or Polluted Water

We recommend that you flush the internal water passages of your outboard with fresh water after each use in salt or polluted water. This will prevent a buildup of deposits from clogging the water passages. Refer to **Maintenance - Flushing the Cooling System**.

# OPERATION

If you keep your boat moored in the water, always tilt the outboard so the gearcase is completely out of water (except in freezing temperatures) when not in use.

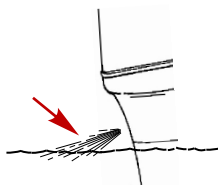
Wash the outboard exterior and flush out the exhaust outlet of the propeller and gearcase with fresh water after each use. Each month, spray Mercury Precision or Quicksilver Corrosion Guard on external metal surfaces. Do not spray on corrosion control anodes as this will reduce the effectiveness of the anodes.

## Operating at High Elevations

Your engine automatically compensates for high elevation changes. A different pitch propeller may help reduce some normal performance loss resulting from reduced oxygen in the air. Consult your dealer.

## Setting Trim Angle While Running Engine at Idle Speed

The exhaust relief hole on the outboard may become submerged if the outboard is trimmed full-in while running at idle speed. This will cause exhaust restriction, rough idle, excessive smoke, and fouled spark plugs. If this condition exists, trim the outboard up until the exhaust relief hole is out of the water. The outboard should be lowered for accelerating from a standing start or from idle speed.



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## Engine Break-in

**IMPORTANT:** Failure to follow the engine break-in procedures can result in poor performance throughout the life of the engine and can cause engine damage. Always follow break-in procedures.

Break-in Procedure
Vary throttle settings during break-in. Use the following suggestions.
<b>First Hour</b>
<ul style="list-style-type: none"><li>Allow the engine to warm-up for 30–60 seconds.</li></ul>

# OPERATION

Break-in Procedure
• Do not idle for more than five minutes.
• Run the engine the majority of the time between 4000–5400 RPM (approximately three-quarter throttle).
• Short bursts of wide-open throttle for 10 seconds or less are acceptable.
• Change the engine speed approximately every two minutes.
• Avoid trimming the outboard out (up) beyond a vertical trim position during operation.
• Avoid using a hydraulic jack plate to raise the engine during the break-in cycle.
<b>Next Three Hours:</b> Change the engine speed every 10 minutes.

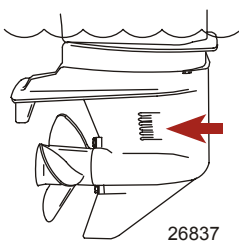
## Starting the Engine

Before starting, read the prestarting check list, special operating instructions, and engine break-in procedure in the **Operation** section.

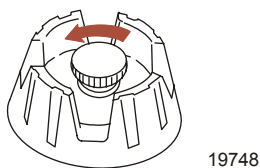
### NOTICE

Without sufficient cooling water, the engine, the water pump, and other components will overheat and suffer damage. Provide a sufficient supply of water to the water inlets during operation.

1. Lower the outboard to the vertical operating position. Make sure all cooling water intake holes are submerged.

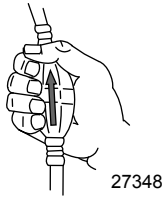


2. Open the fuel tank vent screw, located in the filler cap, on manual venting type fuel tanks.

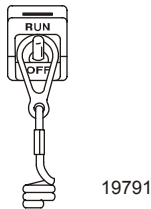


# OPERATION

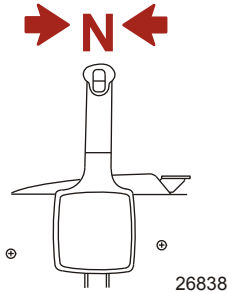
3. Position the fuel line primer bulb so the arrow on the side of the bulb is pointing up. Squeeze the fuel line primer bulb several times until it feels firm.



4. Set the lanyard stop switch to "RUN" position. Refer to **General Information - Lanyard Stop Switch**.



5. Shift the outboard to neutral ("N") position.

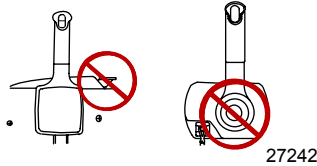


6. For the initial start of a new engine, or for an engine that ran out of fuel or was drained of fuel, the fuel system should be filled as follows:
  - a. Squeeze the fuel line primer bulb until it feels firm.
  - b. Turn the ignition key switch to the "ON" position for three seconds. This operates the electric fuel pump.
  - c. 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.

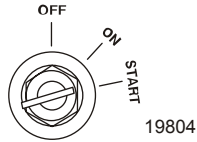


# OPERATION

7. Do not advance the neutral fast idle speed feature on the remote control for starting.



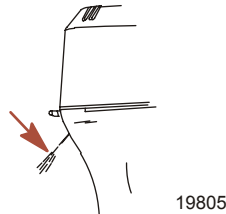
8. Turn the ignition key to "START" position. Release the key when engine starts. If engine fails to start in 10 seconds, return the key to "OFF" position, wait one second and try again.



**NOTE:** The electronic starting system will automatically prime (choke) the engine and increase idle speed for starting.

9. Check for a steady stream of water flowing out of the water pump indicator hole.

**IMPORTANT:** If no water is coming out of the water pump indicator hole, stop the engine and check cooling water intake holes for obstruction. No obstruction may indicate a water pump failure or blockage in the cooling system. This condition will cause the engine to overheat. Have the outboard checked by your dealer. Operating the engine while overheated will cause engine damage.



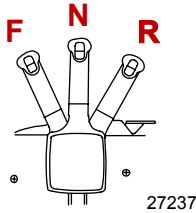
## Gear Shifting

**IMPORTANT:** Observe the following:

- Never shift the outboard into gear unless the engine speed is at idle.
- Do not shift the outboard into reverse when the engine is not running.
- Your outboard has three gear shift positions to provide operation: forward (F), neutral (N), and reverse (R).

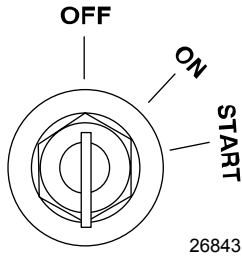
# OPERATION

- When shifting, always stop at neutral position and allow the engine speed to return to idle.
- Always shift the outboard into gear with a quick motion.
- After shifting the outboard into gear, advance the lever further to increase speed.



## Stopping the Engine

Reduce the engine speed and shift the outboard to neutral position. Turn the ignition key to "OFF" position.



## Jet Drive Operation

### PRESTARTING CHECK LIST

- Operator knows safe navigation, boating, and operating procedures.
- An approved personal flotation device of suitable size for each person aboard and readily accessible (it is the law).
- A ring type life buoy or buoyant cushion designed to be thrown to a person in the water.
- Know your boats maximum load capacity. Look at the boat capacity plate.
- Fuel supply OK.
- Oil supply (oil injection) OK.
- Ensure the boat drain plug is installed.
- Arrange passengers and load in the boat so the weight is distributed evenly and everyone is seated in a proper seat.
- Tell someone where you are going and when you expect to return.

# OPERATION

- It is illegal to operate a boat while under the influence of alcohol or drugs.
- Know the waters and area you will be boating; tides, currents, sand bars, rocks, and other hazards.
- Make inspection checks listed in **Maintenance - Inspection and Maintenance Schedule**.
- Check steering for free operation.
- Check for debris around the rudder and reverse gate which may jam or hinder operation.
- Before launching, examine the jet drive water intake for obstructions which may prevent pumping of water.
- Ensure the driveshaft bearing on the jet drive is lubricated.

## OPERATING IN FREEZING TEMPERATURES

If there is a chance of ice forming on the water, the jet drive should be removed and drained completely of water. If ice should form at the water level inside the outboard driveshaft housing, it will block water flow to the engine causing possible damage. Do not start the engine until the ice is clear.

## OPERATING IN SALTWATER OR POLLUTED WATER

If the boat is kept moored in the water, always tilt the outboard so the water intake is completely out of the water (except in freezing temperatures) when not in use.

Wash down the outboard exterior and flush out the exhaust outlet of the jet drive with fresh water after each use. Each month, spray Mercury Precision or Quicksilver Corrosion Guard on external metal surfaces.

**NOTE:** *Do not spray on corrosion control anodes as this will reduce the effectiveness of the anodes.*

## OPERATING IN SHALLOW WATER

The life of the impeller and water intake can be greatly increased by avoiding the intake of sand and gravel. The intake suction will act like a dredge when the water intake comes close to the bottom. It is better to stop the engine and drift up to shore when landing, and to shove off with an oar when leaving. The engine can idle through areas of water less than 61 cm (2 ft) deep, but there should be more than 61 cm (2 ft) of water under the boat when increasing speed to reach full plane.

Once the boat is on plane, the boat speed will prevent the ingestion of gravel and other debris from the bottom. The suction is still present, but the water intake passes too quickly over the bottom to allow debris to be drawn into the water intake.

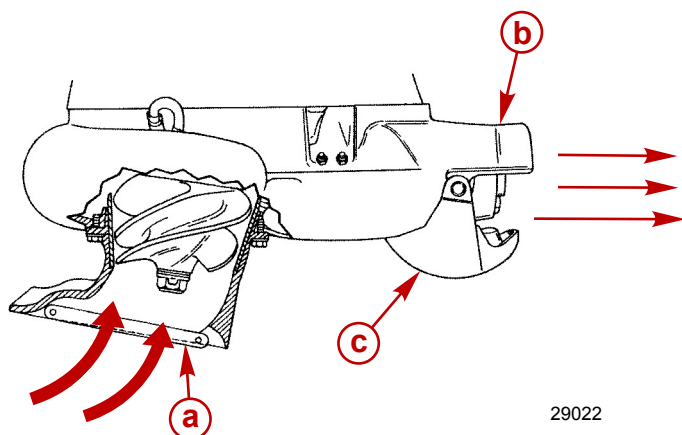
# OPERATION

When boating through shallow water areas, choose a course of travel that avoids sharp rocks and other underwater obstacles that could damage the boat. Running the boat through these areas on full plane may be helpful as the boat will be riding higher in the water. If the boat gets stuck on the bottom, immediately stop the engine and move the boat to deeper water.

## HOW THE JET DRIVE OPERATES

A jet driven boat has substantially different handling characteristics compared to a propeller driven boat. It is recommended that the operator adjusts to these characteristics by experimenting in open water at both high and low speeds.

The driveshaft driven impeller draws water up through the water intake and then directs it at a high pressure through the water outlet nozzle to create forward thrust. To obtain reverse, the reverse gate moves over the outlet nozzle to direct the water in the opposite direction.



29022

- a** - Water intake
- b** - Water outlet nozzle
- c** - Reverse gate

When the jet drive is in neutral, the impeller continues to rotate. However, the reverse gate is positioned so that some of the forward thrust is diverted to create reverse thrust. This approximate balancing of forward and reverse thrust will minimize any boat movement. Because the impeller is always rotating and creating thrust when the engine is running, the boat may tend to move slowly forward or backward. This is normal for a direct-drive jet driven boat. The operator should be aware of this and use caution whenever the engine is running.

# OPERATION

## **⚠ WARNING**

**Avoid injury resulting from contacting the rotating impeller or having hair, clothing, or loose objects drawn into the water intake and wrapping around the impeller shaft. Stay away from the water intake and never insert an object into the water intake or water outlet nozzle when the engine is running.**

The jet drive is always drawing water into the housing when the engine is running. Do not operate the jet drive with the grate removed from the water intake. Keep hands, feet, hair, loose clothing, life jackets, etc., away from the water intake. Never insert an object into the water intake or water outlet nozzle when the engine is running.

## **STOPPING THE BOAT IN AN EMERGENCY**

A jet powered boat has emergency stopping capability unique to this form of propulsion.

## **⚠ WARNING**

**Using the emergency stopping capability of a jet drive unit will slow down the boat in an emergency. However, sudden stopping may cause the occupants of the boat to be thrown forward or out of the boat resulting in serious injury or death. Use caution when performing the emergency stopping procedure, and be sure to practice in a safe area.**

In an emergency, putting the jet outboard into reverse and applying reverse throttle can rapidly slow down the boat and reduce stopping distance. However, such a maneuver may cause occupants in the boat to be thrown forward or possibly out of the boat.

## **STEERING THE BOAT**

The jet drive is dependent on water jet thrust for steering the boat. If the water jet thrust should ever stop (water blockage, engine stops, etc.), the boat will slow to a stop. However, while slowing there will be a reduced ability to steer the boat.

## **⚠ WARNING**

**Steering the vessel in a tight turn can result in loss of boat control. In some cases, the boat can spin out or roll over, causing serious injury or death. Avoid steering beyond the capabilities of the vessel, especially at high speeds.**

# OPERATION

## WARNING

A loss or reduction in water jet thrust will directly affect boat directional control, and may result in property damage, personal injury, or death. Boat directional control can also be substantially reduced or lost altogether by a sudden loss of power such as running out of gas, quickly backing off the throttle, turning off the ignition switch, activating the lanyard stop switch, or plugging the water intake to the jet pump. Use caution when maneuvering at high speeds in areas where debris (weeds, logs, gravel, etc.) could be picked up into the jet drive. The ability to take evasive action is dependent on sufficient water jet thrust to control the boat.

While steering the boat at engine speeds above idle, the boat will respond quickly; but, due to the relatively flat-bottom hulls and lack of a gearcase in the water, the boat will tend to skid on turns. Turns must be started early and use sufficient power to maintain steering control.

## MOORING THE BOAT

Be sure to tilt the jet drive out of the water when the boat is pulled onto a beach or tied to a dock in shallow water. Failure to do this may cause the water intake housing to fill with sand or debris and could prevent the outboard from cranking over for starting.

## WATER INTAKE BLOCKAGE

### WARNING

A rotating impeller could cause injury if contact is made with hands, clothing, or tools. To avoid injury, keep hands and clothing away from the inlet or outlet of the jetdrive, regardless of whether the boat is in the water. Secure tools and loose items to avoid being struck by projectiles as a result of contact with the rotating impeller, and to prevent damage to the impeller.

A large amount of debris being drawn into the water intake may result in a loss of power. Intake suction holding debris against the grate will result in restricted water flow. Shutting the engine off may allow the debris to fall off the intake grate allowing full power to be restored. If debris does not fall off the intake grate, the engine must be shut off and debris physically removed from the grate.

## CLEARING A LODGED IMPELLER

### WARNING

Rotating the flywheel to free a lodged impeller can accidentally start the engine, resulting in serious injury or death. Always turn the ignition key or lanyard stop switch to the "OFF" position and remove all spark plug leads from the spark plugs.

# OPERATION

It is possible for debris to lodge between the impeller and jet housing wall, especially after the engine has been stopped. This will lock the driveshaft and will prevent the engine from being able to crank over for starting. Following are steps for dislodging the impeller.

1. Position the lanyard stop switch to the "OFF" position.
2. Remove the spark plug leads to prevent the engine from accidentally starting.
3. Remove the flywheel or rewind cover and rotate the engine flywheel counterclockwise.

If this does not dislodge the impeller, it will be necessary to remove the six screws and water intake housing.

## STARTING THE ENGINE

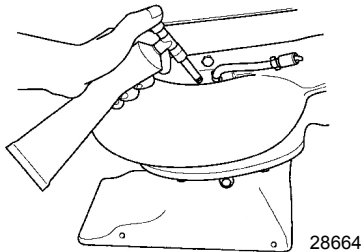
Before starting, read the prestarting check list, special operating instructions, and engine break-in procedure in the **Operation** section.

**NOTE:** When the engine is being run within the RPM range of 3500–4200 RPM, there may be a slight RPM instability. This is caused by the light engine load conditions normally seen with jet lower units. This condition will not cause any adverse affects on the engine.

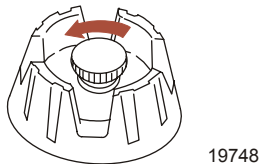
### NOTICE

Without sufficient cooling water, the engine, the water pump, and other components will overheat and suffer damage. Provide a sufficient supply of water to the water inlets during operation.

1. Ensure that the driveshaft bearing on the jet drive is lubricated. Refer to **Maintenance - Lubrication Points**.

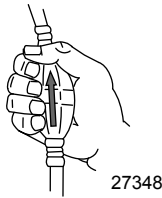


2. Open the fuel tank vent screw, located in the filler cap, on manual venting type fuel tanks.

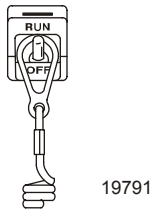


# OPERATION

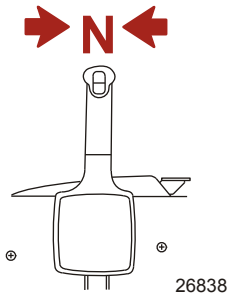
3. Position the fuel line primer bulb so the arrow on the side of the bulb is pointing up. Squeeze the fuel line primer bulb several times until it feels firm.



4. Set the lanyard stop switch to "RUN" position. Refer to **General Information - Lanyard Stop Switch**.



5. Shift the outboard to neutral ("N") position.

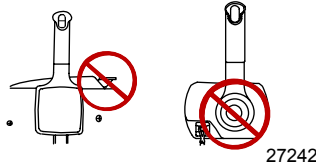


6. For the initial start of a new engine, or for an engine that ran out of fuel or was drained of fuel, the fuel system should be filled as follows:
  - a. Squeeze the fuel line primer bulb until it feels firm.
  - b. Turn the ignition key switch to the "ON" position for three seconds. This operates the electric fuel pump.
  - c. 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.

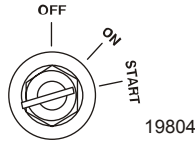


# OPERATION

7. Do not advance the neutral fast idle speed feature on the remote control for starting.



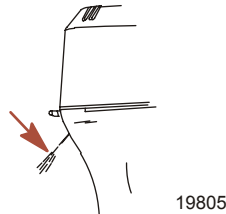
8. Turn the ignition key to "START" position. Release the key when the engine starts. If the engine fails to start in 10 seconds, return the key to "OFF" position, wait one second and try again.



**NOTE:** The electronic starting system will automatically prime (choke) the engine and increase idle speed for starting.

9. Check for a steady stream of water flowing out of the water pump indicator hole.

**IMPORTANT:** If no water is coming out of the water pump indicator hole, stop the engine and check cooling water intake holes for obstruction. No obstruction may indicate a water pump failure or blockage in the cooling system. This condition will cause the engine to overheat. Have the outboard checked by your dealer. Operating the engine while overheated will cause engine damage.



## GEAR SHIFTING

**IMPORTANT:** Never shift the outboard into gear unless the engine speed is at idle.

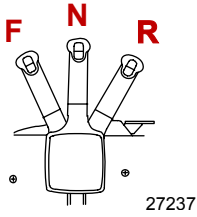
Your outboard has three gear shift positions to provide operation: forward (F), neutral (N), and reverse (R).

When shifting, always stop at neutral position and allow the engine speed to return to idle.

Always shift the outboard into gear with a quick motion.

# OPERATION

After shifting the outboard into gear, advance the lever further to increase speed.



# MAINTENANCE

## 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.

Record maintenance performed in the **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.

## EPA Emissions 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 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.**

# MAINTENANCE

## EMISSION CERTIFICATION LABEL

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

<b>MERCURY</b>		<b>EMISSION CONTROL INFORMATION</b>	
THIS ENGINE CONFORMS TO [ ] CALIFORNIA AND U.S. EPA EMISSION REGULATIONS FOR SPARK IGNITION MARINE ENGINES			
REFER TO OWNERS MANUAL FOR REQUIRED MAINTENANCE, SPECIFICATIONS, AND ADJUSTMENTS			
IDLE SPEED (in gear): [ ]		FAMILY: [ ]	
[ ] hp	[ ] L	HC+NOx:FEL: [ ] g/kWh	
[ ] kw		CO FEL: [ ] g/kWh	
[ ]	SPARK PLUG: [ ]		[ ]
	GAP: [ ]		[ ]
LOW PERM/HIGH PERM: [ ]			

43210

- a - Idle speed
- b - Engine horsepower
- c - Piston displacement
- d - Engine power - kilowatts
- e - Date of manufacture
- f - Family number
- g - Regulated emission limit for the engine family
- h - Regulated emission limit for the engine family
- i - Recommended spark plug and gap
- j - Percent of fuel line permeation

## 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 emission levels to exceed their predetermined factory specifications.

## Inspection and Maintenance Schedule

### PRIOR TO EVERY USE

- Check that the lanyard stop switch stops the engine.
- Check the steering system for binding or loose components.
- Verify that the outboard is securely attached to the boat transom. If the outboard or any of its fasteners are loose, tighten them to the specified torque. When checking to verify the outboard is securely fastened, look for loss of outboard transom bracket material or paint caused by movement between the outboard mounting fasteners and the outboard transom brackets. Also look for signs of movement between the outboard transom brackets and the boat transom or lift plate/setback bracket.

# MAINTENANCE

Description	Nm	lb-in.	lb-ft
Outboard mounting locknuts and bolts – standard boat transom	75	–	55
Outboard mounting locknuts and bolts – metal lift plates and setback brackets	122	–	90


- Check the propeller blades for damage.
- Inspect all hoses, clamps, fittings, tubing, sealing gaskets, and mounting hardware for wear.

## AFTER EACH SALTWATER OR POLLUTED WATER USE

- Flush all internal passages with fresh water.
- Wash the power package exterior (cowl, midsection, and gearcase) with fresh water.
- Flush the propeller and gearcase exhaust outlet with fresh water.
- Remove the cowl and wipe off any saltwater spray with a damp cloth.

## EVERY 25 HOURS OR EVERY 30 DAYS OF SALTWATER OR POLLUTED WATER USE

- Spray the powerhead and all external, unpainted metal surfaces (except anodes) with Corrosion Guard.

Tube Ref No.	Description	Where Used	Part No.
 120	Corrosion Guard	Powerhead and all external, unpainted metal surfaces (except anodes)	92-802878 55

## EVERY 25 HOURS OR EVERY 30 DAYS, WHICHEVER OCCURS FIRST


- Verify that the front and side cowl latches are tight. Tighten them if necessary.
- Inspect the fuel and oil systems for deterioration or leaks.
- Inspect the hydraulic steering hoses for deterioration or leaks.
- Inspect the steering link rod fasteners for wear. Lubricate all of the specified components. Check all attachment hardware to ensure proper torque.
- Check the level and condition of the gearcase lubricant.
- Check the alternator belt tension.

## EVERY 50 HOURS OR ONCE A YEAR, WHICHEVER OCCURS FIRST

- Lubricate all of the lubrication points listed in the manual.
- Lubricate the splines on the driveshaft.<sup>1</sup>
- Lubricate the length of driveshaft with Extreme Grease.

1. These items should be serviced by an authorized dealer.

# MAINTENANCE

Tube Ref No.	Description	Where Used	Part No.
	Extreme Grease	Length of driveshaft	8M0071842

- Lubricate the splines on the propeller shaft.
- Drain and replace the gearcase lubricant.
- Inspect all belts, pulleys, and idler pulleys for deterioration.
- Check the fuel pressure.<sup>1</sup>
- Check the control cable adjustments.
- Inspect the battery.
- Check the corrosion control anodes.
- Check the tightness of all fasteners.
- Check the power trim fluid.
- Use Quicksilver products to remove engine deposits. See your dealer for an explanation of which products to use.

## EVERY 100 HOURS OR ONCE A YEAR, WHICHEVER OCCURS FIRST

- Tighten the fasteners that secure the outboard to the boat transom to the specified torque.<sup>1</sup>

Description	Nm	lb-in.	lb-ft
Outboard mounting locknuts and bolts – standard boat transom	75	–	55
Outboard mounting locknuts and bolts – metal lift plates and setback brackets	122	–	90

- Replace the water pump impeller (more often if overheating occurs or reduced water pressure is noted).<sup>1</sup>
- Replace the spark plugs after the first 100 hours or first year. After that, inspect the spark plugs every 100 hours or once yearly. Replace the spark plugs as needed.
- Replace the water-separating fuel filter.
- Replace the in-line oil filter after the first 100 hours of operation.
- Use Quickleen in the fuel.
- Verify that the cowl seals are intact and not damaged.
- Check that the internal cowl sound reduction foam (if equipped) is intact and not deteriorating.
- Ensure that the intake silencer (if equipped) is in place.
- Ensure that the idle relief muffler (if equipped) is in place.
- Check for loose hose clamps and rubber boots (if equipped) on the air intake assembly.

# MAINTENANCE

- Inspect the carbon fiber reeds for chipping or cracks.

## EVERY 300 HOURS OF OPERATION

- Replace the in-line oil filter every 300 hours of operation.

## BEFORE PERIODS OF STORAGE

- Refer to **Storage** section.

## Flushing the Cooling System

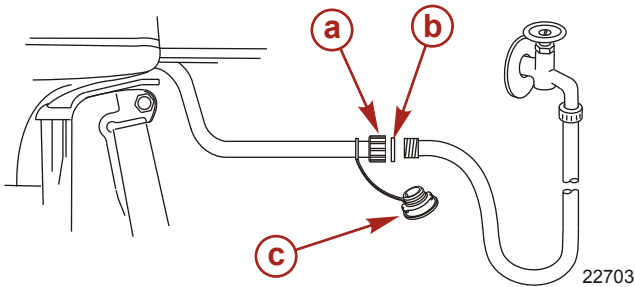
Flush the internal water passages of the outboard with fresh water after each use in salt, polluted, or muddy water. This will help prevent a buildup of deposits from clogging the internal water passages.

**NOTE:** *The engine can be stopped, or running at idle speed in neutral, when flushing the cooling system. Do not flush the engine using a water source that exceeds 310 kPa (45 psi).*

1. Unscrew the cover from the end of the hose adapter.
2. Attach a water hose to the hose adapter.
3. Turn on the water and flush the cooling system for a minimum of three minutes.

**IMPORTANT: Do not run engine above idle speed when flushing.**

4. Turn off the water and remove the water hose from the hose adapter. Install the cover into the hose adapter.



- a - Hose adapter
- b - Sealing washer
- c - Cover

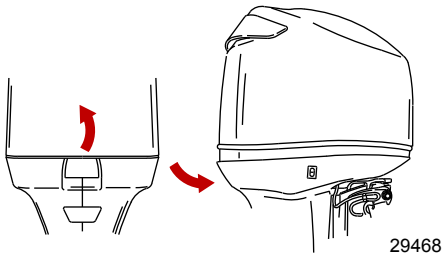
## Top Cowl Removal and Installation

### REMOVAL

1. Unlock the rear latch by pushing lever up.

# MAINTENANCE

2. Lift rear of cowl and disengage front hook.



## INSTALLATION

1. Engage the front hook and push cowl back over the cowl seal.
2. Push cowl down and move the rear latch lever down to lock.

## Cleaning Care for Top Cowl

**IMPORTANT:** Dry wiping (wiping the plastic surface when it is dry) will result in minor surface scratches. Always wet the surface before cleaning. Follow the cleaning and waxing procedure.

## CLEANING AND WAXING PROCEDURE

1. Before washing, rinse the top cowl with clean water to remove the dirt and dust that may scratch the surface.
2. Wash the top cowl with clean water and a mild nonabrasive soap. Use a soft, clean cloth when washing.
3. Dry thoroughly with a soft, clean cloth.
4. Wax the surface using a nonabrasive automotive polish (polish designed for clear coat finishes). Remove the applied wax by hand using a soft, clean cloth.

## Flywheel Cover Removal and Installation

### REMOVAL

Lift the cover off the three mounting pins.



# MAINTENANCE

## INSTALLATION

Position the cover onto the three mounting pins. Insert the tabs into the slots in the side panel and push the cover down onto the mounting pins.



- a** - Flywheel cover
- b** - Mounting pins
- c** - Tabs

## Side Panel Removal and Installation

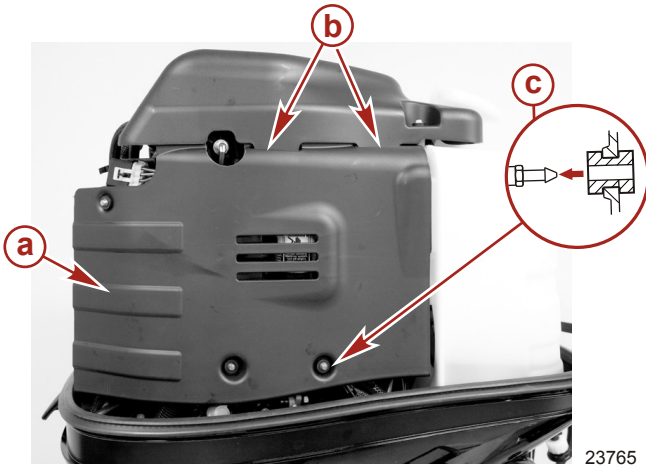
### REMOVAL

Pull the side panel off the three mounting pins.

# MAINTENANCE

## INSTALLATION

Position the side panel onto the three mounting pins. Insert the tabs on the flywheel cover into the upper slots and push the side panel onto the mounting pins.



- a - Side panel
- b - Upper slots
- c - Mounting pins

## Oil Injection System

### OIL INJECTION FILTER

**IMPORTANT:** The oil injection in-line filter must be replaced after the first 100 hours of operation. Afterwards, this filter must be replaced every 300 hours of operation. After replacing the in-line filter, the oil injection system must be purged to remove air trapped in the system.

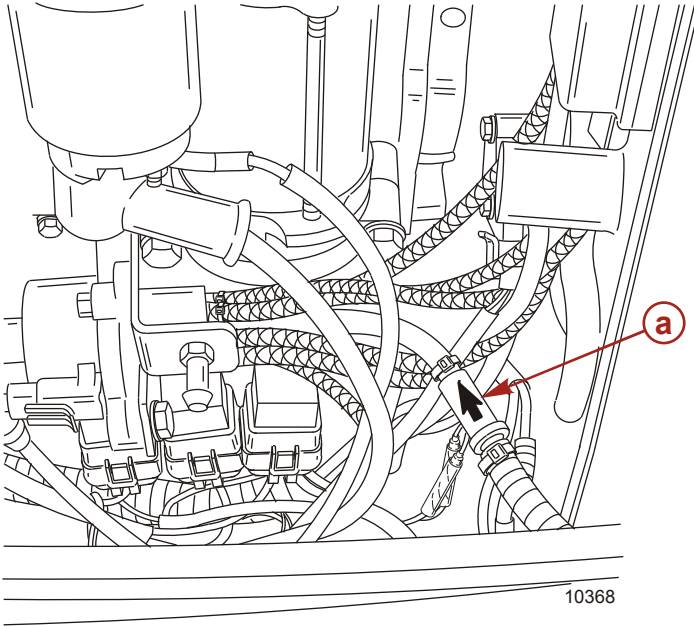
1. Cut the cable ties securing the in-line oil filter.
2. Place an appropriate container or shop towels under the in-line filter to capture oil that will leak out of the hoses.

**IMPORTANT:** The arrow on the filter identifies the direction of the oil flow and should point towards the oil pump.

3. Quickly remove the old filter and install a new filter.

# MAINTENANCE

4. Secure the filter with cable ties.



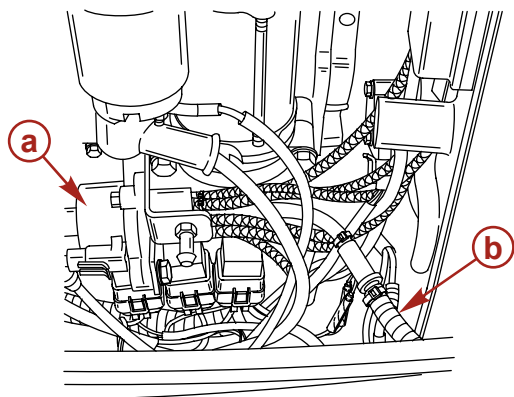
**a** - Oil filter

5. Purge the trapped air from the oil injection system. Refer to **Oil Injection Pump Purge**.

# MAINTENANCE

## OIL INJECTION PUMP PURGE

Before starting the engine after changing the in-line oil filter, the oil injection pump must be purged. This will remove any air that may be in the pump, oil supply hose, or internal passages.

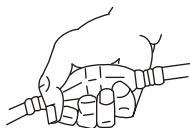


- a - Oil injection pump
- b - Oil supply hose

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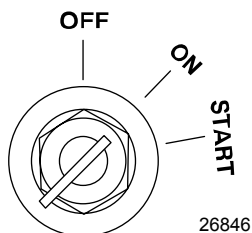
**IMPORTANT:** Fill the engine fuel system with fuel before purging the oil injection pump.

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



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



26846

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 purging process.

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

# MAINTENANCE

## Fuel System

### ⚠ WARNING

Fuel is flammable and explosive. Ensure that the key switch is off and the lanyard is positioned so that the engine cannot start. Do not smoke or allow sources of spark or open flame in the area while servicing. Keep the work area well ventilated and avoid prolonged exposure to vapors. Always check for leaks before attempting to start the engine, and wipe up any spilled fuel immediately.

Before servicing any part of the fuel system, stop the 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.

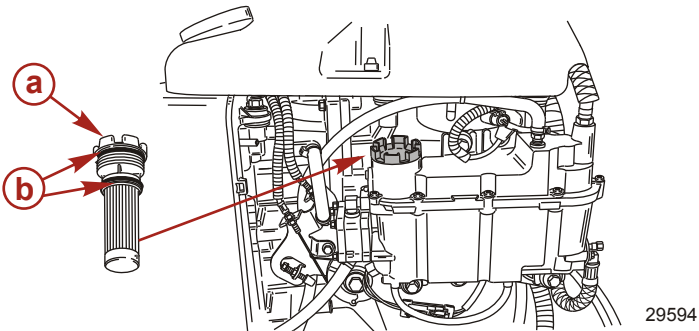
### FUEL LINE INSPECTION

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 FILTER REPLACEMENT

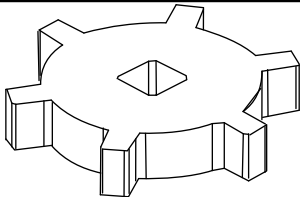
#### Removal

Use fuel filter tool 91-896661, or the shaft of a screwdriver, between the lugs on the filter cap and unscrew the filter.



- a** - Filter
- b** - O-rings

# MAINTENANCE

Fuel Filter Removal/Installation Tool	91-896661
 24896	Aids in the removal and installation of the fuel filter cap assembly.

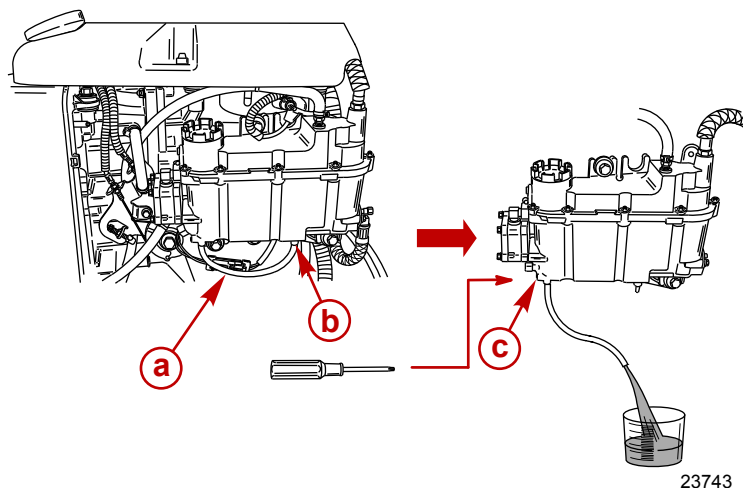
## Installation

1. Lubricate the O-ring seals with oil.
2. Install the fuel filter and tighten securely.
3. Squeeze the primer bulb until firm and inspect for fuel leakage at the filter.

## DRAINING WATER FROM THE FUEL FILTER CHAMBER

**NOTE:** If a sufficient amount of water has accumulated in the fuel filter chamber, the warning system will turn on. Draining the water from the fuel filter chamber is required.

1. Pull the drain hose off the right side fitting. Hold the open end of the hose over a container.
2. Use a 1/8 in. hex wrench and loosen the drain screw and drain the fuel filter chamber.



- a - Drain hose
- b - Right side fitting
- c - Drain screw

3. Tighten the drain screw and attach the hose.

# MAINTENANCE

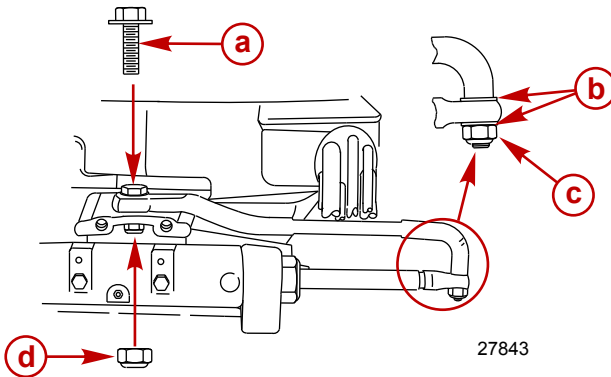
**IMPORTANT:** Visually inspect for fuel leakage from the drain screw by squeezing the primer bulb until firm, forcing fuel into the chamber.

## Steering Link Rod Fasteners

**IMPORTANT:** The steering link rod that connects the steering cable to the engine must be fastened using a special washer head bolt ("a" - Part Number 10-849838) and self-locking nylon insert locknuts ("c" and "d" - Part Number 11-826709113). These locknuts must never be replaced with common nuts (nonlocking) as they will work loose and vibrate off, freeing the link rod to disengage.

### ⚠ WARNING

Improper fasteners or improper installation procedures can result in loosening or disengagement of the steering link rod. This can cause a sudden, unexpected loss of boat control, resulting in serious injury or death due to occupants being thrown within or out of the boat. Always use required components and follow instructions and torque procedures.



- a** - Special washer head bolt (10-849838)
- b** - Flat washer (2)
- c** - Nylon insert locknut (11-826709113)
- d** - Nylon insert locknut (11-826709113)

Description	Nm	lb-in.	lb-ft
Special washer head bolt	27	-	20
Nylon insert locknut "d"	27	-	20
Nylon insert locknut "c"	Tighten until it seats, then back off 1/4 turn		

# MAINTENANCE

Assemble steering link rod to steering cable with two flat washers and self-locking nylon insert locknut. Tighten locknut until it seats, then back nut off 1/4 turn.

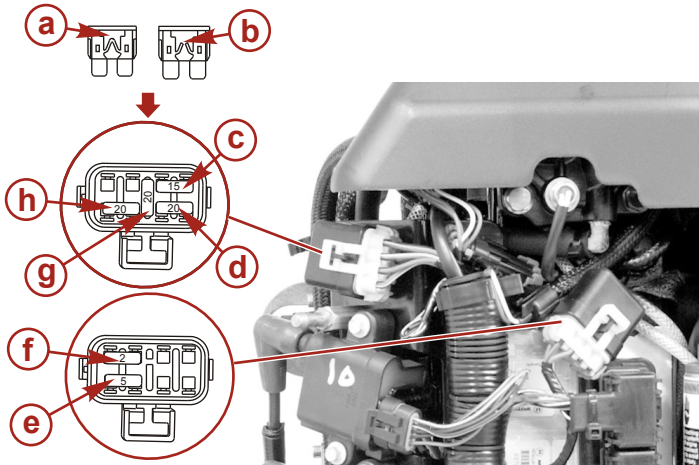
Assemble steering link rod to engine with special washer head bolt and self-locking nylon insert locknut. First torque bolt, then torque locknut to specifications.

## Fuse Replacement

**IMPORTANT: Always carry spare 5 and 20-amp fuses.**

The electrical wiring circuits on the outboard are protected from overload by fuses in the wiring. If a fuse is blown, try to locate and correct the cause of the overload. If the cause is not found, the fuse may blow again.

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



23793

- a** - Good fuse
- b** - Blown fuse
- c** - 14 pin remote control harness/cowl trim switch/main power relay - 15-amp fuse
- d** - Ignition coil circuit - 20-amp fuse
- e** - SmartCraft data bus circuit - 5-amp fuse
- f** - Diagnostics terminal - 2-amp fuse
- g** - Spare fuse - 20-amp fuse
- h** - Fuel injectors/direct injectors/oil pump/PCM - 20-amp fuse



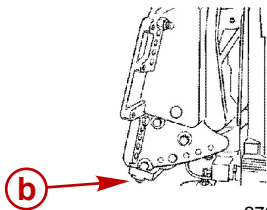
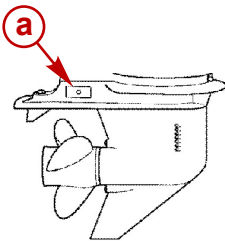
# MAINTENANCE

## Corrosion Control Anode

Your outboard has corrosion control anodes at different locations. An anode helps protect the outboard against galvanic corrosion by sacrificing its metal to be slowly corroded instead of the outboard metals.

Each anode requires periodic inspection, especially in saltwater 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.

The gearcase has two corrosion control anodes, one on each side. A third anode is installed on the bottom of the transom bracket assembly.



- a** - Anode (2) on each side of gearcase
- b** - Anode on transom bracket assembly

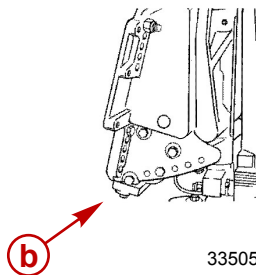
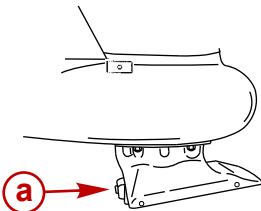
27844

## Corrosion Control Anode

Your outboard has corrosion control anodes at different locations. An anode helps protect the outboard against galvanic corrosion by sacrificing its metal to be slowly corroded instead of the outboard metals.

Each anode requires periodic inspection, especially in saltwater 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.

The gearcase has two corrosion control anodes, one on each side. A third anode is installed on the bottom of the transom bracket assembly and the other is located on the water intake housing.



33505

- a** - Anode on the water intake housing
- b** - Anode on the transom bracket assembly

# MAINTENANCE

## 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. Ensure the battery is secure against movement.
3. Battery cable terminals should be clean, tight, and correctly installed. Positive to positive and negative to negative.
4. Ensure the battery is equipped with a nonconductive shield to prevent accidental shorting of battery terminals.

## Battery Information (All Batteries Including DTS)

### **▲ WARNING**

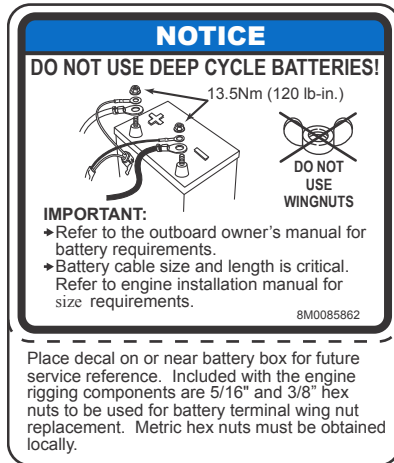
Failure to properly secure the battery leads can result in a loss of power to the Digital Throttle and Shift (DTS) system, leading to serious injury or death due to loss of boat control. Secure the battery leads to the battery posts with hex nuts to avoid loose connections.

- Do not use deep cycle batteries. The engine must use a marine starting battery with 1000 MCA, 800 CCA, or 180 Ah rating.
- When connecting the engine battery, use hex nuts to secure the battery leads to the battery posts. Tighten the nuts to the specified torque.

Description	Nm	lb-in.	lb-ft
Hex nuts	13.5	120	–

# MAINTENANCE

A decal advising against using deep cycle batteries and wing nuts should be placed on or near the battery box for future service reference. One 5/16 in. and one 3/8 in. hex nut is supplied per battery for wing nut replacement. Metric hex nuts are not supplied.



54395

## Propellers

### REMOVAL

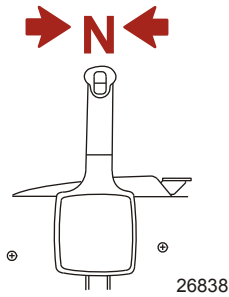
**IMPORTANT:** Propellers used on this product require the Mercury Marine Flo-Torq III type hub or equivalent.

### ⚠ WARNING

Rotating propellers can cause serious injury or death. Never operate the boat out of the water with a propeller installed. Before installing or removing a propeller, place the drive unit in neutral and engage the lanyard stop switch to prevent the engine from starting. Place a block of wood between the propeller blade and the anti-ventilation plate.

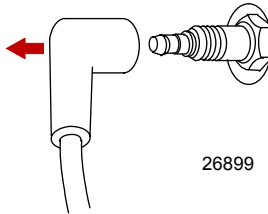
# MAINTENANCE

1. Shift the outboard to the neutral ("N") position.

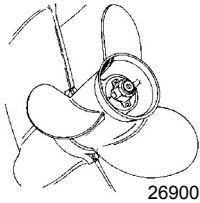


**IMPORTANT: Refer to Spark Plug Inspection and Replacement for removing spark plug leads.**

2. Remove the spark plug leads to prevent the engine from starting.

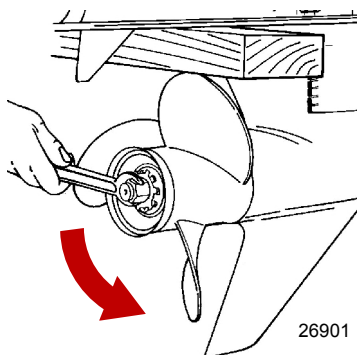


3. Straighten the bent tabs on the propeller nut retainer.



# MAINTENANCE

- Place a block of wood between the gearcase and propeller and remove the propeller nut.

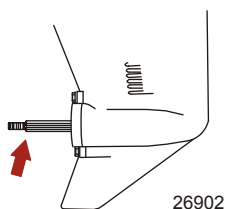




- Pull the propeller straight off the shaft. If the propeller is seized to the shaft and cannot be removed, have the propeller removed by an authorized dealer.

## INSTALLATION

**IMPORTANT:** To prevent the propeller hub from corroding and seizing to the propeller shaft (especially in saltwater), 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.

- Coat the propeller shaft with Extreme Grease or 2-4-C with PTFE.

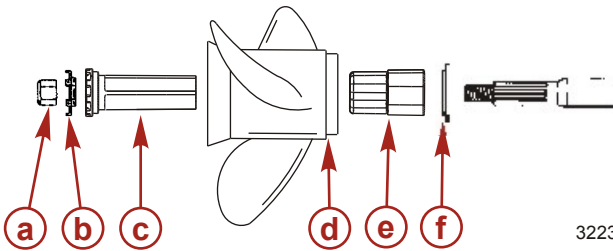


Tube Ref No.	Description	Where Used	Part No.
	Extreme Grease	Propeller shaft	8M0071842
	2-4-C with PTFE	Propeller shaft	92-802859A 1

**NOTE:** The Flo-Torq III propeller drive hubs are designed to have a small amount of free play when installed. This free play allows the propeller to slide back and forth on the rear thrust hub (up to 3.17 mm [1/8 in.]) and rotate up to 10 degrees.

# MAINTENANCE

- Flo-Torq III drive hub propellers** - Install the forward thrust hub, replaceable drive sleeve, propeller, thrust hub, propeller nut retainer, and propeller nut onto the shaft.



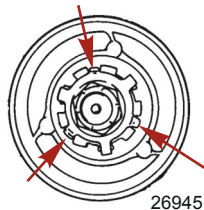
3223

- a** - Propeller nut
- b** - Propeller nut retainer
- c** - Rear thrust hub
- d** - Propeller
- e** - Replaceable drive sleeve
- f** - Forward thrust hub

- Place a block of wood between the gearcase and propeller. Torque the propeller nut to specification.

Description	Nm	lb-in.	lb-ft
Propeller nut	75	-	55

- Secure the propeller nut by bending three of the tabs into the thrust hub grooves.



26945

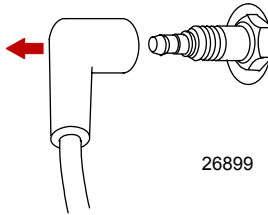
## Spark Plug Inspection and Replacement

### ⚠ WARNING

Damaged spark plug boots may emit sparks that can ignite fuel vapors under the engine cowl, resulting in serious injury or death from a fire or explosion. To avoid damaging the spark plug boots, do not use any sharp object or metal tool to remove the spark plug boots.

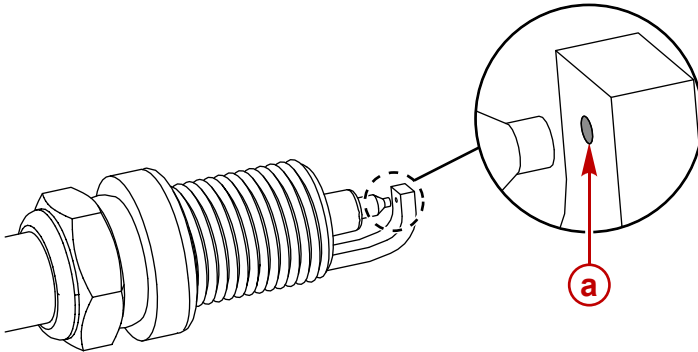
# MAINTENANCE

1. Remove the spark plug leads by twisting the rubber boots while pulling them off the spark plugs.



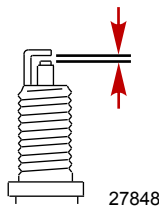
2. Remove the spark plugs. Replace the spark plug if the electrode is worn; the insulator is rough, cracked, broken, or blistered; or if the precious metal is not visible on the spark plug electrode.

**IMPORTANT: The color of the plug may not accurately reflect its condition. To accurately diagnose a faulty plug, inspect the precious metal on the plug's electrode. If no precious metal is visible, replace the plug.**



**a** - Precious metal

3. Set the spark plug gap. Refer to **Specifications**.



- a. All of the spark plugs should have the gap checked and corrected as necessary before installation.
- b. Measure the gap with a feeler gauge or pin gauge. Never use a wedge-type gap checking tool to inspect or to adjust the gap.

# MAINTENANCE

- c. If an adjustment is necessary, do not pry or apply any force on the center electrode. This is critical with any type of spark plug that has a wear surface, such as platinum or iridium added to either the ground electrode or the center electrode.
  - d. When it is necessary to widen the gap, use a tool that only pulls back on the ground electrode without touching the center electrode, the porcelain, or the wear portion of the ground electrode.
  - e. When it is necessary to close the gap, gently tap the plug ground electrode on a hard surface.
4. Before installing spark plugs, clean off any dirt on the spark plug seats. Install the plugs finger-tight and then tighten an additional 1/4 turn or tighten to the specified torque.

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

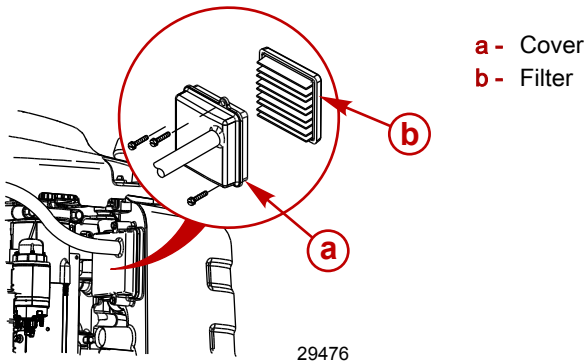
## Compressor Air Intake Filter

The filter should be changed every 100 hours of operation, or once a season.

**IMPORTANT: Never run the engine without the air filter.**

### REMOVAL

1. Remove the three screws and filter cover from the engine.
2. Remove the filter from the cover.



### INSTALLATION

1. Install the filter into cover.
2. Fasten the filter cover with three screws.



# MAINTENANCE

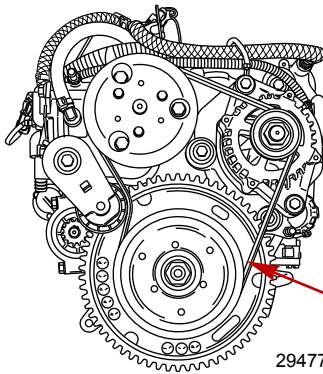
## Alternator Belt Inspection

### ⚠ WARNING

Inspecting the belts with the engine running may cause serious injury or death. Turn off the engine and remove the ignition key before adjusting tension or inspecting belts.



Inspect the alternator belt and have it replaced by an authorized dealer if any of the following conditions are found.

- Cracks or deterioration in the rubber portion of the belt.
- Belt surfaces rough or uneven.
- Signs of wear on edges or outer surfaces of belt.



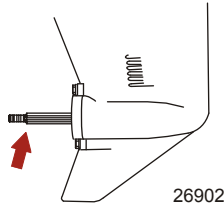
## Lubrication Points

1. Lubricate the following with Extreme Grease or 2-4-C with PTFE.


Tube Ref No.	Description	Where Used	Part No.
	Extreme Grease	Propeller shaft	8M0071842
 95	2-4-C with PTFE	Propeller shaft	92-802859A 1

# MAINTENANCE

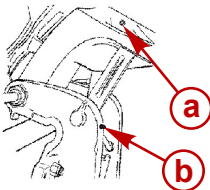
- Propeller shaft - Refer to **Propeller Replacement** for removal and installation of the propeller. Coat the entire propeller shaft with lubricant to prevent the propeller hub from corroding and seizing to the shaft.



2. Lubricate the following with 2-4-C with PTFE.

Tube Ref No.	Description	Where Used	Part No.
 95	2-4-C with PTFE	Swivel bracket, tilt support lever, tilt tube, steering cable grease fitting	92-802859A 1

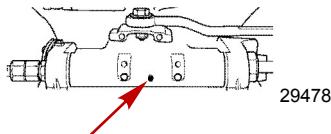
- Swivel bracket - Lubricate through fitting.
- Tilt support lever - Lubricate through fitting.



- a - Swivel bracket
- b - Tilt support lever

27873

- Tilt tube - Lubricate through fitting.

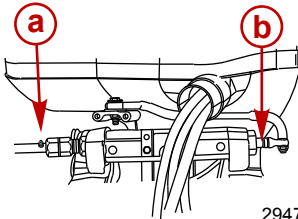


- Steering cable grease fitting (if equipped) - Rotate steering wheel to fully retract the steering cable end into the outboard tilt tube. Lubricate through fitting.

# MAINTENANCE

## ⚠ WARNING

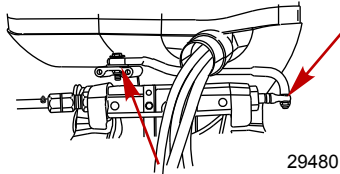
Incorrect cable lubrication can cause hydraulic lock, leading to serious injury or death from loss of boat control. Completely retract the end of the steering cable before applying lubricant.



- a - Fitting
- b - Steering cable end

29479

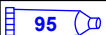
3. Lubricate the following with lightweight oil.
  - Steering link rod pivot points - Lubricate pivot points.



29480

## Lubrication Points

1. Lubricate the following with Quicksilver or Mercury Precision 2-4-C with PTFE.

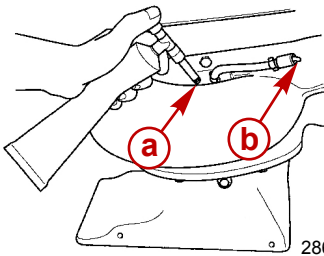
Tube Ref No.	Description	Where Used	Part No.
 95	2-4-C with PTFE	Driveshaft bearing	92-802859A 1

**IMPORTANT:** It is important not to use a general all-purpose grease for this bearing. The lubricant recommended is a water-resistant grease of the proper consistency for this application. If a substitute is used, be sure that it is water-resistant.

- Driveshaft bearing
  - i. Pull the vent hose off of the grease fitting.
  - ii. Pump in grease through the grease fitting until excess grease starts to exit the vent hose.

# MAINTENANCE

- iii. Reconnect the vent hose onto the grease fitting after greasing.


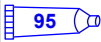


- a - Grease fitting  
b - Vent hose

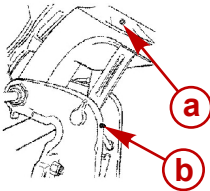
28691

**NOTE:** After 30 hours of operation, pump in extra grease to purge out any moisture. Visually inspecting the purged grease at this time will give an indication of conditions inside the bearing housing. A gradual increase in moisture content indicates seal wear. If the grease begins to turn a dark, dirty gray color, the driveshaft bearing and seals should be inspected and replaced if necessary. Some discoloration of the grease is normal during the break-in period on a new set of seals.

2. Lubricate the following with Quicksilver or Mercury Precision Lubricants 2-4-C with PTFE or Extreme Grease.

Tube Ref No.	Description	Where Used	Part No.
	Extreme Grease	Swivel bracket, tilt support lever, tilt tube, steering cable grease fitting	8M0071842
	2-4-C with PTFE	Swivel bracket, tilt support lever, tilt tube, steering cable grease fitting	92-802859A 1

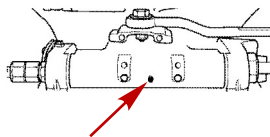
- Swivel bracket - Lubricate through fitting.
- Tilt support lever - Lubricate through fitting.



- a - Swivel bracket  
b - Tilt support lever

27873

- Tilt tube - Lubricate through fitting.



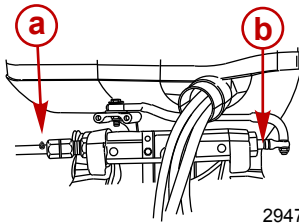
29478

# MAINTENANCE

- Steering cable grease fitting (if equipped) - Rotate steering wheel to fully retract the steering cable end into the outboard tilt tube. Lubricate through fitting.

## ⚠ WARNING

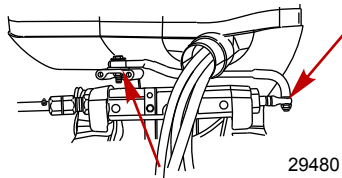
Incorrect cable lubrication can cause hydraulic lock, leading to serious injury or death from loss of boat control. Completely retract the end of the steering cable before applying lubricant.



29479

- a - Fitting
- b - Steering cable end

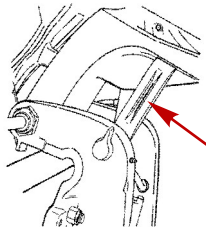
3. Lubricate the following with lightweight oil.
  - Steering link rod pivot points - Lubricate pivot points.



29480

## Checking Power Trim Fluid


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

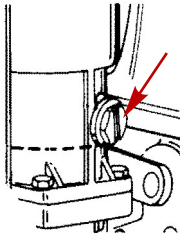


27877

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

# MAINTENANCE

Tube Ref No.	Description	Where Used	Part No.
 114	Power Trim and Steering Fluid	Power trim reservoir	92-858074K01



27884

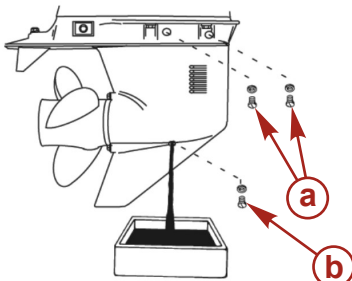
## Gearcase Lubrication

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.

Examine the drained gearcase lubricant for metal particles. A small amount of 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 the outboard in a vertical operating position.
2. Place a drain pan below the outboard.
3. Remove the vent plugs and fill/drain plug and drain the lubricant.



26977

## GEARCASE LUBRICANT CAPACITY

Gearcase lubricant capacity is approximately 665 ml (22.5 fl oz).

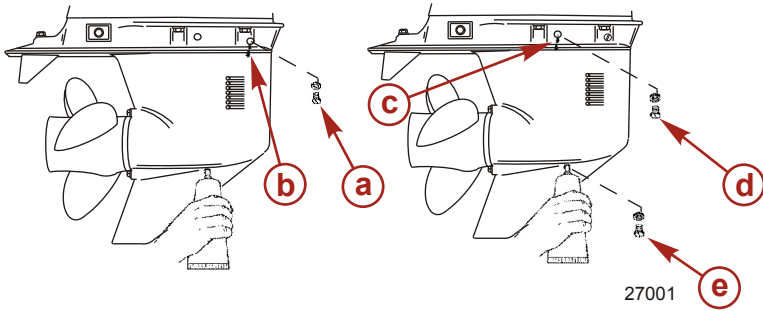
# MAINTENANCE

## GEARCASE LUBRICANT RECOMMENDATION

Mercury or Quicksilver Premium or High Performance Gear Lubricant.

## CHECKING LUBRICANT LEVEL AND FILLING GEARCASE

1. Place the outboard in a vertical operating position.
2. Remove the front vent plug and rear vent plug.
3. Remove the fill/drain plug. Place the lubricant tube into the fill/drain plug hole and add lubricant until it appears at the front vent hole. At this time install the front vent plug and sealing washer.



- a** - Front vent plug
- b** - Front vent hole
- c** - Rear vent hole
- d** - Rear vent plug
- e** - Fill/drain plug

4. Continue adding the lubricant until it appears at the rear vent hole.
5. Stop adding the lubricant. Install the rear vent plug and sealing washer before removing lubricant tube.
6. Remove the lubricant tube and install cleaned fill/drain plug and sealing washer.

## 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.

# STORAGE

## Storage Preparation

The major consideration in preparing your outboard for storage is to protect it from rust, corrosion, and damage caused by freezing of trapped water.

The following storage procedures should be followed to prepare your outboard for out of season storage or prolonged storage (two months or longer).



### NOTICE

Without sufficient cooling water, the engine, the water pump, and other components will overheat and suffer damage. Provide a sufficient supply of water to the water inlets during operation.

## Fuel System

**IMPORTANT:** Gasoline containing alcohol (ethanol or methanol) can cause a formation of acid during storage and can damage the fuel system. If the gasoline contains alcohol, it is advisable to drain as much of the remaining gasoline as possible from the fuel tank, remote fuel line, and engine fuel system.

The most effective method of storage preparation is to add the recommended amount of Mercury Quickstor fuel stabilizer and Mercury Quickleen products as described on the containers to the fuel tank before the last operation of the boat. Adding Quickstor will help prevent the formation of varnish and gum in the gasoline. Quickleen will help clean and lubricate the fuel injectors.

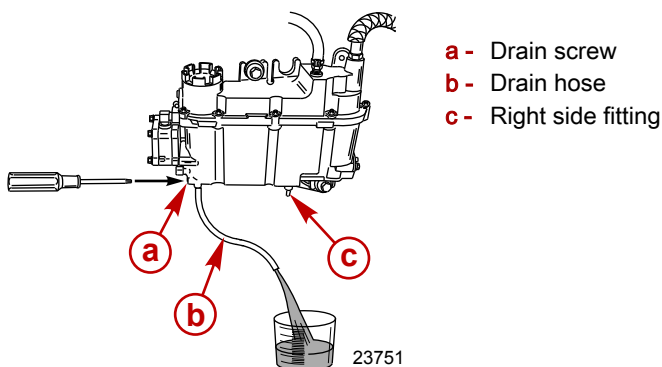
Tube Ref No.	Description	Where Used	Part No.
	Quickleen Engine & Fuel System Cleaner	Fuel system	8M0047931
	Quickstor Fuel Stabilizer	Fuel system	92-8M0047932

1. Portable fuel tank - Pour the required amount of Quickstor fuel stabilizer and Quickleen (follow instructions on containers) into fuel tank. Tip fuel tank back and forth to mix stabilizer and Quickleen with the fuel.
2. Permanently installed fuel tank - Pour the required amount of Quickstor fuel stabilizer and Quickleen (follow instructions on containers) into a separate container and mix with approximately 1 liter (1 US qt) of gasoline. Pour this mixture into fuel tank.
3. Pull the drain hose off the right side fitting. Hold the open end of the hose over a container.

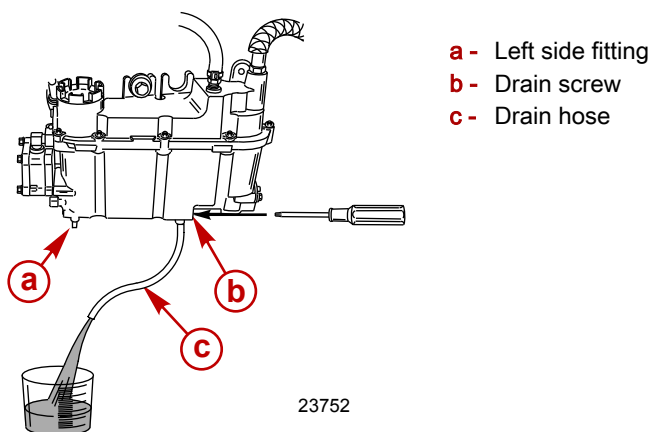


# STORAGE

- Loosen drain screw and drain the fuel filter chamber.




- Tighten the drain screw and attach the hose.
- Pull the drain hose off the left side fitting. Hold the open end of the hose over a container.
- Loosen the drain screw and drain the float chamber.



- Tighten the drain screw and attach the hose.
- Premix the following in a container:
  - 8 cc (0.27 oz) or 2 teaspoons of Mercury Quickleen.
  - 8 cc (0.27 oz) or 2 teaspoons of Mercury Quickstor.
- Remove the fuel filter. Refer to **Maintenance - Fuel System** for procedure.
- Pour this mixture into the fuel filter opening. Install the fuel filter.
- Prime the fuel system. Refer to **Operation - Starting The Engine**.
- Place the outboard in water or use the flush hose or flushing device or for circulating cooling water. Start the engine and run at idle speed for five minutes to allow the treated fuel to fill the fuel system.

# STORAGE

Flushing Device	91-44357Q 2
 <p style="text-align: center;">9192</p>	<p>Attaches to the water intakes; provides a fresh water connection when flushing the cooling system or operating the engine.</p>

## Protecting Internal Engine Components

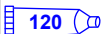
**NOTE:** Make sure the fuel system has been prepared for storage. Refer to **Fuel System**, preceding.

**IMPORTANT:** Refer to **Spark Plug Inspection and Replacement** for correct procedure for removing spark plug leads.

1. Remove the spark plugs. Add approximately 30 ml (1 oz) of engine oil or inject a five second spray of storage seal into each spark plug hole.
2. Rotate the flywheel manually several times to distribute the oil or storage seal in the cylinders.
3. Install the spark plugs.

## Protecting External Outboard Components

- Lubricate all outboard components listed in **Maintenance - Inspection and Maintenance Schedule**.
- Touch up any paint nicks. See your dealer for touch-up paint.
- Spray Quicksilver or Mercury Precision Lubricants Corrosion Guard on external metal surfaces (except corrosion control anodes).

Tube Ref No.	Description	Where Used	Part No.
 120	Corrosion Guard	External metal surfaces	92-802878 55

## Gearcase

- Drain and refill the gearcase lubricant (refer to **Gearcase Lubrication**).

## Jet Drive

- Pump extra grease into the jet drive bearing to purge out moisture.

## Positioning Outboard for Storage

Store outboard in an upright (vertical) position to allow water to drain out of the outboard.

# STORAGE

## *NOTICE*

Storing the outboard in a tilted position can damage the outboard. Water trapped in the cooling passages or rain water collected in the propeller exhaust outlet in the gearcase can freeze. Store the outboard in the full down position.

### **Battery Storage**

- Follow the battery manufacturer's instructions for storage and charging.
- Remove the battery from the boat and check water level. Charge if necessary.
- Store the battery in a cool, dry place.
- Periodically check the water level and charge the battery during storage.

# OWNER SERVICE ASSISTANCE

## Local Repair Service

Always return your outboard to your local authorized dealer should the need for service arise. Only he has the factory trained mechanics, knowledge, special tools, equipment, and genuine parts and accessories to properly service your engine should the need occur. He knows your engine best.

## Service Away from Home

If you are away from your local dealer and the need arises for service, contact the nearest authorized dealer. Refer to the Yellow Pages of the telephone directory. If, for any reason, you cannot obtain service, contact the nearest Mercury Marine Service Office.

## Parts and Accessories Inquiries

All inquiries concerning genuine replacement parts and accessories should be directed to your local authorized dealer. The dealer has the necessary information to order parts and accessories for you. When inquiring about parts and accessories, the dealer requires the model and serial number to order the correct parts.

## Service Assistance

### LOCAL REPAIR SERVICE

If you need service for your Mercury-outboard-powered boat, take it to your authorized dealer. Only authorized dealers specialize in Mercury products and have factory-trained mechanics, special tools and equipment, and genuine Quicksilver parts and accessories to properly service your engine.

**NOTE:** *Quicksilver parts and accessories are engineered and built by Mercury Marine specifically for your power package.*

### SERVICE AWAY FROM HOME

If you are away from your local dealer and the need arises for service, contact the nearest authorized dealer. If, for any reason, you cannot obtain service, contact the nearest Regional Service Center. Outside the United States and Canada, contact the nearest Marine Power International Service Center.

### STOLEN POWER PACKAGE

If your power package is stolen, immediately advise the local authorities and Mercury Marine of the model and serial numbers and to whom the recovery is to be reported. This information is maintained in a database at Mercury Marine to aid authorities and dealers in the recovery of stolen power packages.

### ATTENTION REQUIRED AFTER SUBMERSION

1. Before recovery, contact an authorized Mercury dealer.
2. After recovery, immediate service by an authorized Mercury dealer is required to reduce the possibility of serious engine damage.

# OWNER SERVICE ASSISTANCE

## REPLACEMENT SERVICE PARTS

### WARNING

**Avoid fire or explosion hazard. Electrical, ignition, and fuel system components on Mercury Marine products comply with federal and international standards to minimize risk of fire or explosion. Do not use replacement electrical or fuel system components that do not comply with these standards. When servicing the electrical and fuel systems, properly install and tighten all components.**

Marine engines are expected to operate at or near full throttle for most of their lives. They are also expected to operate in both fresh and saltwater environments. These conditions require numerous special parts.

## PARTS AND ACCESSORIES INQUIRIES

Direct any inquiries concerning Quicksilver replacement parts and accessories to your local authorized dealer. The dealer has the necessary information to order parts and accessories for you if they are not in stock. Only authorized dealers can purchase genuine Quicksilver parts and accessories from the factory. Mercury Marine does not sell to unauthorized dealers or retail customers. When inquiring about parts and accessories, the dealer requires the **engine model** and **serial numbers** to order the correct parts.

## RESOLVING A PROBLEM

Satisfaction with your Mercury product is important to your dealer and to us. If you ever have a problem, question or concern about your power package, contact your dealer or any authorized Mercury dealership. If you need additional assistance:

1. Talk with the dealership's sales manager or service manager. Contact the owner of the dealership if the sales manager and service manager have been unable to resolve the problem.
2. If your question, concern, or problem cannot be resolved by your dealership, please contact the Mercury Marine Service Office for assistance. Mercury Marine will work with you and your dealership to resolve all problems.

The following information will be needed by the Customer Service:

- Your name and address
- Your daytime telephone number
- The model and serial numbers of your power package
- The name and address of your dealership
- The nature of the problem

# OWNER SERVICE ASSISTANCE

## CONTACT INFORMATION FOR MERCURY MARINE CUSTOMER SERVICE

For assistance, call, fax, or write to the geographic office in your area. Please include your daytime telephone number with mail and fax correspondence.

<b>United States, Canada</b>		
Telephone	English +1 920 929 5040 Français +1 905 636 4751	Mercury Marine W6250 Pioneer Road P.O. Box 1939 Fond du Lac, WI 54936-1939
Fax	English +1 920 929 5893 Français +1 905 636 1704	
Website	www.mercurymarine.com	

<b>Australia, Pacific</b>		
Telephone	+61 3 9791 5822	Brunswick Asia Pacific Group 41-71 Bessemer Drive Dandenong South, Victoria 3175 Australia
Fax	+61 3 9706 7228	

<b>Europe, Middle East, Africa</b>		
Telephone	+32 87 32 32 11	Brunswick Marine Europe Parc Industriel de Petit-Rechain B-4800 Verviers, Belgium
Fax	+32 87 31 19 65	

<b>Mexico, Central America, South America, Caribbean</b>		
Telephone	+1 954 744 3500	Mercury Marine 11650 Interchange Circle North Miramar, FL 33025 U.S.A.
Fax	+1 954 744 3535	

<b>Japan</b>		
Telephone	+072 233 8888	Kisaka Co., Ltd. 4-130 Kannabecho, Sakai-ku Sakai-shi, Osaka 590-0984, Japan
Fax	+072 233 8833	

<b>Asia, Singapore</b>		
Telephone	+65 65466160	Brunswick Asia Pacific Group T/A Mercury Marine Singapore Pte Ltd 29 Loyang Drive Singapore, 508944
Fax	+65 65467789	

# OWNER SERVICE ASSISTANCE

## Ordering Literature

Before ordering literature, have the following information about your power package available:

Model		Serial Number	
Horsepower		Year	

## UNITED STATES AND CANADA

For additional literature for your Mercury Marine power package, contact your nearest Mercury Marine dealer or contact:

Mercury Marine		
Telephone	Fax	Mail
(920) 929-5110 (USA only)	(920) 929-4894 (USA only)	Mercury Marine Attn: Publications Department P.O. Box 1939 Fond du Lac, WI 54936-1939

## OUTSIDE THE UNITED STATES AND CANADA

Contact your nearest Mercury Marine authorized service center to order additional literature that is available for your particular power package.

Submit the following order form with payment to:	Mercury Marine Attn: Publications Department W6250 Pioneer Road P.O. Box 1939 Fond du Lac, WI 54936-1939
<b>Ship To: (Copy this form and print or type—This is your shipping label)</b>	
<b>Name</b>	
<b>Address</b>	
<b>City, State, Province</b>	
<b>ZIP or postal code</b>	
<b>Country</b>	

Quantity	Item	Stock Number	Price	Total
			.	.
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			.	.
			.	.

# OWNER SERVICE ASSISTANCE

Quantity	Item	Stock Number	Price	Total
			.	.
			Total Due	.



# TROUBLESHOOTING

## Starter Motor Will Not Crank the Engine

### POSSIBLE CAUSES

- Blown 20-amp fuse in the starting circuit. Refer to **Maintenance**.
- Outboard is not shifted to neutral position.
- Weak battery or battery connections are loose or corroded.
- Ignition key switch failure.
- Wiring or electrical connection faulty.
- Starter motor solenoid or slave solenoid failure.

## Engine Will Not Start

### POSSIBLE CAUSES

- Lanyard stop switch not in "RUN" position.
- Battery not fully charged.
- Incorrect starting procedure. Refer to **Operation** section.
- Old or contaminated fuel.
- Fuel is not reaching the engine.
  - Fuel tank is empty.
  - Fuel tank vent not open or restricted.
  - Fuel line is disconnected or kinked.
  - Primer bulb not squeezed.
  - Primer bulb check valve is faulty.
  - Fuel filter is obstructed. Refer to **Maintenance** section.
  - Fuel pump failure.
  - Fuel tank filter obstructed.
- Open 20-amp fuse. Check fuses, refer to **Maintenance** section.
- Threaded connection of an air hose is loose.
- Ignition system component failure.
- Spark plugs fouled or defective. Refer to **Maintenance** section.

## Engine Runs Erratically

### POSSIBLE CAUSES

- Spark plugs fouled or defective. Refer to **Maintenance** section.
- Incorrect setup and adjustments.
- Fuel is being restricted to the engine.
  - a. Engine fuel filter is obstructed. Refer to **Maintenance** section.
  - b. Fuel tank filter obstructed.
  - c. Stuck antisiphon valve on built-in fuel tank.

# TROUBLESHOOTING

- d. Fuel line is kinked or pinched.
- e. Injector plugged.
- Threaded connection of an air hose is loose.
- Fuel pump failure.
- Ignition system component failure.

## Performance Loss

### POSSIBLE CAUSES

- Throttle not fully open.
- Damaged propeller or improper propeller size.
- Boat overloaded or load improperly distributed.
- Excessive water in bilge.
- Boat bottom is dirty or damaged.

## Battery Will Not Hold Charge

### POSSIBLE CAUSES

- Battery connections are loose or corroded.
- Low electrolyte level in battery.
- Worn out or inefficient battery.
- Excessive use of electrical accessories.
- Defective rectifier, alternator, or voltage regulator.
- Open circuit in the alternator output wire (fused link).

## Jet Application Troubleshooting

### PERFORMANCE LOSS

#### Possible causes

- Throttle not fully open.
- Damaged impeller.
- Boat overloaded or load improperly distributed.
- Excessive water in bilge.
- Boat bottom is dirty or damaged.

### ENGINE OVERSPEED (EXCESSIVE RPM)

#### Possible causes

- Outboard mounted too high on the transom.
- Worn jet pump impeller or liner.
- Incorrect jet pump impeller clearance adjustment.
- Tilting the outboard out beyond a vertical position.

# TROUBLESHOOTING

- Cavitation of the impeller due to rough water or obstruction in the boat hull.
- Blockage of the water intake.

# OUTBOARD INSTALLATION

## Mercury Marine Validated Engine Mounting Hardware

**IMPORTANT:** Mercury Marine provides validated fasteners and installation instructions, including torque specifications, with all of our outboards so they can be properly secured to boat transoms. Improper installation of the outboard can cause performance and reliability issues that can lead to safety concerns. Follow all of the instructions relating to the outboard installation. **DO NOT** mount any other accessory onto the boat with the fasteners provided with the outboard. For example, do not mount a tow sport bars or boarding ladders onto the boat using the mounting hardware included with the outboard. Installing other products onto the boat that utilize the outboard mounting hardware will compromise the ability of that hardware to properly and safely secure the outboard to the transom.

Outboards that require validated mounting hardware will have the following decal on the transom clamp.



51965

## Accessories Mounted to the Transom Clamp Bracket

Mercury Marine has been made aware that certain aftermarket marine accessories, such as emergency boarding ladders, shallow water anchors, transom wedge kits, and tow sport attaching devices, have been mounted to the boat by use of the same fasteners that secure the outboard to the transom or jack plate. Using the same fastener to secure both an accessory and the engine to the boat compromises the ability of the fasteners to maintain the proper clamp load. A boat with loose engine mounting fasteners creates the possibility of performance, durability, and safety issues.

# OUTBOARD INSTALLATION

## **⚠ WARNING**

**Avoid serious injury or death resulting from a loss of boat control. Loose engine fasteners could cause the transom bracket to fail, resulting in a loss of the driver's ability to control the boat. Always ensure that the engine fasteners are tightened to the specified torque.**

### **ACCEPTABLE ACCESSORY MOUNTING TO THE TRANSOM CLAMP BRACKET**

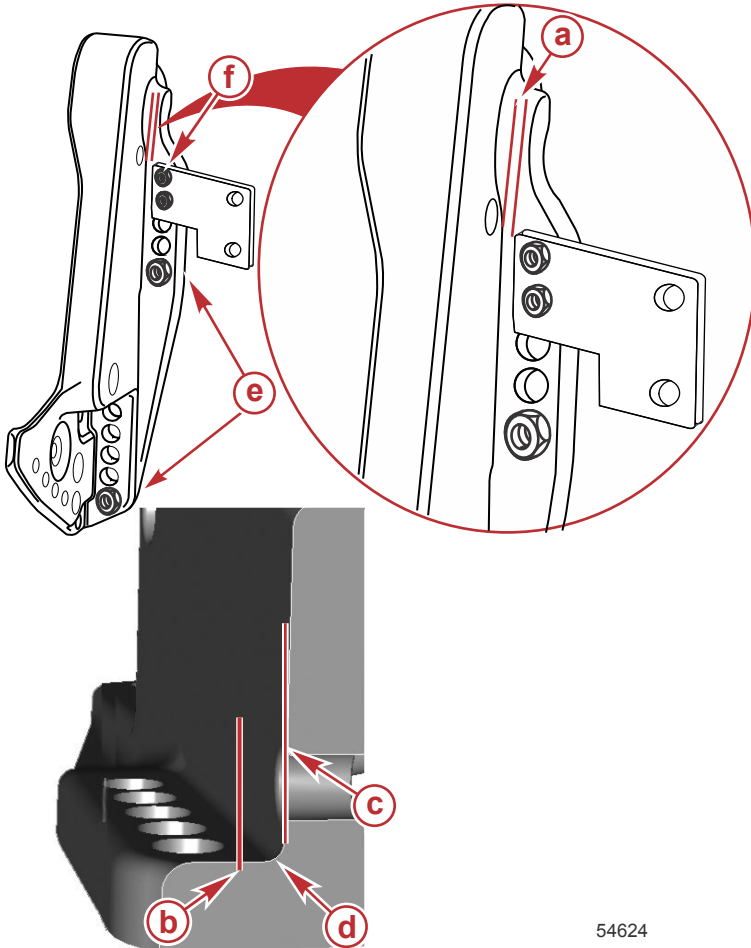
After the engine is mounted to the transom or jack plate in accordance with the engine installation instructions, it is acceptable to attach an accessory to the boat by use of the unused bolt holes in the transom clamp bracket as shown in Figure 1.

The following list provides additional guidelines for mounting accessories to the transom clamp bracket.

- The accessory fasteners must pass through the boat transom or jack plate.

# OUTBOARD INSTALLATION

- The installation must not create interference issues, as would an accessory mounting plate resting in the radius of the transom clamp bracket. Refer to Figure 1.



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**Figure 1**

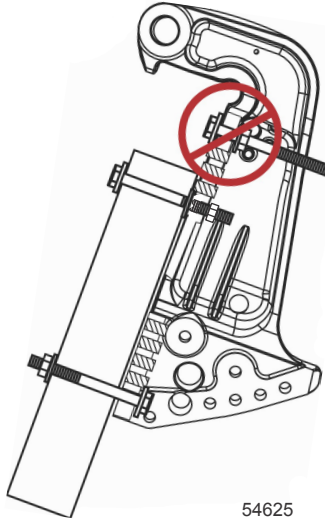
- a** - Minimum clearance 3.175 mm (0.125 in.)
- b** - Edge of accessory bracket
- c** - Transom clamp bracket wall
- d** - Radius
- e** - Engine supplied mounting fasteners
- f** - Fasteners supplied by the accessory manufacturer installed through unused engine mounting bracket holes

# OUTBOARD INSTALLATION

## UNACCEPTABLE ACCESSORY MOUNTING

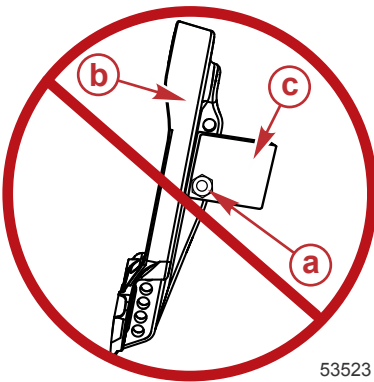
**IMPORTANT:** Do not use the fasteners that secure the engine to the boat (either the transom or the jack plate) for any purpose other than securing the engine to the boat.

1. Do not mount an accessory to the transom clamp bracket in an unsupported condition. Refer to Figure 2.



**Figure 2**

2. Do not attach an accessory to the boat by use of the engine mounting hardware. Refer to Figure 3.

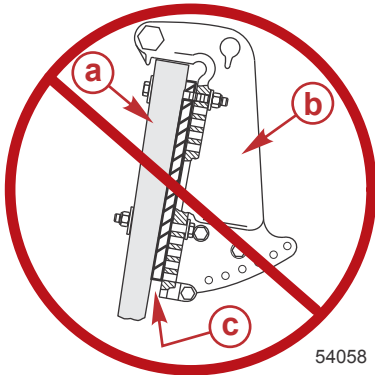


**Figure 3**

- a - Engine supplied mounting fasteners
- b - Transom clamp bracket
- c - Accessory

# OUTBOARD INSTALLATION

3. Do not install wedges or plates between the transom clamp brackets and the transom (or jack plate). Refer to Figure 4.



**Figure 4**

- a** - Boat transom or jack plate
- b** - Transom clamp bracket
- c** - Wedge/plate

## Important Information

Rigging boats, which includes proper engine installation, has become more complex over the years. As a result, we recommend our engines be installed only by Mercury authorized dealers. If you intend to disregard this recommendation and install the engine yourself, please make sure to read and comply with these instructions. Failure to comply with these installation instructions could lead to serious injury or death.

## Boat Horsepower Capacity

### **⚠ WARNING**

Exceeding the boat's maximum horsepower rating can cause serious injury or death. Overpowering the boat can affect boat control and flotation characteristics or break the transom. Do not install an engine that exceeds the boat's maximum power rating.



# OUTBOARD INSTALLATION

Do not overpower or overload your 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.

U.S. COAST GUARD CAPACITY	
MAXIMUM HORSEPOWER	XXX
MAXIMUM PERSON CAPACITY (POUNDS)	XXX
MAXIMUM WEIGHT CAPACITY	XXX

26777

## Start in Gear Protection

### WARNING

**Starting the engine with the drive in gear can cause serious injury or death. Never operate a boat that does not have a neutral-safety-protection device.**

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

## Fuel System

### AVOIDING FUEL FLOW RESTRICTION

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

### ELECTRIC FUEL PUMP

The fuel pressure must not exceed 28 kPa (4 psi). If necessary, install a pressure regulator.

### LOW PERMEATION FUEL HOSE REQUIREMENT

Required for outboards manufactured for sale, sold, or offered for sale in the United States.

- The Environmental Protection Agency (EPA) requires that any outboard manufactured after January 1, 2009, must use low permeation fuel hose for the primary fuel hose connecting the fuel tank to the outboard.
- Low permeation hose is USCG Type B1-15 or Type A1-15, defined as not exceeding 15/gm<sup>2</sup>/24 h with CE 10 fuel at 23 °C as specified in SAE J 1527 - marine fuel hose.

# OUTBOARD INSTALLATION

## EPA PRESSURIZED PORTABLE FUEL TANK REQUIREMENTS

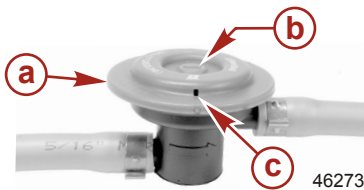
The Environmental Protection Agency (EPA) requires portable fuel systems that are produced after January 1, 2011, for use with outboard engines to remain fully sealed (pressurized) up to 34.4 kPa (5.0 psi). These tanks may contain the following:

- An air inlet that opens to allow air to enter as the fuel is drawn out of the tank.
- An air outlet that opens (vents) to the atmosphere if pressure exceeds 34.4 kPa (5.0 psi).

## FUEL DEMAND VALVE (FDV) REQUIREMENT

Whenever a pressurized fuel tank is used, a fuel demand valve is required to be installed in the fuel hose between the fuel tank and primer bulb. The fuel demand valve prevents pressurized fuel from entering the engine and causing a fuel system overflow or possible fuel spillage.

The fuel demand valve has a manual release. The manual release can be used (pushed in) to open (bypass) the valve in case of a fuel blockage in the valve.



- a - Fuel demand valve - installed in the fuel hose between the fuel tank and primer bulb
- b - Manual release
- c - Vent/water drain holes

## FUEL TANKS

### Portable Fuel Tank

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

### Permanent Fuel Tank

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

## FILLING THE FUEL SYSTEM

When starting an engine for the first time, or starting an engine that ran out of fuel or was drained of fuel, fill and prime the fuel system.

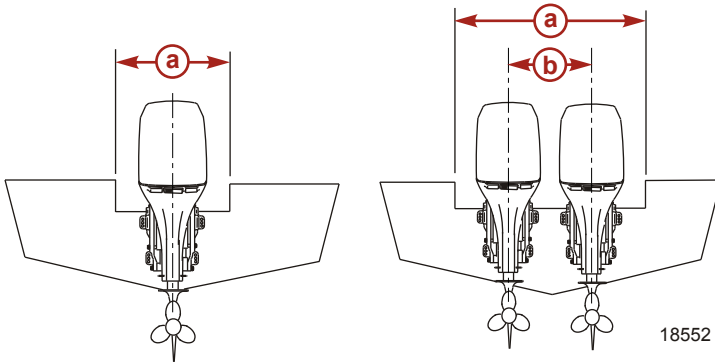
To fill and prime the fuel system:

1. Squeeze the fuel line primer bulb until it feels firm.
2. Turn the key switch to the "ON" position for three seconds. This operates the electric fuel pump.
3. Turn the key switch back to the "OFF" position and squeeze the primer bulb again until it feels firm.

# OUTBOARD INSTALLATION

4. Turn the key switch to the "ON" position again for three seconds.
5. Continue this procedure until the fuel line primer bulb stays firm.

## Installation Specifications



**a** - Minimum transom opening

**b** - Engine centerline for dual engine - 66.0 cm (26 in.)

Minimum Transom Opening	
Single engine	84.2 cm (33 in.)
Dual engine	149.9 cm (59 in.)

## Lifting the Outboard

### **⚠ WARNING**

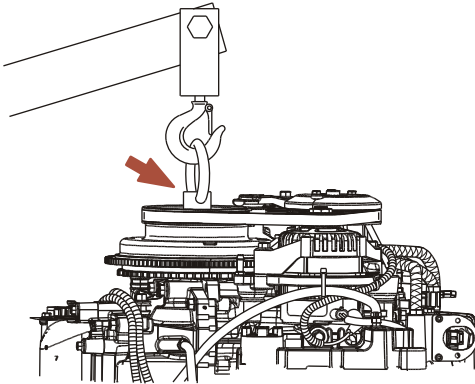
Improperly supporting an engine during lifting can result in the engine falling, causing serious injury or death. Before lifting the engine, verify that the lifting ring is threaded into the flywheel for a minimum of five turns and that the hoist has the correct lifting capacity for the engine weight.

To lift the outboard:

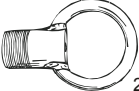
1. Remove the cowl from the outboard.

# OUTBOARD INSTALLATION

- Thread the lifting eye into the flywheel hub for a minimum of five turns.



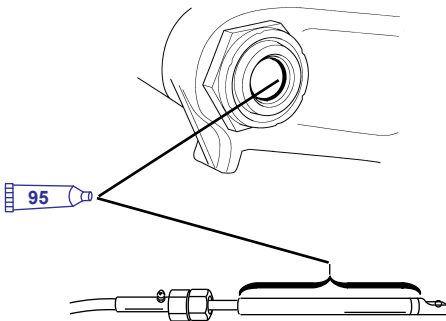
15363

Lifting Eye	91-90455--1
 2756	Threads into the flywheel to remove the powerhead assembly from the driveshaft housing, or to lift entire engine for removal/installation.


- Connect a hoist to the lifting eye.
- Lift the outboard and place it on the boat transom.

## Steering Cable - Starboard Side Routed Cable

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

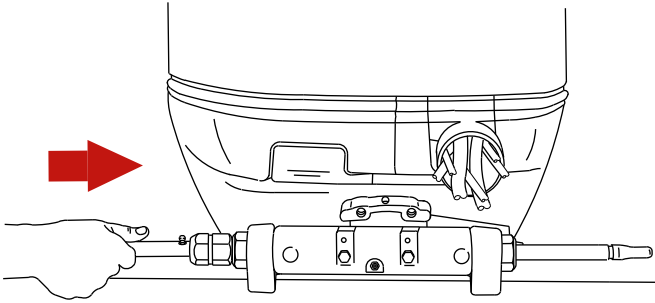


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Tube Ref No.	Description	Where Used	Part No.
 95	2-4-C with PTFE	O-ring seal and entire cable end	92-802859A 1

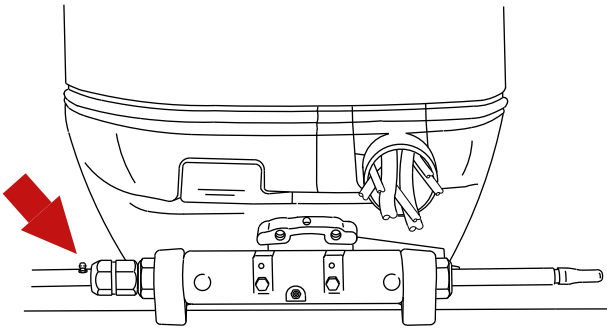
# OUTBOARD INSTALLATION

2. Insert the steering cable into the tilt tube.



3725

3. Tighten the nut to the specified torque.

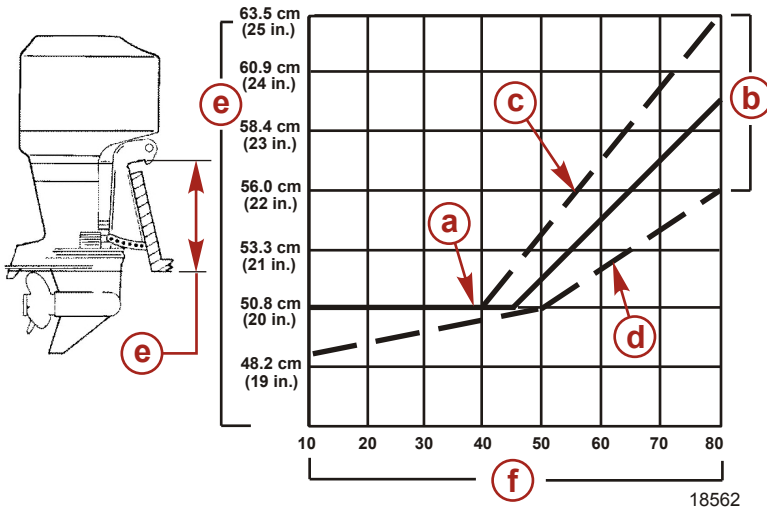


3727

Description	Nm	lb-in.	lb-ft
Nut	47.5	-	35

# OUTBOARD INSTALLATION

## Determining Recommended Outboard Mounting Height



- a** - The solid line is recommended to determine the outboard mounting height
- b** - The 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 mounting brackets from bottom of boat transom). For heights over 56.0 cm (22 in.), a propeller that is designed for surfacing operation is usually preferred.
- f** - Maximum boat speed (MPH) anticipated

# OUTBOARD INSTALLATION

## NOTICE

1. The outboard should be mounted high enough on the transom so the exhaust relief hole will stay at least 25.4 mm (1 in.) above the waterline when the engine is running at idle speed. Having the exhaust relief hole above the waterline will prevent exhaust restrictions. Exhaust restrictions will result in poor performance at idle.
2. Add 12.7 cm (5 in.) for XL models to the listed outboard mounting heights.
3. The mounting height of the outboard must not exceed 63.5 cm (25 in.) for L models, 76 cm (30 in.) for XL models. Mounting the outboard higher may cause damage to the gearcase components.

Increasing the mounting height will usually:

- Reduce steering torque
- Increase top speed
- Increase boat stability
- Cause propeller to break loose during planing

## Determining the Mounting Height of the Outboard Jet

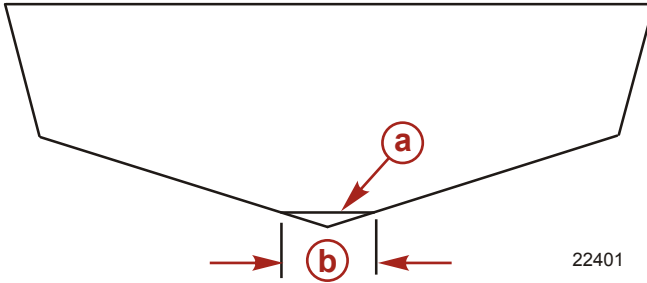
The following outboard mounting height settings will work good for most applications, however, because of different boat/hull designs, the setting should be checked by test running the boat. Refer to **Water Testing**.

- Installing the outboard too high on the transom will allow the water intake to suck in air and cause cavitation. (Cavitation will cause the engine to overspeed in spurts and reduce thrust.) This condition should be avoided by proper height setting.
- Installing the outboard too low on the transom will allow excessive drag.

# OUTBOARD INSTALLATION

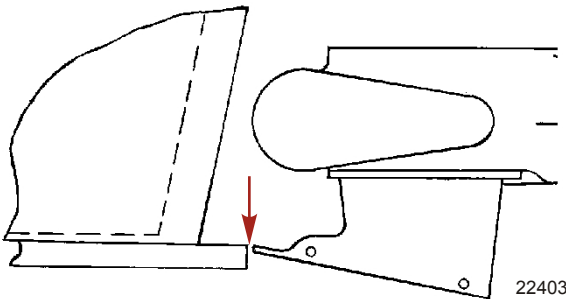
## BOATS WITH A "V" BOTTOM HULL

1. Measure the width of the leading edge on the water intake housing. Make a horizontal line on the transom up from the "V" bottom the same length as the width of the water intake housing.



- a - Horizontal line
- b - Width of the leading edge on the water intake housing

2. Place (center) the outboard on the boat transom. Set the height of the outboard on the boat transom so that the front edge of the water intake housing is in line with the horizontal line made in step 1. Temporarily clamp the outboard to the transom at this position.
3. Fasten the outboard to the transom at this height. Refer to **Fastening the Outboard**.



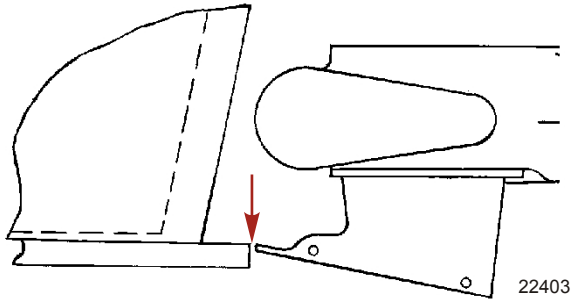
## BOATS WITH A FLAT BOTTOM HULL

1. Place (center) the outboard on the boat transom. Set the height of the outboard on the boat transom so that the front edge of the water intake housing is in line with the bottom of the boat as shown. Temporarily clamp the outboard to the transom at this position.



# OUTBOARD INSTALLATION

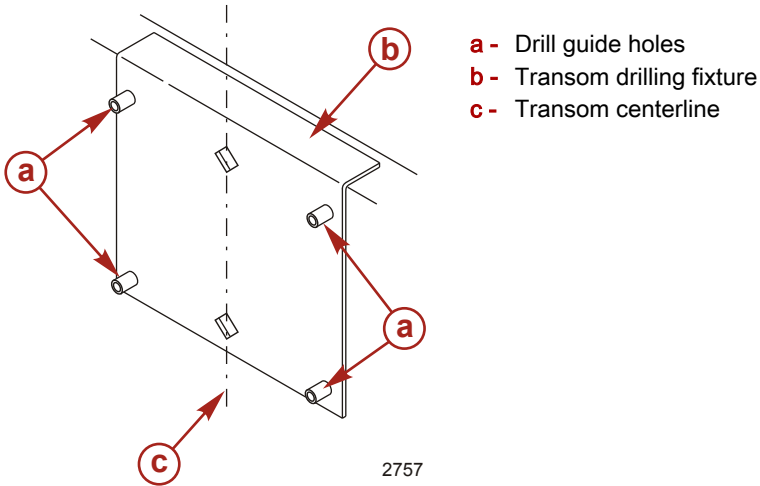
2. Fasten outboard to the transom at this height. Refer to **Fastening the Outboard**.



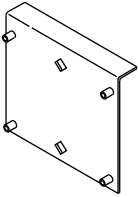
## Drilling Outboard Mounting Holes

**IMPORTANT:** Before drilling any mounting holes, carefully read **Determining Recommended Outboard Mounting Height** and install outboard to the nearest recommended mounting height.

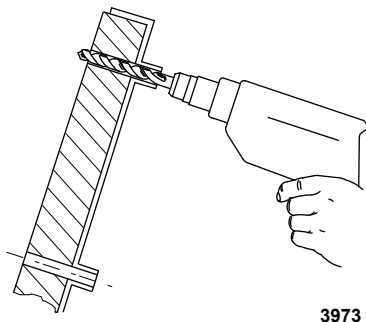
1. Mark four mounting holes on the transom using the transom drilling fixture.



# OUTBOARD INSTALLATION

Transom Drilling Fixture	91-98234A2
 <p>5489</p>	Aids in engine installation by acting as a template for engine mounting holes.

2. Drill four 13.5 mm (17/32 in.) mounting holes.



## Fastening the Outboard to the Transom

### MOUNTING BOLTS

Outboard Transom Mounting Hardware - Supplied with Outboard		
Part Number	Part Name	Description
8M0071543	Outboard mounting bolt	½-20 x 5.00 in. long (3.25 in. thread)
826711-17	Nylon insert locknut	½-20
28421	Flat washer	1.50 in. diameter
54012	Flat washer	0.875 in. diameter

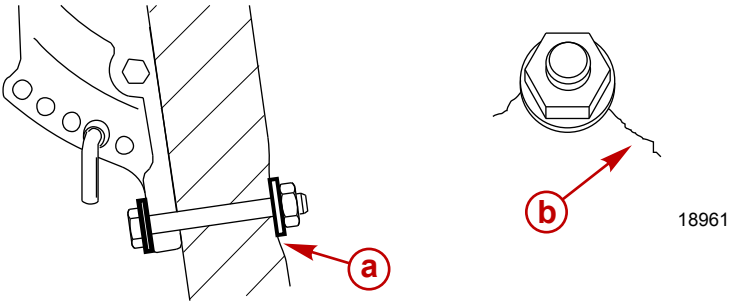
Available Outboard Mounting Bolts	
Part Number	Description
67755005	½-20 x 2.50 in. long (1.25 in. thread)
67755006	½-20 x 3.50 in. long (1.25 in. thread)
814259	½-20 x 4.00 in. long (2.25 in. thread)
67755-1	½-20 x 4.50 in. long (2.25 in. thread)
8M0071543	½-20 x 5.00 in. long (3.25 in. thread)
8M0038370	½-20 x 5.50 in. long (3.25 in. thread)

# OUTBOARD INSTALLATION

Available Outboard Mounting Bolts	
Part Number	Description
67755-2	½-20 x 6.50 in. long (2.75 in. thread)
8M0028080	½-20 x 7.50 in. long (2.75 in. thread)
8M0032860	½-20 x 8.00 in. long (2.75 in. thread)

## CHECKING BOAT TRANSOM CONSTRUCTION

**IMPORTANT:** Determine the strength of the boat transom. The outboard mounting locknuts and bolts should be able to hold 75 Nm (55 lb-ft) of torque without the boat transom yielding or cracking. If the boat transom yields or cracks under this torque, the construction of the transom may not be adequate. The boat transom must be strengthened or the load carrying area increased.

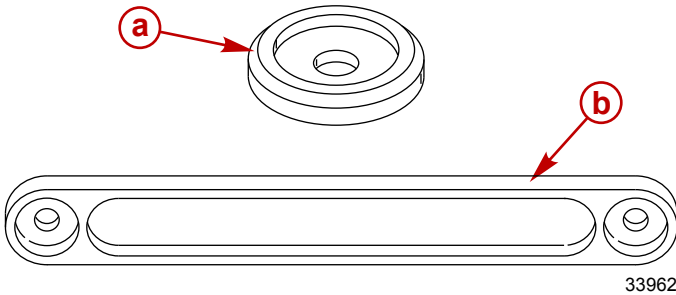


- a** - Transom yielding under bolt torque
- b** - Transom cracking under bolt torque

18961

# OUTBOARD INSTALLATION

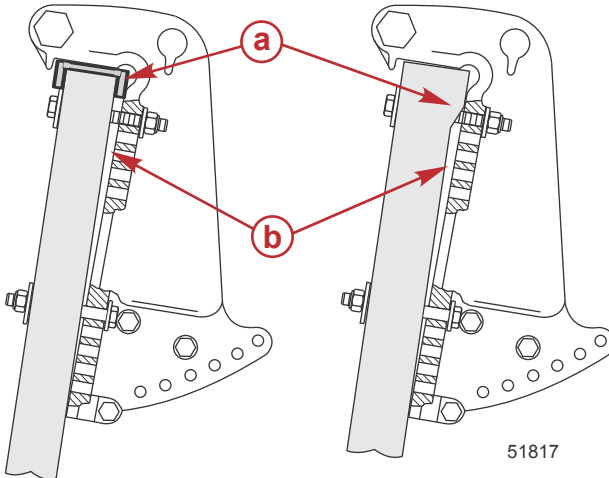
Use a dial torque wrench to determine transom strength. If the bolt or nut continues to turn without the torque reading on the dial increasing, it is an indication that the transom is yielding. The load area can be increased by using a larger washer or a transom reinforcement plate.



- a** - Large transom washer
- b** - Transom reinforcement plate

## FASTENING THE OUTBOARD TO THE TRANSOM

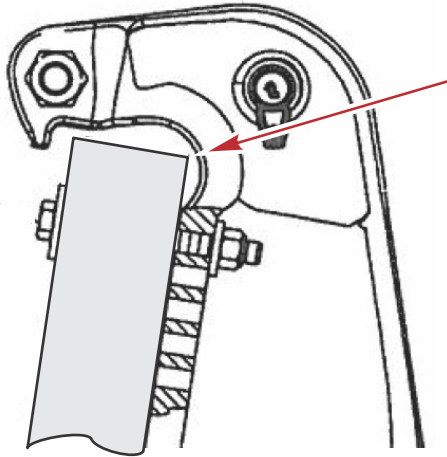
**IMPORTANT:** The transom mounting surface must be flat within 3.17 mm (0.125 in.). No step in the transom mounting surface is allowed. The inside transom mounting bolt washer surface must be flat within 3.17 mm (0.125 in.).



- a** - Step (not allowed)
- b** - Gap between transom clamp and boat transom (not allowed)

# OUTBOARD INSTALLATION

**IMPORTANT:** Clearance must be maintained between the vessel transom and the outboard transom bracket relief radius area. Failure to maintain clearance may damage the transom bracket and cause the transom bracket to fail. Adjustments to the position of the Mercury Marine transom drilling fixture may be required to ensure proper clearance of the transom bracket relief radius area.



51867

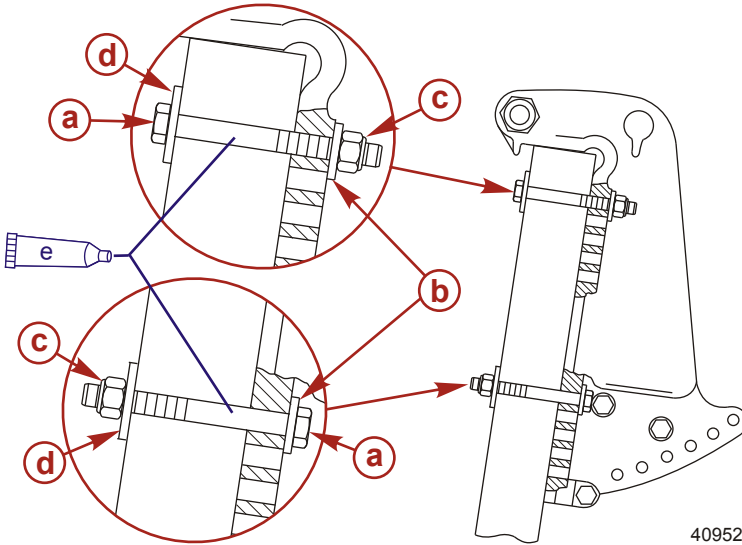
## Installation

1. Apply marine sealer to the shanks of the bolts, not to the threads.
2. Fasten the outboard with the correct mounting hardware. Tighten the locknuts to the specified torque.

**IMPORTANT:** Ensure that a minimum of two full threads of the mounting bolts extend beyond the locknut after tightening. The locknut must be drawn tight while still engaging the bolt threads and not contacting the shank of the bolt.

# OUTBOARD INSTALLATION

**NOTE:** For a more accurate torque reading, tighten the mounting locknuts rather than the outboard mounting bolts.

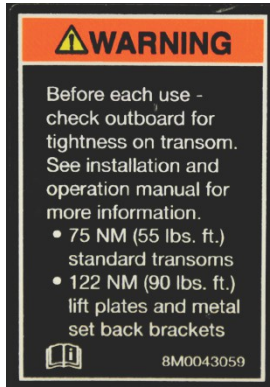


- a** - 0.500 in. diameter outboard mounting bolt (4)
- b** - 0.875 in. flat washer (4)
- c** - Nylon insert locknut (4)
- d** - 1.500 in. flat washer (4)
- e** - Marine sealer – apply to the shank of the bolts, not the threads

Description	Nm	lb-in.	lb-ft
Outboard mounting locknuts and bolts – standard boat transom	75	–	55
Outboard mounting locknuts and bolts – metal lift plates and setback brackets	122	–	90

# OUTBOARD INSTALLATION

A decal on the transom bracket reminds the owner to check the fasteners securing the outboard to the transom before each use.



51985

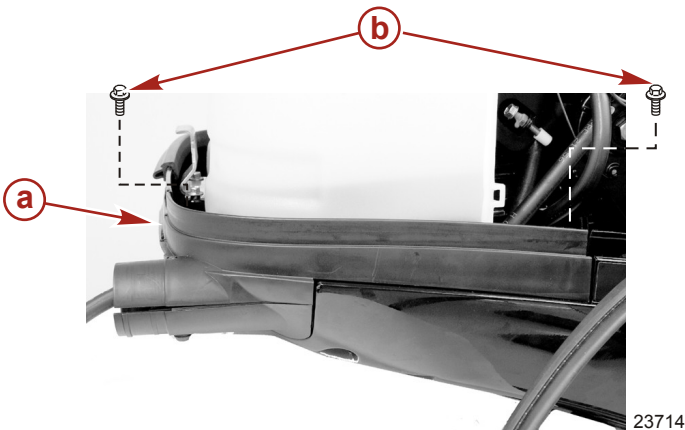
Decal on the transom bracket

## Electrical, Fuel Hose, Flush Hose, and Control Cables

### FRONT COWL GROMMET

**NOTE:** Sufficient slack must exist in wiring, battery cables, and hoses that are routed between the grommet and engine attachment points to relieve stress and prevent hoses from being kinked or pinched.

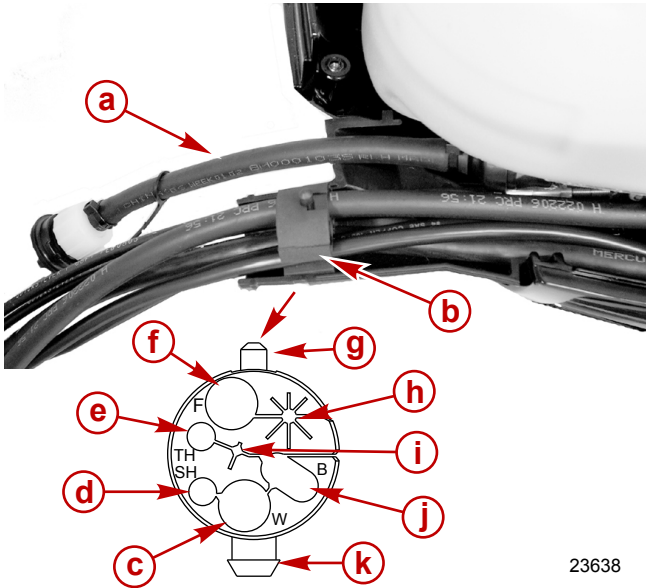
1. Pull up the cowl seal. Remove the access cover from the bottom cowl.



- a - Access cover
- b - Screws

# OUTBOARD INSTALLATION

2. Insert the lower alignment pin on the grommet into the hole in the lower cover. Ensure the lettered side of the grommet is facing out.
3. Route the hoses, wiring, and cables through the correct opening in the grommet, as shown.
4. Install the flush hose after removing the knockouts. Refer to **Flush Hose Routing**.



23638

- a - Flush hose
- b - Grommet
- c - Remote boat harness
- d - Not used
- e - Throttle cable
- f - Fuel hose
- g - Upper alignment pin
- h - SmartCraft harness or additional harness opening
- i - Water pressure tube
- j - Battery cables
- k - Lower alignment pin

5. Install the access cover with two screws. Tighten the screws to the specified torque.

Description	Nm	lb-in.	lb-ft
Access cover screws	7.3	65	–



# OUTBOARD INSTALLATION

6. Attach two cable ties around the grommet tube. Attach the cowl seal.

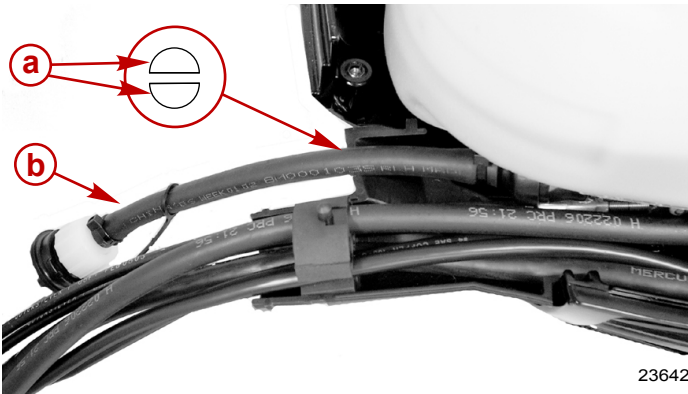


**a** - Cable tie

## FLUSH HOSE ROUTING

If desired, the flush hose can be routed outside the cowling as follows:

1. Using a needle-nose pliers, break out the semi-circular knockouts in the access cover and lower cover. Smooth the edges of the knockout with sandpaper or a small knife.
2. Route the flush hose through this opening.

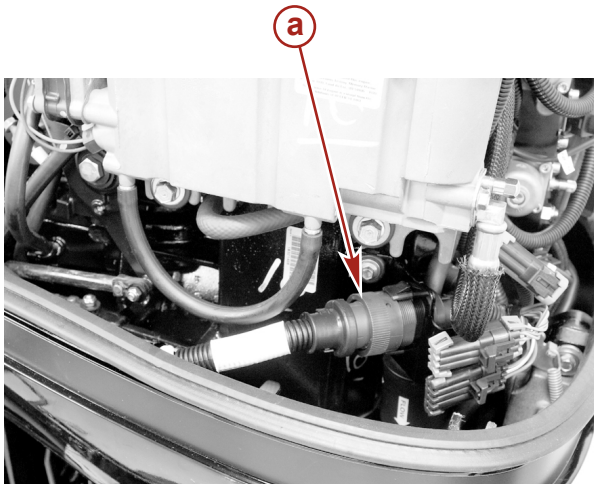


**a** - Knockout  
**b** - Flush hose

# OUTBOARD INSTALLATION

## REMOTE BOAT HARNESS

Route the remote boat harness through the grommet. Connect the remote harness to the 14 pin connector on the engine harness.



23699

**a** - Remote 14 pin boat harness

## BATTERY INFORMATION (ALL BATTERIES INCLUDING DTS)

### **⚠ WARNING**

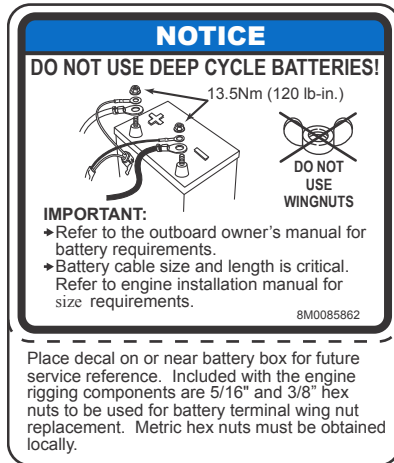
Failure to properly secure the battery leads can result in a loss of power to the Digital Throttle and Shift (DTS) system, leading to serious injury or death due to loss of boat control. Secure the battery leads to the battery posts with hex nuts to avoid loose connections.

- Do not use deep cycle batteries. The engine must use a marine starting battery with 1000 MCA, 800 CCA, or 180 Ah rating.
- When connecting the engine battery, use hex nuts to secure the battery leads to the battery posts. Tighten the nuts to the specified torque.

Description	Nm	lb-in.	lb-ft
Hex nuts	13.5	120	–

# OUTBOARD INSTALLATION

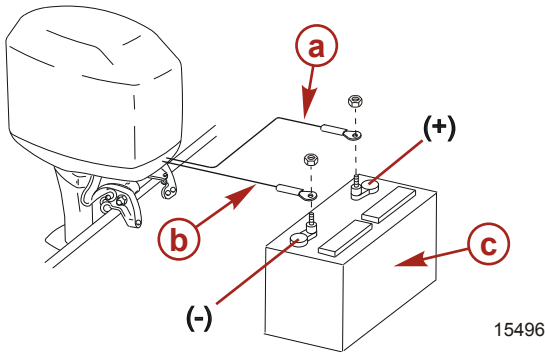
A decal advising against using deep cycle batteries and wing nuts should be placed on or near the battery box for future service reference. One 5/16 in. and one 3/8 in. hex nut is supplied per battery for wing nut replacement. Metric hex nuts are not supplied.



54395

## BATTERY CABLE CONNECTIONS

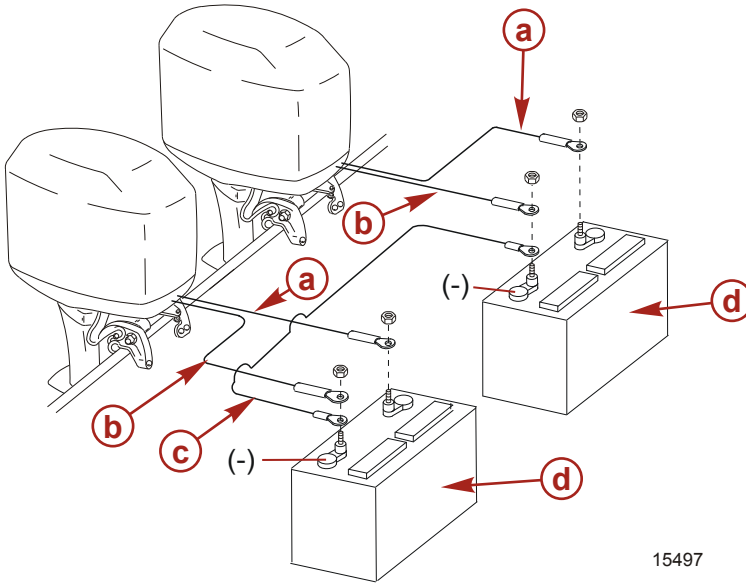
### Single Outboard



# OUTBOARD INSTALLATION

## Dual Outboards

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



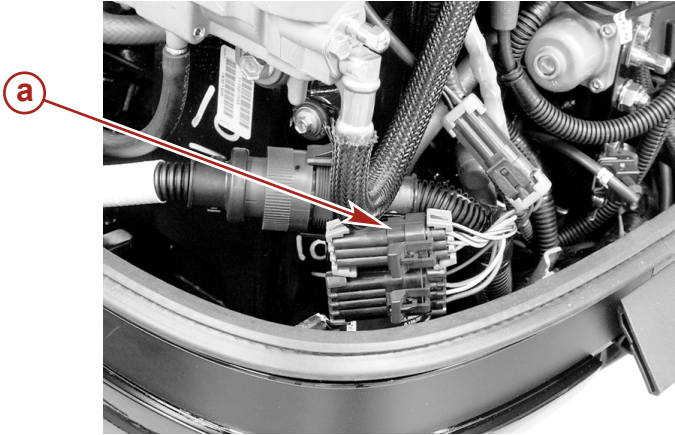
15497

- a** - Red sleeve - positive (+)
- b** - Black sleeve - negative (-)
- c** - Ground cable
- d** - Cranking battery

# OUTBOARD INSTALLATION

## SMARTCRAFT HARNESS CONNECTION

If SmartCraft gauges are being used with the outboard, route the SmartCraft wiring harness through the grommet and connect it to the SmartCraft harness connector on the engine.



23700

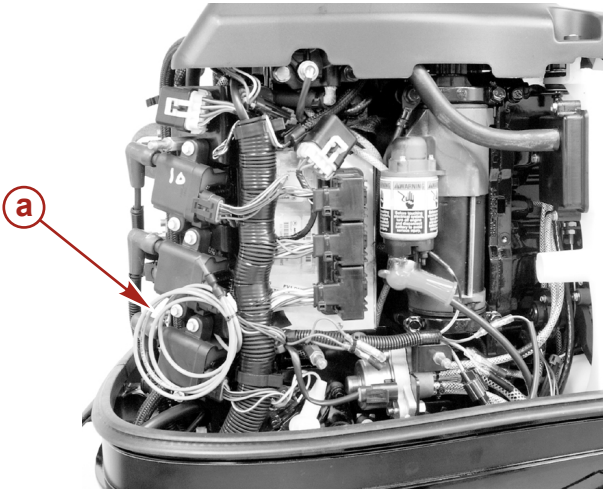
**a** - SmartCraft harness connector

## WATER PRESSURE TUBE CONNECTION

If a water connection to the engine is required for a water pressure gauge, make the connection as follows:

# OUTBOARD INSTALLATION

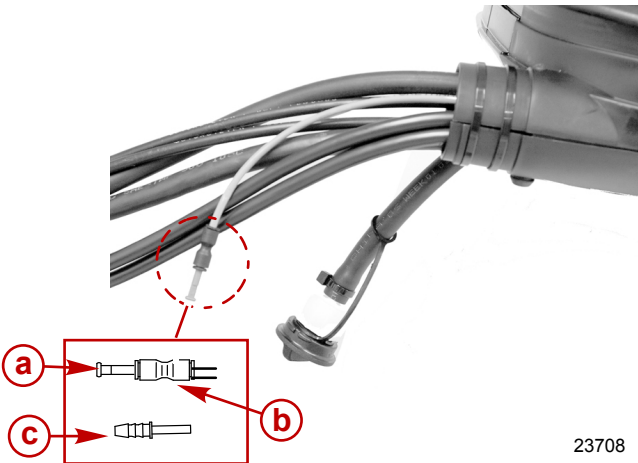
1. The water pressure tube is coiled and attached on the side of the engine. Cut the cable tie and route the water pressure tube out through the grommet.



23702

**a** - Water pressure tube

2. Remove the plug from the coupler and make the connection. A barb fitting (22-859731) can be installed for larger diameter hose connection.



23708

**a** - Plug  
**b** - Coupler  
**c** - Barb fitting (22-859731)

# OUTBOARD INSTALLATION

## FUEL HOSE CONNECTION

### Remote Fuel Hose Size

Minimum fuel hose inside diameter (ID) is 8 mm (5/16 in.) with separate fuel hose/fuel tank pickup for each engine.

### Fuel Hose Connection

Fasten the remote fuel hose to the fitting with a hose clamp.



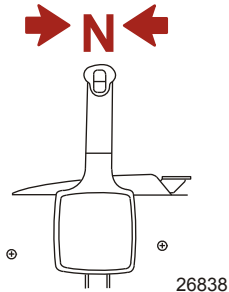
- a - Hose clamp
- b - Remote fuel hose

## SHIFT CABLE INSTALLATION

**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.

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

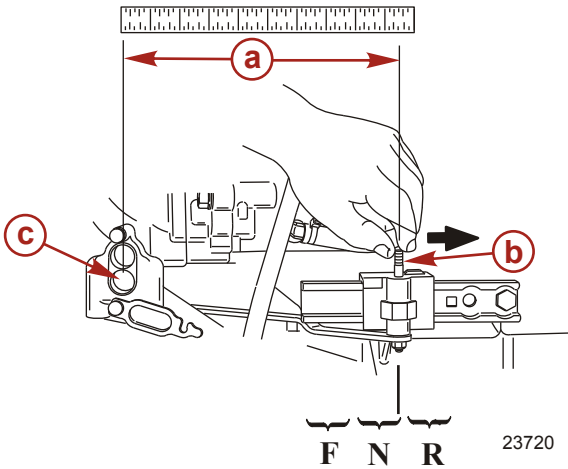
1. Position the remote control into neutral.



2. Shift the outboard into neutral.

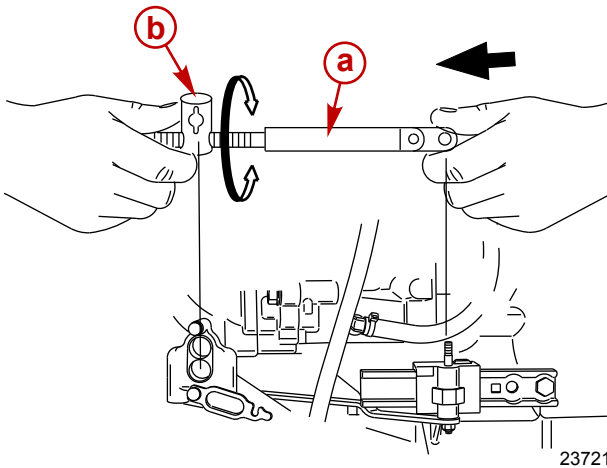
# OUTBOARD INSTALLATION

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



- a** - Distance between pin and center of lower hole
- b** - Pin
- c** - Barrel pocket

4. Push in on the shift cable end until resistance is felt. Adjust the cable barrel to attain distance measured in Step 3.

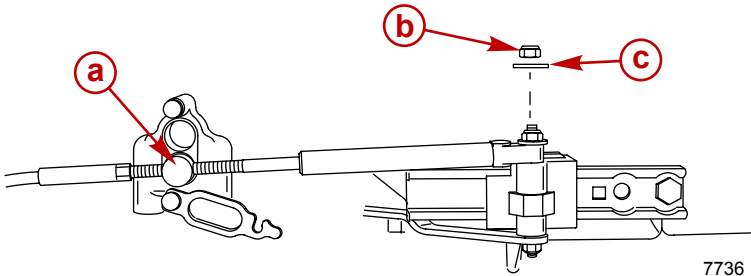


- a** - Shift cable end
- b** - Cable barrel



# OUTBOARD INSTALLATION

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



- a - Cable barrel
- b - Locknut
- c - Flat washer

6. Check the shift cable adjustments as follows:
  - a. Shift the remote control into forward. The propeller shaft should be locked in gear. If not, adjust the barrel closer to the cable end.
  - b. Shift the 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 the 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 through c.
  - d. Shift the 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 through d.

## SHIFT CABLE INSTALLATION—OUTBOARD JET

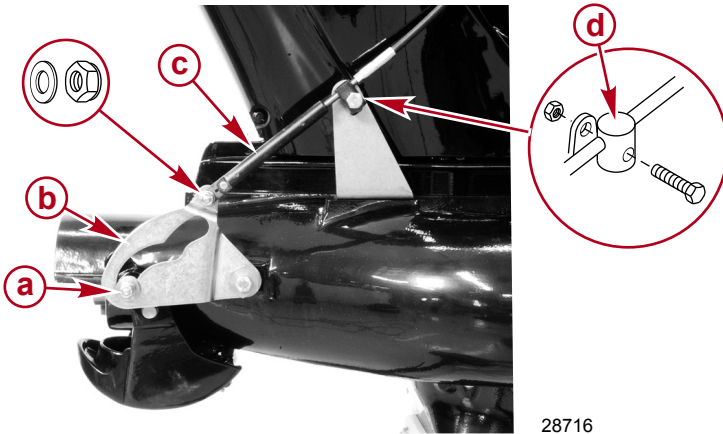
### **▲ WARNING**

If not properly installed, the reverse gate can interfere with water coming off the rudder, suddenly and unexpectedly slowing the boat. This can cause serious injury or death from occupants being thrown within or out of the boat. Adjust the shift cable to prevent the reverse gate from interfering with water flow off the rudder.

1. Attach the shift cable to the shift cam with a flat washer and a self-locking nylon insert locknut as shown. Tighten the locknut against the flatwasher, then back-off the locknut 1/4 turn.
2. Place the remote control handle into full forward position.
3. Adjust the shift cable adjustment barrel so that the roller is at the full end of travel (bottom) in the shift cam.

## OUTBOARD INSTALLATION

- Attach the shift cable adjustment barrel to the bracket with a bolt and locknut. Tighten the bolt until it seats against the adjustment barrel, then back-off the bolt 1/4 turn. Hold the bolt from turning, and tighten the locknut on the bolt. The adjustment barrel must be free to pivot.



- a** - Roller
- b** - Shift cam
- c** - Shift cable
- d** - Shift cable adjustment barrel

- Check the shift cable adjustment in forward shift position. The correct shift adjustment will position the cam far enough on the roller to lock the reverse gate into forward position. Push on the reverse gate by hand to verify it is locked into position. The reverse gate should not move when pushed toward the neutral position.

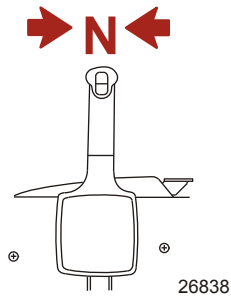
**IMPORTANT: The forward locking of the reverse gate must be met. If not, readjust the shift cable.**

### THROTTLE CABLE INSTALLATION

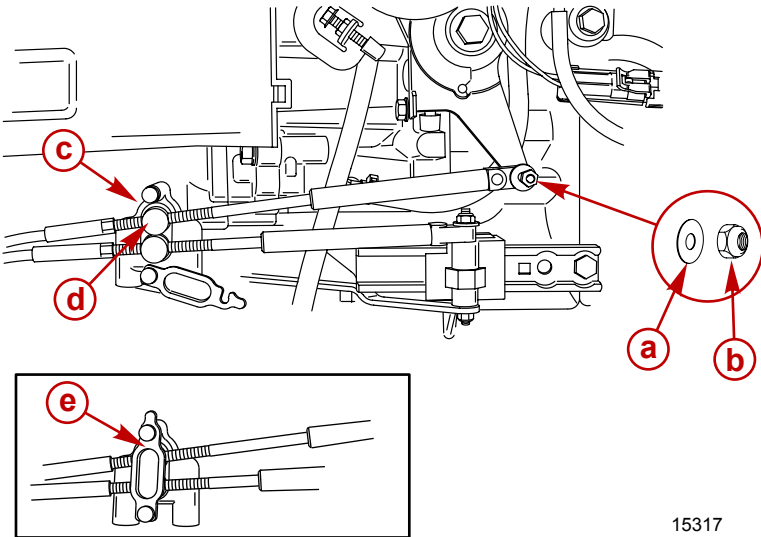
Install the cables into the remote control following the instructions provided with the remote control.

# OUTBOARD INSTALLATION

1. Position the remote control into neutral.



2. Install the throttle cable to the throttle arm with a flat washer and locknut. Tighten the locknut, then back off the locknut 1/4 turn.
3. Adjust the cable barrel so that the installed throttle cable will hold the throttle arm against the idle stop.
4. Place the cable barrel into the barrel retainer.
5. Lock the retainer and cables in place with the cable latch.



15317

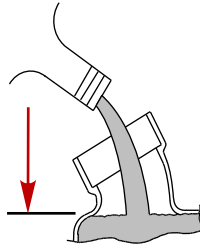
- a - Flat washer
- b - Locknut
- c - Barrel retainer
- d - Cable barrel
- e - Cable latch

# OUTBOARD INSTALLATION

## Oil Injection Set-Up

### FILLING OIL INJECTION SYSTEM

1. Fill the oil tank with the specified oil. Refer to **Filling Oil Injection System**. Add only enough oil to bring the oil level up to the bottom of the fill neck.

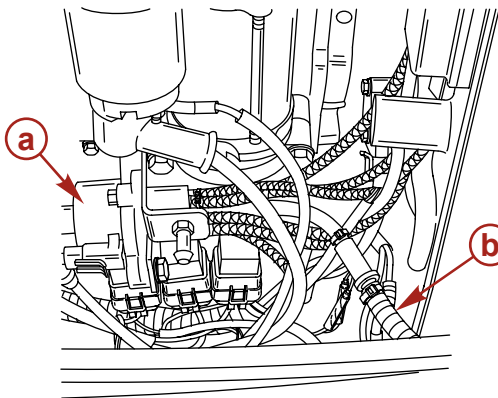


29465

All Models	Capacity	Fluid Type
Oil tank	4.72 liters (5 US qt)	OptiMax/DFI 2-Cycle Engine Oil

### 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.



- a - Oil injection pump
- b - Oil supply hose

7912

**IMPORTANT:** Fill the engine fuel system with fuel before priming the oil injection pump. Otherwise, the fuel pump will run without fuel during the priming process and may be damaged.

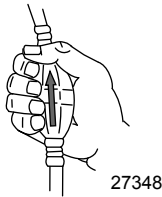
Prime the oil injection pump as follows:

1. Fill the engine fuel tank with fuel.

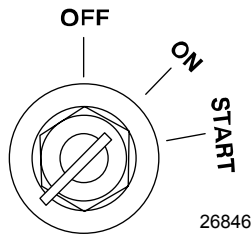
# OUTBOARD INSTALLATION

**NOTE:** Use the primer bulb located in the fuel hose to the engine to draw fuel from the tank to fill the engine fuel system.

2. Position the fuel hose primer bulb so that the arrow on the side of the bulb is pointing up. Squeeze the fuel hose primer bulb until it feels firm.



3. Turn the ignition key switch to the "ON" position.



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

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

## Trim In Pin

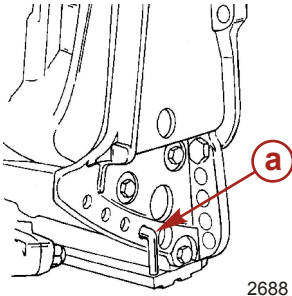
### ⚠ WARNING

Operating the boat at high speeds with the outboard trimmed too far under can create excessive bow steer, resulting in the operator losing control of the boat. Install the trim limit pin in a position that prevents excessive trim under and operate the boat in a safe manner.

Some 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 spent in a bow high boat during planing off, and in some cases, may be necessary to plane off a boat with aft livewells, given the variety of available propellers and height range of engine installations.

# OUTBOARD INSTALLATION

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 oversteering and inefficiently consumes horsepower.



**a** - Tilt pin (not included with engine)

Stainless Steel Tilt Pin	17-49930A 1
<p>2749</p>	Limits the down trim angle of the power trim equipped engines, or aids in determining the trim out angle on non-power trim engines.

The owner may decide to limit the trim in. This can be accomplished by purchasing a stainless steel tilt pin from your dealer and insert it in whatever adjustment hole in the transom brackets is desired. A nonstainless steel shipping bolt should not be used in this application other than on a temporary basis.

# MAINTENANCE LOG

## Maintenance Log

Record all maintenance performed on your outboard here. Be sure to save all work orders and receipts.

Date	Maintenance Performed	Engine Hours