

Thank You

for your purchase of one of the finest outboards available. You have made a sound investment in boating pleasure. Your outboard has been manufactured by Mercury Marine, a world leader in marine technology and outboard manufacturing since 1939. These years of experience have been committed to the goal of producing the finest quality products. This led to Mercury Marine's reputation for strict quality control, excellence, durability, lasting performance, and being the best at providing after the sale support.

Please read this manual carefully before operating your outboard. This manual has been prepared to assist you in the operation, safe use, and care of your outboard.

All of us at Mercury Marine took pride in building your outboard and wish you many years of happy and safe boating.

Again, thank you for your confidence in 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 important 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, to change specifications, designs, methods, or procedures without notice and without incurring obligation.

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

Litho in U.S.A.

© 2010, Mercury Marine

Mercury, Mercury Marine, MerCruiser, Mercury MerCruiser, Mercury Racing, Mercury Precision Parts, Mercury Propellers, Mariner, Quicksilver, #1 On The Water, Alpha, Bravo, Pro Max, OptiMax, Sport-Jet, K-Planes, MerCathode, RideGuide, SmartCraft, Zero Effort, M with Waves logo, Mercury with Waves logo, and SmartCraft logo are all registered trademarks of Brunswick Corporation. Mercury Product Protection logo is a registered service mark of Brunswick Corporation.

Mercury Premier Service

Mercury 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 CSI (Customer Satisfaction Index) score for warranty service.
- Possesses all 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 adequate inventory of genuine Mercury Precision Parts.
- Offers a clean, neat shop with well organized tools and service literature.

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

Name of engine manufacturer: Mercury Marine			
Address: W6250 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: 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:	<input type="checkbox"/> B+C	<input type="checkbox"/> B+D	<input type="checkbox"/> B+E	<input type="checkbox"/> B+F	<input type="checkbox"/> G	<input checked="" type="checkbox"/> H
Conformity assessment module used for noise emissions:	<input type="checkbox"/> A	<input type="checkbox"/> Aa	<input type="checkbox"/> G	<input checked="" type="checkbox"/> H		
Other Community Directives applied: Safety of Machinery Directive 98/37/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: starting serial number	EC Module H certificate number
1.5L OptiMax 75, 80, 90, 115, 125 hp	1B227000	RCD-H-2
2.5L OptiMax 135, 150, 175 hp	1B227000	RCD-H-2
3.0L OptiMax 200, 225 hp	1B227000	RCD-H-2

Essential requirements	standards	other normative document/ method	technical file	Please specify in more detail (* = mandatory standard)
Annex 1.B—Exhaust Emissions				
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: 1995
Annex 1.C—Noise Emissions				
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:

Mark D. Schwabero, President, Mercury
Outboard

A handwritten signature in black ink, reading "Mark D. Schwabero". The signature is written in a cursive style with a large, stylized initial 'M'.

Date and place of issue: July 24, 2008
Fond du Lac, Wisconsin, USA

WARRANTY INFORMATION

Warranty Registration.....	1
Transfer of Warranty.....	2
Transfer of Mercury Product Protection (Extended Service Coverage) Plan United States and Canada.....	2
Outboard Limited Warranty.....	3
3 Year Limited Warranty Against Corrosion.....	7
Warranty Coverage and Exclusions.....	11
U.S. EPA Emissions Limited Warranty.....	13
Emission Control System Components.....	13
California Emissions Limited Warranty.....	14
California Air Resources Board Explanation of Your California Emission Control Warranty Statement.....	18
Emission Certification Star Label.....	19

General Information

Boater's Responsibilities.....	21
Before Operating Your Outboard.....	21
Boat Horsepower Capacity.....	21
Intended Boat Application.....	22
Propeller Selection.....	22
Outboard Remote Control Models	25
Remote Steering Notice.....	26
Lanyard Stop Switch.....	26
Protecting People in the Water.....	30
Exhaust Emissions.....	30
Passenger Safety Message - Pontoon Boats and Deck Boats	33
Wave and Wake Jumping.....	35
Impact with Underwater Hazards.....	36
Selecting Accessories for Your Outboard.....	37
Safe Boating Suggestions.....	37
Recording Serial Number.....	40
Specifications.....	40
Component Identification.....	42

Transporting

Trailer Boat/Outboard	43
-----------------------------	----

Fuel and Oil

Avoiding Fuel Flow Restrictions.....	44
Fuel Requirements.....	44
Low Permeation Fuel Hose Requirement	46
Oil Recommendation.....	46
Filling Remote Oil Tank.....	47
Filling Engine Mounted Oil Reservoir Tank.....	47
Filling Fuel Tank.....	47

Features and Controls

Remote Control Features.....	49
Zero Effort Control Features.....	50
Warning System.....	50
Overspeed Rev Limit.....	53
Power Trim and Tilt.....	54

Operation

Engine Break-in.....	59
Engine Break-in Fuel Mixture.....	59
Pre-Starting Check List.....	59
Operating in Freezing Temperatures.....	60
Operating in Saltwater or Polluted Water.....	60
Operating at High Elevations.....	61
Effects of Elevation and Weather on Performance.....	61
Setting Trim Angle While Running Engine at Idle Speed.....	62
Operating in Shallow Water.....	62
Starting the Engine.....	63
Gear Shifting.....	66
Stopping the Engine.....	66

Maintenance

Power Package Care.....	67
Submerged Power Package.....	67
Replacement Parts for Your Power Package.....	67
EPA Emissions Regulations.....	68
Inspection and Maintenance Schedule.....	69
Flushing the Cooling System (Powerhead).....	72
Flushing the Cooling System (Lower Unit).....	73
Top Cowl Removal and Installation.....	74
Cleaning Care for Top Cowl.....	74
Fuel System.....	75
Steering Link Rod Fasteners.....	78
Fuses	80
Corrosion Control Anode.....	81
Spark Plug Inspection and Replacement.....	82
Battery Inspection	84
Charging System Fusible Link.....	85
Propeller Replacement - 25.4 mm (1.0 in.) Diameter Propeller Shaft.....	85
Propeller Replacement - 31.75 mm (1-1/4 in.) Diameter Propeller Shaft.....	88
Lubrication Points.....	90
Checking Power Trim Fluid.....	92
Gearcase Lubrication.....	93

Storage

Storage Preparation.....	95
Protecting Internal Engine Components.....	97
Protecting External Outboard Components.....	97
Gearcase.....	98
Positioning Outboard for Storage.....	98
Battery Storage.....	98

Troubleshooting

Starter Motor Will Not Crank the Engine.....	99
Engine Will Not Start.....	99
Engine Runs Erratically.....	100
Performance Loss.....	100
Warning Horn Activates (With Power Loss).....	100
Warning Horn Activates (No Power Loss).....	101
Battery Will Not Hold Charge.....	101

Owner Service Assistance

Local Repair Service.....	103
Service Away from Home.....	103
Parts and Accessories Inquiries.....	103
Service Assistance.....	103
Mercury Marine Service Offices.....	104
Ordering Literature.....	105

Outboard Installation

Important Information.....	106
Avoiding Fuel Flow Restriction.....	106
Boat Horsepower Capacity.....	107
Start in Gear Protection.....	107
Selecting Accessories for Your Outboard.....	107
Fuel Tanks.....	108
Low Permeation Fuel Hose Requirement	108
Filling the Fuel System.....	108
Installation Specifications.....	109
Lifting the Outboard.....	109
Steering Cable - Starboard Side Routed Cable.....	110
Steering Link Rod Fasteners.....	111
Determining Recommended Outboard Mounting Height.....	114
Drilling Outboard Mounting Holes.....	115
Fastening the Outboard to the Transom.....	116
Electrical, Hoses, Control Cables, and Front Clamp.....	120
Filling the Fuel System.....	137
Oil Injection Set-Up.....	138
Trim In Pin.....	141

Maintenance Log

Maintenance Log.....	143
----------------------	-----

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 on marine products sold in the United States, should a safety recall notification under the Federal Safety Act be required.*

You may change your 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 W. Pioneer Road

P.O. Box 1939

Fond du Lac, WI 54936-1939

920-929-5054

Fax +1 920 929 5893

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.

WARRANTY INFORMATION

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 W. Pioneer Road
P.O. Box 1939
Fond du Lac, WI 54936-1939
920-929-5054
Fax +1 920 929 5893

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.

WARRANTY INFORMATION

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 non-eligible applications.

The Certified Pre-Owned 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 email mpp_support@mercmarine.com.

Outboard Limited Warranty

UNITED STATES, CANADA, EUROPE, MIDDLE EAST, AFRICA, AND THE CONFEDERATION OF INDEPENDENT STATES

WHAT IS COVERED: Mercury Marine warrants its new 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 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.

Commercial users of these products receive warranty coverage 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.

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.

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. Inaccurate warranty registration information regarding recreational use, or subsequent change of use from recreational to commercial (unless properly reregistered) 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.

WARRANTY INFORMATION

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.

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.

WARRANTY INFORMATION

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 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, 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 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, M² 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.

WARRANTY INFORMATION

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.

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.

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. 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.

WARRANTY INFORMATION

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.

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 INFORMATION

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.
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.

WARRANTY INFORMATION

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.

WARRANTY INFORMATION

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.

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, 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 which 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

WARRANTY INFORMATION

- 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
 - 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.

WARRANTY INFORMATION

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.

WARRANTY INFORMATION

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.

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.

WARRANTY INFORMATION

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 2001 model year and later 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 occurs first. However, warranty coverage based on the hourly period is only permitted for outboard engines and personal watercraft equipped with appropriate hour meters 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>The One Star label features a black oval with a white star in the center. The word "LOW" is at the top, "EMISSION" is at the bottom, and "CALIFORNIA EMISSION STANDARDS" is written in a smaller font around the star. A small number "22531" is located to the right of the label.</p>	<p>One Star - Low Emission</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>The Two Stars label features a circular design with two stars. The words "VERY LOW" are at the top, "EMISSION" is at the bottom, and "20% LOWER" is written across the stars. A small number "42537" is located to the right of the label.</p>	<p>Two Stars - Very Low Emission</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>

WARRANTY INFORMATION



42538

Three Stars - Ultra Low Emission

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.



42539

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.

GENERAL INFORMATION

Boater's Responsibilities

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

Be sure 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.

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.

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.

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

Intended Boat Application

This engine is not intended for use on high speed boats (operating in excess of 80 miles per hour).

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 or see your local authorized Mercury dealer.

SELECTING THE CORRECT PROPELLER

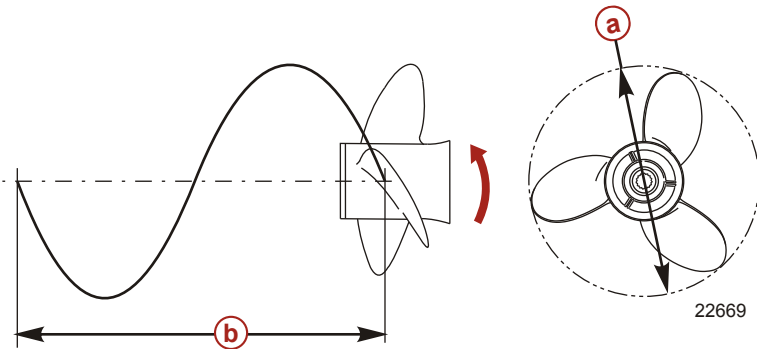
An accurate tachometer for measuring engine speed is important in choosing the correct propeller.

GENERAL INFORMATION

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.

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.

GENERAL INFORMATION

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
- 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 which allows the engine to exceed the recommended full throttle RPM range when under normal full throttle operation.

GENERAL INFORMATION

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

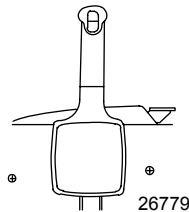
Available in many sizes of both aluminum and stainless, 3 and 4-blade propellers have unique performance characteristics. In general, 3-blade propellers offer good all around performance and higher top speed than 4-blade propellers. However, 4-blade propellers are usually faster to plane and more efficient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



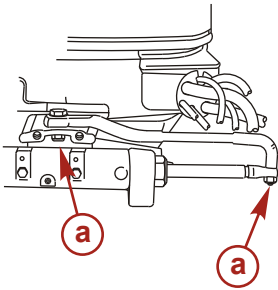
GENERAL INFORMATION

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 (non-locking) 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.



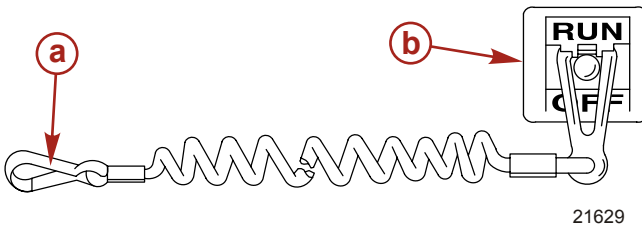
a - Self-locking nuts

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.

GENERAL INFORMATION

The lanyard is a cord 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 snap on the other end for attaching to the operator. 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
- b** - Lanyard stop switch

Read the following Safety Information before proceeding.

GENERAL INFORMATION

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.

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 (e.g. 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.

GENERAL INFORMATION

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 in the water to take quick action to avoid a boat heading in their direction, even at slow speeds.



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 (even coasting) and the gear shift is in neutral, 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 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 into neutral and shut off the engine before allowing people to swim or be in the water near your boat.

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.

GENERAL INFORMATION

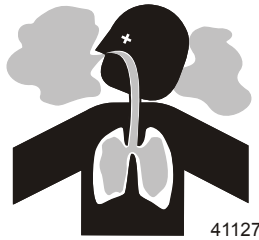
Early symptoms of carbon monoxide poisoning, which are similar to the symptoms of seasickness and intoxication, include headache, dizziness, drowsiness, and nausea.

⚠ 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



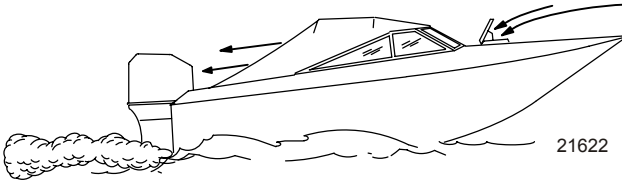
Engine exhaust gases contain harmful carbon monoxide. Avoid areas of concentrated engine exhaust gases. When engines are running, keep swimmers away from the boat, and do not sit, lie, or stand on swim platforms or boarding ladders. While underway, do not allow passengers to be positioned immediately 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.

GOOD VENTILATION

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

GENERAL INFORMATION

Example of desired air flow through the boat:

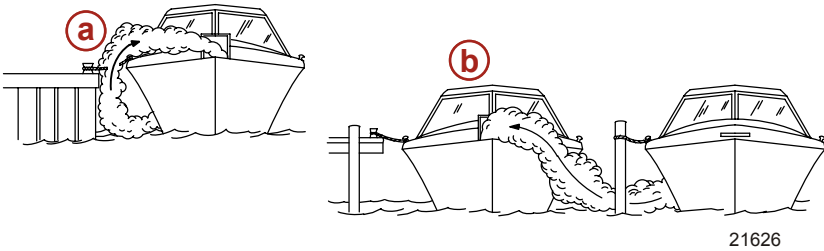


POOR VENTILATION

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.

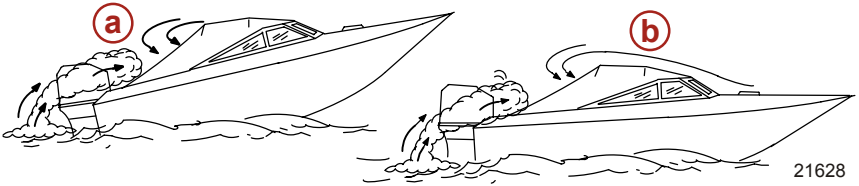
1. Examples of poor ventilation while the boat is stationary:



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

GENERAL INFORMATION

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)

Passenger Safety Message - Pontoon Boats and Deck Boats

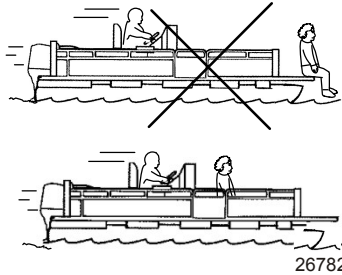
Whenever the boat is in motion, observe the location of all passengers. Do not allow any passengers to stand or use seats other than those designated for traveling faster than idle speed. A sudden reduction in boat speed, such as plunging into a large wave or wake, a sudden throttle reduction, or a sharp 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.



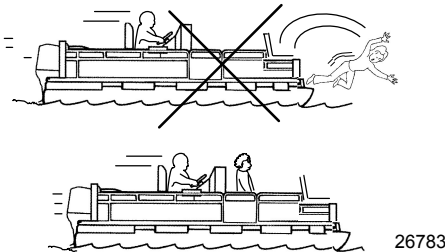
⚠ WARNING

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.

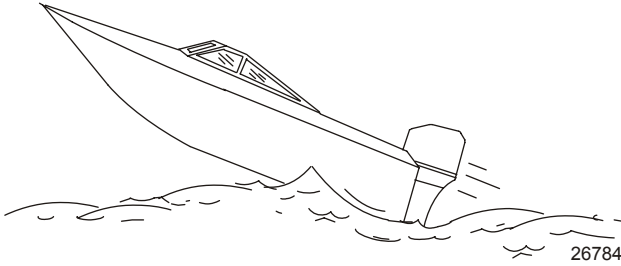
Any unexpected, sudden reduction in boat speed could result in the elevated passenger falling over the front of the boat.



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 reenters 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

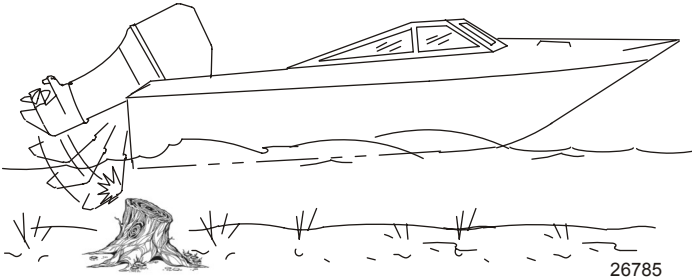
Wave or wake jumping can cause serious injury or death from occupants being thrown within or out of the boat. Avoid wave or wake jumping whenever possible.

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.

GENERAL INFORMATION

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.

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.

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. Acquire and read the installation, operation and maintenance manuals for all your selected accessories.

Safe Boating Suggestions

In order to safely enjoy the waterways, familiarize yourself with local and other governmental boating regulations and restrictions, and consider the following suggestions.

GENERAL INFORMATION

Use flotation devices. Have an approved personal flotation device of suitable size for each person aboard (it is the law) and have it readily accessible.

Do not overload your boat. Most boats are rated and certified for maximum load (weight) capacities (refer to your boat capacity plate). If in doubt, contact your dealer or the boat's manufacturer.

Perform safety checks and required maintenance. Follow a regular schedule and ensure that all repairs are properly made.

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

Boat operators should complete a boating safety course.

Courses are offered in the U.S.A. by 1) the U.S. Coast Guard Auxiliary, 2) the Power Squadron, 3) the Red Cross, and 4) your state boating law enforcement agency. Inquiries may be made to the Boating Hotline, 1-800-368-5647 or the Boat U.S. Foundation information number 1-800-336-BOAT.

Make sure 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 back of seats, gunwales, transom, bow, decks, raised fishing seats, any rotating fishing seat; or anywhere that an 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.

Never be under the influence of alcohol or drugs while boating (it is the law). Alcohol or drug use impairs your judgment and greatly reduces your ability to react quickly.

Prepare other boat operators. Instruct at least one other person onboard in the basics of starting and operating the outboard, and boat handling, in case the driver becomes disabled or falls overboard.

Passenger boarding. Stop the engine whenever passengers are boarding, unloading, or are near the back (stern) of the boat. Just shifting the outboard into neutral is not sufficient.

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 operating the boat above idle speed.

Never drive your boat directly behind a water-skier in case the skier falls. As an example, your boat traveling at 40 km/h (25 MPH) will overtake a fallen skier 61 m (200 ft) in front of you in 5 seconds.

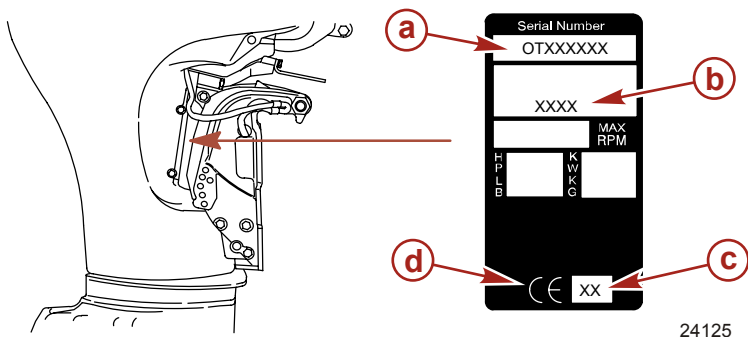
Watch fallen skiers. When using your boat for waterskiing or similar activities, always keep a fallen or down skier on the operator's side of the boat while returning to assist the skier. The operator should always have the down skier in sight and never back up to the skier or anyone in the water.

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.

GENERAL INFORMATION

Recording Serial Number

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



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

Specifications

Models	200	225	250
Cylinder configuration	60° V6	60° V6	60° V6
Propeller shaft horsepower	200	225	250
Propeller shaft kilowatts	147	165	184
Number of cylinders	6		
Idle RPM	575 RPM		
Full throttle RPM range	5000–5750 RPM	5500–6000 RPM	
Engine displacement	3032 cc (185 in ³)		
Cylinder bore	92.075 mm (3.625 in.)		
Stroke	76.2 mm (3.0 in.)		
Recommended spark plugs	NGK IZFR5G	NGK IZFR6J or NGK IZFR6J-11 (if these plugs are unavailable, use NGK PZFR6H)	

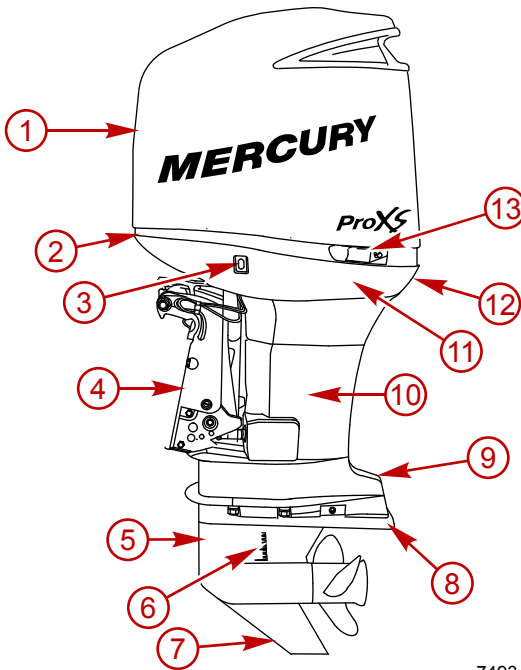
GENERAL INFORMATION

Models	200	225	250
Spark plug gap	0.8 mm (0.031 in.)	1.06 mm (0.042 in.)	
Firing order	1-2-3-4-5-6		
Fuel line pressure	655 ± 13.8 kPa (95 ± 2 psi)		
Air pressure	58 ± 13.8 kPa (110 ± 2 psi)		
Gear ratio	1.75:1		
Required fuel	Refer to Fuel and Oil		
Recommended oil	Refer to Fuel and Oil		
Gearcase lubricant	High Performance Gear Lubricant		
Gearcase lubricant capacity - 25.4 mm (1.0 in.) diameter propeller shaft gearcase	Right-hand rotation 970 ml (32.8 fl oz) Left-hand rotation 900 ml (30.4 fl oz)		
Gearcase lubricant - 31.75 mm (1-1/4 in.) diameter propeller shaft gearcase	760 ml (25.7 fl oz)		
Battery rating	1000 marine cranking amps (MCA) or 800 cold cranking amps (CCA) ¹ .		
Charging system output (maximum)	60 A		
Emission control system	Electronic engine control (EC)		
Sound at driver's ear (ICOMIA 39-94) dBA	89		

1. Battery manufacturers may rate and test their batteries to different standards. Consult with the specific battery manufacturer for comparison ratings.

GENERAL INFORMATION

Component Identification



7493

- 1** - Top cowl
- 2** - Front cowl latch
- 3** - Auxiliary tilt switch
- 4** - Clamp/swivel bracket
- 5** - Gearcase
- 6** - Cooling water intake
- 7** - Skeg
- 8** - Anti-ventilation plate
- 9** - Anodes (one per side)
- 10** - Driveshaft housing
- 11** - Bottom cowl
- 12** - Water pump indicator (tell-tale)
- 13** - Side cowl latches (both sides)

TRANSPORTING

Trailing Boat/Outboard

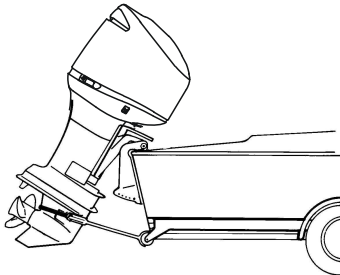
Ensure the outboard is in forward gear before trailering. This prevents the propeller from spinning freely during transportation.

NOTICE

Shifting into gear at engine speeds above idle will damage the gearcase. Shifting into gear when the engine is not running can cause misalign the clutch, preventing proper shifting. Always shift the gearcase into gear when the engine is operating at idle. If you must shift while the engine is not operating, rotate the propeller shaft in the appropriate direction during shifting.

Trailer 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.

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.



2722

FUEL AND OIL

Avoiding Fuel Flow Restrictions

NOTICE

Adding components to the fuel supply system can damage the engine. These additions can restrict fuel flow, stall the engine at low speeds, and create lean fuel conditions at high speeds. Follow all regulations for fuel system installation and do not add any additional components to the fuel system.

Fuel Requirements

Use a major brand of unleaded gasoline, preferably without alcohol.

NOTICE

The use of improper fuel can cause serious damage to the engine. Damage resulting from the use of improper fuel is considered engine misuse and is not covered under the limited warranty. Use only the recommended fuel in the engine.

OCTANE REQUIREMENTS (U.S./CANADA)

FUEL TYPE	MINIMUM POSTED OCTANE
Unleaded premium ¹ .	87 (R+M)/2

OCTANE REQUIREMENTS (OUTSIDE THE U.S./CANADA)

FUEL TYPE	MINIMUM POSTED OCTANE
Unleaded premium ² .	92 RON

1. Mercury Marine does not recommend using leaded gasoline. Read the information in the Fuel Containing Alcohol section.
2. Mercury Marine does not recommend using leaded gasoline. Leaded gasoline is acceptable in areas where unleaded gasoline is not available; however, exhaust passageway corrosion may occur due to the accumulation of exhausted lead particles. Automotive fuels that contain fuel injector cleaner are recommended for added internal cleanliness.

FUEL AND OIL

USING REFORMULATED (OXYGENATED) FUELS (USA ONLY)

This type of fuel is required in certain areas of the U.S. 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 the **Fuel Containing Alcohol** section.

These reformulated fuels are acceptable for use in your Mercury engine.

FUEL CONTAINING ALCOHOL

If the fuel 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 fuel 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 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).

Fuel containing alcohol may increase:

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

FUEL AND OIL

IMPORTANT: Operating a Mercury Marine engine with gasoline containing alcohol creates unique problems as a result of long storage periods common to a boat. Cars normally consume alcohol-blend fuels before they absorb enough moisture to cause problems; however, boats often sit idle long enough for phase separation to occur. In addition, alcohol can wash protective oil films from internal components causing corrosion.

IMPORTANT: Because of possible adverse effects of alcohol in gasoline, it is recommended that only alcohol-free fuel 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.

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/gm²/24 h with CE 10 fuel at 23 °C as specified in SAE J 1527 - marine fuel hose.

Oil Recommendation

Recommended Oil	Mercury OptiMax/DFI or Quicksilver DFI 2-Cycle Engine Oil
------------------------	--

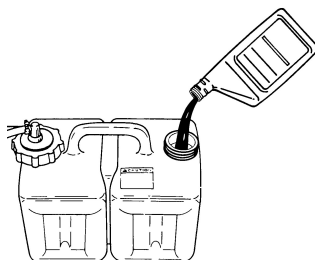
Mercury OptiMax/DFI or Quicksilver DFI 2-Cycle Engine Oil is recommended for your engine. If Mercury OptiMax/DFI or Quicksilver DFI 2-Cycle Engine Oil is not available, we recommend using Mercury or Quicksilver TC-W3 Premium Plus 2-Cycle Oil. Severe engine damage may result from use of an inferior oil.

FUEL AND OIL

Filling Remote Oil Tank

Remove filler cap and fill with the specified oil. Oil tank capacity is 11.5 liters (3 gallons). Replace filler cap and tighten securely.

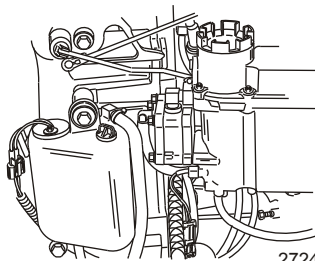
IMPORTANT: Always make sure the oil tank caps are threaded on tight. An air leak will prevent oil flow to the engine.



2723

Filling Engine Mounted Oil Reservoir Tank

Remove the top cowl. Loosen the fill cap on the engine oil reservoir tank. Run the engine until all the air has been vented out of the oil reservoir tank and tank is filled with oil to the point of overflow. Retighten the fill cap. Stop the engine and replace the top cowl.



2724

NOTE: Filling this tank is only necessary if the oil level should ever drop and the low oil warning system is activated.

Filling Fuel Tank

- Fill fuel tanks outdoors away from heat, sparks, and open flames.
- Remove portable fuel tanks from boat to refill them.

FUEL AND OIL

- Always stop engine before refilling 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.

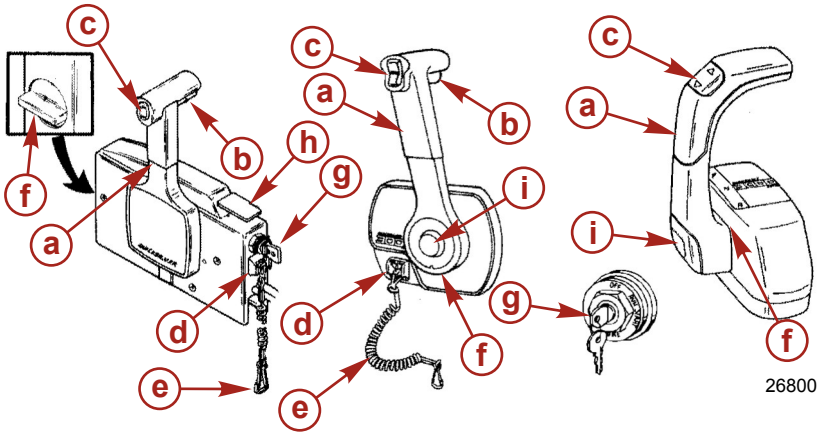
WARNING

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.

FEATURES AND CONTROLS

Remote Control Features

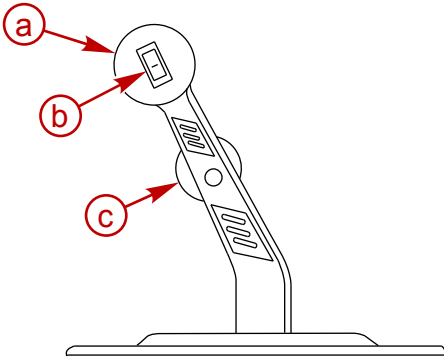
Your boat may be equipped with one of the Mercury Precision or Quicksilver remote controls shown. If not, consult your dealer for a description of the functions and operations of the remote control.



- 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**

FEATURES AND CONTROLS

Zero Effort Control Features

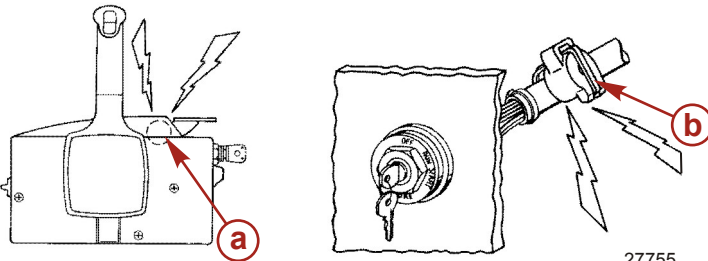


- a** - Throttle lever
- b** - Trim switch
- c** - Shift lever

4090

Warning System

The warning system incorporates a warning horn inside the boat. The warning horn may be located inside the remote control or under the dash connected to the ignition key switch.



27755

- a** - Inside the remote control
- b** - Under the dashboard

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 tell you the horn is working.

FEATURES AND CONTROLS

The warning horn will emit either a continuous beep or intermittent short beeps. This will alert the operator and help identify the following listed situations. Refer to the **Troubleshooting** section for specific information. For visual display of the specific engine functions and for additional engine data, refer to SmartCraft product information.

ENGINE GUARDIAN SYSTEM

The Engine Guardian System monitors the critical sensors on the engine for any early indications of problems. The system will respond to a problem by emitting a continuous beep and/or reducing engine power in order to provide engine protection.

If Guardian System is activated, the system must be reset before the engine will operate at higher speeds. Moving throttle lever back to idle, or to the required reduced throttle position, resets the system.

Problem	Horn	Monitor Display	Guardian Activated	Percentage of Full Engine Power Available
Power Up/ System Check	Single Beep	Yes	N/A	N/A
During Engine Break-In	No	No	No	100%
Low Oil in Engine Oil Tank	4 Beeps... 2 Minutes Off	Yes	Yes	95%
Critically Low Oil in Engine Oil Tank	Continuous Beep	Yes	Yes	5%
Oil Pump Electrical Failure	Continuous Beep	Yes	Yes	5%
Throttle Position Sensor Failure	Continuous Intermittent Beeping	Yes	Yes	95%
Overspeed	Continuous Beep	Yes	Yes	65%
High Engine Temperature	Continuous Beep	Yes	Yes	From 100% down to 4%

FEATURES AND CONTROLS

Problem	Horn	Monitor Display	Guardian Activated	Percentage of Full Engine Power Available
Low Block Water Pressure	Continuous Beep	Yes	Yes	From 100% down to 4%
Faulty Sensor (Block psi, Coolant Temp)	No	Yes	Yes	95%
Battery Voltage Out of Limits	Single Beep...Continuous Beep when Guardian Engages	Yes	Yes	<10 v = 0% <11.5 v = 50%
		No	No	11.5 - 16 v = 100%
		Yes	Yes	>16 v = 50% >17 v = 0%
Horn Failure	No	Yes	Yes	95%
Water In Fuel	4 Beeps... 2 Minutes Off	Yes	No	N/A
MAP Sensor Failure	No	Yes	Yes	95%
Air Temperature Sensor Failure	No	Yes	No	N/A
Ignition Coil Failure	No	Yes	No	N/A
Injector Failure	No	Yes	No	N/A

SMARTCRAFT PRODUCT

A Mercury SmartCraft System instrument package can be purchased for this power package. A few functions the instrument packages display are:

- Engine RPM
- Coolant temp
- Water pressure
- Battery voltage

FEATURES AND CONTROLS

- Fuel consumption
- 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.

Refer to the **Mercury SmartCraft Operator's Supplement** provided with the power package for the warning functions monitored on your power package and basic operation of the SmartCraft Instrument package.

***NOTE:** If equipped with SmartCraft instruments, the check engine icon will be displayed during the engine break-in period.*

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 required. Refer to **Specifications** to determine this engine's RPM limit.

Upon reaching the rev limit, the Guardian System activates the warning horn. If the operator does not reduce engine speed within five seconds, the Guardian Systems reduces available engine power.

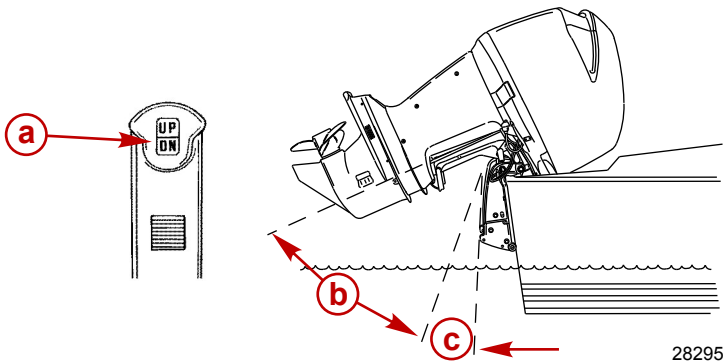
To reset the Guardian System protection:

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

FEATURES AND CONTROLS

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.



- a** - Trim switch
- b** - Tilt range of travel
- c** - Trim range of travel

POWER TRIM OPERATION

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.

FEATURES AND CONTROLS

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 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.

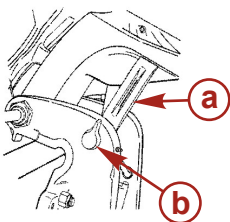
FEATURES AND CONTROLS

- 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 other than on a temporary basis.
2. Trimming out or up can:
- 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 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.



27778

- a** - Tilt support lever
- b** - Knob

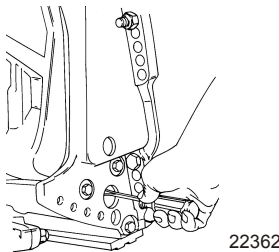
FEATURES AND CONTROLS

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.*

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

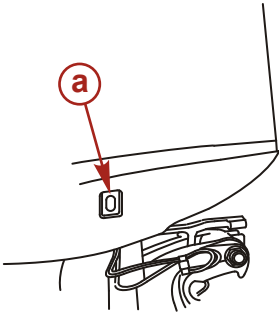
When operating your boat in shallow water, you can tilt the outboard beyond the maximum trim range to prevent hitting bottom.

1. Reduce engine speed below 2000 RPM.
2. Tilt 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.

FEATURES AND CONTROLS

AUXILIARY TILT SWITCH

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



a - Auxiliary tilt switch

2745

OPERATION

Engine Break-in

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.

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
Always vary throttle settings during Break-in
1st Hour
<ul style="list-style-type: none">• Allow engine to warm-up for 30–60 seconds.
<ul style="list-style-type: none">• Do not idle for more than five (5) minutes
<ul style="list-style-type: none">• Run the engine the majority of the time between 4000–5400 RPM (approximately three quarter throttle).
<ul style="list-style-type: none">• Change engine speed approximately every two (2) minutes.
<ul style="list-style-type: none">• Avoid trimming the outboard out (up) beyond a vertical trim position during operation.
<ul style="list-style-type: none">• Avoid using hydraulic jack plate (if equipped) to raise engine during break-in cycle.
Next 3 Hours: Change engine speed every 10 minutes.

Engine Break-in Fuel Mixture

The propulsion control module (PCM) controls oil and fuel mixture during engine break-in.

Pre-Starting Check List

- Engine lowered to run position with all water intake holes submerged

OPERATION

- Fuel tank vent cap open or fuel drain valve on
- Fuel supply OK
- Lanyard stop switch in "RUN" position and cord connected
- Remote control in neutral
- Top cowl latches secure
- Make inspection checks listed in the **Inspection and Maintenance Schedule**. Refer to **Maintenance** section.

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**.

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.

OPERATION

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.

Effects of Elevation and Weather on Performance

The following conditions lower engine performance and cannot be compensated by the engine fuel or electronic management systems:

- Above sea level elevations
- High temperature
- Low barometric pressure
- High humidity

These conditions above reduce air density to the engine, which in turn lowers the following:

- Boost pressure on supercharged engines
- Horsepower and torque throughout the RPM range
- Peak RPM
- Cranking compression

EXAMPLE: An engine run at an elevation of 8,000 feet will have over a 30% power loss while a loss of engine power on a hot and humid day could be as much as 14%. These losses apply to normally aspirated and supercharged engines.

Compensating for power robbing conditions:

- Switch to lower pitch propeller.
- Change gear ratio.

Some boat performance can be regained by dropping to a lower pitch propeller, but engine performance will still remain lower. In some cases, a gear ratio reduction may be more beneficial. To optimize engine performance, prop the engine to allow it to operate at or near the top end of the recommended maximum RPM range at wide-open throttle with a normal boat load.

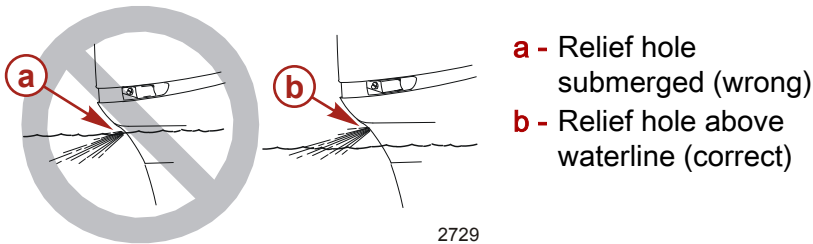
Other advantages to propeller or gear ratio changes:

OPERATION

- Reduces the possibility of detonation
- Enhances overall reliability and durability of the engine

Setting Trim Angle While Running Engine at Idle Speed

Submerging the exhaust relief hole on the outboard can happen on some boats if you trim full in while running at idle speed, resulting in, exhaust restriction, rough idle, excessive smoke, and fouled spark plugs. If this condition exists, trim outboard up until exhaust relief hole is out of the water.



Operating in Shallow Water

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

NOTICE

Operating the engine with the outboard in the tilt range can damage the engine or the transom. If operating the engine in the tilt range, such as in shallow water, do not exceed 2000 RPM.

1. Reduce engine speed below 2000 RPM.
2. Tilt outboard up. Make sure all the cooling water intake holes stay submerged at all times.
3. Operate the engine at slow speed only.

Models with a three-ram trim system: If engine speed exceeds 2000 RPM, the outboard will automatically return down to the maximum trim range.

OPERATION

Models with a single-ram trim system: The outboard will remain at the selected tilt position, regardless of engine RPM.

Starting 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.

INITIAL STARTING PROCEDURE

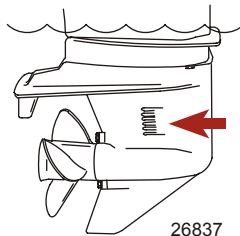
NOTE: For the initial start up of a new engine, or for an engine that ran out of fuel or was drained of fuel, the fuel system should be filled according to the following procedure.

1. Position the fuel line primer bulb so the arrow on the side of the bulb is pointing up. Squeeze the fuel line primer bulb until it feels firm.
2. Turn the ignition key switch to the "ON" position for three seconds to operate the electric fuel pump.
3. Turn the ignition key switch back to the "OFF" position, and squeeze the primer bulb 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.

Before starting, read the pre-starting check list and special operating instructions in the **Operation** section.

STARTING PROCEDURE

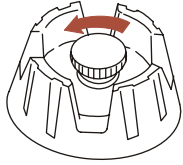
1. Lower the outboard to the "RUN" position. Make sure all the cooling water intake holes are submerged.



26837

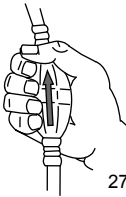
OPERATION

2. Open the fuel tank filler cap vent screw (manual venting fuel tanks).



19748

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.



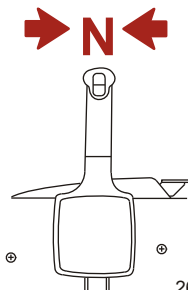
27348

4. Set the lanyard stop switch to the "RUN" position. Read the lanyard stop switch safety explanation and warning in the **General Information** section.



19791

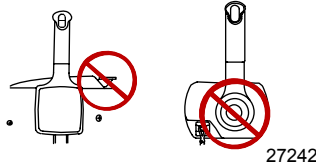
5. Shift the outboard to the neutral position.



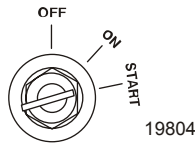
26838

OPERATION

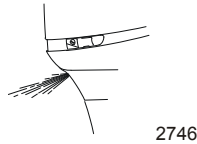
- Do not advance the throttle-only feature on the remote control for starting (if equipped).



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



- Check for water coming out of the water pump indicator hole.



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

NOTICE

Operating the engine while overheated can cause engine damage. If no water exits the water pump indicator hole, stop the engine and check the cooling water intake holes for obstruction. No obstruction may indicate a water pump failure or blockage in the cooling system, which can overheat the engine. Have an authorized Mercury Marine dealer check the system.

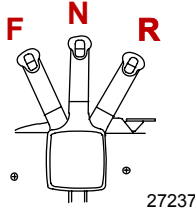
OPERATION

Gear Shifting

NOTICE

Shifting into gear at engine speeds above idle will damage the gearcase. Shifting into gear when the engine is not running can cause misalign the clutch, preventing proper shifting. Always shift the gearcase into gear when the engine is operating at idle. If you must shift while the engine is not operating, rotate the propeller shaft in the appropriate direction during shifting.

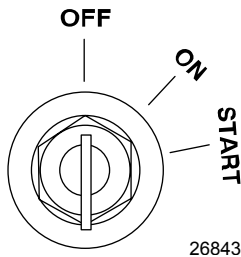
- Your outboard has three gear shift positions to provide operation: forward, neutral (out of gear) and reverse.



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

Stopping the Engine

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



MAINTENANCE

Power Package Care

WARNING

Neglect or improper maintenance, repairs, or inspections of the power package can result in product damage or serious injury or death. Perform all procedures as described in this manual. If you are not familiar with proper maintenance or service procedures, consign the work to an authorized Mercury Marine dealer.

To ensure safety and retain dependability, keep your power package in the best operating condition by performing the periodic inspections and maintenance listed in the **Inspection and Maintenance Schedule**. Record maintenance performed in the **Maintenance Log** at the back of this book. Save all maintenance work orders and receipts.

Submerged Power Package

A submerged power package requires prompt service by an authorized dealer after recovery. This immediate attention is necessary once the engine is exposed to the atmosphere to minimize internal corrosion damage to the engine.

Replacement Parts for Your Power Package

Mercury recommends using original Mercury Precision replacement parts and lubricants.

MAINTENANCE

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.**

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.

The diagram shows a rectangular label with the Mercury logo on the left and the title "EMISSION CONTROL INFORMATION" on the right. The label contains several fields for engine specifications and emission limits. Red circles with letters a through j are placed around the label, with arrows pointing to specific fields: a points to the idle speed field, b to the horsepower field, c to the piston displacement field, d to the kilowatt field, e to the date of manufacture field, f to the family number field, g to the HC+NOx emission limit field, h to the CO emission limit field, i to the spark plug and gap field, and j to the fuel line permeation field. The number 43210 is printed at the bottom right of the label.

MERCURY		EMISSION CONTROL INFORMATION	
THIS ENGINE CONFORMS TO <input type="checkbox"/> 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): <input type="text"/>		FAMILY: <input type="text"/>	
<input type="text"/> hp	<input type="text"/> L	HC+NOx:FEL: <input type="text"/> g/kWh	
<input type="text"/> kw		CO FEL: <input type="text"/> g/kWh	
<input type="text"/>	SPARK PLUG: GAP: <input type="text"/>		
LOW PERM/HIGH PERM: <input type="text"/>			

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

MAINTENANCE

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 lanyard stop switch stops the engine.
- Check steering system for binding or loose components.
- Inspect the outboard for tightness to the boat transom. If any looseness of the outboard or mounting fasteners exist, retorque the outboard mounting fasteners to the specified torque. When looking for signs of looseness, 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 (lift plate/setback bracket).

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 propeller blades for damage.
- Visually 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.

MAINTENANCE

- 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

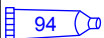
EVERY 25 HOURS OR EVERY 30 DAYS, WHICHEVER OCCURS FIRST

- Visually inspect the front and side cowl latches for tightness. Tighten if necessary.
- Visually inspect the fuel and oil systems for deterioration or leaks.
- Visually check steering link rod fasteners for wear. Lubricate all components (refer to the **Installation Manual** for lubrication specifications). Check all attachment hardware for proper torque tightness.
- Check level and condition of gearcase lubricant.
- Check alternator belt tension.

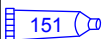
EVERY 50 HOURS OR ONCE A YEAR, WHICHEVER OCCURS FIRST

- Lubricate all lubrication points.
- Lubricate splines on the driveshaft.
- Lubricate entire length of driveshaft with Anti-Corrosion Grease.

MAINTENANCE

Tube Ref No.	Description	Where Used	Part No.
 94	Anti-Corrosion Grease	Entire length of driveshaft	92-802867Q 1

- Lubricate splines on the propeller shaft.
- Drain and replace gearcase lubricant.
- Inspect all belts, pulleys, and idler pulleys for deterioration.
- Check fuel pressure.
- Check control cable adjustments.
- Inspect battery.
- Check corrosion control anodes.
- Check tightness of bolts, nuts, and other fasteners.
- Check power trim fluid.
- Remove engine deposits with Power Tune Engine Cleaner.

Tube Ref No.	Description	Where Used	Part No.
 151	Power Tune Engine Cleaner	Use to remove engine deposits	92-858080K03

EVERY 100 HOURS OR ONCE A YEAR, WHICHEVER OCCURS FIRST

- Retorque the outboard mounting fasteners that fasten the outboard to the boat transom. Tighten the fasteners to the specified torque.¹

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 water pump impeller (more often if overheating occurs or reduced water pressure is noted).¹

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

MAINTENANCE

- Replace spark plugs at first 100 hours or first year. After that, inspect spark plugs every 100 hours or once yearly. Replace spark plugs as needed.
- Replace the water separating fuel filter.
- Use QuickKleen in fuel.
- Check cowl seals to make sure seals are intact and not damaged.
- Check internal cowl sound reduction foam (if equipped) to make sure foam is intact and not damaged.
- Check that the intake silencer (if equipped) is in place.
- Check 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.

EVERY 100 HOURS OF OPERATION

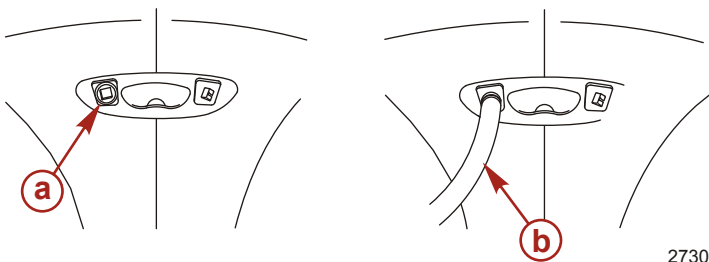
- Inspect carbon fiber reeds for chipping or cracks.

BEFORE PERIODS OF STORAGE

- Refer to **Storage** section.

Flushing the Cooling System (Powerhead)

Flush the internal water passages of the engine 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.



2730

a - Plug located on fitting

b - Water hose

1. Remove the plug from fitting in the bottom cowl.

MAINTENANCE

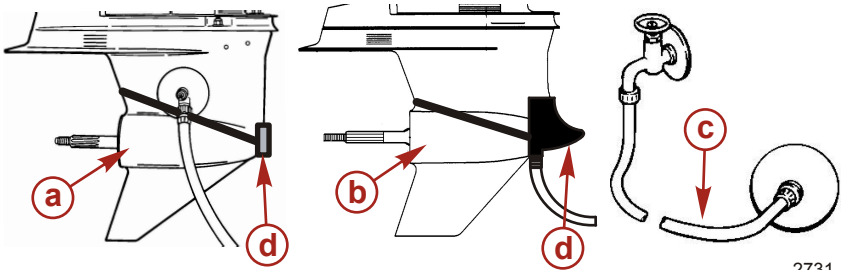
2. Attach a water hose to the fitting. Turn on the water and flush for three to five minutes.

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

Flushing the Cooling System (Lower Unit)

⚠ 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.



2731

- a** - Fleet Master and Torque Master gearcase
- b** - Sport Master gearcase
- c** - Water hose
- d** - Flushing attachments

1. Remove the propeller. Refer to **Propeller Replacement**.
2. Fleet Master and Torque Master gearcases – Install the appropriate flushing attachment so the rubber cups fit tightly over the strut intake holes. Attach the dual water flush seal over the nose inlets.
3. Sport Master gearcases – Install the appropriate flushing attachment so the nose cone cup fits tightly over the intake holes.

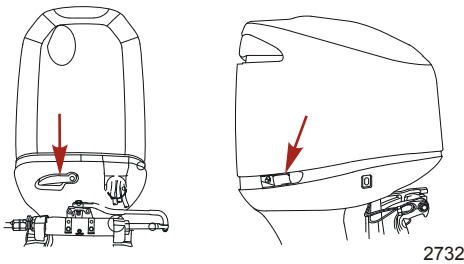
MAINTENANCE

4. Attach a water hose to the flushing attachment. Turn on the water and adjust the flow so water is leaking around the rubber cups or nose cone cup to ensure the engine receives an adequate supply of cooling water.
5. Start the engine and run it at idle speed in neutral shift position.
6. Adjust water flow so excess water continues leaking out from around the rubber cups or nose cone cup to ensure the engine is receiving an adequate supply of cooling water.
7. Check for water coming out of the water pump indicator hole. Continue flushing for three to five minutes, carefully monitoring water supply at all times.
8. Stop the engine, turn off the water, and remove the flushing attachment. Reinstall the propeller.

Top Cowl Removal and Installation

REMOVAL

Release the front and side cowl latches. Lift the top cowl from the outboard.



INSTALLATION

Position the top cowl over the engine. Make sure the bottom rubber seal fits properly and lock the front and side latches.

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.

MAINTENANCE

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 non-abrasive soap. Use a soft clean cloth when washing.
3. Dry thoroughly with a soft clean cloth.
4. Wax the surface using a non-abrasive automotive polish (polish designed for clear coat finishes). Remove the applied wax by hand using a clean soft cloth.

Fuel System

FUEL SYSTEM SERVICE INFORMATION

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.

IMPORTANT: 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.

Before servicing any part of the fuel system:

- Stop engine and disconnect the battery.
- Drain the fuel system completely.
- Perform fuel system service 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.

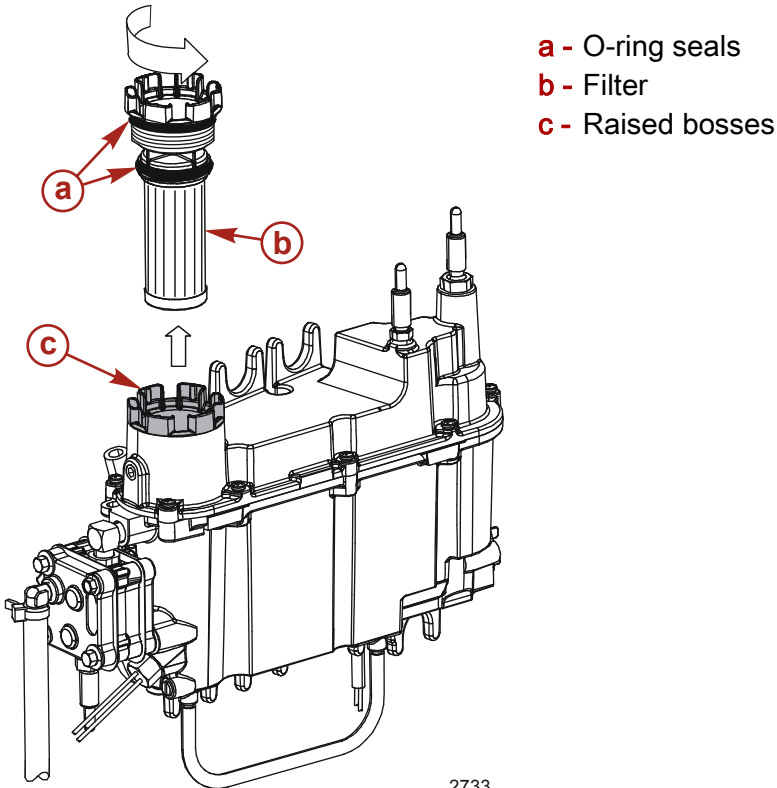
MAINTENANCE

WATER SEPARATING FUEL FILTER

This filter removes moisture and debris from the fuel. If the filter becomes filled with water, the water can be removed. If the filter becomes plugged with debris, replace the filter. The warning system engages when water in the fuel filter reaches the full level. Refer to **Warning System in Features and Controls**.

Refer to the **Inspection and Maintenance Schedule** for the proper maintenance interval.

Removal



1. Disconnect the link rod.
2. Use the shaft of a screwdriver between the filter cap bosses and unscrew the filter.

Installation

1. Lubricate the O-ring seals with oil.

MAINTENANCE

2. Install the fuel filter and tighten securely.
3. Reconnect the link rod.

IMPORTANT: Visually inspect for fuel leakage from the filter while squeezing the primer bulb until firm, forcing fuel into the filter.

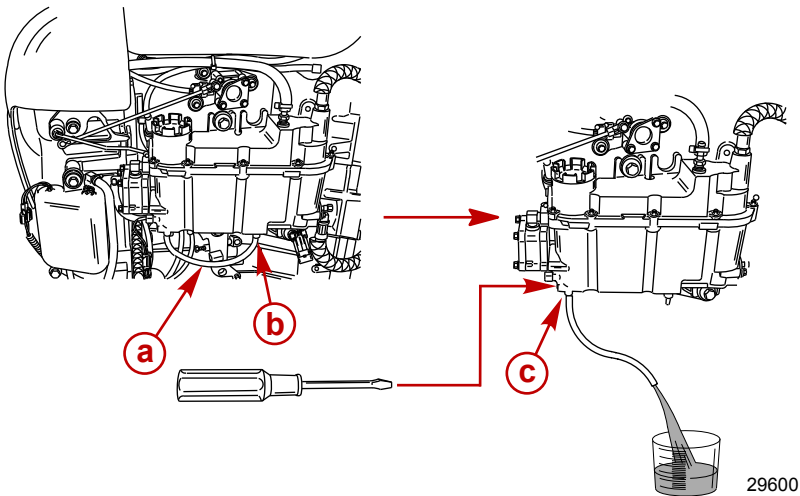
DRAINING WATER FROM THE FUEL FILTER CHAMBER

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 open end of the hose over a container.
2. Loosen drain screw and drain the fuel filter chamber.

NOTE: If little or no liquid drains from the hose, loosen the red filter to vent the chamber.

3. Retighten drain screw and reattach hose.



- a - Drain hose
- b - Side fitting
- c - Drain screw

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 (P/N 10-849838) and self-locking nylon insert locknuts (P/N 11-826709113). Never replace locknuts with common nuts (nonlocking) as they will work loose and vibrate off, freeing the link rod to disengage.

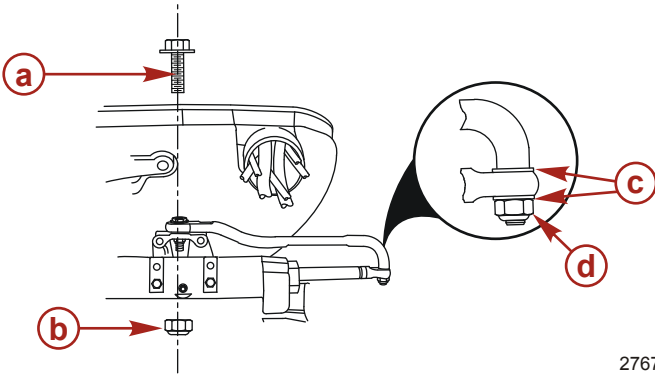
WARNING

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.

MAINTENANCE

⚠ WARNING

Worn, loose, or seized steering components can lead to loss of boat control. Inspect all steering attachment components for wear, lubricate all attachment hardware, and check all fasteners for proper tightness in accordance with the inspection and maintenance schedule.



2767

- a** - Special washer head bolt (P/N 10-849838)
- b** - Nylon insert locknut (P/N 11-826709113) - used on head bolt
- c** - Flat washer (2)
- d** - Nylon insert locknut (P/N 11-826709113) - used on cable coupler

1. Assemble steering link rod to steering cable coupler with two flat washers "c" and a self-locking nylon insert locknut "d." Tighten the locknut until it seats, then loosen ¼ turn.
2. Assemble the steering link rod to the engine with the special washer head bolt "a" and self-locking nylon insert locknut "b."
3. Torque the head bolt, then the locknut to specifications.

Description	Nm	lb-in.	lb-ft
Cable coupler nylon insert locknut "d"	Tighten locknut until it seats, then loosen ¼ turn.		
Head bolt nylon insert locknut "b"	27		20

MAINTENANCE

Description	Nm	lb-in.	lb-ft
Special washer head bolt	27		20

Fuses

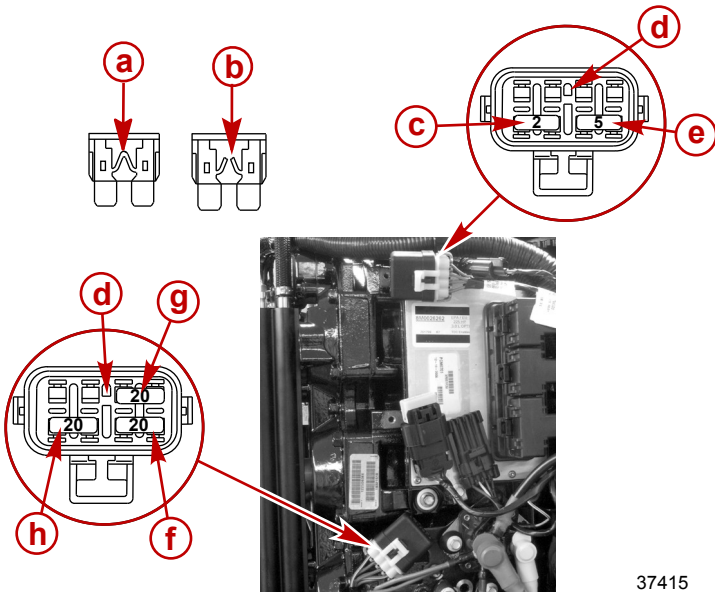
IMPORTANT: Always carry spare 5 and 20 amp fuses.

The electrical wiring circuits on the engine 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.

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

MAINTENANCE

The fuses and circuits are identified as follows:



37415

- a** - Good fuse
- b** - Blown fuse
- c** - Diagnostic circuit - 2 amp fuse
- d** - Spare fuse slot
- e** - SmartCraft data bus circuit - 5 amp fuse
- f** - Ignition coil circuit - 20 amp fuse
- g** - Accessories/cowl mounted tilt switch/wake power to ECM - 20 amp fuse
- h** - Electric fuel pump/ECM driver power/oil pump circuit/injectors - 20 amp fuse

Corrosion Control Anode

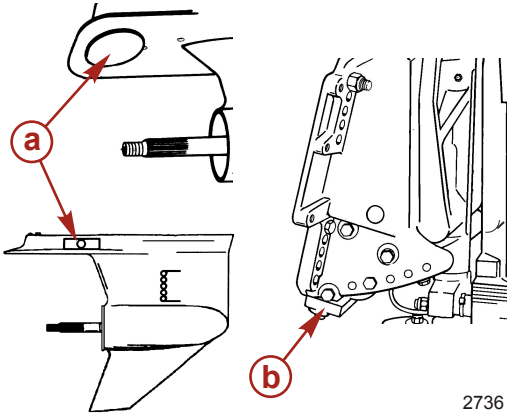
NOTICE

Anodes made of insufficiently pure aluminum alloys may not adequately protect critical drive components from corrosion. We recommend using anodes sold through Mercury Precision Parts only.

MAINTENANCE

Anodes help protect the power package against galvanic corrosion by sacrificing its metal to be slowly eroded instead of other metals.

This model has three corrosion control anodes—two above and one below the anti-ventilation plate. A fourth anode is located on the bottom of the clamp/swivel bracket assembly.



- a - Corrosion control anodes (three on gearcase)
- b - Corrosion control anode (one on clamp/swivel bracket)

All anodes require periodic inspection, especially in saltwater (refer to the **Inspection and Maintenance Schedule**). Replace any anodes before they are 50% corroded. Never paint or apply protective coating on the anode, as effectiveness of the anode will be reduced.

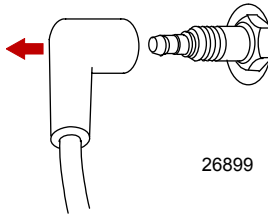
Spark Plug Inspection and Replacement

WARNING

Damaged spark plug boots may emit sparks which 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.

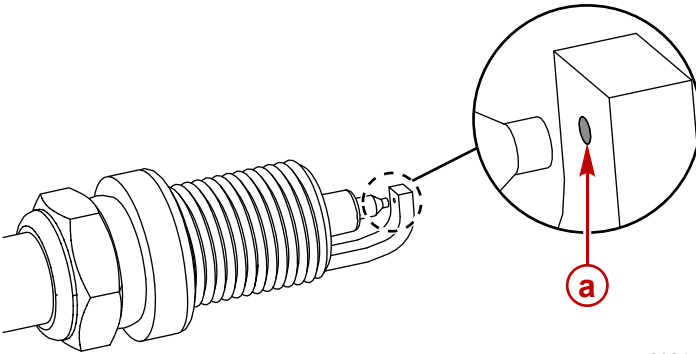
MAINTENANCE

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



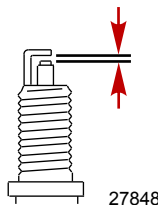
2. Remove the spark plugs to inspect. Replace spark plug if electrode is worn or the insulator is rough, cracked, broken, or blistered, or if the precious metal is not visible on the plug's electrode.

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 to specifications.



MAINTENANCE

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

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

Battery Inspection

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

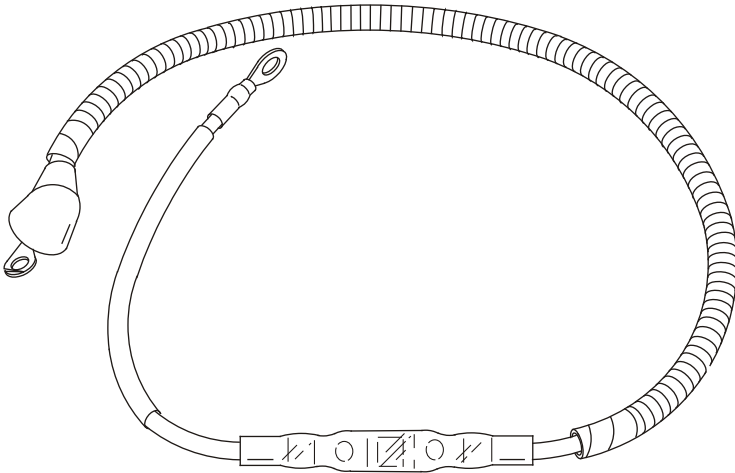
IMPORTANT: Read the safety and maintenance instructions which accompany your battery.

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.

MAINTENANCE

Charging System Fusible Link

This model has a 100 ampere fusible link between the alternator and the +12 volt stud. This fusible link protects the alternator from damage due to accidental reverse battery connection. If the battery cables are reversed, the fusible link creates an open circuit, protecting the alternator. With the fusible link open, the engine can be started; however, the run time is limited, because the alternator is not charging the boat battery. If the fusible link circuit becomes open, contact your authorized Mercury Marine dealer.



3797

Propeller Replacement - 25.4 mm (1.0 in.) Diameter Propeller Shaft

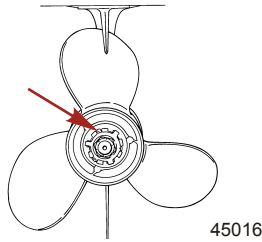
⚠ WARNING

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.

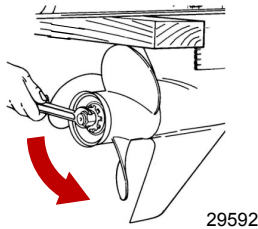
1. Shift outboard to neutral position.

MAINTENANCE

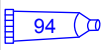
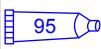
2. Straighten the bent tabs on the propeller nut retainer.



3. Place a block of wood between the gearcase and propeller to hold the propeller and remove the propeller nut.

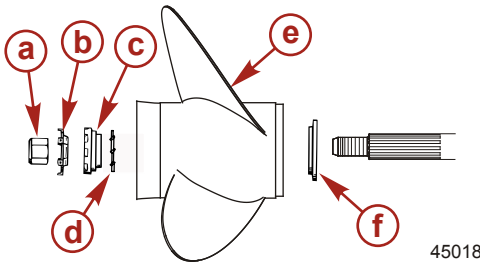


4. Pull propeller straight off the shaft. If the propeller is seized to the shaft and cannot be removed, have the propeller removed by an authorized dealer.
5. To aid in future removal of the propeller, liberally coat the propeller shaft splines with one of the following Mercury/Quicksilver products:

Tube Ref No.	Description	Where Used	Part No.
 94	Anti-Corrosion Grease	Propeller shaft splines	92-802867Q 1
 95	2-4-C with PTFE	Propeller shaft splines	92-802859A 1

MAINTENANCE

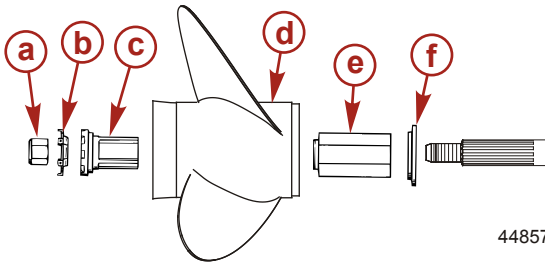
6. **Flo-Torq I drive hub propellers** - Install forward thrust hub, propeller, continuity washer, rear thrust hub, propeller nut retainer, and propeller nut onto the shaft.



- a** - Propeller nut
- b** - Propeller nut retainer
- c** - Rear thrust hub
- d** - Continuity washer
- e** - Propeller
- f** - Forward thrust hub

45018

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



44857

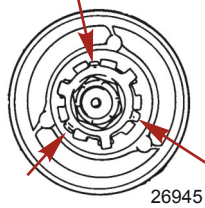
- a** - Propeller nut
- b** - Propeller nut retainer
- c** - Thrust hub
- d** - Propeller
- e** - Replaceable drive sleeve
- f** - Forward thrust hub

8. Place a block of wood between the gearcase and propeller and torque to specifications.

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

MAINTENANCE

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

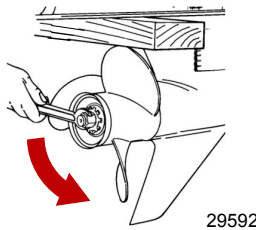


Propeller Replacement - 31.75 mm (1-1/4 in.) Diameter Propeller Shaft

⚠ WARNING

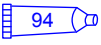
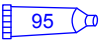
Rotating propellers can cause serious injury or death. Never operate the boat out of the water with a propeller installed. Before installing or removing a propeller, place the drive unit in neutral and engage the lanyard stop switch to prevent the engine from starting. Place a block of wood between the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

- Shift outboard to neutral position.
- Place a block of wood between the gearcase and propeller to hold the propeller and remove the propeller nut.



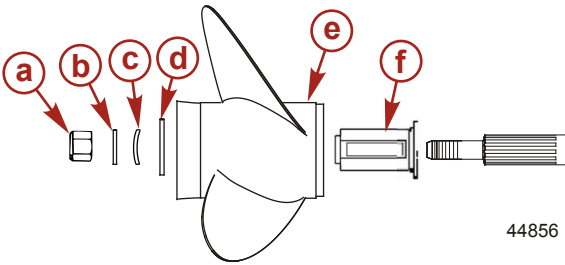
- Pull propeller straight off the shaft. If the propeller is seized to the shaft and cannot be removed, have the propeller removed by an authorized dealer.
- To aid in future removal of the propeller, liberally coat the propeller shaft splines with one of the following Mercury/Quicksilver products:

MAINTENANCE

Tube Ref No.	Description	Where Used	Part No.
 94	Anti-Corrosion Grease	Propeller shaft splines	92-802867Q 1
 95	2-4-C with PTFE	Propeller shaft splines	92-802859A 1

NOTE: Propellers used on the 31.75 mm (1-1/4 in.) diameter propeller shaft require the heavy-duty propeller hub kit.

- 5. Heavy-duty propeller hub** - Install the propeller hub, propeller, washer, Belleville washer, washer, and propeller nut onto the shaft.

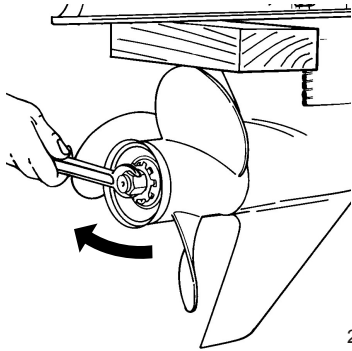


44856

- a** - Propeller nut
- b** - Washer
- c** - Belleville washer
- d** - Washer
- e** - Propeller
- f** - Propeller hub

MAINTENANCE

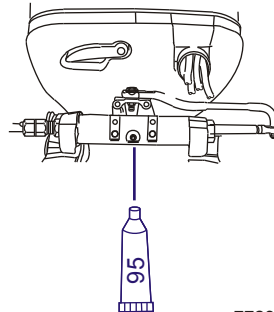
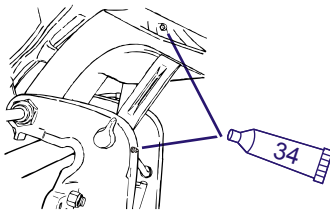
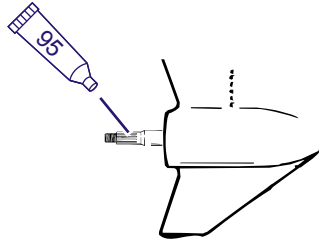
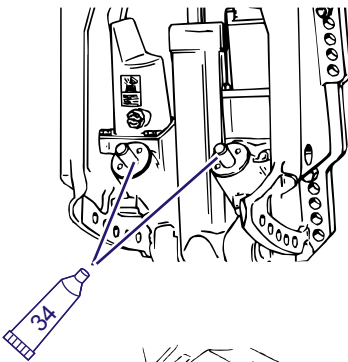
- Place a block of wood between the gearcase and propeller and tighten the propeller nut to the specified torque.



2691


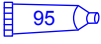
Description	Nm	lb-in.	lb-ft
Propeller nut	75		55

Lubrication Points



7723

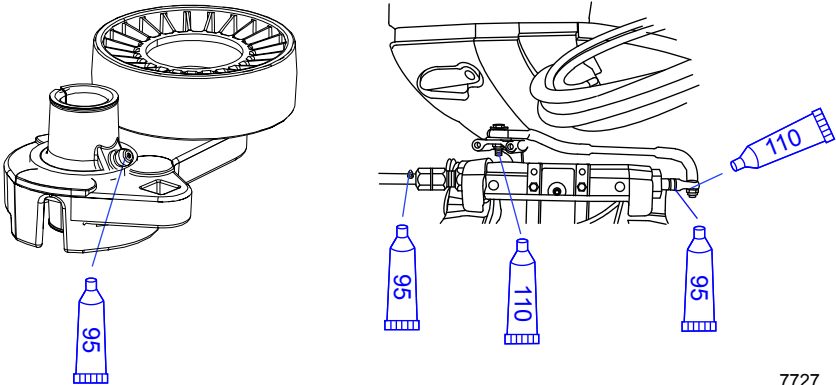
MAINTENANCE

Tube Ref No.	Description	Where Used	Part No.
	Special Lubricant 101	Trim Rod Ball Ends	92-802865Q02
	2-4-C Marine Lubricant with PTFE	Prop Shaft, Swivel Bracket, Tilt Support Lever, Tilt Tube	92-802859A 1


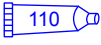
NOTE: Turn the ball ends to work the lubricant into the ball sockets. Lubricate through fittings.

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.



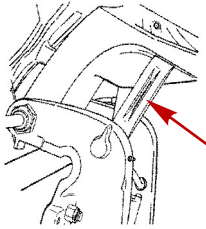
7727

Tube Ref No.	Description	Where Used	Part No.
	2-4-C Marine Lubricant with PTFE	Steering cable and grease fitting on belt tensioner pulley	92-802859A 1
	4 Stroke 10W30 Outboard Oil	Steering cable	92-858045K01

MAINTENANCE

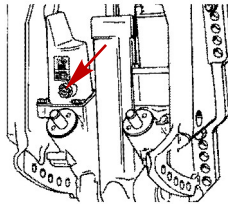
Checking Power Trim Fluid

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




27877

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



28460

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

MAINTENANCE

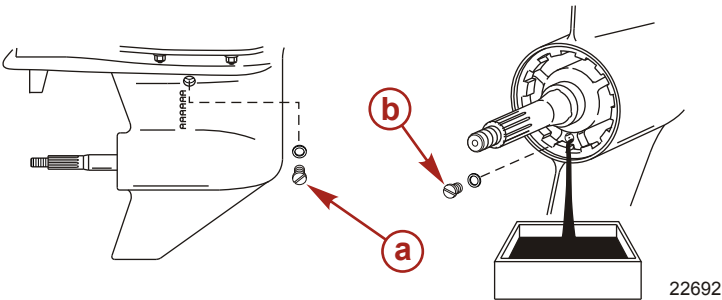
Gearcase Lubrication

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 outboard in a vertical operating position.
2. Remove propeller. Refer to **Propeller Replacement**.
3. Place drain pan below outboard.
4. Remove vent plug and fill/drain plug and drain lubricant.



a - Vent plug

b - Fill/drain plug

GEARCASE LUBRICANT CAPACITY

Gearcases with 25.4 mm (1.0 in.) diameter propeller shaft

Right-hand rotation - 970 ml (32.8 fl oz)

Left-hand rotation - 900 ml (30.4 fl oz)

MAINTENANCE

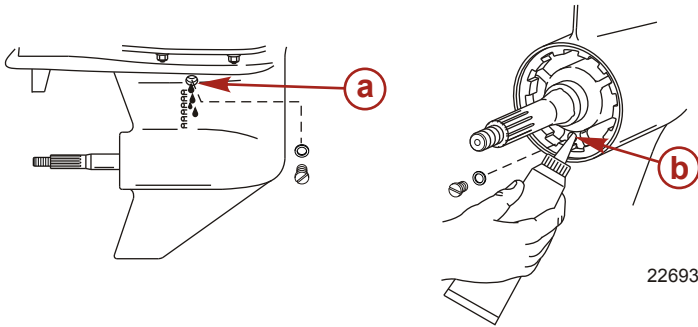
Gearcases with 31.75 mm (1-1/4 in.) diameter propeller shaft
- 760 ml (25.7 fl oz)

GEARCASE LUBRICANT RECOMMENDATION

Mercury or Quicksilver High Performance Gear Lubricant.

CHECKING LUBRICANT LEVEL AND REFILLING GEARCASE

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



a - Vent hole

b - Fill hole

IMPORTANT: Replace sealing washers if damaged.

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

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

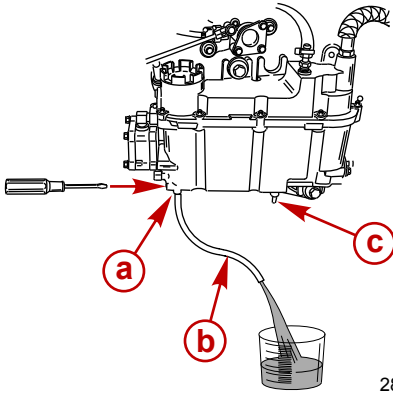
IMPORTANT: Gasoline containing alcohol (ethanol or methanol) can cause a formation of acid during storage and can damage the fuel system. If the gasoline being used contains alcohol, it is advisable to drain as much of the remaining gasoline as possible from the fuel tank, remote fuel line, and engine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

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

1. Portable fuel tank - Pour the required amount of gasoline stabilizer (follow instructions on container) into fuel tank. Tip fuel tank back and forth to mix stabilizer with the fuel.
2. Permanently installed fuel tank - Pour the required amount of gasoline stabilizer (follow instructions on container) into a separate container and mix with approximately one quart (one liter) 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. Loosen drain screw and drain the fuel filter chamber.

STORAGE

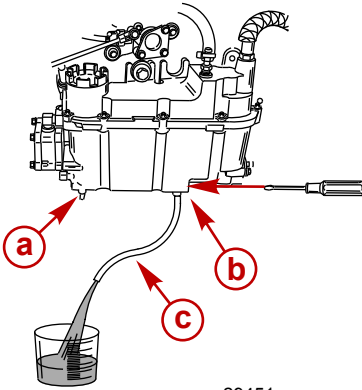
NOTE: If little or no liquid drains from the hose, loosen the red filter to vent the chamber.



28956

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

4. Retighten drain screw and reattach hose.
5. Pull the drain hose off the left side fitting. Hold the open end of the hose over a container and loosen drain screw and drain the float chamber. Retighten drain screw and reattach hose.



29451

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

6. Premix the following in a container:
 - 8 cc (0.27 oz) or 2 teaspoons of Mercury Precision Quickleen lubricant.
 - 8 cc (0.27 oz) or 2 teaspoons of Mercury Precision Fuel Stabilizer.

STORAGE

7. Remove the fuel filter. Refer to **Maintenance - Fuel System**.
8. Pour mixture into the fuel filter opening.
9. Reinstall the fuel filter.
10. Prime the fuel system as outlined in the **Operation - Starting the Engine**.
11. Place the outboard in water or use the flushing attachment 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.

Protecting Internal Engine Components

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

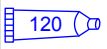
IMPORTANT: Refer to **Spark Plug Inspection and Replacement** for correct procedure for removing spark plug leads.

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. Reinstall 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).

STORAGE

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**).

Positioning Outboard for Storage

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

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 recharging.
- Remove the battery from the boat and check water level. Recharge if necessary.
- Store the battery in a cool, dry place.
- Periodically check the water level and recharge the battery during storage.

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.

TROUBLESHOOTING

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.
 - 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 opening fully.
- Damaged propeller or improper propeller size.
- Boat overloaded or load improperly distributed.
- Excessive water in bilge.
- Boat bottom is dirty or damaged.
- Warning horn failure.
- Engine block pressure sensor or coolant temperature sensor failure (Guardian is activated).
- Restricted fuel system or filter (loss of fuel or air pressure).

Warning Horn Activates (With Power Loss)

POSSIBLE CAUSES

- Intermittent horn sound:

TROUBLESHOOTING

- The oil level in the engine-mounted oil reservoir tank is low. Refill the reservoir tank and the remote oil tank. Refer to **Fuel and Oil** for details.
- Battery voltage is out of limits.
- Throttle position sensor failure.
- Continuous horn sound:
 - The oil level in the engine-mounted oil reservoir tank is critically low. Refill the reservoir tank and the remote oil tank. Refer to **Fuel and Oil** for details.
 - The oil pump has failed, halting the oil supply to the engine.
 - Engine speed exceeds the maximum-allowable RPM. The system limits the engine to within the allowable range. If the overspeed condition continues, Guardian places the engine into power reduction. Overspeed may be caused by incorrect propeller pitch, engine height, trim angle, etc.
 - High engine temperature or low block water pressure.
 - Cooling system clogged.
 - Incorrect transom height (water pickups not getting adequate water supply).

Warning Horn Activates (No Power Loss)

POSSIBLE CAUSES

- Warning horn activates on start up. This is normal operation.
- Water is detected in the water-separating fuel filter. Refer to **Maintenance** for procedures on removing water from the filter.

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.

TROUBLESHOOTING

- Defective rectifier, alternator, or voltage regulator.

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 on parts and accessories, the dealer requires the model and serial number to order the correct parts.

Service Assistance

Your satisfaction with your outboard product is very important to your dealer and to us. If you ever have a problem, question or concern about your outboard product, contact your dealer or any authorized Mercury Marine dealership. If additional assistance is required, take these steps.

1. Talk with the dealership's sales manager or service manager. If this has already been done, then contact the owner of the dealership.
2. Should you have a question, concern, or problem that cannot be resolved by your dealership, please contact 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 service office:

OWNER SERVICE ASSISTANCE

- Your name and address
- Daytime telephone number
- Model and serial number of your outboard
- The name and address of your dealership
- Nature of problem

Mercury Marine Service Offices

For assistance, call, fax, or write. Please include your daytime telephone number with mail and fax correspondence.

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

Australia, Pacific		
Telephone	(61) (3) 9791-5822	Brunswick Asia Pacific Group 41-71 Bessemer Drive Dandenong South, Victoria 3175 Australia
Fax	(61) (3) 9706-7228	

Europe, Middle East, Africa		
Telephone	(32) (87) 32 • 32 • 11	Brunswick Marine Europe Parc Industriel de Petit-Rechain B-4800 Verviers, Belgium
Fax	(32) (87) 31 • 19 • 65	

Mexico, Central America, South America, Caribbean		
Telephone	(954) 744-3500	Mercury Marine 11650 Interchange Circle North Miramar, FL 33025 U.S.A.
Fax	(954) 744-3535	

Japan		
Telephone	072-233-8888	Kisaka Co., Ltd. 4-130 Kannabecho Sakai-shi Sakai-ku 5900984 Osaka, Japan
Fax	072-233-8833	

OWNER SERVICE ASSISTANCE

Asia, Singapore		
Telephone	(65) 65466160	Brunswick Asia Pacific Group T/A Mercury Marine Singapore Pte Ltd 29 Loyang Drive Singapore, 508944
Fax	(65) 65467789	

Ordering Literature

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

Engine Model:		Horsepower:	
Serial Number:		Model year:	

UNITED STATES AND CANADA

For information on additional literature that is available for your particular Mercury/MerCruiser power package and how to order that literature contact your nearest dealer or contact:

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

OUTSIDE THE UNITED STATES AND CANADA

Contact your nearest dealer or Marine Power Service Center for information on additional literature that is available for your particular Mercury/MerCruiser power package and how to order that literature.

OUTBOARD INSTALLATION

Important Information

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

Recommended Oil	OptiMax Oil or Premium Plus 2-Cycle TC-W3 Outboard Oil
-----------------	--

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.

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.

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.

OUTBOARD INSTALLATION

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.

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.

Selecting Accessories for Your Outboard

Genuine Mercury Precision or Quicksilver Accessories have been specifically designed and tested for this outboard.

OUTBOARD INSTALLATION

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

Fuel 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.

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 $15/\text{gm}^2/24 \text{ h}$ with CE 10 fuel at $23 \text{ }^\circ\text{C}$ as specified in SAE J 1527 - marine fuel hose.

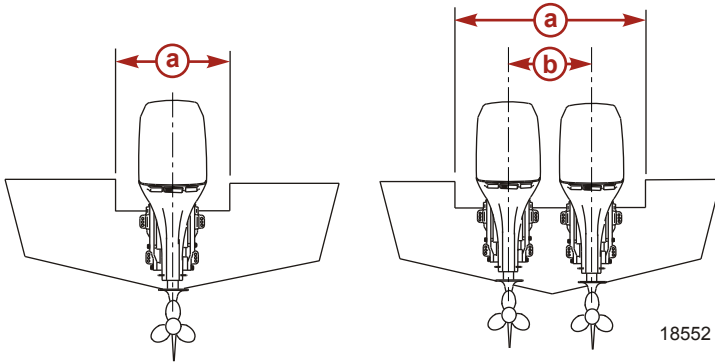
Filling the Fuel System

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

Turn the ignition key switch to the "ON" position for approximately one minute. This operates the fuel lift pump. Turn the ignition key switch back to the "OFF" position and then return the ignition key switch to the "ON" position again for an additional minute. Turn the ignition key switch back to the "OFF" position. The filling of the fuel system is complete.

OUTBOARD INSTALLATION

Installation Specifications



a - Minimum transom opening

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

Minimum Transom Opening	
Single engine	84.8 cm (33-3/8 in.)
Dual engine	151.8 cm (59-3/4 in.)

Lifting the Outboard

WARNING

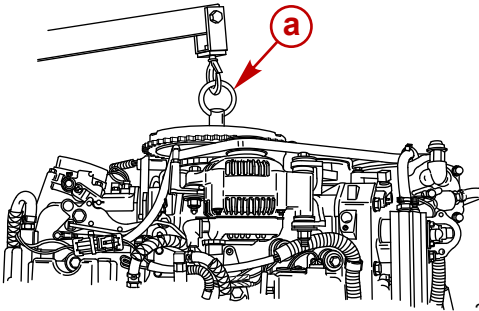
Improperly supporting an engine during lifting can result in the engine falling, causing serious injury or death. Before lifting the engine, verify that the lifting ring is threaded into the flywheel for a minimum of five turns and that the hoist has the correct lifting capacity for the engine weight.

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.



a - Lifting eye

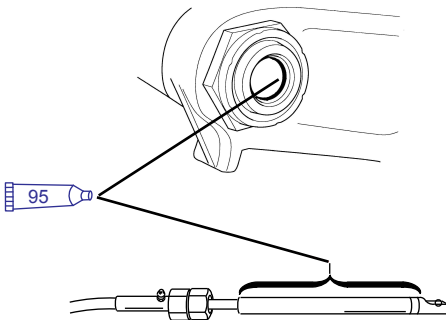
28495

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

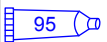
Lifting Eye	91-90455--1
	Threads into the flywheel to remove the powerhead assembly from the driveshaft housing, or to lift entire engine for removal/installation.

Steering Cable - Starboard Side Routed Cable

- Lubricate O-ring seal and entire cable end.

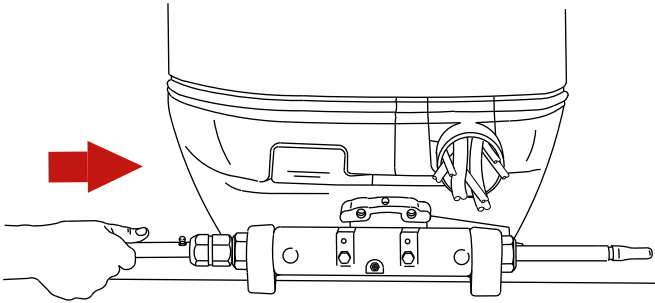


3724

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

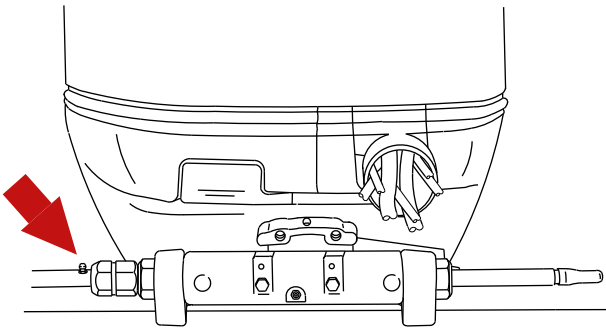
OUTBOARD INSTALLATION

2. Insert steering cable into tilt tube.



3725

3. Torque nut to specification.



3727

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

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 (P/N 10-849838) and self-locking nylon insert locknuts (P/N 11-826709113). Never replace locknuts with common nuts (nonlocking) as they will work loose and vibrate off, freeing the link rod to disengage.

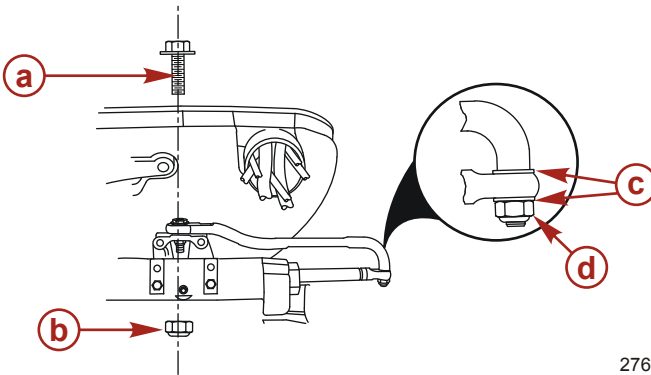
OUTBOARD INSTALLATION

⚠ 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.

⚠ WARNING

Worn, loose, or seized steering components can lead to loss of boat control. Inspect all steering attachment components for wear, lubricate all attachment hardware, and check all fasteners for proper tightness in accordance with the inspection and maintenance schedule.



2767

- a** - Special washer head bolt (P/N 10-849838)
- b** - Nylon insert locknut (P/N 11-826709113) - used on head bolt
- c** - Flat washer (2)
- d** - Nylon insert locknut (P/N 11-826709113) - used on cable coupler

1. Assemble steering link rod to steering cable coupler with two flat washers "c" and a self-locking nylon insert locknut "d." Tighten the locknut until it seats, then loosen $\frac{1}{4}$ turn.

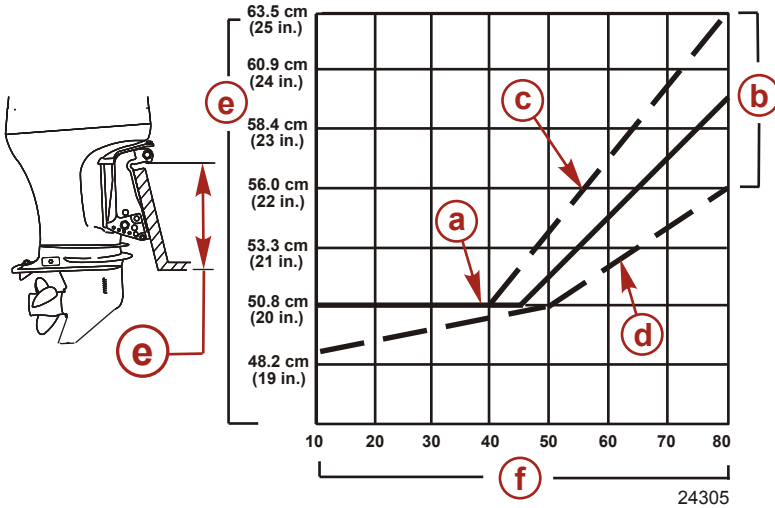
OUTBOARD INSTALLATION

2. Assemble the steering link rod to the engine with the special washer head bolt "a" and self-locking nylon insert locknut "b."
3. Torque the head bolt, then the locknut to specifications.

Description	Nm	lb-in.	lb-ft
Cable coupler nylon insert locknut "d"	Tighten locknut until it seats, then loosen $\frac{1}{4}$ turn.		
Head bolt nylon insert locknut "b"	27		20
Special washer head bolt	27		20

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.

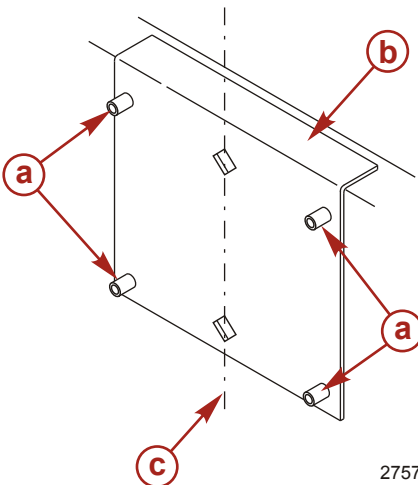
Increasing the mounting height will usually:

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

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.

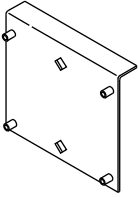
1. Mark four mounting holes on the transom using the transom drilling fixture.



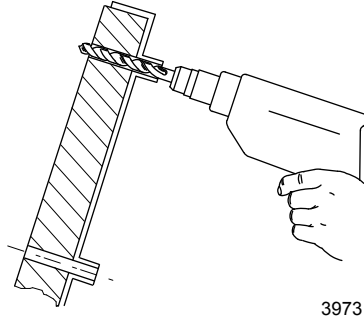
- a - Drill guide holes
- b - Transom drilling fixture
- c - Transom centerline

2757

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
10-67755-1	Outboard mounting bolt	1/2-20 x 4.50 in. long (2.25 in. thread)
11-826711-17	Nylon insert locknut	1/2-20
12-28421	Flat washer	1-1/2 in. diameter
12-54012	Flat washer	7/8 in. diameter

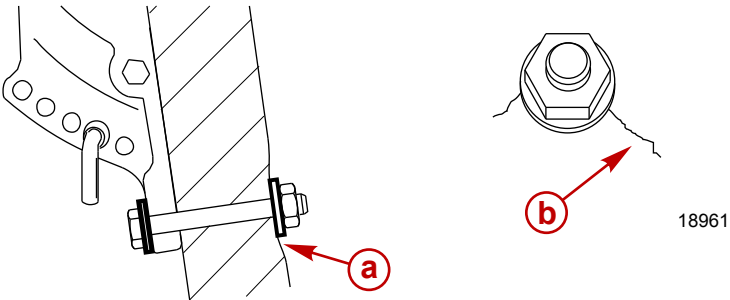
Available Outboard Mounting Bolts	
Part Number	Description
10-67755005	1/2-20 x 2.50 in. long (1.25 in. thread)
10-67755006	1/2-20 x 3.50 in. long (1.25 in. thread)
10-814259	1/2-20 x 4.00 in. long (2.25 in. thread)
10-67755-1	1/2-20 x 4.50 in. long (2.25 in. thread)

OUTBOARD INSTALLATION

Available Outboard Mounting Bolts	
Part Number	Description
10-8M0033366	½-20 x 5.00 in. long (3.25 in. thread)
10-67755-003	½-20 x 5.50 in. long (3.25 in. thread)
10-67755-2	½-20 x 6.50 in. long (2.75 in. thread)
10-8M0028080	½-20 x 7.50 in. long (2.75 in. thread)
10-8M0032860	½-20 x 8.00 in. long (2.75 in. thread)

CHECKING BOAT TRANSOM CONSTRUCTION

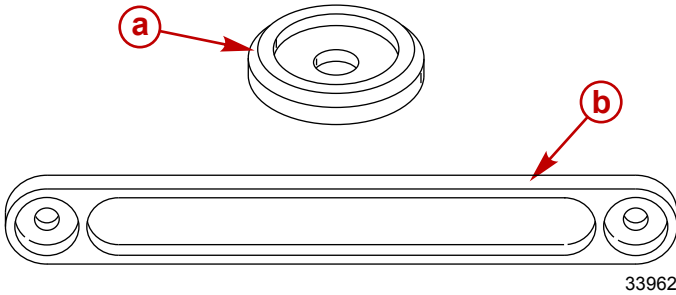
IMPORTANT: Determine the strength of the boat transom. The outboard mounting locknuts and bolts should be able to hold 75 Nm (55 lb-ft) of torque without the boat transom yielding or cracking. If the boat transom yields or cracks under this torque, the construction of the transom may not be adequate.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



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

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.



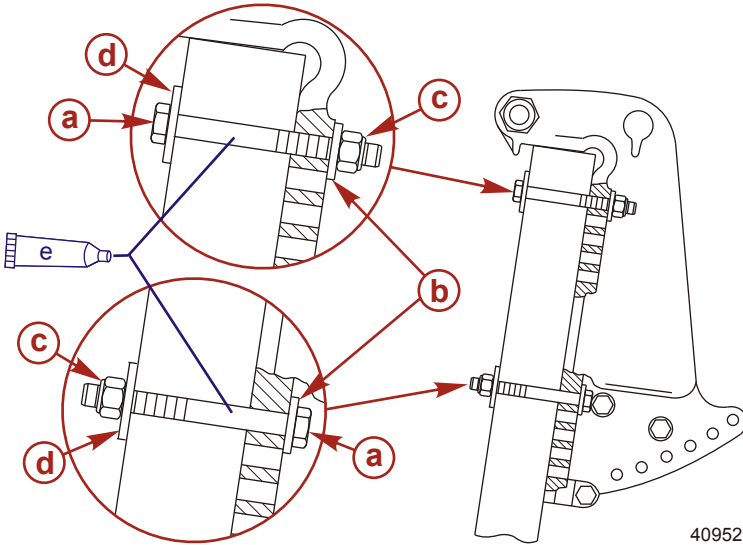
- a** - Large transom washer
- b** - Transom reinforcement plate

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 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 more accurate torque, tighten the mounting locknuts rather than the outboard mounting bolts.



- a** - 1/2 in. diameter outboard mounting bolt (4)
- b** - 7/8 in. flat washer (4)
- c** - Nylon insert locknut (4)
- d** - 1-1/2 in. flat washer (4)
- e** - Marine sealer - apply to the shank of the bolts, not the threads

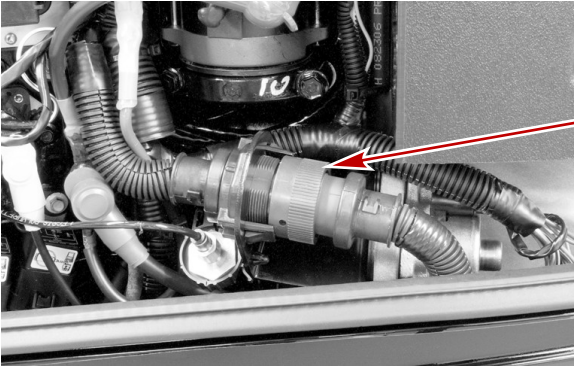
Description	Nm	lb-in.	lb-ft
Outboard mounting locknuts and bolts - standard boat transom	75		55
Outboard mounting locknuts and bolts - metal lift plates and setback brackets	122		90

OUTBOARD INSTALLATION

Electrical, Hoses, Control Cables, and Front Clamp

REMOTE WIRING HARNESS

Route the remote 14 pin boat harness through the front clamp opening in the bottom cowl. Connect remote harness to the 14 pin connector on the engine harness.



28742

a - 14 pin connector

BATTERY INFORMATION

⚠ 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. Engines must use a marine starting battery with 1000 MCA, 800 CCA, or 180 Ah.
- When connecting the engine battery, hex nuts must be used to secure battery leads to battery posts. Torque nuts to specification.

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

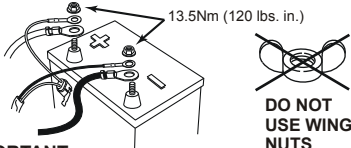
OUTBOARD INSTALLATION

IMPORTANT: Battery cable size and length is critical. Refer to engine installation manual for size requirements.

The decal needs to 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.

NOTICE - DTS & OptiMax Engines

DO NOT USE DEEP CYCLE BATTERIES!
DTS (Digital Throttle and Shift) applications and OptiMax engines must use a marine starting battery with 1000 MCA, 800 CCA, or 180 Ah. rating.



IMPORTANT:
Battery cable size and length is critical. Refer to engine installation manual for size requirements.

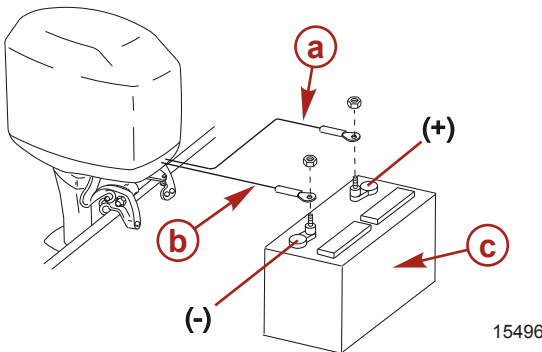
37-895387

Place decal on or near battery box for future service reference. 5/16" and 3/8" hex nuts supplied for wing nut replacement. Metric hex nuts not supplied.

3486

BATTERY CABLE CONNECTIONS

Single Outboard



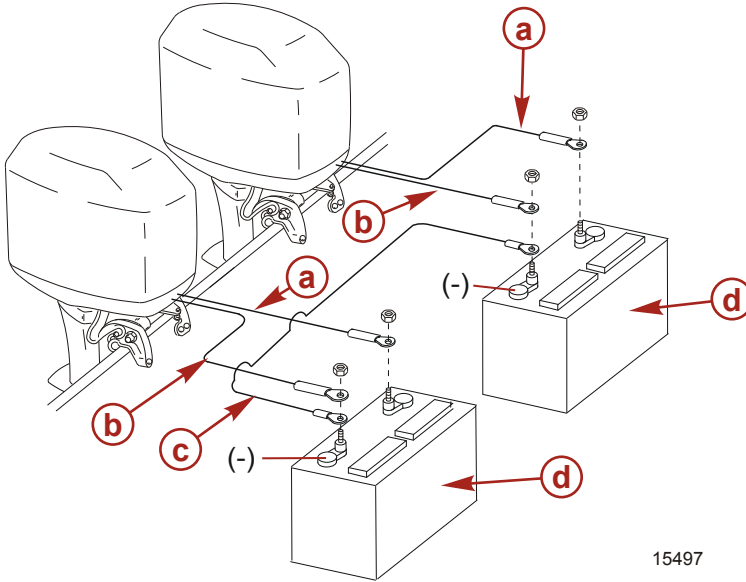
- a** - Red sleeve - Positive (+)
- b** - Black sleeve - Negative (-)
- c** - Cranking battery

15496

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

HOSE AND TUBING CONNECTIONS

Fuel Hose

The minimum fuel line inside diameter (I.D.) is 8 mm (5/16 in.), with a separate fuel line/fuel tank pickup for each engine.

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

Oil Hoses

Connect the remote oil hoses to the engine hose connections.

Fasten hose connections with cable ties.

OUTBOARD INSTALLATION

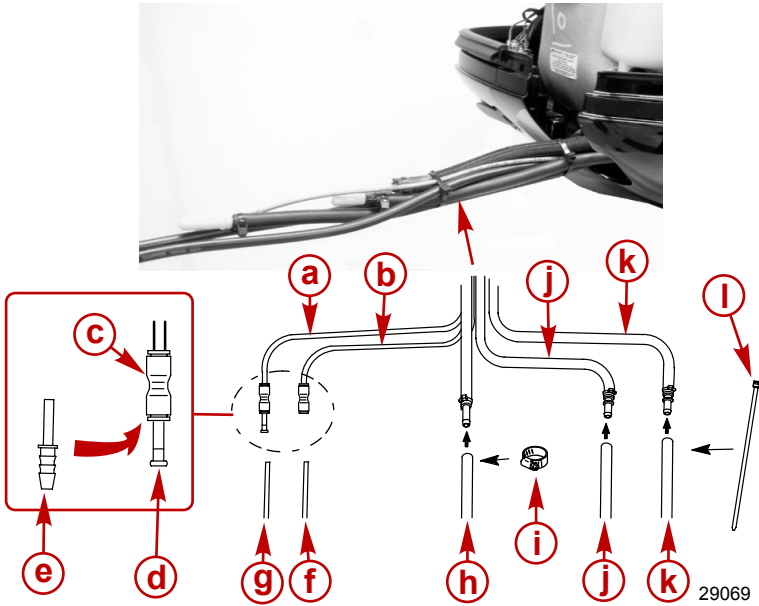
Water Pressure and Speedometer Hose or Tubing

NOTE: *This applies to models without SmartCraft gauges.*

This outboard has a speedometer water pickup located in the leading edge of the gearcase. If you want to use this water pickup for the speedometer, disconnect the water pickup tubing from the speedometer sensor and route tubing out of the cowl. Install the coupler provided with the outboard on the end of the tubing.

OUTBOARD INSTALLATION

Make the water pressure gauge hose connection to the tubing as shown.



- a** - Water pressure tube
- b** - Speedometer water pickup tube (if required)
- c** - Coupler
- d** - Plug
- e** - Barb hose fitting
- f** - Speedometer hose or tubing
- g** - Water pressure tube
- h** - Remote fuel hose
- i** - Hose clamp
- j** - Oil hose with blue stripe
- k** - Oil hose without blue stripe
- l** - Cable tie

OUTBOARD INSTALLATION

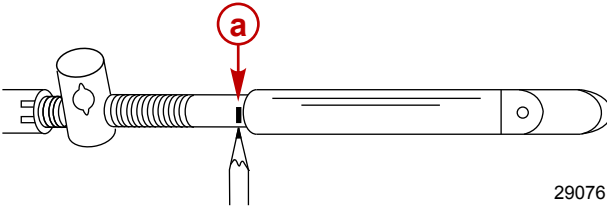
INSTALLING THE SHIFT CABLE - MODELS WITH 25.4 MM (1.0 IN.) DIAMETER PROPELLER SHAFT

IMPORTANT: The shift cable is the first cable to move when the remote control handle is moved out of neutral, so install/connect it to the engine first.

Locating the Center Point of the Shift Cable

IMPORTANT: Locate the center point of the slack or lost motion that exists in the shift cable for proper adjustment of the shift cable.

1. Mark the forward position as follows:
 - a. Move the remote control handle from neutral into forward and advance the handle to the full speed position. Ensure the throttle control lever is touching the throttle control lever stop screw.
 - b. Slowly return the handle back to the neutral detent position.
 - c. Place a mark on the shift cable against the cable end guide.

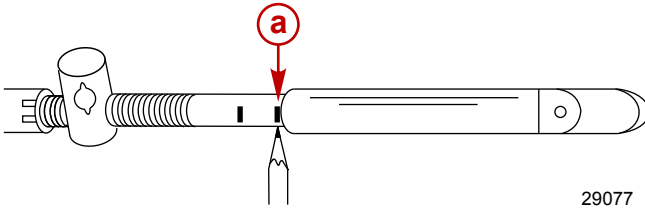


a - Forward position mark

2. Mark the reverse position as follows:
 - a. Move the remote control handle into reverse and advance the handle to the full speed position. Ensure the throttle control lever is touching the throttle control lever stop screw.
 - b. Slowly return the handle back to the neutral detent position.

OUTBOARD INSTALLATION

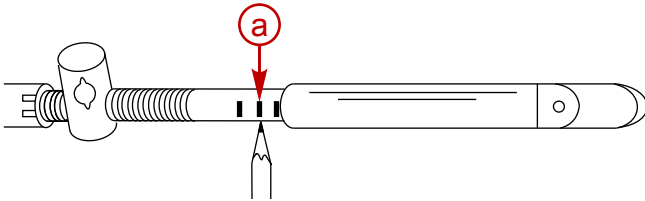
- c. Place a mark on the shift cable against the cable end guide.



29077

a - Reverse position mark

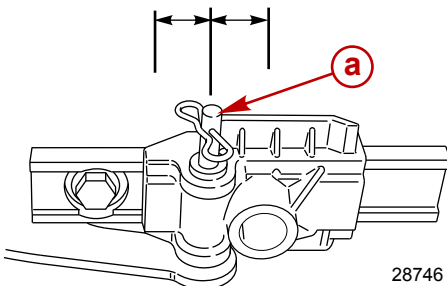
3. Mark the center on the shift cable midway between the forward and reverse marks.



4361

a - Center mark

4. Align the cable end guide against this center mark when installing the cable to the engine.
5. Position the remote control and outboard into neutral position.
6. Slide the anchor pin forward until resistance is felt, then slide the anchor pin toward the rear until resistance is felt.
7. Center the anchor pin between these resistance points.



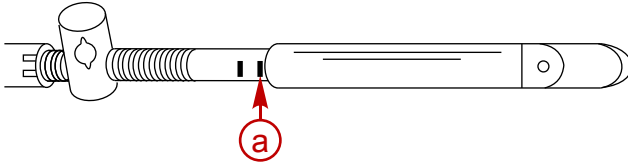
28746

a - Anchor pin

OUTBOARD INSTALLATION

Adjusting the Shift Cable

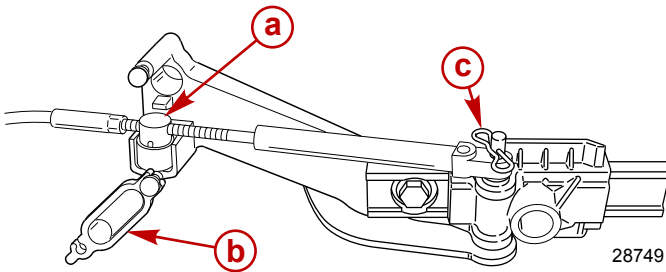
1. Align the shift cable end guide with the center mark as instructed in **Locating the Center Point of the Shift Cable**.



4362

a - Center mark

2. Place the shift cable end guide on the anchor pin and adjust the cable barrel so that it slips freely into the barrel holder.
3. Secure the shift cable to the anchor pin with the retainer clip.



28749

a - Cable barrel
b - Cable latch
c - Retainer clip

4. Check the shift cable adjustments as follows:
 - a. Shift the remote control to forward while turning the propeller shaft. If the propeller shaft does not lock in gear, adjust the cable barrel closer to the cable end guide.
 - b. Shift the remote control into neutral. If the propeller shaft does not turn freely without drag, adjust the barrel away from the cable end guide. Repeat steps a and b.

OUTBOARD INSTALLATION

- c. Shift the remote control into reverse while turning the propeller shaft. If the propeller shaft does not lock solidly in gear, adjust the barrel away from the cable end guide. Repeat steps a through c.
- d. Return the remote control handle to neutral. If the propeller shaft does not turn freely without drag, adjust the barrel closer to the cable end guide. Repeat steps a through d.

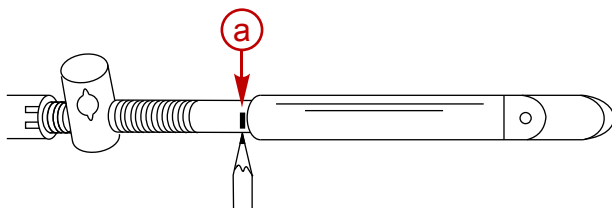
INSTALLING THE SHIFT CABLE - MODELS WITH 31.75 MM (1-1/4 IN.) DIAMETER PROPELLER SHAFT

IMPORTANT: The shift cable is the first cable to move when the remote control handle is moved out of neutral, so install/connect it to the engine first.

Locating the Center Point of the Shift Cable

IMPORTANT: Locate the center point of the slack or lost motion that exists in the shift cable for proper adjustment of the shift cable.

1. Mark the forward position as follows:
 - a. Move the remote control handle from neutral into forward and advance the handle to the full speed position. Ensure the throttle control lever is touching the throttle control lever stop screw.
 - b. Slowly return the handle back to the neutral detent position.
 - c. Place a mark on the shift cable against the cable end guide.



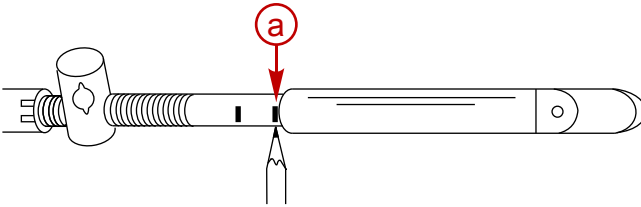
4355

a - Forward position mark

2. Mark the reverse position as follows:

OUTBOARD INSTALLATION

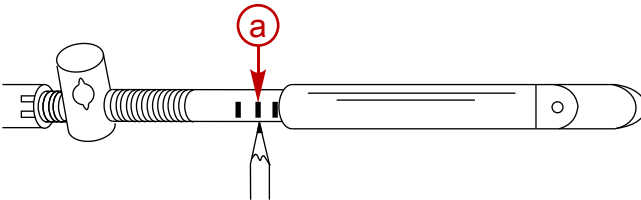
- a. Move the remote control handle into reverse and advance the handle to the full speed position. Ensure the throttle control lever is touching the throttle control lever stop screw.
- b. Slowly return the handle back to the neutral detent position.
- c. Place a mark on the shift cable against the cable end guide.



4356

a - Reverse position mark

3. Mark the center on the shift cable midway between the forward and reverse marks.



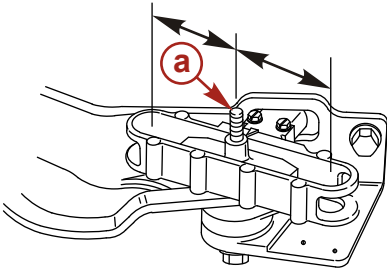
4361

a - Center mark (standard and counter rotation outboards)

4. Align the cable end guide against this center mark when installing the cable to the engine.
5. Position the remote control and outboard into neutral position.
6. Slide the shift cable retainer forward until resistance is felt, then slide the cable anchor toward the rear until resistance is felt.

OUTBOARD INSTALLATION

7. Center the anchor pin between these resistance points.

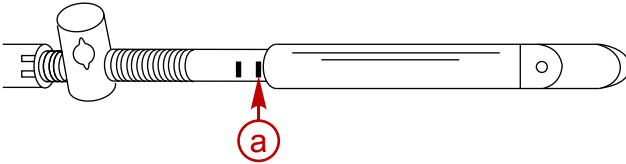


a - Anchor pin

Adjusting the Shift Cable

To adjust the shift cable:

1. Align the shift cable end guide with the center mark as instructed in **Locating the Center Point of the Shift Cable**.

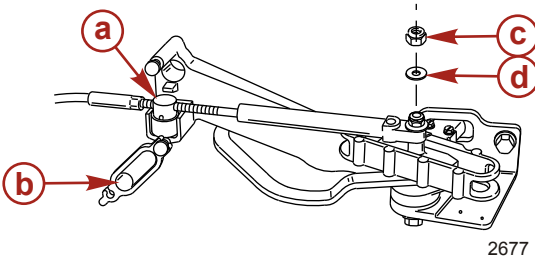


a - Center mark

2. Place the shift cable end guide on the anchor pin and adjust the cable barrel so that it slips freely into the barrel holder.

OUTBOARD INSTALLATION

- Secure the shift cable to the anchor pin with a nylon washer and locknut. Tighten the locknut to the specified value.



- a** - Cable barrel
- b** - Cable latch
- c** - Locknut
- d** - Nylon washer

Description	Nm	lb-in.	lb-ft
Shift cable locknut	Tighten, then loosen 1/4 turn		

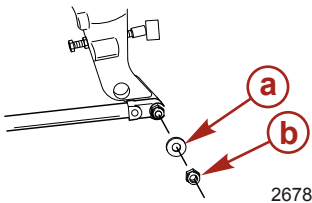
- Check the shift cable adjustments as follows:
 - Shift the remote control to forward while turning the propeller shaft. If the propeller shaft does not lock in gear, adjust the cable barrel closer to the cable end guide.
 - Shift the remote control into neutral. If the propeller shaft does not turn freely without drag, adjust the barrel away from the cable end guide. Repeat steps a and b.
 - Shift the remote control into reverse while turning the propeller shaft. If the propeller shaft does not lock solidly in gear, adjust the barrel away from the cable end guide. Repeat steps a through c.
 - Return the remote control handle to neutral. If the propeller shaft does not turn freely without drag, adjust the barrel closer to the cable end guide. Repeat steps a through d.

OUTBOARD INSTALLATION

INSTALLING THE THOTTLE CABLE - MODELS WITH 25.4 MM (1.0 IN.) DIAMETER PROPELLER SHAFT

IMPORTANT: Attach the shift cable to the engine prior to attaching the throttle cable.

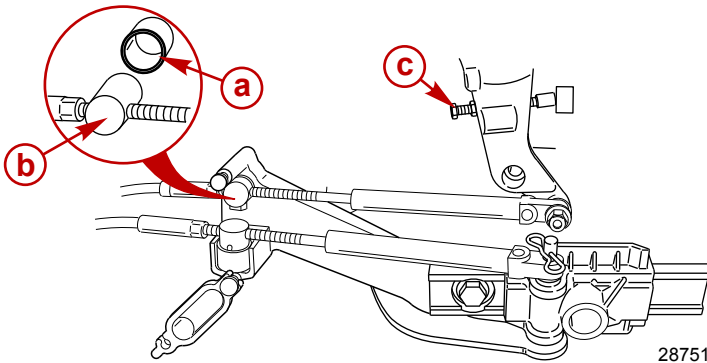
1. Shift the remote control into the neutral position.
2. Attach the throttle cable to the throttle lever. Secure with a washer and locknut. Tighten the locknut to the specified value.



- a - Nylon washer
- b - Locknut

Description	Nm	lb-in.	lb-ft
Throttle cable locknut "b"	Tighten, then loosen 1/4 turn		

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



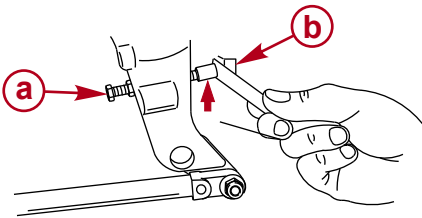
- a - Barrel sleeve
- b - Cable barrel
- c - Idle stop screw

4. Check the throttle cable adjustment as follows:

OUTBOARD INSTALLATION

- a. Shift the outboard into gear a few times to activate the throttle linkage. Rotate the propeller shaft while shifting into reverse.
- b. Return the remote control to neutral.
- c. Place a thin piece of paper between the idle adjustment screw and the idle stop. The adjustment is correct when the paper can be removed without tearing, but has some drag on it.

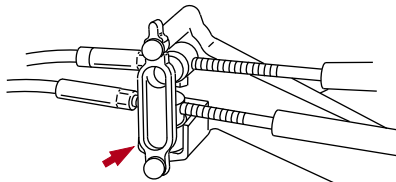
IMPORTANT: The idle stop screw must be touching the stop.



2680

- a** - Idle stop screw
b - Idle stop

- d. Adjust the cable barrel if necessary.
5. Lock the barrel holder in place with the cable latch.



2682

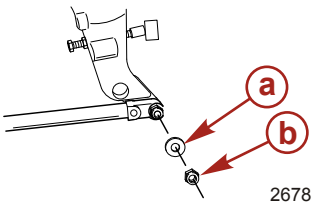
INSTALLING THE THROTTLE CABLE - MODELS WITH 31.75 MM (1-1/4 IN.) DIAMETER PROPELLER SHAFT

IMPORTANT: Attach the shift cable to the engine prior to attaching the throttle cable.

1. Shift the remote control into the neutral position.

OUTBOARD INSTALLATION

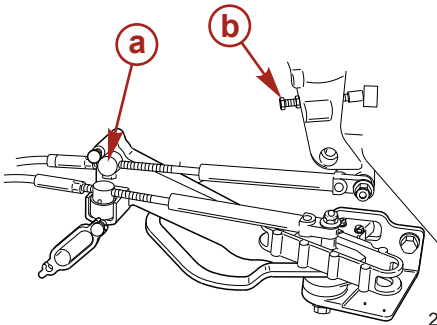
2. Attach the throttle cable to the throttle lever. Secure with a washer and locknut. Tighten the locknut to the specified value.



- a** - Nylon washer
- b** - Locknut

Description	Nm	lb-in.	lb-ft
Throttle cable locknut "b"	Tighten, then loosen 1/4 turn		

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

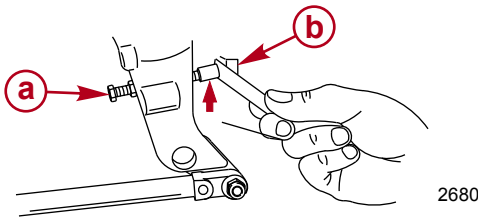


- a** - Cable barrel
- b** - Idle stop screw

4. Check the throttle cable adjustment as follows:
 - a. Shift the outboard into gear a few times to activate the throttle linkage. Rotate the propeller shaft while shifting into reverse.
 - b. Return the remote control to neutral.
 - c. Place a thin piece of paper between the idle adjustment screw and the idle stop. The adjustment is correct when the paper can be removed without tearing, but has some drag on it.

OUTBOARD INSTALLATION

IMPORTANT: The idle stop screw must be touching the stop.

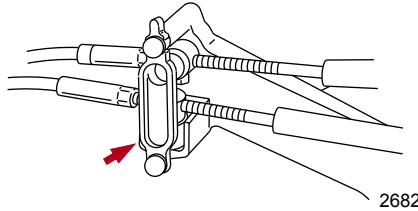


a - Idle stop screw

b - Idle stop

d. Adjust the cable barrel if necessary.

5. Lock the barrel holder in place with the cable latch.



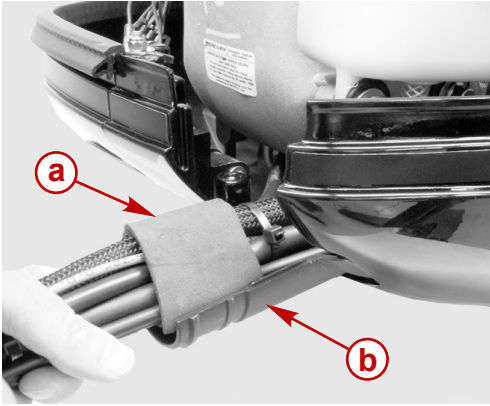
FRONT CLAMP ASSEMBLY INSTALLATION

IMPORTANT: There must be sufficient slack in the engine wiring harness, battery cables, fuel hose, and oil hoses, between clamp and engine attachment point, to relieve stress and prevent hoses from being kinked or pinched.

1. Place the lower half of the front clamp into the bottom cowl opening.

OUTBOARD INSTALLATION

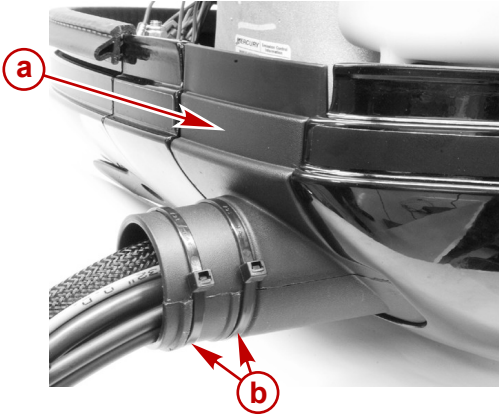
2. Place the neoprene wrap around the wiring, hoses, and control cables, and place into the lower half of the front clamp.



29073

- a** - Neoprene wrap
- b** - Lower half of the front clamp

3. Join the top half of the front clamp with the bottom half. Secure both halves together with cables ties.



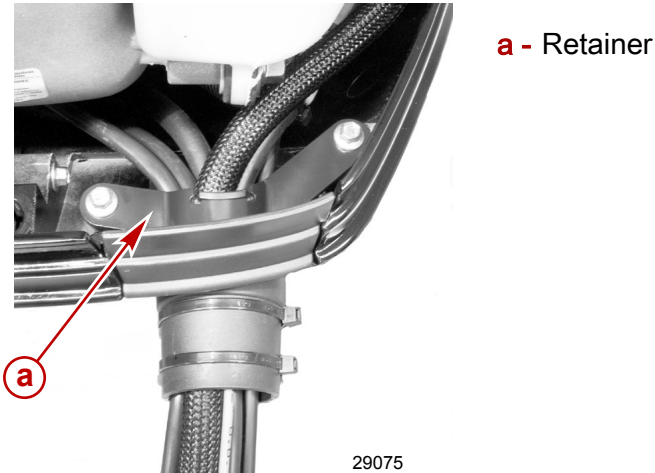
29074

- a** - Top half of the front clamp
- b** - Cable ties

4. Secure the front clamp into the bottom cowl with the retainer and two screws.

OUTBOARD INSTALLATION

5. Install the cowl seal.



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:

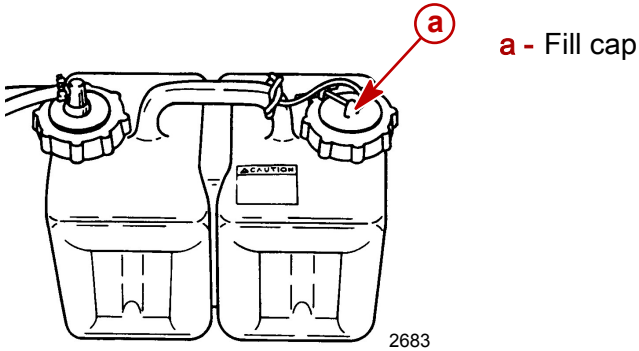
1. Squeeze the fuel line primer bulb until it feels firm.
2. Turn the key switch to the "ON" position for three seconds. This operates the electric fuel pump.
3. Turn the key switch back to the "OFF" position and squeeze the primer bulb again until it feels firm.
4. Turn the key switch to the "ON" position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

OUTBOARD INSTALLATION

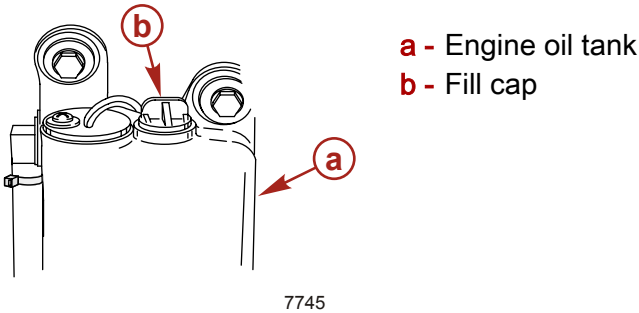
Oil Injection Set-Up

FILLING OIL SYSTEM

1. Fill remote oil tank with the recommended oil listed in the **Operation and Maintenance Manual**. Tighten fill cap.



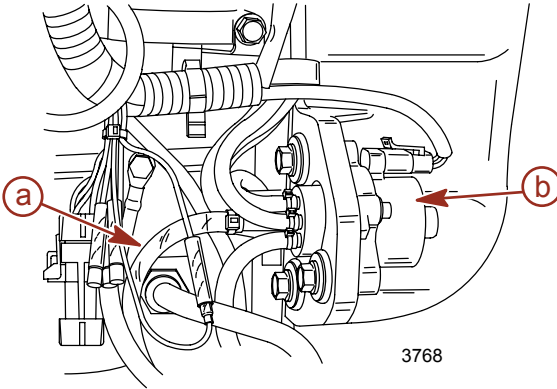
2. Remove cap and fill engine oil tank with oil. Reinstall the fill cap.



OUTBOARD INSTALLATION

PRIMING OIL INJECTION PUMP

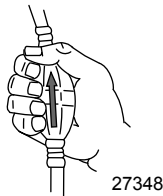
Before starting the engine for the first time, prime the oil injection pump. Priming will remove any air that may be in the pump, oil supply hose, or internal passages.



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

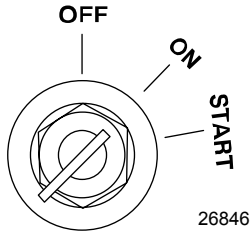
IMPORTANT: Fill the engine fuel system with fuel before priming the oil injection pump. Otherwise, the fuel pump will run without fuel during the priming process and may be damaged.

1. Fill the fuel system.
 - a. Connect fuel hose.
 - b. Fill the fuel system by squeezing the primer bulb.
 - c. Position the fuel line primer bulb so the arrow on the side of the bulb is pointing up. Squeeze the fuel line primer bulb until it feels firm.



OUTBOARD INSTALLATION

- d. Turn the ignition key switch to the "ON" position for three seconds. This operates the electric fuel pump.



- e. Turn the ignition key switch back to the "OFF" position, and squeeze the primer bulb again until it feels firm.
- f. Turn the ignition key switch to the "ON" position again for three seconds.
- g. Continue this procedure until the fuel primer bulb stays firm.
2. Turn the ignition key switch to the "ON" position.
 3. Within the first 10 seconds after the key switch has been turned on, move the remote control handle from neutral into forward. This will automatically start the priming process.

PURGING AIR FROM THE ENGINE OIL TANK

1. Loosen the fill cap on the engine oil tank.
2. Start the engine.
3. Operate the engine until all the air has vented out and oil starts to flow out of the tank.
4. Tighten fill cap.

OUTBOARD INSTALLATION

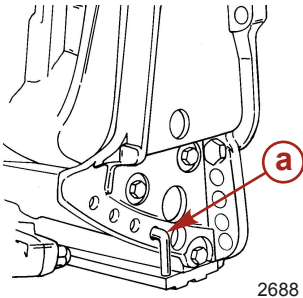
Trim In Pin

WARNING

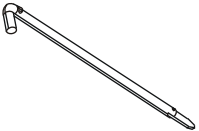
Operating the boat at high speeds with the outboard trimmed too far under can create excessive bow steer, resulting in the operator losing control of the boat. Install the trim limit pin in a position that prevents excessive trim under and operate the boat in a safe manner.

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.

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
 2749	Limits the down trim angle of the power trim equipped engines, or aids in determining the trim out angle on non-power trim engines.

OUTBOARD INSTALLATION

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.

