

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.

© 2011, 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 Four Stroke - 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:

☐ B+C ☐ B+D ☐ B+E ☐ B+F ☐ G ☒ H

Conformity assessment module used for noise emissions:

☐ A ☐ Aa ☐ G ☒ H

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

Description of Engines and Essential Requirements

Engine Type	Fuel Type	Combustion Cycle
<input checked="" type="checkbox"/> Outboard engine	<input checked="" type="checkbox"/> Petrol	<input checked="" type="checkbox"/> 4 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
Verado 6 cylinder 200, 225, 250, 275, 300, 350 hp	OP401000 or 1B227000	RCD-H-2
Verado 4 cylinder 135, 150, 175, 200 hp	OP401000 or 1B227000	RCD-H-2
L4NA 4 cylinder 80, 100, 115 hp	OP401000 or 1B227000	RCD-H-2
150 hp 4-stroke (3.0L)	OP401000 or 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, appearing to read "Mark D. Schwabero". The signature is fluid and cursive, with the first name "Mark" being more prominent.

Date and place of issue:

August 29, 2011
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
FourStroke Outboard Limited Warranty.....	3
FourStroke Outboard Limited Warranty.....	7
FourStroke Outboard Limited Warranty.....	11
3 Year Limited Warranty Against Corrosion.....	15
Warranty Coverage and Exclusions.....	18
U.S. EPA Emissions Limited Warranty.....	20
Emission Control System Components.....	20
California Emissions Limited Warranty.....	21
California Air Resources Board Explanation of Your California Emission Control Warranty Statement.....	25
Emission Certification Star Label.....	26

General Information

Boater's Responsibilities.....	28
Before Operating Your Outboard.....	28
Boat Horsepower Capacity.....	29
High-Speed and High-Performance Boat Operation.....	29
Propeller Selection.....	30
Outboard Remote Control Models	33
Remote Steering Notice.....	33
Lanyard Stop Switch.....	34
Protecting People in the Water.....	38
Passenger Safety Message - Pontoon Boats and Deck Boats	39
Wave and Wake Jumping.....	40
Impact with Underwater Hazards.....	41
Exhaust Emissions.....	43
Selecting Accessories for Your Outboard.....	45
Safe Boating Suggestions.....	45
Recording Serial Number.....	47
Specifications.....	47
Component Identification.....	50

Transporting

Trailer Boat/Outboard.....	51
----------------------------	----

Fuel and Oil

Fuel Recommendations.....	52
Low Permeation Fuel Hose Requirement	54
EPA Pressurized Portable Fuel Tank Requirements.....	54
Fuel Demand Valve (FDV) Requirement.....	54
Mercury Marine's Pressurized Portable Fuel Tank.....	55
Filling Fuel Tank.....	56
Engine Oil Recommendations.....	57
Checking and Adding Engine Oil.....	58

Features and Controls

Remote Control Features.....	61
Warning System.....	62
Power Trim and Tilt.....	64

Operation

Prestarting Check List.....	68
Operating in Freezing Temperatures.....	68
Operating in Saltwater or Polluted Water.....	69
Setting Trim Angle while Running Engine at Idle Speed.....	69
Engine Break-in Procedure.....	69
Starting the Engine.....	70
Gear Shifting.....	72
Stopping the Engine.....	73

Maintenance

Outboard Care.....	74
EPA Emissions Regulations.....	74
Inspection and Maintenance Schedule.....	75
Flushing the Cooling System.....	78
Top Cowl Removal and Installation.....	79
Cleaning Care for Top and Bottom Cowsls.....	80
Cleaning Care for the Powerhead (Saltwater Use).....	81
Battery Inspection	81
Fuel System.....	82
Corrosion Control Anode.....	84
Propeller Replacement.....	85
Spark Plug Inspection and Replacement.....	90
Fuse Replacement.....	91
Alternator Drive Belt Inspection.....	93
Lubrication Points.....	94
Checking Power Trim Fluid.....	96
Changing Engine Oil	96
Gearcase Lubrication.....	99

Storage

Storage Preparation.....	102
Protecting External Outboard Components.....	103
Protecting Internal Engine Components.....	103
Gearcase.....	103
Positioning Outboard for Storage.....	104
Battery Storage.....	104

Troubleshooting

Starter Motor Will Not Crank the Engine.....	105
Engine Will Not Start.....	105
Engine Runs Erratically.....	105
Performance Loss.....	106
Battery Will Not Hold Charge.....	106

Owner Service Assistance

Local Repair Service.....	107
Service Away from Home.....	107
Parts and Accessories Inquiries.....	107
Service Assistance.....	107
Mercury Marine Service Offices.....	108

Outboard Installation

Important Information.....	110
Boat Horsepower Capacity.....	110
Start in Gear Protection.....	111
Selecting Accessories for Your Outboard.....	111
Fuel System.....	111
Installation Specifications.....	113
Lifting Outboard.....	114
Shipping Bracket Removal.....	114
Steering Cable - Starboard Side Routed Cable.....	115
Steering Link Rod Fasteners (if equipped).....	116
Determining Recommended Outboard Mounting Height.....	118
Drilling Outboard Mounting Holes.....	119
Fastening the Outboard to the Transom.....	120
Electrical, Fuel Hose, and Control Cables.....	124

Maintenance Log

Maintenance Log.....	136
----------------------	-----

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.

FourStroke Outboard Limited Warranty

UNITED STATES AND CANADA

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

WHAT IS COVERED: Mercury Marine warrants its new 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.

FourStroke Outboard Limited Warranty

EUROPE AND CONFEDERATION OF INDEPENDENT STATES

Outside Europe and Confederation of Independent States - check with local distributor.

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 two (2) 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 in 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 or repossessed product; or product purchased at auction, from a salvage yard, or from an insurance company.

CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE: Warranty coverage is available only to retail customers that purchase from a Dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified predelivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Routine maintenance outlined in the Operation and Maintenance Manual must be timely performed in order to maintain warranty coverage. Mercury Marine reserves the right to make future warranty coverage contingent on 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, or 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.

FourStroke Outboard Limited Warranty

MIDDLE-EAST AND AFRICA

WHAT IS COVERED: Mercury Marine warrants its new Outboard and Jet Products to be free of defects in material and workmanship during the period described below.

WARRANTY INFORMATION

DURATION OF COVERAGE: This Limited Warranty provides coverage for one (1) year from 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) years 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.

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

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

WARRANTY INFORMATION

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

WARRANTY INFORMATION

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.

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

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.

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

WARRANTY INFORMATION

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

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

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

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.

 The label is an oval with a black border. Inside, there is a black star with a white outline. Above the star, the word "LOW" is written in white. Below the star, the word "EMISSION" is written in white. A banner across the middle of the star contains the text "CALIFORNIA EMISSIONS STANDARDS". The number "22531" is printed in black at the bottom right of the oval.	<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>
 The label is a circular seal with a black border. Inside, there is a black star with a white outline. Above the star, the words "VERY • LOW" are written in white. Below the star, the word "EMISSION" is written in white. A banner across the middle of the star contains the text "FEDERAL". The number "42537" is printed in black at the bottom right of the seal.	<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

 <p>42538</p>	<p>Three Stars - Ultra Low Emission</p> <p>The Three Star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2008 exhaust emissions standards or the Sterndrive and Inboard marine engine 2003-2008 exhaust emission standards. Engines meeting these standards have 65% lower emissions than One Star - Low Emission engines.</p>
 <p>42539</p>	<p>Four Stars - Super Ultra Low Emission</p> <p>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.</p>

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.

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

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

DANGER

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

WARNING

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

CAUTION

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

NOTICE

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

GENERAL INFORMATION

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

High-Speed and High-Performance Boat Operation

If your outboard is to be used on a high-speed or high-performance boat with which you are unfamiliar, we recommend that you never operate it at its high speed capability without first requesting an initial orientation and familiarization demonstration ride with your dealer or an operator experienced with your boat/outboard combination. For additional information, obtain a copy of our **Hi-Performance Boat Operation** booklet from your dealer, distributor, or Mercury Marine.

GENERAL INFORMATION

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.mercurymarinepropellers.com or see your local authorized Mercury dealer.

SELECTING THE CORRECT PROPELLER

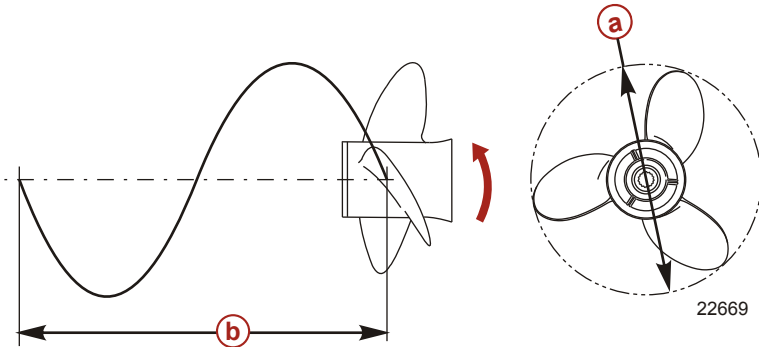
An accurate tachometer for measuring engine speed is important in choosing the correct propeller.

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

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

GENERAL INFORMATION

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



a - Diameter

b - Pitch - Travel during one revolution

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

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

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

GENERAL INFORMATION

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.

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.

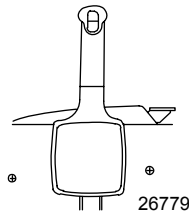
GENERAL INFORMATION

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.



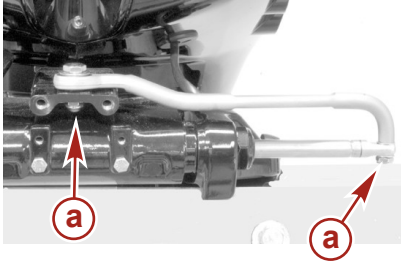
Remote Steering Notice

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

GENERAL INFORMATION

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

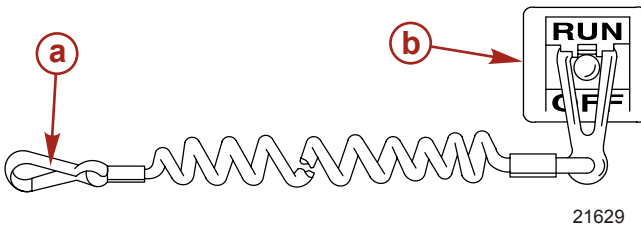
47823

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



Always slow down and exercise extreme caution any time you are boating in an area where there might be people in the water. Whenever a boat is moving (coasting) and the outboard gear shift is in neutral position, there is sufficient force by the water on the propeller to cause the propeller to rotate. This neutral propeller rotation can cause serious injury.

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

GENERAL INFORMATION

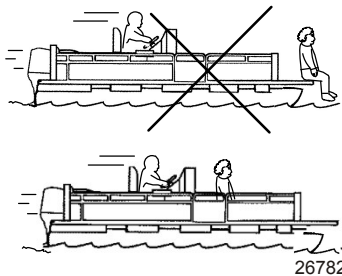
Passenger Safety Message - Pontoon Boats and Deck Boats

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.

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

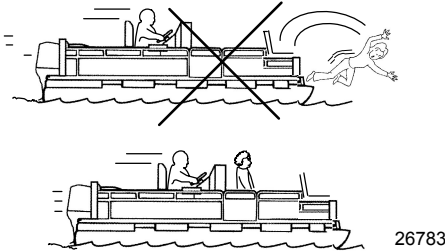
Sitting or standing in an area of the boat not designed for passengers at speeds above idle can cause serious injury or death. Stay back from the front end of deck boats or raised platforms and remain seated while the boat is in motion.

GENERAL INFORMATION

BOATS WITH FRONT MOUNTED, RAISED PEDESTAL FISHING SEATS

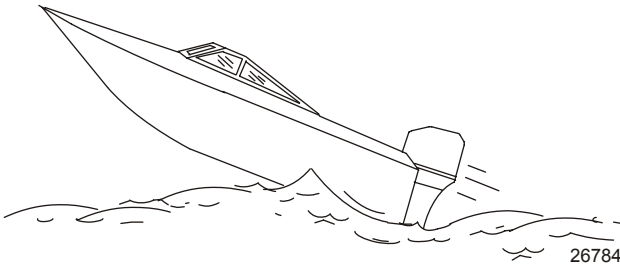
Elevated fishing seats are not intended for use when the boat is traveling faster than idle or trolling speed. Sit only in seats designated for traveling at faster speeds.

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



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.

GENERAL INFORMATION

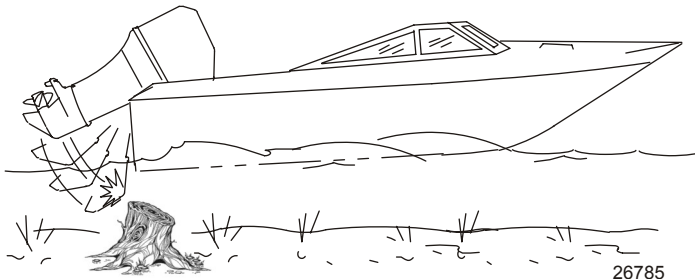
WARNING

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.

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.

GENERAL INFORMATION

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

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

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

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

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

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.

GENERAL INFORMATION

Exhaust Emissions

BE ALERT TO CARBON MONOXIDE POISONING

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

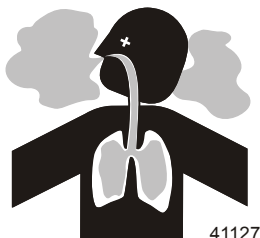
Early symptoms of carbon monoxide poisoning, which are similar to the symptoms of seasickness and intoxication, include headache, dizziness, drowsiness, and nausea.

WARNING

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

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

STAY CLEAR OF EXHAUST AREAS



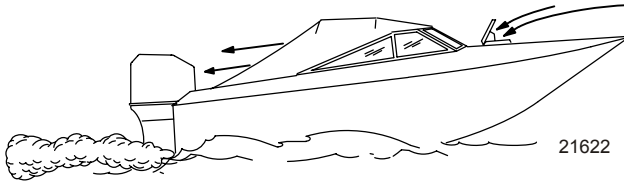
Engine exhaust gases contain harmful carbon monoxide. Avoid areas of concentrated engine exhaust gases. When engines are running, keep swimmers away from the boat, and do not sit, lie, or stand on swim platforms or boarding ladders. While underway, do not allow passengers to be positioned immediately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

GENERAL INFORMATION

GOOD VENTILATION

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

Example of desired air flow through the boat:

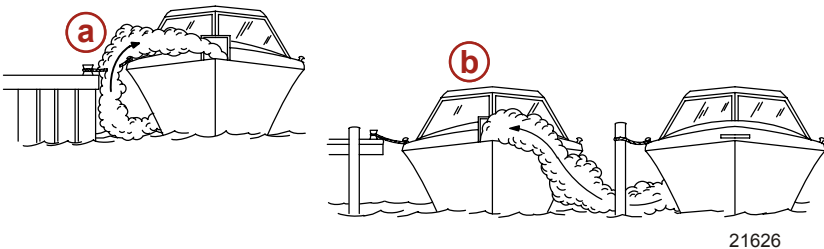


POOR VENTILATION

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

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

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



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

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)

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.

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.

GENERAL INFORMATION

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.

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.

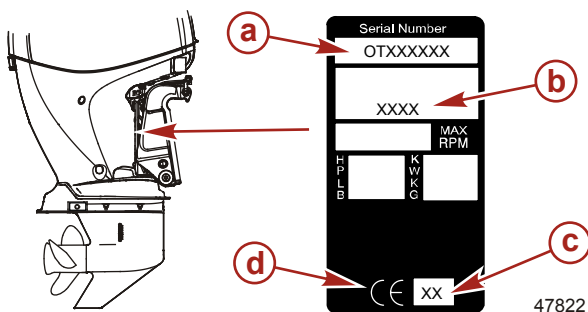
GENERAL INFORMATION

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.

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	150
Horsepower	150
Kilowatts	110

GENERAL INFORMATION

Models	150
Full throttle RPM range	5000–5800
Idle speed in neutral gear ¹ .	650 RPM
Number of cylinders	4
Piston displacement	3.0 L (183 cid)
Cylinder bore	101.6 mm (4.0 in.)
Stroke	92 mm (3.62 in.)
Valve clearance	
Intake	0.075 mm (0.003 in.)
Exhaust	0.25 mm (0.010 in.)
Recommended spark plug	NGK ZFR5F
Spark plug gap	0.8 mm (0.032 in.)
Spark plug hex size	16 mm (5/8 in.)
Spark plug torque	27 Nm (20 lb-ft)
Gear ratio	1.92:1
Recommended gasoline	Refer to Fuel and Oil
Recommended oil	Refer to Fuel and Oil
Gearcase lubricant capacity	
Right-hand rotation	780 mL (26.4 fl oz)
Left-hand rotation	545 mL (18.4 fl oz)
Engine oil capacity with oil filter replacement	6.0 liters (6.3 US qt)

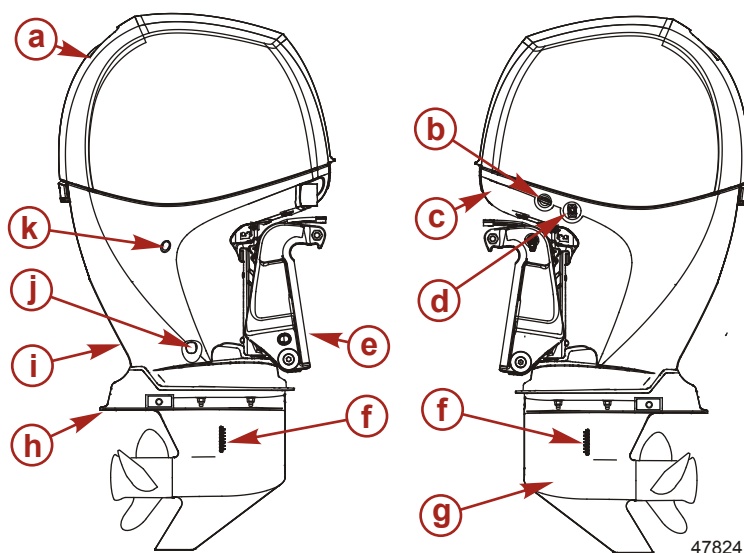
1. With engine fully warmed up.

GENERAL INFORMATION

Models	150
Battery rating	1000 marine cranking amps (MCA), 800 cold cranking amps (CCA), or 180 ampere hour (Ah)
Emission control system	Electronic engine control (EC)
Sound at driver's ear (ICOMIA 39-94) dBA	82.9

GENERAL INFORMATION

Component Identification



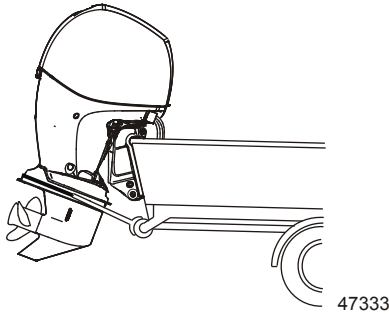
- a** - Top cowl
- b** - Engine flush
- c** - Bottom cowl
- d** - Auxiliary tilt switch
- e** - Transom brackets
- f** - Cooling water intake holes
- g** - Gearcase
- h** - Anti-ventilation plate
- i** - Driveshaft housing
- j** - Engine oil drain
- k** - Water pump indicator hole

TRANSPORTING

Trailer Boat/Outboard

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.

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

FUEL AND OIL

Fuel Recommendations

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

FUEL RATINGS

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

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

Outside USA and Canada - having a posted pump Octane Rating of 90 RON minimum. Premium gasoline (98 RON) is also acceptable. Do not use leaded gasoline.

USING REFORMULATED (OXYGENATED) GASOLINES (USA ONLY)

This type of gasoline is required in certain areas of the USA. The 2 types of oxygenates used in these fuels are Alcohol (Ethanol) or Ether (MTBE or ETBE). If Ethanol is the oxygenate that is used in the gasoline in your area, refer to **Gasolines Containing Alcohol**.

These Reformulated Gasolines are acceptable for use in your Mercury Marine engine.

GASOLINES CONTAINING ALCOHOL

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

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

FUEL AND OIL

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

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

WARNING

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

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

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

FUEL AND OIL

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°C as specified in SAE J 1527 - marine fuel hose.

EPA Pressurized Portable Fuel Tank Requirements

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

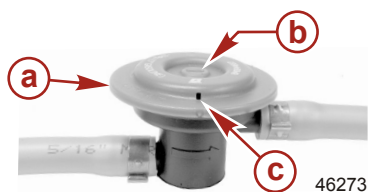
- An air inlet that opens to allow air to enter as the fuel is drawn out of the tank.
- An air outlet that opens (vents) to the atmosphere if pressure exceeds 34.4 kPa (5.0 psi).

Fuel Demand Valve (FDV) Requirement

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

FUEL AND OIL

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



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

Mercury Marine's Pressurized Portable Fuel Tank

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

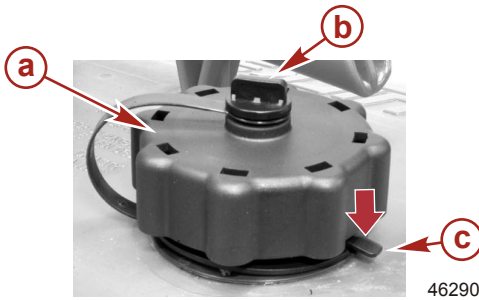
SPECIAL FEATURES OF THE PORTABLE FUEL TANK

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

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

FUEL AND OIL

REMOVING THE FUEL CAP



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

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

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

DIRECTIONS FOR USING THE PRESSURIZED PORTABLE FUEL TANK

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

Filling Fuel Tank

WARNING

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

FUEL AND OIL

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

Remove portable fuel tanks from boat to refill them.

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.

PORTABLE FUEL TANK PLACEMENT IN THE BOAT

Place the fuel tank in the boat so the vent is higher than the fuel level under normal boat operating conditions.

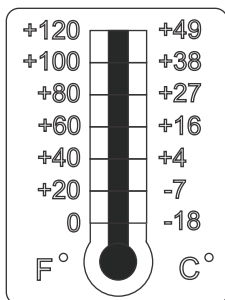
Engine Oil Recommendations

Mercury or Quicksilver NMMA FC-W certified synthetic blend 25W-40 multi-viscosity 4-Stroke Outboard Oil is recommended for commercial, and general, all-temperature use. As an optional choice, Mercury or Quicksilver NMMA FC-W certified 10W-30 multi-viscosity 4-Stroke Outboard Oil may be used for boating where optimum acceleration performance is desired like water skiing or tournament fishing. If the recommended Mercury or Quicksilver NMMA FC-W certified oils are not available, a major brand of NMMA FC-W certified 4-Stroke Outboard Oil of similar viscosity may be used.

FUEL AND OIL

IMPORTANT: The use of nondetergent oils, multi-viscosity oils (other than Mercury or Quicksilver NMMA FC-W certified oil or a major brand NMMA FC-W certified oil), synthetic oils, low quality oils, or oils that contain solid additives are not recommended.

Engine Oil
25W-40 FC-W
10W-30 FC-W
6.0L (6.3 U.S. qt.)



47814

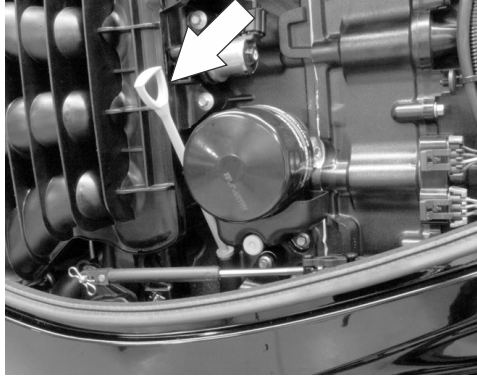
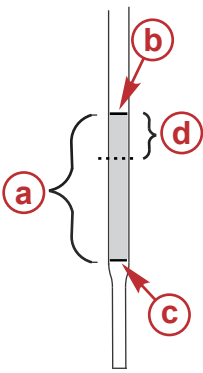
Checking and Adding Engine Oil

IMPORTANT: Do not overfill. Tilt outboard out/up past vertical for approximately one minute to allow trapped oil to drain back to the oil sump. Tilt outboard to vertical (not tilted) position when checking engine oil. For accurate readings, check oil only when engine is cold or after engine has not run for at least an hour.

1. Before starting (cold engine) tilt outboard out/up past vertical to allow trapped oil to drain back to the oil sump. Allow outboard to remain tilted for approximately one minute.
2. Tilt outboard to vertical operating position.
3. Remove the top cowl. Refer to **Maintenance - Top Cowl Removal and Installation**.
4. Pull out the dipstick. Wipe the dipstick end with a clean rag or towel and push it back in all the way.
5. Pull the dipstick back out again and observe the oil level. Oil should be in the operating range (between the top bar and bottom bar).

FUEL AND OIL

IMPORTANT: Do not try to fill the oil level to the top bar. Oil level is correct as long as it appears in the operating range (between the top bar and bottom bar).



47403

a - Oil level operating range

b - Top bar

c - Bottom bar

d - Upper 1/3 level

6. If the oil level is below the bottom bar, remove the oil filler cap and add approximately 500 ml (16 oz) of the specified outboard motor oil. Allow a few minutes for the oil to drain to the oil sump and recheck the dipstick. If necessary, add additional oil to bring the oil level within the upper 1/3 level of the operating range. Avoid overfilling, do not try to fill the oil level to the top bar.



47404

FUEL AND OIL

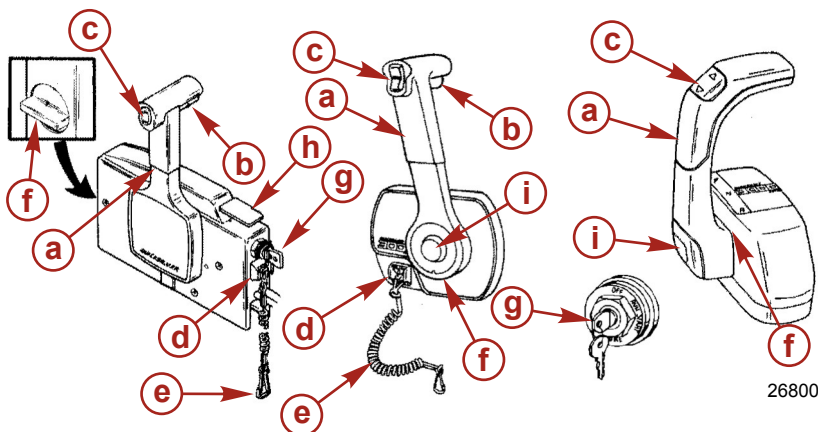
IMPORTANT: Inspect oil for signs of contamination. Oil contaminated with water will have a milky color to it; oil contaminated with fuel will have a strong fuel smell. If contaminated oil is noticed, have the engine checked by your dealer.

7. Push the dipstick back in all the way.
8. Install the oil fill cap hand-tight.
9. Install the top cowl.

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.



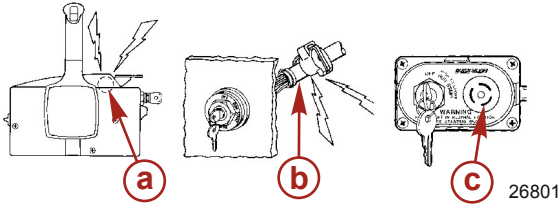
- a** - Control handle - forward, neutral, reverse
- b** - Neutral release lever
- c** - Trim/tilt switch (if equipped) - Refer to **Features and Controls - Power Trim and Tilt**
- d** - Lanyard stop switch - Refer to **General Information - Lanyard Stop Switch**
- e** - Lanyard - Refer to **General 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

Warning System

WARNING HORN SIGNALS

The outboard warning system incorporates a warning horn inside the boat. Remote control models will have the warning horn located inside the remote control or connected to the ignition key switch. Tiller handle models will have the warning horn located in the ignition key panel.



- a** - Horn inside remote control
- b** - Horn connected to ignition key switch
- c** - Horn in ignition key panel

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

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

FEATURES AND CONTROLS

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

The operator is able to correct a couple engine problems indicated by the warning horn. These conditions are as follows:

- Cooling system (water pressure or engine temperature) problem. The warning horn will sound Intermittent short beeps for six seconds. Stop the engine and check the water intake holes in the gearcase for obstruction.
- Low oil pressure problem. The warning horn will sound a continuous six second beep. Stop the engine and check for low engine oil level. Refer to **Fuel and Oil – Checking and Adding Engine Oil**.

ENGINE GUARDIAN SYSTEM

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

If the Guardian System has been activated, reduce throttle speed. The problem will need to be identified and corrected, if possible. The system must be reset before the engine will operate at higher speeds. Moving the throttle lever back to the idle position will reset the system.

SMARTCRAFT PRODUCT

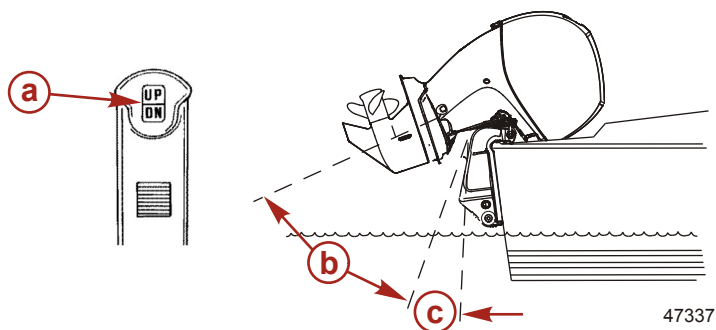
A Mercury SmartCraft System instrument package can be purchased for this outboard. A few of the functions the instrument package will display are engine RPM, coolant temperature, oil pressure, water pressure, battery voltage, fuel consumption, and engine operating hours.

FEATURES AND CONTROLS

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

Power Trim and Tilt

The 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 the 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 and ignition switch turned on, 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
- c** - Trim range

FEATURES AND CONTROLS

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.

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.
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

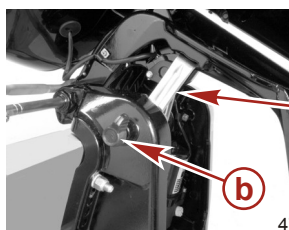
FEATURES AND CONTROLS

- 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.



- a** - Tilt support lever
b - Knob

MANUAL TILTING

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

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

FEATURES AND CONTROLS

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



47663

AUXILIARY TILT SWITCH

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



a - Auxiliary tilt switch

47704

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.

OPERATION

Prestarting Check List

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

Operating in Freezing Temperatures

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

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

OPERATION

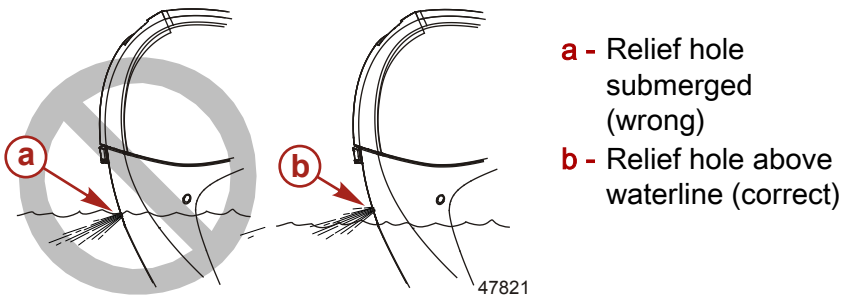
Operating in Saltwater or Polluted Water

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.

Setting Trim Angle while Running Engine at Idle Speed



Engine Break-in Procedure

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.

1. For the first two hours of operation, run the engine at varied throttle settings up to 4500 RPM or at three-quarter throttle, and at full throttle for approximately one minute every ten minutes.
2. For the next eight hours of operation, avoid continuous operation at full throttle for more than five minutes at a time.

OPERATION

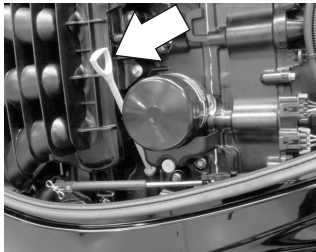
Starting the Engine

Before starting, read the **Prestarting Check List**, and **Engine Break-in Procedure** in the **Operation** section.

NOTICE

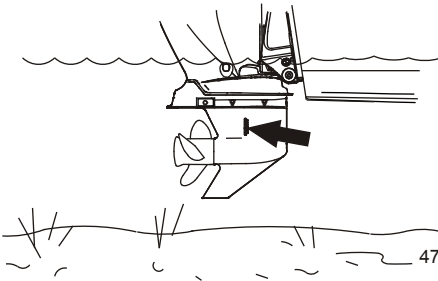
Without sufficient cooling water, the engine, the water pump, and other components will overheat and suffer damage. Provide a sufficient supply of water to the water inlets during operation.

1. Check the engine oil level.



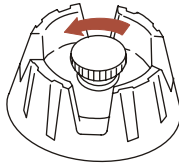
47820

2. Ensure the cooling water intake is submerged.



47412

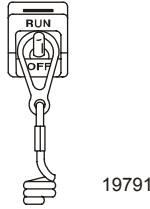
3. Open the fuel tank vent screw (in filler cap) on manual venting type fuel tanks.



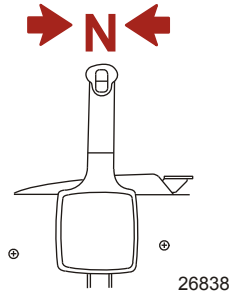
19748

OPERATION

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



5. Shift outboard to neutral (N) position.

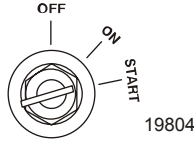


NOTE: For initial start of a new engine or for an engine that ran out of fuel or was drained of fuel, the fuel system should be filled as follows:

Turn the ignition key switch to the "ON" position for approximately five seconds. Turn the key to the "START" position and release it, the engine will crank for a maximum of eight seconds. The engine may start, run rough, and stall while filling the system. Repeat this start keyup procedure until the engine remains running. Allow the starter motor to cool for 20–30 seconds in-between start attempts.

OPERATION

6. Ignition key starting - Turn ignition key to the "START" position and release the key. The electronic starting system will automatically crank the engine for starting. If the engine fails to start, the engine will stop cranking. Turn the key to the "START" position again until engine starts.



7. After the engine starts, check for a steady stream of water flowing out of the water pump indicator hole.

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

WARMING UP ENGINE

Before beginning operation, allow the engine to warm up at idling speed for three minutes.

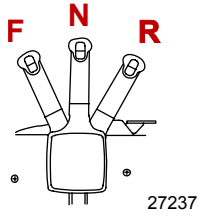
Gear Shifting

IMPORTANT: Observe the following:

- Never shift outboard into gear unless engine speed is at idle.
- Do not shift outboard into reverse when the engine is not running.
- Your outboard has three gear shift positions to provide operation: Forward (F), Neutral (N), and Reverse (R).
- When shifting, always stop at neutral position and allow the engine speed to return to idle.
- Always shift outboard into gear with a quick motion.

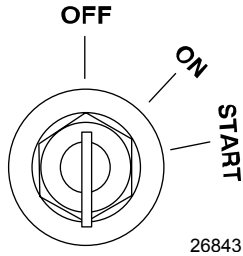
OPERATION

- After shifting outboard 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

Outboard Care

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

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

SELECTING REPLACEMENT PARTS FOR YOUR OUTBOARD

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

EPA Emissions Regulations

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

MAINTENANCE

EMISSION CERTIFICATION LABEL

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

The diagram shows a rectangular label for a Mercury engine. The label is divided into several sections. At the top left is the 'MERCURY' logo. To its right is the heading 'EMISSION CONTROL INFORMATION'. Below the logo, the text reads: 'THIS ENGINE CONFORMS TO [] CALIFORNIA AND U.S. EPA EMISSION REGULATIONS FOR SPARK IGNITION MARINE ENGINES'. Below this is: 'REFER TO OWNERS MANUAL FOR REQUIRED MAINTENANCE, SPECIFICATIONS, AND ADJUSTMENTS'. The label is then divided into two columns. The left column contains: 'IDLE SPEED (in gear): []', '[] hp', '[] L', '[] kw', and a date field with a box for the month and a box for the year. The right column contains: 'FAMILY: []', 'HC+NOx:FEL: [] g/kWh', 'CO FEL: [] g/kWh', 'SPARK PLUG: []', 'GAP: []', and 'LOW PERM/HIGH PERM: []'. Red circles with letters 'a' through 'j' are placed around the label, with arrows pointing to specific fields: 'a' points to the idle speed box, 'b' to the hp box, 'c' to the L box, 'd' to the kw box, 'e' to the date field, 'f' to the family box, 'g' to the HC+NOx:FEL box, 'h' to the CO FEL box, 'i' to the spark plug box, and 'j' to the low perm/high perm box. The number '43210' is printed at the bottom right of the label.

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

43210

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

OWNER RESPONSIBILITY

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

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

Inspection and Maintenance Schedule

BEFORE EACH USE

- Check engine oil level. See **Fuel and Oil - Checking and Adding Engine Oil**.

MAINTENANCE

- Check that lanyard stop switch stops the engine.
- 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

- Visually inspect the fuel system for deterioration or leaks.
- Check steering system for binding or loose components.
- Check propeller blades for damage.

AFTER EACH USE

- Flush out the outboard cooling system if operating in salt, polluted, or muddy water. See **Flushing the Cooling System**.
- Wash off all salt deposits and flush out the exhaust outlet of the propeller and gearcase with fresh water if operating in saltwater.
- If operating in saltwater, inspect the powerhead and powerhead components for salt buildup. See **Cleaning Care for the Powerhead (Saltwater Use)**.

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

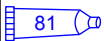
- Change engine oil and replace the oil filter. The oil should be changed more often when the engine is operated under adverse conditions, such as extended trolling. See **Changing Engine Oil**.

MAINTENANCE

- Inspect the thermostat visually for corrosion or a broken spring. Ensure the thermostat closes completely at room temperature.¹.
- Check low-pressure fuel filter for contaminants. Replace filter if required. See **Fuel System**.
- 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

- Check corrosion control anodes. Check more frequently when used in saltwater. See **Corrosion Control Anode**.
- Drain and replace gearcase lubricant. See **Gearcase Lubrication**.
- Inspect battery. See **Battery Inspection**.
- In saltwater usage, remove spark plugs and apply a thin coating of Anti-Seize Compound only on the threads of the spark plugs. Reinstall spark plugs. See **Spark Plug Inspection and Replacement**.

Tube Ref No.	Description	Where Used	Part No.
 81	Anti-Seize Compound	Spark plug threads	92-898101385

- Check wiring and connectors.
- Check tightness of bolts, nuts, and other fasteners.
- Check cowl seals to ensure seals are intact and not damaged.
- Check internal cowl sound reduction foam (if equipped) to ensure foam is intact and not damaged.
- Check that the intake silencer (if equipped) is in place.

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

MAINTENANCE

- 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 300 HOURS OF USE OR THREE YEARS

- Check power trim fluid. See **Checking Power Trim Fluid**.
- Replace water pump impeller (more often if overheating occurs or reduced water pressure is noted).¹.
- Lubricate the splines on the upper driveshaft.¹.
- Replace alternator drive belt. See **Alternator Drive Belt Inspection**.¹.

BEFORE PERIODS OF STORAGE

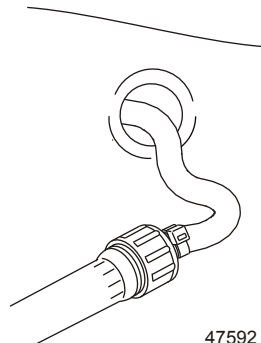
- See **Storage** section.

Flushing the Cooling System

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

NOTE: *The outboard can be tilted or in the vertical operating position during flushing.*

1. With the engine turned off, place the outboard in either the operating position (vertical) or in a tilted position.
2. Remove the flush connector from the bottom cowl.
3. Remove the cover from the flush connector and thread a water hose into the flush connector.



MAINTENANCE

4. Turn on the water tap ($\frac{1}{2}$ maximum) and let the water flush through the cooling system for about 15 minutes.
5. When flushing is complete, turn off the water and disconnect the water hose.
6. Install the cover on the flush connector. Place the flush connector back into the bottom cowl.

Top Cowl Removal and Installation

REMOVAL

Unlock the top cowl by pulling out on the rear cowl latch. Lift the top cowl off the engine.



47632

INSTALLATION

1. Lower the top cowl over the engine.

MAINTENANCE

2. Bring the front of the cowl down first and engage the front cowl hook. Lower the cowl into the seated position and apply pressure to the back of the cowl to lock it in place. Ensure the cowl is securely fastened by trying to pull up on the back of the cowl.



Cleaning Care for Top and Bottom Cowls

IMPORTANT: Dry wiping (wiping the plastic surface when it is dry) will result in minor surface scratches. Always wet the surface before cleaning. Do not use detergents containing hydrochloric acid. Follow the cleaning and waxing procedure.

CLEANING AND WAXING PROCEDURE

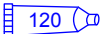
1. Before washing, rinse the cowls with clean water to remove dirt and dust that may scratch the surface.
2. Wash the cowls with clean water and a mild nonabrasive soap. Use a soft clean cloth when washing.
3. Dry thoroughly with a soft clean cloth.
4. Wax the surface using a nonabrasive automotive polish (polish designed for clear coat finishes). Remove the applied wax by hand using a clean soft cloth.
5. To remove minor scratches, use Mercury Marine Cowl Finishing Compound (92-859026K 1).

MAINTENANCE

Cleaning Care for the Powerhead (Saltwater Use)

If the outboard is operated in saltwater, remove the top cowl and flywheel cover. Inspect the powerhead and powerhead components for salt buildup. Wash off any salt buildup from the powerhead and powerhead components with fresh water. Keep water spray out of the air filter/intake and alternator. After washing, allow the powerhead and components to dry. Apply Quicksilver or Mercury Precision Lubricants Corrosion Guard spray on the external metal surfaces of the powerhead and powerhead components. Do not allow the Corrosion Guard spray to come in contact with the alternator drive belt or belt pulleys.

IMPORTANT: Do not allow lubricant or Corrosion Guard spray to come in contact with the alternator drive belt or the belt pulleys. The alternator drive belt could slip and be damaged if it becomes coated with any lubricant or Corrosion Guard spray.

Tube Ref No.	Description	Where Used	Part No.
 120	Corrosion Guard	External metal surfaces of the powerhead and powerhead components.	92-802878 55

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

Fuel System

WARNING

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

IMPORTANT: Use an approved container to collect and store fuel. Wipe up spilled fuel immediately. Material used to contain spilled fuel must be disposed of in an approved receptacle.

Before servicing any part of the fuel system:

1. Stop engine and disconnect the battery.
2. Perform fuel system service in a well-ventilated area.
3. Inspect any completed service work for sign of fuel leakage.

FUEL LINE INSPECTION

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

LOW-PRESSURE FUEL FILTER

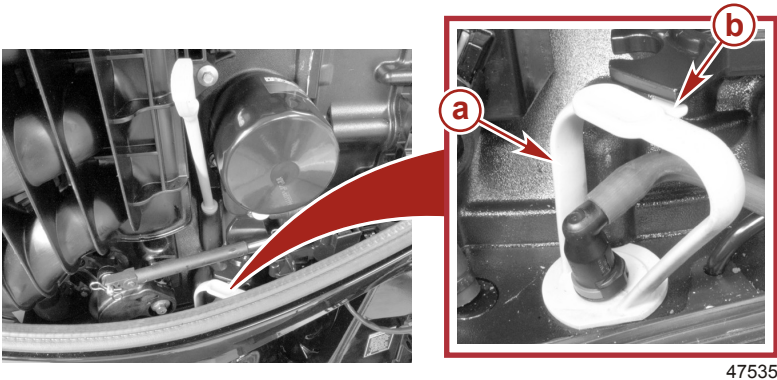
The low-pressure filter can be serviced as a general maintenance item, however, the high-pressure filter is under high pressure and should only be serviced by an authorized dealer.

Removal

1. Turn the ignition key switch to the "OFF" position.

MAINTENANCE

2. Move the lift handle so that the locking tab clears the bracket.

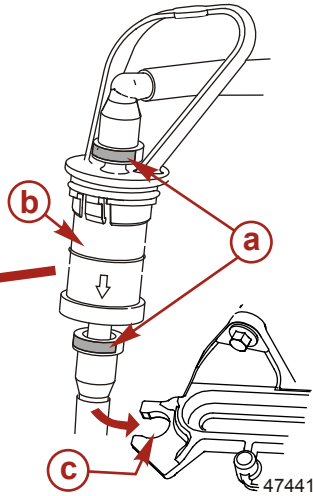
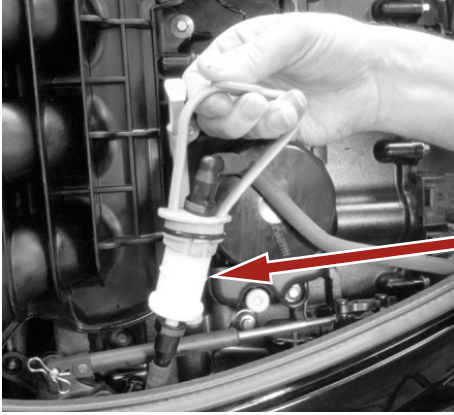


47535

- a** - Lift handle
 - b** - Locking tab secured under bracket
3. Use the lift handle and pull the fuel filter out of its opening. If necessary, move the fuel hose so that it clears the bracket while lifting the fuel filter.
 4. Push in on the fuel hose release tabs and disconnect the fuel hoses from the fuel filter.
 5. Place the lower hose into the hose holder to prevent it from dropping into the filter hole.

MAINTENANCE

6. Remove the fuel filter from the lift handle.



- a** - Fuel hose release tab
- b** - Low-pressure fuel filter
- c** - Hose holder

Installation

1. Place the lift handle onto the fuel filter. Install the new fuel filter so the arrow points towards the engine.
2. Connect the fuel hoses to the fuel filter securely with the locking hose connections.
3. Visually inspect for fuel leakage from the fuel filter while turning the ignition key to the "RUN" position, forcing fuel into the fuel filter. Repair any fuel leaks if necessary.
4. Install the fuel filter back into the opening. Position the lift handle so that the locking tab is secured under the bracket.

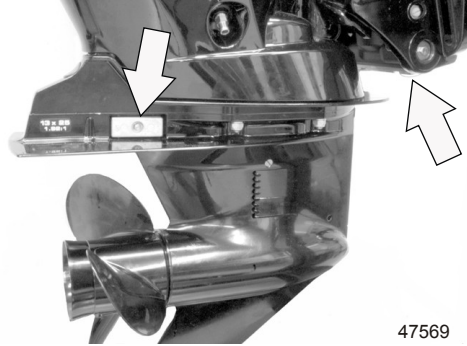
Corrosion Control Anode

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

MAINTENANCE

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

Two anodes are located on each side of the gearcase. Another anode is installed on the bottom of the transom bracket assembly.



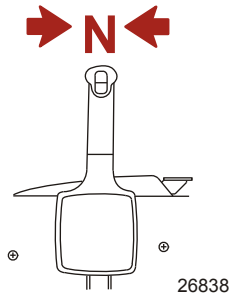
Propeller Replacement

WARNING

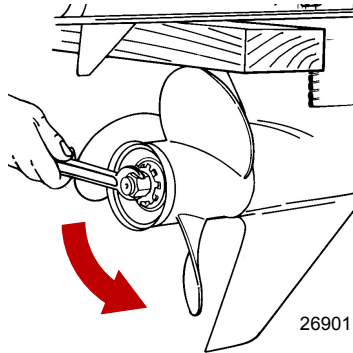
Rotating propellers can cause serious injury or death. Never operate the boat out of the water with a propeller installed. Before installing or removing a propeller, place the drive unit in neutral and engage the lanyard stop switch to prevent the engine from starting. Place a block of wood between the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

MAINTENANCE

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



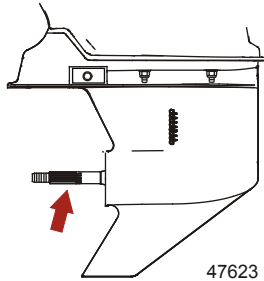
2. Straighten the bent tabs on the propeller nut retainer.
3. Place a block of wood between the gearcase and the propeller to hold the propeller and remove the propeller nut.





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

MAINTENANCE

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



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

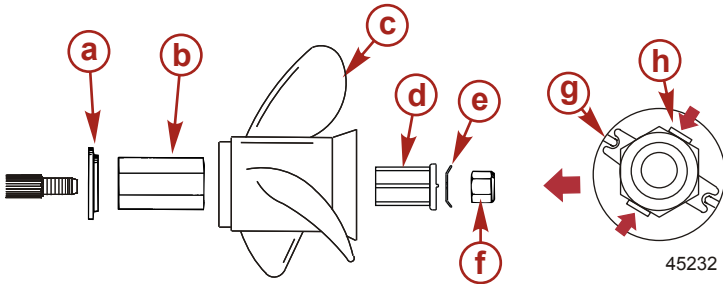
IMPORTANT: To prevent the propeller hub from corroding and seizing to the propeller shaft, especially in saltwater, always apply a coat of the recommended lubricant to the entire propeller shaft at the recommended maintenance intervals and also each time the propeller is removed.

FLO-TORQ II PROPELLERS

1. Install the propeller onto the shaft with the supplied components as shown.
2. Place the locknut retainer over the raised pins on the drive sleeve adapter and tighten the locknut to the specified torque.

MAINTENANCE

3. Secure the locknut by bending the tabs up against the locknuts.



- a** - Forward thrust washer
- b** - Drive sleeve
- c** - Propeller
- d** - Drive sleeve adapter
- e** - Locknut retainer
- f** - Locknut
- g** - Raised pins
- h** - Tabs bent against the locknut

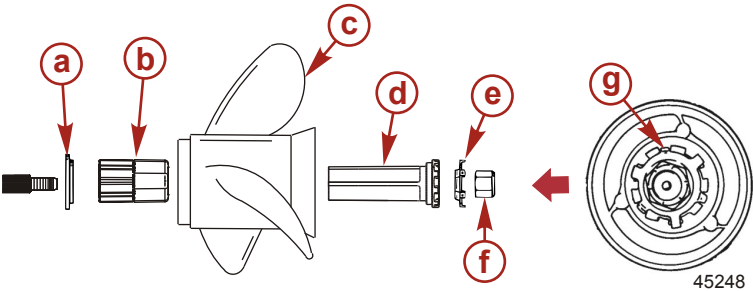
Description	Nm	lb-in.	lb-ft
Propeller nut	75		55

FLO-TORQ IV PROPELLERS

1. Install the propeller onto the shaft with the supplied components as shown.
2. Tighten the locknut to the specified torque.

MAINTENANCE

3. Secure the locknut by bending three of the tabs into the grooves in the drive sleeve adapter.



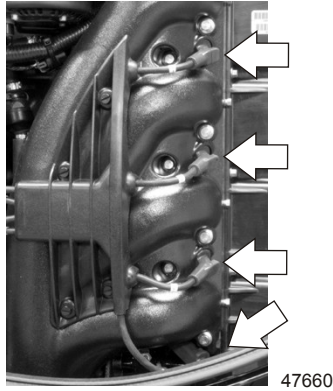
- a** - Forward thrust washer
- b** - Drive sleeve
- c** - Propeller
- d** - Drive sleeve adapter
- e** - Locknut retainer
- f** - Locknut
- g** - Tabs bent into grooves

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

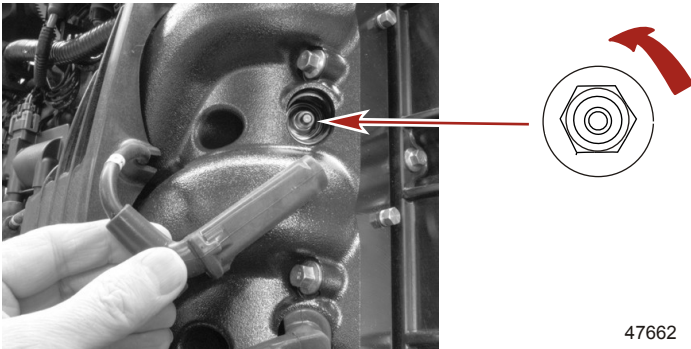
MAINTENANCE

Spark Plug Inspection and Replacement

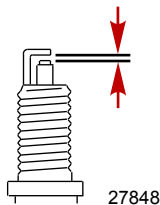
1. Remove the spark plug leads. Pull the rubber boots off the spark plugs.



2. Remove the spark plugs to inspect. Replace spark plug if electrode is worn, threads of seal area are corroded, or the insulator is rough, cracked, broken, blistered, or fouled.



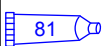
3. Set the spark plug gap to specifications.



MAINTENANCE

Spark Plug	
Spark plug gap	0.8 mm (0.032 in.)

4. Saltwater use - Apply a thin coating of Anti-Seize Compound only on threads of spark plugs.

Tube Ref No.	Description	Where Used	Part No.
 81	Anti-Seize Compound	Spark plug threads	92-898101385

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

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

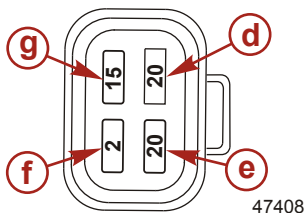
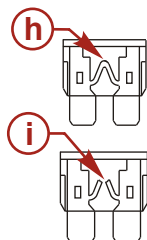
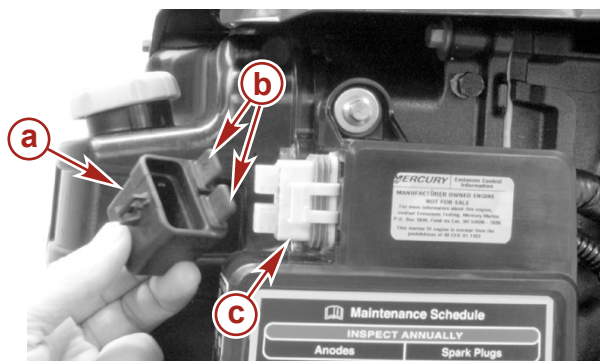
Fuse Replacement

IMPORTANT: Always carry spare fuses.

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

MAINTENANCE

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

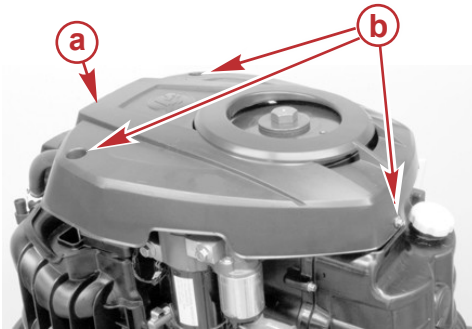


- a** - Cover
- b** - Spare fuse holders
- c** - Fuse holder
- d** - Fuse 4 - IGN. 20 amp - ignition system
- e** - Fuse 2 - FUEL 20 amp - fuel delivery
- f** - Fuse 1 - DIAG. 2 amp - diagnostics/vessel (accessory) harness
- g** - Fuse 3 - HELM 15 amp - 14 pin remote control harness/ cowl trim switch
- h** - Good fuse
- i** - Blown fuse

MAINTENANCE

Alternator Drive Belt Inspection

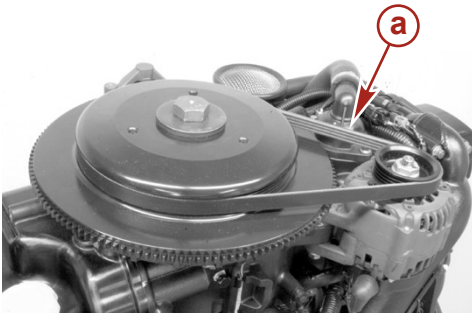
1. Remove the three screws that fastens the flywheel cover to the engine. Lift the flywheel cover off the engine.



47585

- a** - Flywheel cover
b - Screws (3)

2. Inspect the alternator drive belt.



47588

- a** - Alternator drive belt


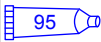
3. Have the belt replaced by an authorized dealer if any of the following conditions are found:
 - Cracks in the back of the belt or in the base of the V grooves.
 - Excessive wear at the roots of the grooves.
 - Rubber portion swollen by oil.
 - Belt surfaces roughened.
 - Signs of wear on edges or outer surfaces of belt.
4. Install the flywheel cover with three screws. Tighten the screws to the specified torque.

MAINTENANCE

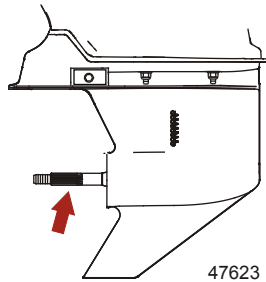
Description	Nm	lb-in.	lb-ft
Flywheel cover screws	8	71	

Lubrication Points

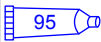

- Lubricate the following with Quicksilver or Mercury Precision Lubricants Anti-Corrosion Grease or 2-4-C with PTFE.

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

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

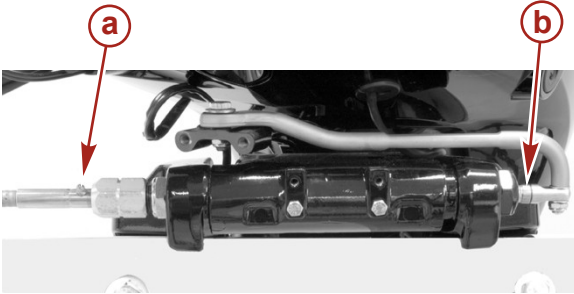


- Lubricate the following with Quicksilver or Mercury Precision Lubricants 2-4-C with PTFE or Special Lubricant 101.

Tube Ref No.	Description	Where Used	Part No.
 95	2-4-C with PTFE	Steering cable	92-802859A 1
 34	Special Lubricant 101	Steering cable	92-802865Q02

MAINTENANCE

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



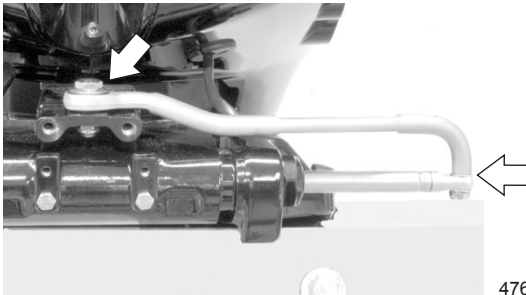
47651

- a** - Fitting
- b** - Steering cable end

⚠ 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.

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

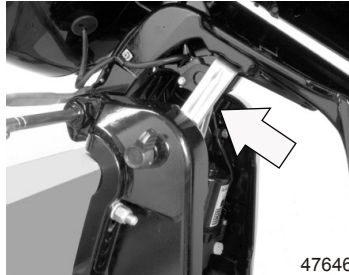


47652


MAINTENANCE

Checking Power Trim Fluid

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



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

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



Changing Engine Oil

ENGINE OIL CAPACITY

Engine oil capacity is approximately 6 liter (6.3 US qt).

MAINTENANCE

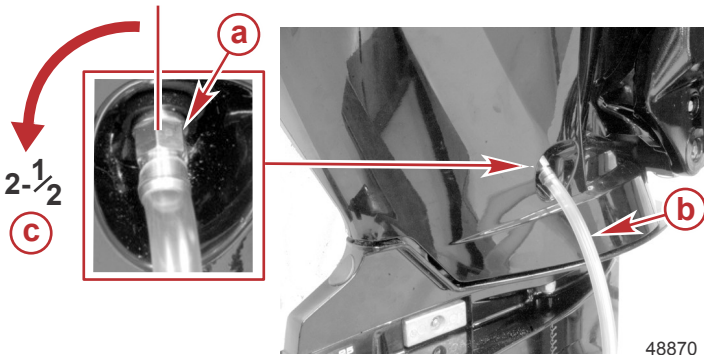
IMPORTANT: Tilt the outboard out/up past vertical for approximately one minute to allow any trapped oil to drain back to the oil sump.

OIL CHANGING PROCEDURE

1. Tilt the outboard out/up past vertical for approximately one minute to allow any trapped oil to drain back to the oil sump.
2. Tilt the outboard to a vertical position.
3. Use a 16 mm (5/8 in.) wrench and loosen the oil drain valve so that it can be turned by hand. Be careful not to open the valve too far allowing oil to drain.
4. Attach a 12 mm (7/16 in.) I.D. drain hose to the oil drain valve. Position the opposite end of the hose into an appropriate container.
5. Loosen the oil drain valve 2-1/2 turns to allow oil to drain. Do not exceed 2-1/2 turns.

IMPORTANT: Do not loosen the oil drain valve more than 2-1/2 turns out. The oil seal could get damaged beyond 2-1/2 turns.

6. After the oil has drained, hand-tighten the oil drain valve (clockwise) and remove the oil drain hose.
7. Tighten the oil drain valve securely and clean any oil from the valve area.

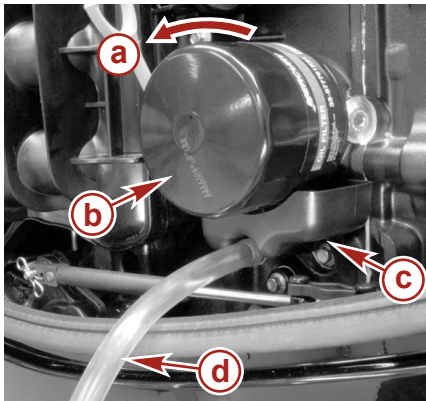


- a** - Oil drain valve
- b** - Drain hose
- c** - Loosen 2-1/2 turns maximum

MAINTENANCE

CHANGING OIL FILTER

1. Remove the plug from the oil trough and attach a 12 mm (7/16 in.) I.D. drain hose to the fitting. Position the opposite end of the hose into an appropriate container.
2. Unscrew the old filter by turning the filter to the left.
3. Allow oil in the trough to drain and remove the oil drain hose.
4. Clean any oil from the oil trough and install the plug.
5. Clean the oil filter mounting base. Apply a film of clean oil to the filter gasket. Do not use grease. Screw new filter on until gasket contacts base, then tighten 3/4 to 1 turn.



47562

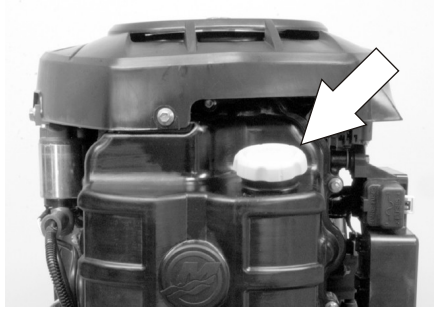
- a - Loosen
- b - Oil filter
- c - Oil trough
- d - Drain hose

OIL FILLING

1. Remove the oil fill cap and add approximately 6 liters (6.3 US qt) of the recommended oil. This will bring the oil level within the midpoint of the operating range.
2. Idle engine for five minutes and check for leaks. Stop the engine. For an accurate oil level reading, allow the engine to cool for at least an hour before checking the oil level. Refer to **Fuel and Oil - Checking and Adding Engine Oil**.

MAINTENANCE

NOTE: *Checking the oil level within five minutes of engine shutdown can falsely read up to 1 liter (1 US qt) low. Allow the engine to cool for at least an hour before checking the oil level.*



47404

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.

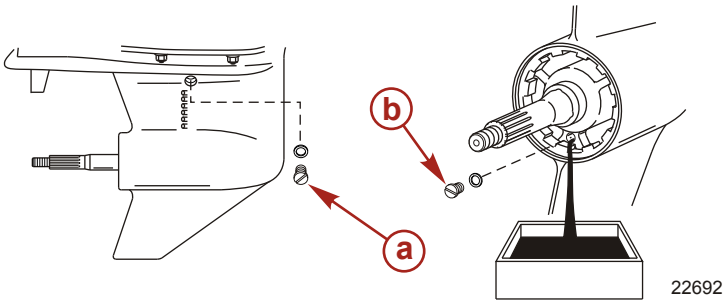
Examine the drained gearcase lubricant for metal particles. A small amount of metal particles indicates normal gear wear. An excessive amount of metal filings or larger particles (chips) may indicate abnormal gear wear and should be checked by an authorized dealer.

DRAINING GEARCASE

1. Place outboard in a vertical operating position.
2. Remove propeller. Refer to **Propeller Replacement**.
3. Place drain pan below outboard.

MAINTENANCE

4. Remove vent plug and fill/drain plug and drain lubricant.



a - Vent plug

b - Fill/drain plug

GEARCASE LUBRICANT CAPACITY

Gearcase Lubricant Capacity (approximate)	
Right-hand rotation gearcase	780 ml (26.4 fl oz)
Left-hand rotation gearcase	545 ml (18.4 fl oz)

GEARCASE LUBRICANT RECOMMENDATION

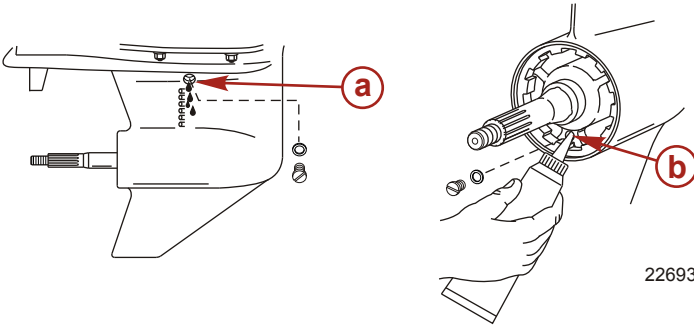
Mercury or Quicksilver High Performance Gear Lubricant.

CHECKING LUBRICANT LEVEL AND REFILLING GEARCASE

1. Place outboard in a vertical operating position.
2. Remove vent plug/sealing washer.

MAINTENANCE

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.

IMPORTANT: This outboard is equipped with a closed fuel system when the engine is not running. With this closed system, fuel within the engine's fuel system, other than the fuel tank, will remain stable during normal storage periods without the addition of fuel treatment stabilizers.

Fill the fuel tank and engine fuel system with treated (stabilized) fuel to help prevent formation of varnish and gum. Proceed with the following instructions.


- **Portable fuel tank** - Pour the required amount of Fuel System Treatment and Stabilizer (follow instructions on container) into fuel tank. Tip fuel tank back and forth to mix stabilizer with the fuel.
- **Permanently installed fuel tank** - Pour the required amount of Fuel System Treatment and Stabilizer (follow instructions on container) into a separate container and mix with approximately one liter (one quart) of gasoline. Pour this mixture into fuel tank.

STORAGE

Tube Ref No.	Description	Where Used	Part No.
 124	Fuel System Treatment and Stabilizer	Fuel tank	92-8M0047932

Protecting External Outboard Components

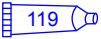
- Touch up any paint nicks. See your dealer for touch-up paint.
- Spray Quicksilver or Mercury Precision Lubricants Corrosion Guard on external metal surfaces (except corrosion control anodes).

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

Protecting Internal Engine Components

IMPORTANT: Refer to Maintenance - Spark Plug Inspection and Replacement for correct procedure for removing spark plugs.

- Change the engine oil and filter.
- Remove the spark plugs.
- Spray approximately 30 ml (1 fl oz) of Storage Seal Rust Inhibitor into each spark plug hole.

Tube Ref No.	Description	Where Used	Part No.
 119	Storage Seal Rust Inhibitor	Spark plug holes	92-858081K03

- Actuate key/push button start switch to crank the engine through one start cycle, which will distribute the storage seal throughout the cylinders.
- Install the spark plugs.

Gearcase

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

STORAGE

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

- Lanyard stop switch not in "RUN" position.
- Blown 15 amp fuse. Check 14 pin remote control harness/cowl trim switch/main power relay fuse. Refer to **Maintenance** section.
- 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

- Incorrect starting procedure. Refer to **Operation** section.
- Old or contaminated gasoline.
- Fuel is not reaching the engine.
 - Fuel tank is empty.
 - Fuel tank vent not open or restricted.
 - Fuel line is disconnected or kinked.
 - Fuel filter is obstructed. Refer to **Maintenance** section.
 - Fuel pump failure.
 - Fuel tank filter obstructed.
- Ignition system component failure.
- Spark plugs fouled or defective. Refer to **Maintenance** section.

Engine Runs Erratically

POSSIBLE CAUSES

- Overheating - Warning horn not working.
- Low oil pressure. Check oil level.
- Spark plugs fouled or defective. Refer to **Maintenance** section.

TROUBLESHOOTING

- 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 anti-siphon valve located on permanently built-in type fuel tanks.
 - d. Fuel line is kinked or pinched.
- Fuel pump failure.
- Ignition system component failure.

Performance Loss

POSSIBLE CAUSES

- Overheating - Warning horn not working.
- Low oil pressure. Check oil level.
- Throttle not opening fully.
- Damaged propeller or improper propeller size.
- Incorrect engine timing, adjustment, or setup.
- Boat overloaded or load improperly distributed.
- Excessive water in bilge.
- Boat bottom is dirty or damaged.

Battery Will Not Hold Charge

POSSIBLE CAUSES

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

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	

OUTBOARD INSTALLATION

Important Information

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

NOTE: Do not install an accessory electric fuel pump or a fuel line primer bulb into the fuel system of this engine.

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

OUTBOARD INSTALLATION

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.

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 System

ACCESSORY ELECTRIC FUEL PUMP/FUEL LINE PRIMER BULB

IMPORTANT: Do not install an accessory electric fuel pump or a fuel line primer bulb into the fuel system of this engine.

AVOIDING FUEL FLOW RESTRICTION

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

LOW PERMEATION FUEL HOSE REQUIREMENT

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

OUTBOARD INSTALLATION

- 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.

EPA PRESSURIZED PORTABLE FUEL TANK REQUIREMENTS

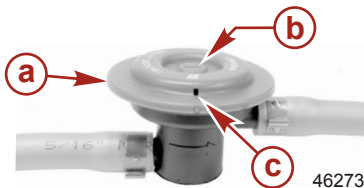
The Environmental Protection Agency (EPA) will require portable fuel systems that are produced after January 1, 2011 for use with outboard engines to remain fully sealed (pressurized) up to 34.4 kPa (5.0 psi). These tanks may contain the following:

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

FUEL DEMAND VALVE (FDV) REQUIREMENT

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

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



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

OUTBOARD INSTALLATION

FUEL TANKS

Portable Fuel Tank

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

Permanent Fuel Tank

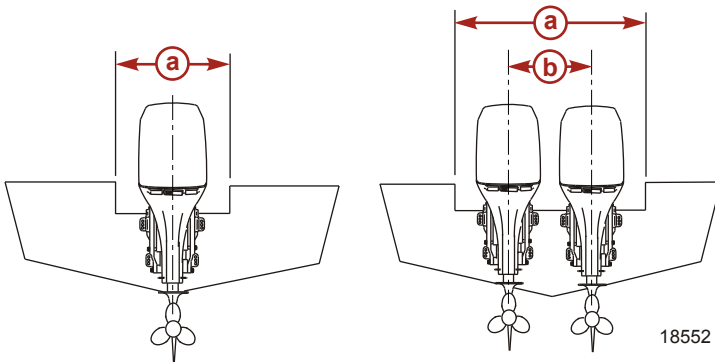
Permanent fuel tanks should be installed in accordance with industry and federal safety standards, which include recommendations applicable to grounding, anti-siphon protection, ventilation, etc.

FILLING THE FUEL SYSTEM

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:

NOTE: Turn the ignition key switch to the "ON" position for approximately five seconds. Turn the key to the "START" position and release it, the engine will crank for a maximum of eight seconds. The engine may start, run rough, and stall while filling the system. Repeat this start keyup procedure until the engine remains running. Allow the starter motor to cool for 20–30 seconds in-between start attempts.

Installation Specifications



a - Minimum transom opening

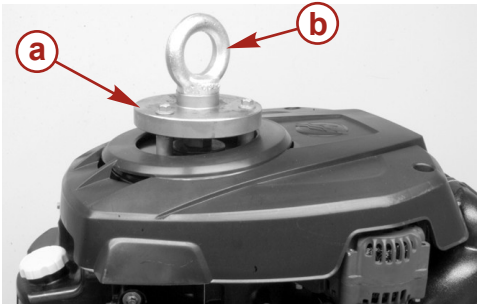
b - Engine centerline for dual engine - 66.0 cm (26 in.)

OUTBOARD INSTALLATION

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

Lifting Outboard


1. Remove the top cowl.
2. Install the lifting base to the flywheel using three bolts. Tighten the bolts securely.
3. Thread the lifting eye into the lifting base.
4. Connect a hoist that has a minimum lift capacity of 450 kg (1000 lb) to the lifting eye.
5. Lift the outboard and place it on the transom.



47706

a - Lifting base

b - Lifting eye

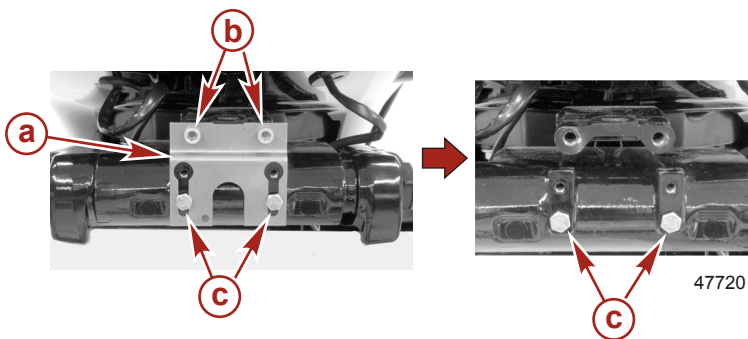
Flywheel Puller/Lifting Ring	91-895343T02
 14869	Removes flywheel from engine. Used for lifting powerhead/engine.

Shipping Bracket Removal

1. Remove the two top screws and loosen the two bottom screws.
2. Slide the shipping bracket off the bottom screws.

OUTBOARD INSTALLATION

3. Retighten the bottom screws to the specified torque.

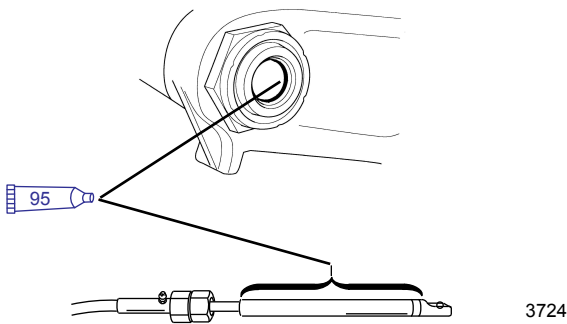


- a** - Shipping bracket
- b** - Top screws
- c** - Bottom screws

Description	Nm	lb-in.	lb-ft
Bottom screws	7.9	70	

Steering Cable - Starboard Side Routed Cable

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

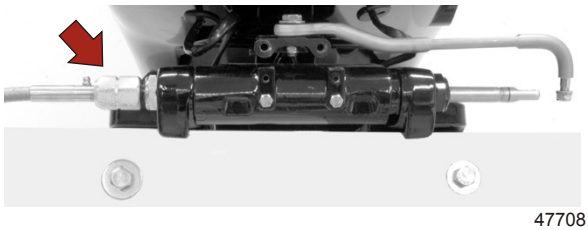


Tube Ref No.	Description	Where Used	Part No.
95	2-4-C with PTFE	O-ring seal and entire cable end	92-802859A 1

2. Insert steering cable into tilt tube.

OUTBOARD INSTALLATION

3. Tighten the nut to the specified torque.



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

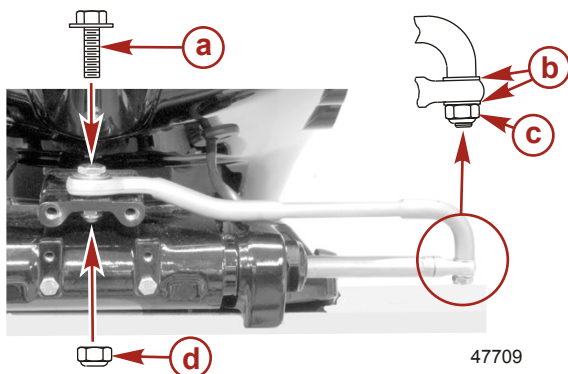
Steering Link Rod Fasteners (if equipped)

IMPORTANT: The steering link rod that connects the steering cable to the engine must be fastened using a special washer head bolt ("a" - Part Number 10-856680) and self-locking nylon insert locknuts ("c" and "d" - Part Number 11-826709113). These locknuts must never be replaced with common nuts (nonlocking) as they will work loose and vibrate off, freeing the link rod to disengage.

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.



- a** - Special washer head bolt (10-856680)
- b** - Flat washers
- c** - Nylon insert locknut (11-826709113)
- d** - Nylon insert locknut (11-826709113)

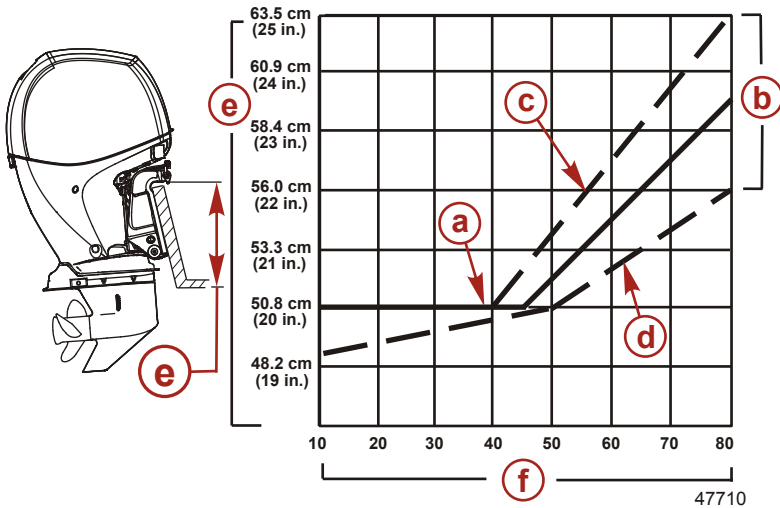
Description	Nm	lb-in.	lb-ft
Special washer head bolt	27		20
Nylon insert locknut "d"	27		20
Nylon insert locknut "c"	Tighten until it seats, then back off 1/4 turn		

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

Assemble steering link rod to engine with special washer head bolt and locknut. First torque special washer head bolt, then torque locknut to specifications.

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.

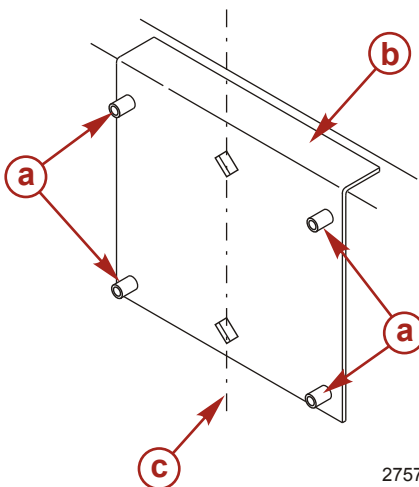
Increasing the mounting height will usually:

- 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.

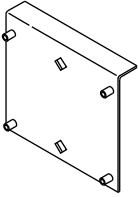
1. Mark four mounting holes on the transom using the transom drilling fixture.



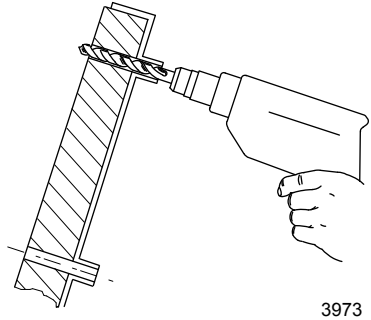
- a** - Drill guide holes
- b** - Transom drilling fixture
- c** - Transom centerline

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	½-20 x 4.50 in. long (2.25 in. thread)
11-826711-17	Nylon insert locknut	½-20
12-28421	Flat washer	1-1/2 in. diameter
12-54012	Flat washer	7/8 in. diameter

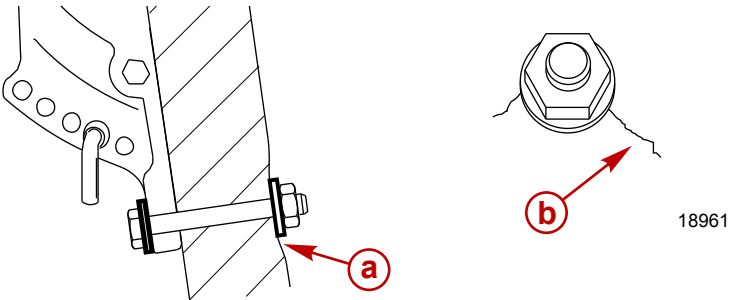
Available Outboard Mounting Bolts	
Part Number	Description
10-67755005	½-20 x 2.50 in. long (1.25 in. thread)
10-67755006	½-20 x 3.50 in. long (1.25 in. thread)
10-814259	½-20 x 4.00 in. long (2.25 in. thread)
10-67755-1	½-20 x 4.50 in. long (2.25 in. thread)

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

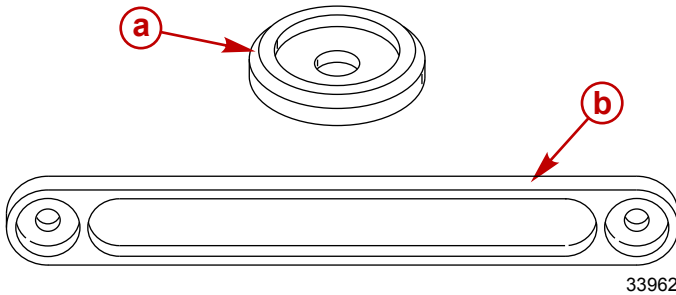
IMPORTANT: Determine the strength of the boat transom. The outboard mounting locknuts and bolts should be able to hold 75 Nm (55 lb-ft) of torque without the boat transom yielding or cracking. If the boat transom yields or cracks under this torque, the construction of the transom may not be adequate.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



33962

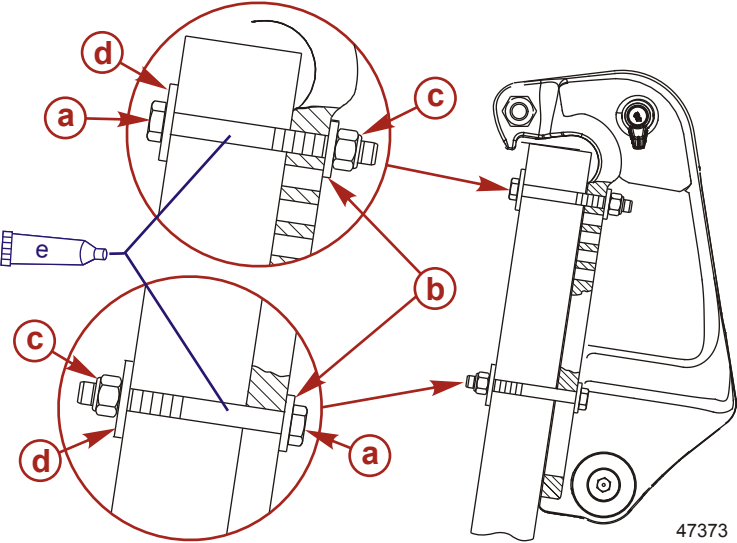
- a** - Large transom washer
- b** - Transom reinforcement plate

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, Fuel Hose, and Control Cables

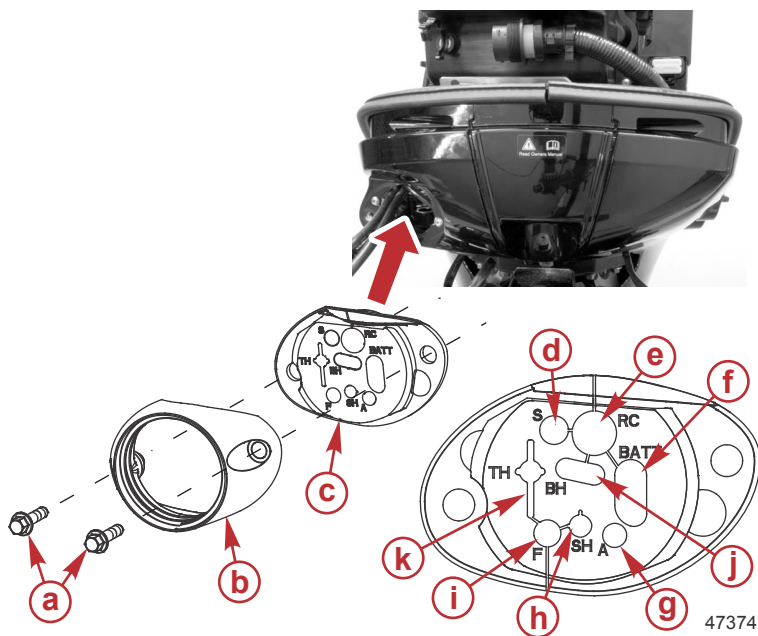
RIGGING GROMMET

Installation

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

OUTBOARD INSTALLATION

1. Route the hoses, wiring, and cables through the rigging adapter and correct opening in the rigging grommet as shown.



- a** - Screw (2)
- b** - Rigging adapter
- c** - Rigging grommet
- d** - Speedometer tube opening
- e** - Remote 14 pin boat harness opening
- f** - Battery cable opening
- g** - Accessory harness opening
- h** - Shift cable opening
- i** - Fuel hose opening
- j** - SmartCraft harness or additional harness opening
- k** - Throttle cable opening

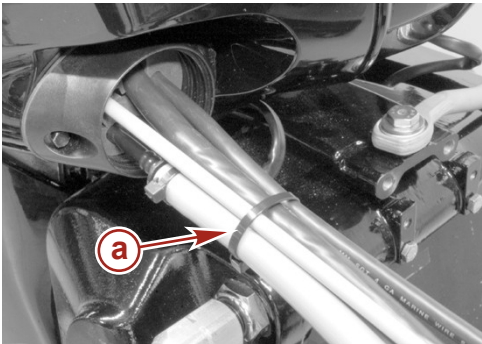
2. Fasten the rigging grommet and rigging adapter with two screws. Tighten the screws to the specified torque.

OUTBOARD INSTALLATION

3. Hold the wiring, hoses, and cables together with a cable tie.

NOTICE

Inspect the position of the hose clamp located on the fuel hose to ensure that it will not chafe or cut into the adjacent wiring harnesses.



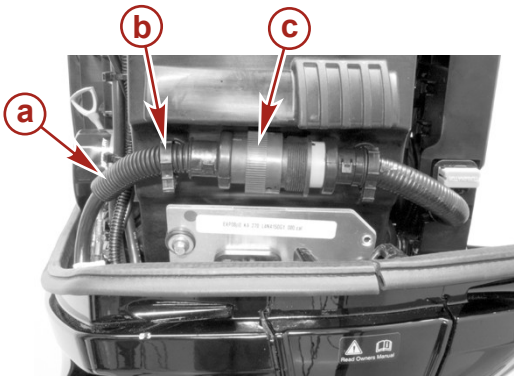
a - Cable tie

47753

Description	Nm	lb-in.	lb-ft
Screws for attaching the rigging adapter	6	53	

REMOTE WIRING HARNESS

Route the remote 14 pin boat harness through the rigging grommet. Connect the remote harness to the 14 pin connector on the engine harness. Fasten the harness with the retainer.



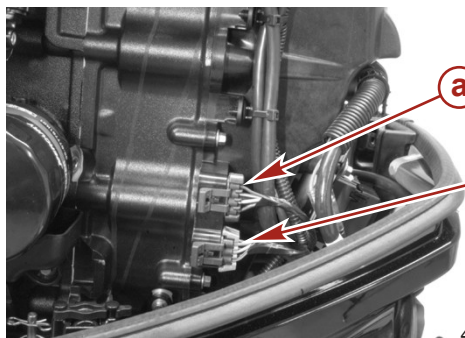
a - Remote 14 pin boat harness
b - Retainer
c - 14 pin connector

47717

OUTBOARD INSTALLATION

SMARTCRAFT HARNESS AND VESSEL HARNESS CONNECTION

If the boat is equipped with a SmartCraft and/or vessel (accessory) harness, route the wiring harness through the rigging grommet and connect it to the connector on the engine.

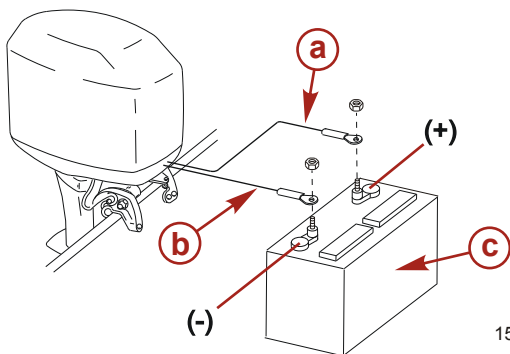


- a** - Vessel (accessory) harness connector
- b** - SmartCraft harness connector

- 47723

BATTERY CABLE CONNECTIONS

Single Outboard



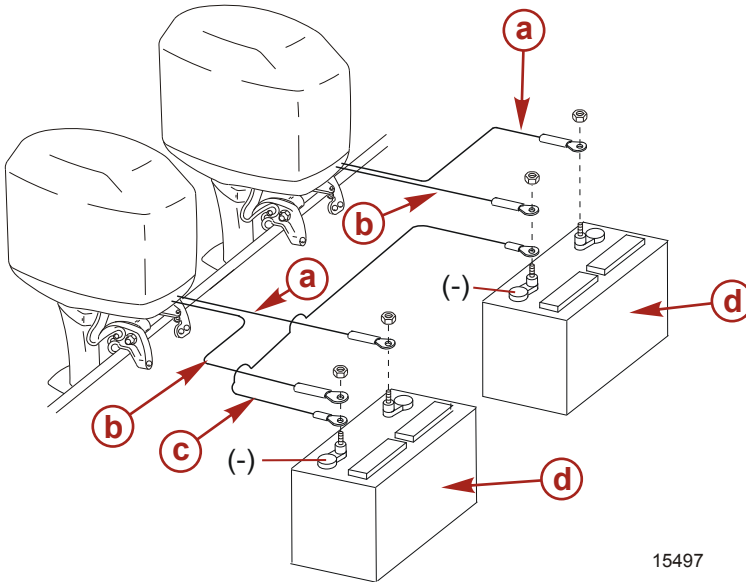
- a** - Red sleeve - Positive (+)
- b** - Black sleeve - Negative (-)
- c** - Cranking battery

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

FUEL HOSE CONNECTION

Fasten the remote fuel hose to fitting with a hose clamp. Position the hose clamp so that it will not chafe or cut into an adjacent wiring harness.

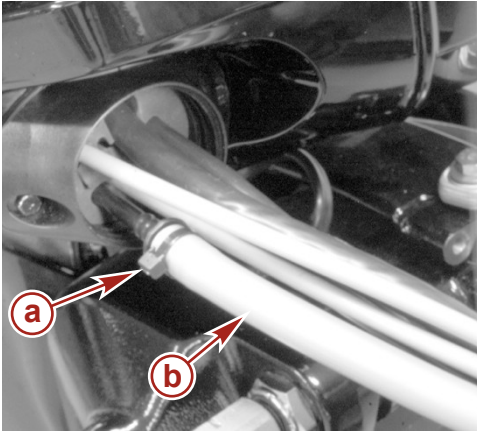
NOTICE

Inspect the position of the hose clamp to ensure that it will not chafe or cut into the adjacent wiring harnesses.

OUTBOARD INSTALLATION

Fuel Hose Size

Minimum fuel hose inside diameter (ID) is 9.5 mm (3/8 in.) with separate fuel hose/fuel tank pickup for each engine.



- a** - Hose clamp
- b** - Remote fuel hose

47751

SHIFT CABLE INSTALLATION

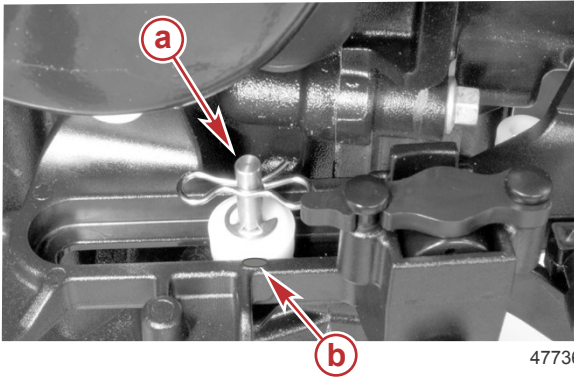
Install cables into the remote control following the instructions provided with the remote control.

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

1. Position the remote control and outboard into neutral position.

OUTBOARD INSTALLATION

2. Center the shift cable anchor pin with the neutral detent alignment mark.

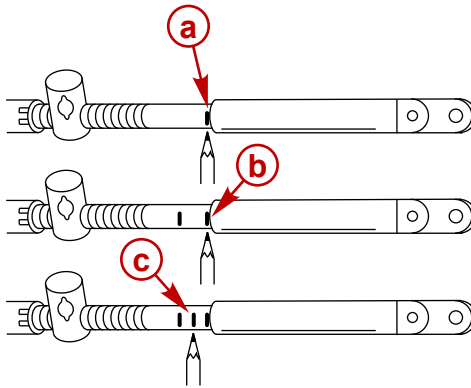


- a** - Shift cable anchor pin
- b** - Neutral detent alignment mark

3. Locate the center point of the slack or lost motion that exists in the shift cable as follows:
 - a. Move the remote control handle from neutral into forward and advance the handle to full speed position. Slowly return the handle back to the neutral position. Place a mark "a" on the cable against the cable end guide.
 - b. Move the remote control handle from neutral into reverse and advance the handle to full speed position. Slowly return the handle back to the neutral position. Place a mark "b" on the cable against the cable end guide.

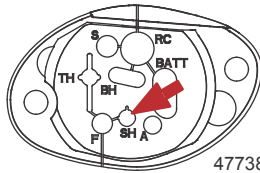
OUTBOARD INSTALLATION

- c. Make a center mark "c," midway between marks "a" and "b." Align the cable end guide against this center mark when installing the cable to the engine.



6098

4. Fit the shift cable through the rigging grommet.

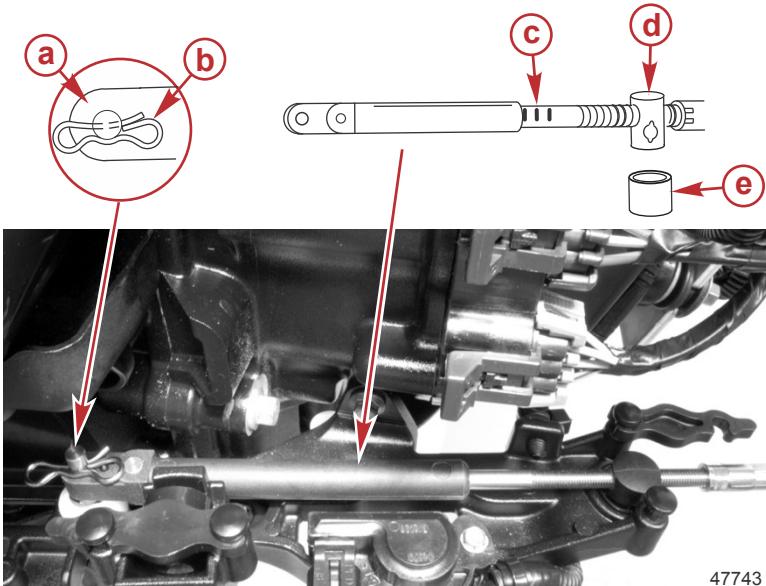


47738

5. Position the remote control into neutral.
6. Place the barrel cup into the barrel pocket.
7. Align the shift cable end guide with the center mark made in step 3. Place the shift cable on the anchor pin. Adjust cable barrel so it slips freely into the barrel cup.

OUTBOARD INSTALLATION

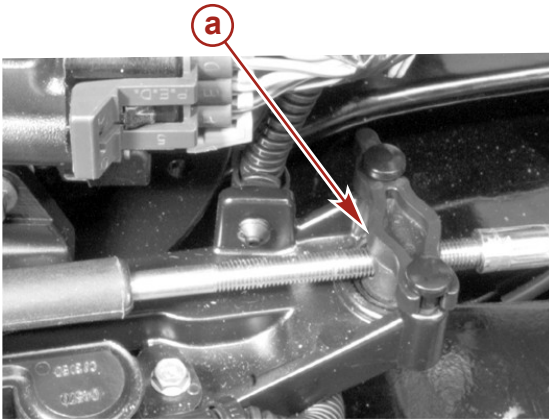
8. Secure the shift cable to the anchor pin with the bow tie clip retainer.



- a** - Shift cable end guide
- b** - Bow tie clip retainer
- c** - Center mark
- d** - Cable barrel
- e** - Barrel cup

OUTBOARD INSTALLATION

9. Lock the barrel in place with the cable latch.



47744

a - Cable latch

10. Check shift cable adjustments as follows:

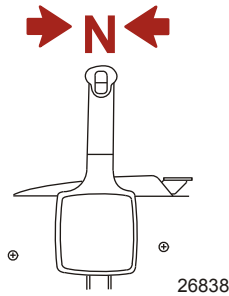
- a. Shift remote control into forward. The propeller shaft should be locked in gear. If not, adjust the barrel closer to the cable end.
- b. Shift remote control into neutral. The propeller shaft should turn freely without drag. If not, adjust the barrel away from the cable end. Repeat steps a and b.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

THROTTLE CABLE INSTALLATION

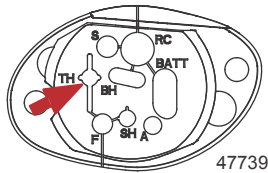
Install cables into the remote control following the instructions provided with the remote control.

OUTBOARD INSTALLATION

1. Shift remote control into the neutral (N) position.



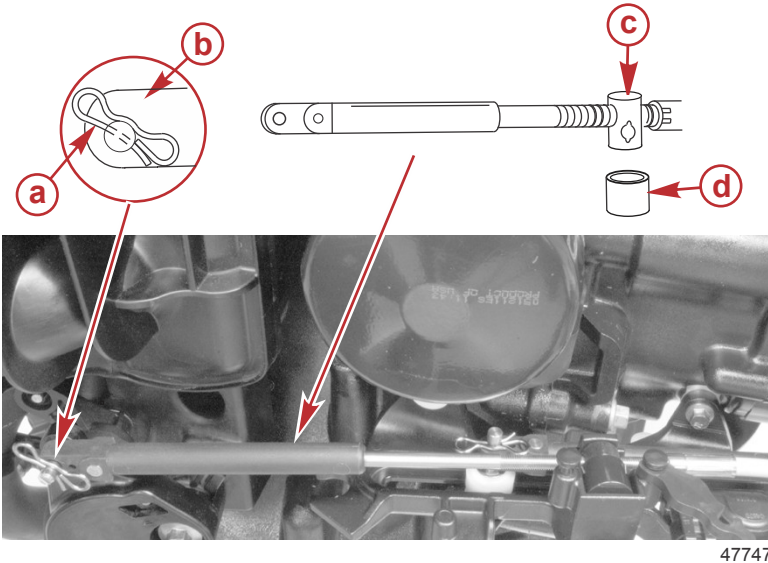
2. Fit the throttle cable through the rigging grommet.



3. Install the throttle cable to the throttle arm with the bow tie clip retainer.
4. Adjust the cable barrel so that the installed throttle cable will hold the throttle arm against the idle stop.

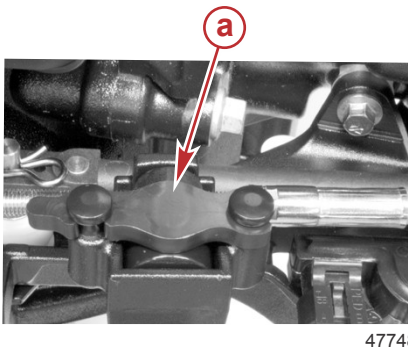
OUTBOARD INSTALLATION

5. Place the barrel cup onto the barrel. Place the cable barrel and barrel cup into the barrel retainer.



- a** - Bow tie retainer
- b** - Throttle cable end guide
- c** - Cable barrel
- d** - Barrel cup

6. Lock the cable in place with the cable latch.



- a** - Cable latch

MAINTENANCE LOG

Maintenance Log

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

[illegible]