



MERCURY[®]

8M0109637 316 eng



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3.0L Diesel Spark Ignition

Declaration of Conformity - DSI Outboard, Not RCD Compliant

The outboard engines covered by this Declaration of Conformity are not intended for installation on recreational craft in the European Union. These engines do not conform to the exhaust and noise emission requirements of the Recreational Craft Directive.

This outboard motor manufactured by Mercury Racing complies with the requirements of the following directives and standards, as amended:

Name of engine manufacturer: Mercury Racing
Address: N7480 County Road UU
Town: Fond du Lac, WI Post Code: 54937-9385 Country: USA

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

Safety of Machinery Directive 2006/42/EC

Principles of safety integration (1.1.2)	EN ISO 12100:2010
Noise (1.5.8)	ICOMIA 39/94
Vibration (1.5.9)	ICOMIA 38/94

Electromagnetic compatibility Directive 2014/30/EU

Generic emission standard	EN 61000-6-3
Generic emission standard	EN 61000-6-1
Vehicles, boats and internal combustion engine driven devices - Radio disturbance characteristics	SAE J551 CISPR 12; EN 55012:2007/ A1:2009

Engine type	Outboard
Fuel type	Diesel
Combustion cycle	2-Stroke, spark-ignited, direct injection

This declaration is issued under the sole responsibility of Mercury Marine and Brunswick Marine in EMEA Inc.

Name / function:

John Pfeifer, President,
Mercury Marine

**Date and place of issue:**

March 03, 2016
Mercury Marine, Fond du Lac, WI USA
European Regulations Contact:
Regulations and Product Safety Department,
Mercury Marine, Fond du Lac, WI USA

Welcome

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

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

This manual contains specific instructions for using and maintaining your product. We recommend that this manual remain with the product for ready reference whenever you are on the water.

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

Mercury Marine

Warranty Message

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

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

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WARRANTY INFORMATION

Warranty Registration United States and Canada

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

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

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

For Mercury Marine's Privacy Policy, visit <http://www.mercurymarine.com/privacy-policy/>

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

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

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

OUTSIDE UNITED STATES AND CANADA

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

Transfer of Warranty United States and Canada

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

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

WARRANTY INFORMATION

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

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.

Products Sold to Government Agencies

Contact the Mercury Racing Sales Department for a copy of the Government Agencies Warranty Packet Kit, which explains the conditions required for government agencies to receive warranty when purchasing Mercury Racing Outboard or Sterndrive product.

Mercury Racing Sales Department
N7480 County Road UU
Fond du Lac, WI 54937-9385
920-921-5330
Fax 920-921-6533

Mercury Racing Division Two Year Limited Government Warranty United States and Canada

WHAT IS COVERED: Mercury Marine warrants its new products and refurbished products sold under the term of Pacemaker, to be free of defects in material and workmanship during the period described below.

DURATION OF WARRANTY COVERAGE FOR GOVERNMENT USE: The limited warranty provides coverage for two (2) years from either the date the product is first sold to an authorized government agency, 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.

WARRANTY INFORMATION

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

WHAT MERCURY WILL DO: Mercury Marine'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 Marine product. Mercury Marine reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

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

WHAT IS NOT COVERED: This limited warranty does not cover routine maintenance items, tune-ups, adjustments, normal wear and tear, and faded paint.

This limited warranty also does not cover damage caused by any of the following:

- Abuse
- Abnormal use
- Use of a propeller or gear ratio that does not allow the engine to run in its recommended RPM range. Refer to the Operation and Maintenance Manual.
- Operation of the product in a manner inconsistent with the recommended operation and duty cycle. Refer to the Operation and Maintenance Manual.

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- 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 that was not manufactured or sold by Mercury Marine and that damages the Mercury product
- Operation with fuels, oils, or lubricants that are not suitable for use with the product. Refer to the Operation and Maintenance Manual.
- Alteration or removal of parts
- Water entering the engine through the fuel intake, air intake, or exhaust system
- 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/drive trimmed out too far
- Expenses related to haul-out, launch, towing, storage, telephone, rental, inconvenience, slip fees, insurance coverage, loan payments, loss of time, loss of income, tournament fees, club fees, prize money, or any other type of incidental or consequential damages.
- Expenses associated with the removal and/or replacement of boat partitions or material caused by boat design for access to the product

WHAT WILL VOID THE WARRANTY: Use of the product for racing or other competitive activity, at any point, even by a prior owner of the product, voids the 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.

TERMINATION OF COVERAGE: Warranty coverage is terminated for used product obtained in any of the following ways:

- Repossession from a retail customer
- Purchase at an auction
- Purchase from a salvage yard
- Purchase from an insurance company that obtained the product as a result of an insurance claim

WARRANTY INFORMATION

DISCLAIMERS AND LIMITATIONS:

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

Warranty Coverage and Exclusions for Mercury Racing Outboard Products

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 Mercury Racing Division Three Year Limited Warranty Against Corrosion Failure, the Mercury Racing Division One and Two Year Limited Warranties.

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 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.

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 or EFI settings, filters, belts, controls, and checking lubrication made in connection with normal services.
2. Damage caused by lack of maintenance.
3. Haul-out, launch, towing charges, and all related transportation charges and/or travel time, etc.
4. Additional service work requested by customer other than that necessary to satisfy the warranty obligation.

WARRANTY INFORMATION

5. Labor performed by other than an authorized dealer may be covered only under 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).
6. Use of other than Mercury Precision or Quicksilver parts when making warranty repairs.
7. 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.
8. Lower unit and/or propeller damage caused by striking a submerged object is considered a marine hazard.
9. Water in the starter motor.
10. Starter motors and/or armatures or field coil assembly, which are burned, or where lead is thrown out of commutator because of excess cranking.
11. Valve or valve seat grinding required because of wear.

3 Year Limited Warranty Against Corrosion

WHAT IS COVERED: Mercury Marine warrants that each new Mercury, Mariner, Mercury Racing Outboards, 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 Marine'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 Marine product. Mercury Marine reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

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

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

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

WARRANTY INFORMATION

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

DISCLAIMERS AND LIMITATIONS:

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

U.S. EPA Emissions Limited Warranty

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

Emission Control System Components

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

COMPONENTS OF THE EMISSIONS CONTROL SYSTEM:

1. Fuel metering system
 - a. Carburetor and internal parts (and/or pressure regulator or fuel injection system)
 - b. Cold start enrichment system
 - c. Intake valves
2. Air induction system
 - a. Intake manifold
 - b. Turbocharger or supercharger systems (where applicable)
3. Ignition system
 - a. Spark plugs
 - b. Magneto or electronic ignition system

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- c. Spark advance/retard system
- d. Ignition coil and/or control module
- e. Ignition wires
- 4. Lubrication system (4-Stroke engines excluded)
 - a. Oil pump and internal parts
 - b. Oil injectors
 - c. Oil meter
- 5. Exhaust system
 - a. Exhaust manifold
 - b. Exhaust valves
- 6. Miscellaneous items used in above systems
 - a. Hoses, clamps, fittings, tubing, sealing gaskets or devices, and mounting hardware
 - b. Pulleys, belts, and idlers
 - c. Vacuum, temperature, check and time sensitive valves and switches
 - d. Electronic controls

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

California Emissions Limited Warranty

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

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

WARRANTY INFORMATION

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.)

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.

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 2015–2016 model year outboard engine. In California, new outboard engines must be designed, built, and equipped to meet the State's stringent antismog 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.

WARRANTY INFORMATION

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 newer outboard engines are warranted for four (4) years, or for 250 hours of use, whichever first occurs. However, warranty coverage based on the hourly period is only permitted for outboard engines and personal watercraft equipped with hour meters as defined in § 2441(a)(13) or their equivalent. If any emission-related part on your engine is defective under warranty, the part will be repaired or replaced by Mercury Marine.

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

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.

GENERAL INFORMATION

Boater's Responsibilities

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

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

Before Operating Your Outboard

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

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

WARNING

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

CAUTION

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

Boat Horsepower Capacity

WARNING

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

GENERAL INFORMATION

Do not overpower or overload your boat. Most boats will carry a required capacity plate indicating the maximum acceptable power and load as determined by the manufacturer following certain federal guidelines. If in doubt, contact your dealer or the boat manufacturer.

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

26777

High-Speed and High-Performance Boat Operation

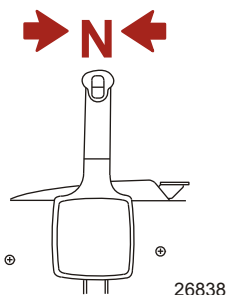
If your outboard is to be used on a high-speed or high-performance boat with which you are unfamiliar, we recommend that you do not operate it at its high speed capability without first requesting an initial orientation and familiarization demonstration ride with your dealer or an operator experienced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

Outboard Remote Control Models

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

▲ WARNING

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



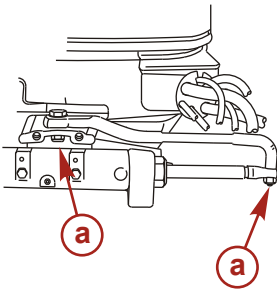
GENERAL INFORMATION

Remote Steering Notice

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

⚠ WARNING

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



a - Self-locking nuts

27740

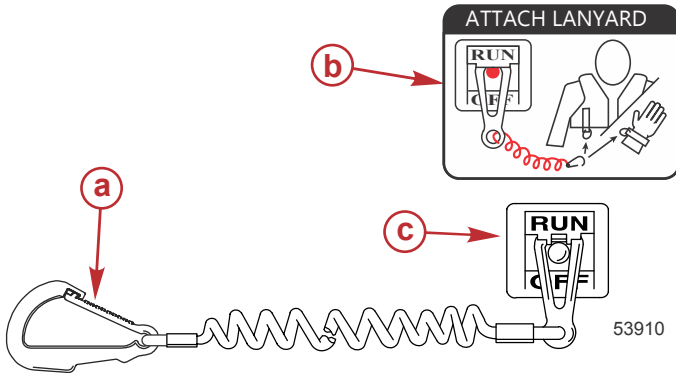
Lanyard Stop Switch

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

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

GENERAL INFORMATION

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



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

Read the following Safety Information before proceeding.

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

GENERAL INFORMATION

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

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

⚠ WARNING

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

⚠ WARNING

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

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

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

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

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

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

GENERAL INFORMATION

Protecting People in the Water

WHILE YOU ARE CRUISING

It is very difficult for a person in the water to take quick action to avoid a boat heading in their direction, even at slow speeds.



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

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

WHILE BOAT IS STATIONARY

▲ WARNING

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

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

Exhaust Emissions

BE ALERT TO CARBON MONOXIDE POISONING

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

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

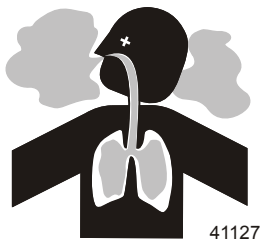
GENERAL INFORMATION

⚠ WARNING

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

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

STAY CLEAR OF EXHAUST AREAS

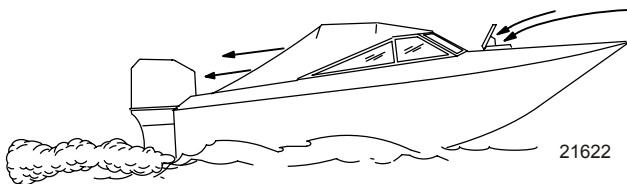


Engine exhaust gases contain harmful carbon monoxide. Avoid areas of concentrated engine exhaust gases. When engines are running, keep swimmers away from the boat, and do not sit, lie, or stand on swim platforms or boarding ladders. While underway, do not allow passengers to be positioned immediately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

GOOD VENTILATION

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

Example of desired air flow through the boat:



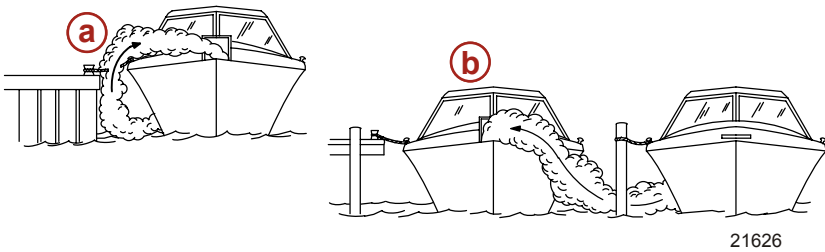
POOR VENTILATION

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.

GENERAL INFORMATION

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



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

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



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

Passenger Safety Message - Pontoon Boats and Deck Boats

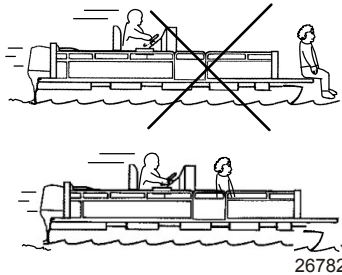
Whenever the boat is in motion, observe the location of all passengers. Do not allow any passengers to stand or use seats other than those designated for traveling faster than idle speed. A sudden reduction in boat speed, such as plunging into a large wave or wake, a sudden throttle reduction, or a sharp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

BOATS HAVING AN OPEN FRONT DECK

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

GENERAL INFORMATION

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



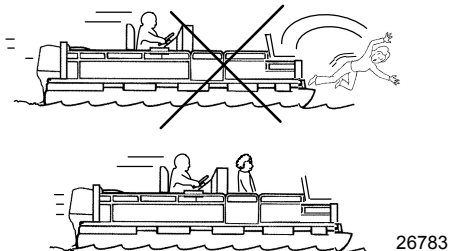
⚠ WARNING

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

BOATS WITH FRONT MOUNTED, RAISED PEDESTAL FISHING SEATS

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

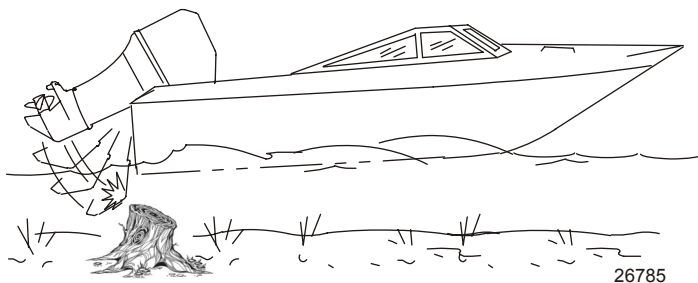
Any unexpected, sudden reduction in boat speed could result in the elevated passenger falling over the front of the boat.



GENERAL INFORMATION

Impact with Underwater Hazards

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



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

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

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

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

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

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

GENERAL INFORMATION

⚠ WARNING

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

Selecting Accessories for Your Outboard

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

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

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

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

Safe Boating Recommendations

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

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

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

Perform safety checks and required maintenance.

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

Check safety equipment onboard.

- Here are some suggestions of the types of safety equipment to carry when boating:
 - Approved fire extinguishers
 - Signal devices: flashlight, rockets or flares, flag, and whistle or horn
 - Tools necessary for minor repairs
 - Anchor and extra anchor line
 - Manual bilge pump and extra drain plugs

GENERAL INFORMATION

- Drinking water
- Radio
- Paddle or oar
- Spare propeller, thrust hubs, and an appropriate wrench
- First aid kit and instructions
- Waterproof storage containers
- Spare operating equipment, batteries, bulbs, and fuses
- Compass and map or chart of the area
- Personal flotation device (one per person onboard)

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

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

Passenger boarding.

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

Use personal flotation devices.

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

Prepare other boat operators.

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

Do not overload your boat.

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

Ensure that everyone in the boat is properly seated.

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

GENERAL INFORMATION

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

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

Know your boating area and avoid hazardous locations.

Be alert.

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

Never drive your boat directly behind a water skier.

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

Watch fallen skiers.

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

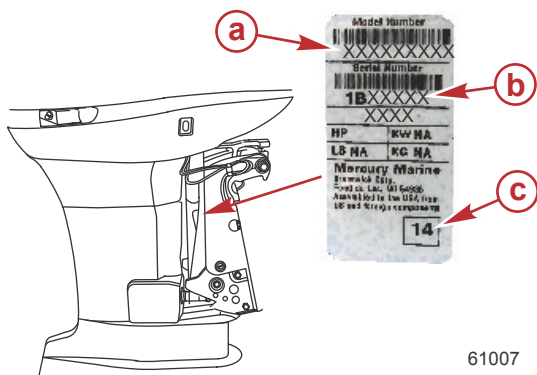
Report accidents.

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

GENERAL INFORMATION

Recording Serial Number

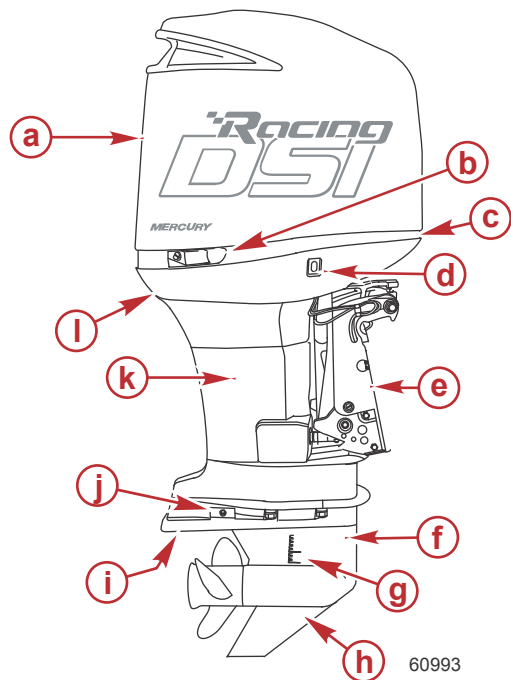
It is important to record this number for future reference. The serial number is located on the outboard as shown.



- a - Model number
- b - Serial number
- c - Year manufactured

61007

Component Identification



- a - Top cowling
- b - Side cowling latches (both sides)
- c - Front cowling latch
- d - Auxiliary tilt switch
- e - Clamp/swivel bracket
- f - Gearcase
- g - Cooling water intake (location dependent on gearcase)
- h - Skeg
- i - Anode
- j - Anode
- k - Driveshaft housing
- l - Water pump indicator

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GENERAL INFORMATION

Specifications

GENERAL INFORMATION

Specifications		
Model		3.0L Diesel Spark Ignition
Cylinder configuration		60° V6
Propshaft horsepower		175
Propshaft kilowatts		130.5
Engine weight	25 in. models	240 kg (528 lb)
Number of cylinders		6
Idle RPM (in gear)		625 (675)
Full throttle RPM range		5250–6000
Neutral rev limit		3000
Overspeed RPM limit		6100
Engine displacement		3032 cc (185.0 cid)
Cylinder bore		92.075 mm (3.6250 in.)
Stroke		76.2 mm (3.00 in.)
Spark plug		NGK IZFR5J (factory installed) Refer to Spark Plug Inspection and Indexing Installation
Spark plug gap		0.762 mm (0.030 in.)
Firing order		1-2-3-4-5-6
Maximum timing		Not adjustable; controlled by ECM
Idle timing		
Fuel pressure		6.55 ± 0.14 bar (655 ± 13.8 kPa [95 ± 2 psi])
Air pressure		7.58 ± 0.14 bar (758 ± 13.8 kPa [110 ± 2 psi])
Gear ratio	Fleet Master	2.08:1
	Standard	2.08:1
Required fuel		Ultra low sulfur diesel (ULSD) 15 ppm maximum
Required engine oil		Mercury Racing Multi Fuel Plus Oil or Oil meeting Mercury Marine Specification 8M0119109-T
Gearcase oil		Mercury Racing Gear Lube

GENERAL INFORMATION

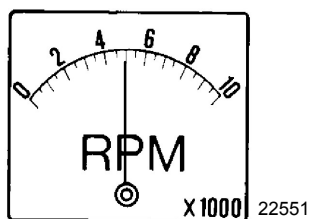
Specifications		
Gearcase capacity	Fleet Master	710 ml (24 fl oz)
	Standard	970 ml (32.8 fl oz)
Battery rating*		AGM 31 series battery 1050 marine cranking amps 105 amp hours
Charging system output		60 A maximum
Starting circuit required voltage		12 V
Emission control system		Electronic engine control (EC)

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

Propeller Selection

Select a propeller that allows the engine to operate in the upper half of the recommended full throttle rpm range with the boat normally loaded (refer to **General Information - Specifications**). This RPM range allows for better acceleration while maintaining maximum boat speed.

If full throttle operation is below the recommended range, the propeller must be changed to prevent loss of performance and possible engine damage. On the other hand, operating an engine above the recommended operating rpm range will cause higher than normal wear and/or damage. Generally, there is a 200-300 RPM change between propeller pitches.



If changing conditions cause the rpm to drop below the recommended range (such as warmer, more humid weather, operation at higher elevations, increased boat load, or a dirty boat bottom/gearcase), a propeller change or cleaning may be required to maintain performance and ensure the outboards durability.

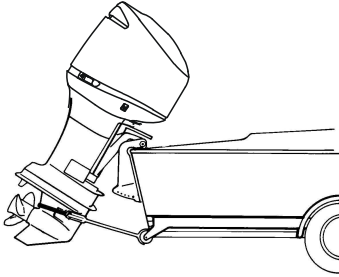
Check full-throttle RPM, using an accurate tachometer, with the engine trimmed out to a balanced-steering condition (steering effort equal in both directions) without causing the propeller to break loose.

TRANSPORTING

Trailing 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.



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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 Requirements

NOTICE

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

Fuel Type	Ultra low sulfur diesel (15 ppm sulfur or less)
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Oil Requirement

Required Engine Oil	Mercury Racing Multi Fuel Plus Oil 9.4 L (2.5 US gal) container 208.2 L (55 US gal) container
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Mercury Racing Multi Fuel Plus Oil is a higher grade oil that provides increased lubrication and extra resistance to carbon buildup when used with varying grades of fuel.

IMPORTANT: Use only Mercury Racing Multi Fuel Plus Oil or oil meeting Mercury Marine Specification 8M0119109-T in this engine. Using any other types of oil will void all warranties. Catastrophic failure will occur if any other oils are used.

Avoiding Fuel Flow Restrictions

NOTICE

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

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 g/m²/24 h with CE 10 fuel at 23 °C as specified in SAE J 1527 - marine fuel hose.

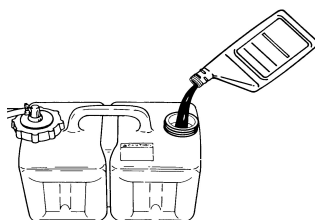
Filling Remote Oil Tank

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

FUEL AND OIL

Required Engine oil	Mercury Racing Multi Fuel Plus Oil or Oil meeting Mercury Marine Specification 8M0119109-T
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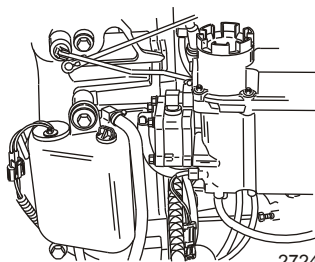
IMPORTANT: Always make sure the oil tank caps are threaded on tight. An air leak will prevent oil flow to the engine.



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Filling Engine Mounted Oil Reservoir Tank

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



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

Filling Fuel Tank

- Fill fuel tanks outdoors away from heat, sparks, and open flames.
- Remove portable fuel tanks from the boat to fill them.
- Always stop engine before filling tanks.

FUEL AND OIL

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

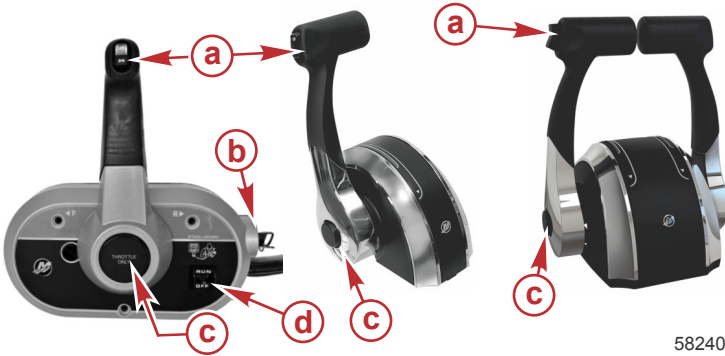
WARNING

This engine requires diesel fuel. Mixing gasoline, gasohol, or alcohol and diesel fuel can cause serious injury or death due to fire or explosion. Never mix gasoline, gasohol, or alcohol with diesel fuel.

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.



58240

- a** - Trim/tilt switch
- b** - Ignition key switch—OFF, ON, START
- c** - Throttle only button
- d** - Lanyard stop switch

- **Trim/tilt switch** - Used to trim the drive during operation or raise the drive for trailering, launching, beaching, or shallow water operation.
- **Throttle only button** - The throttle only button allows throttle advancement without shifting the engine. The throttle only button disengages the shifting mechanism from the control handle. The throttle only button can be pressed and held in only when the remote control handle is in the neutral position. While holding the throttle only button in, move the throttle handle forward to assist in starting the engine.
- **Lanyard stop switch (if equipped)** - The purpose of a lanyard stop switch is to shut down the engine when the operator moves far enough away from the operator's position to activate the switch. A lanyard stop switch can be installed as an accessory, generally on the dashboard or side adjacent to the operator's position.
- **Control handle** - Operation of the shift and throttle is controlled by the movement of the control handle. Push the control handle forward from neutral with a quick firm motion to the first detent for forward gear. Continue pushing forward to increase speed. Pull the control handle back from neutral with a quick firm motion to the first detent for reverse gear. Continue pulling back to increase speed.

IMPORTANT: Forcing the shift mechanism while the engine is not operating can result in product damage.

FEATURES AND CONTROLS

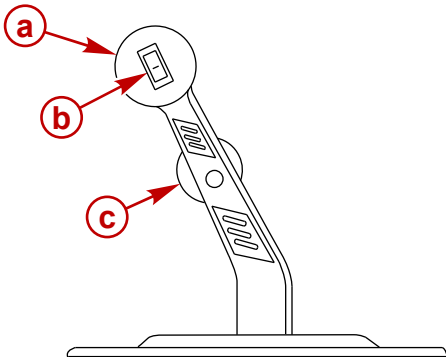
GEAR SHIFTING

IMPORTANT: Observe the following:

- **Never shift the drive into gear unless the engine speed is at idle.**
- **Do not shift the drive into reverse when the engine is not running.**
- Your power package has three gear shift positions to provide operation: forward (F), neutral (N), and reverse (R).
- When shifting, always stop at the neutral position and allow the engine speed to return to idle.
- Always shift into gear with a quick motion.
- After shifting into gear, advance the lever further to increase speed.



Zero Effort Control Features



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

4090

FEATURES AND CONTROLS

Glow Plug Indicator



This engine utilizes glow plugs to aid starting the engine when it is cold. When the key switch is turned to the on position, the glow plug indicator will illuminate, indicating a preheating cycle has started. The preheat cycle usually lasts 2–40 seconds. When the glow plug indicator turns off, the engine can be started. The duration of the preheat cycle depends on the temperature of the cylinder block and cylinder head.

Warning System

WARNING HORN SIGNALS

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

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

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

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

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

FEATURES AND CONTROLS

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

ENGINE GUARDIAN SYSTEM

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

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

OVERSPEED REV LIMIT

The overspeed rev limit is set at an RPM greater than the operating range. In the event that the engine is operated at an RPM greater than or equal to the overspeed limit, the warning horn will engage. If the engine is operated overspeed for more than five seconds, Engine Guardian will engage, reducing the RPM to 5900. The engine throttle RPM must drop below 5900 to disable Engine Guardian and the warning horn. Refer to **Specifications** to determine this engine's RPM limit.

Upon reaching the beginning of the rev limit, Engine Guardian will turn off the ignition to specific cylinders. If the operator does not reduce engine speed, Engine Guardian will turn off the ignition to all the cylinders.

To reset the Engine Guardian protection or warning horn:

1. Reduce the throttle RPM below 5900 for three seconds.
2. Engage the throttle. If the engine does not respond, repeat step one.

SMARTCRAFT PRODUCT

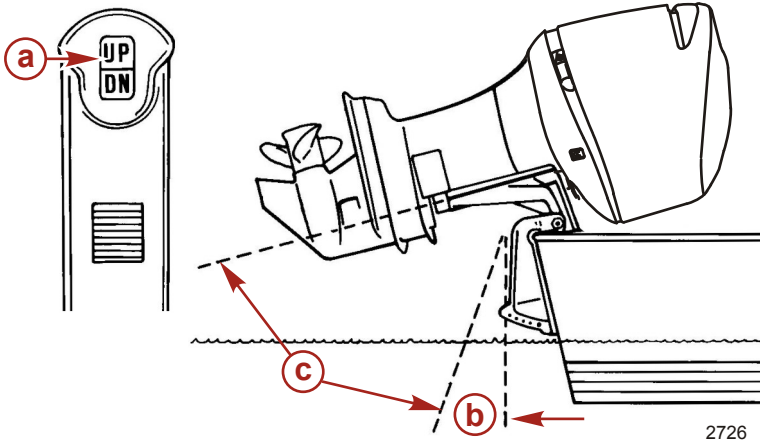
A Mercury SmartCraft System instrument package can be purchased for this outboard. A few of the functions the instrument package will display are engine RPM, coolant temperature, oil pressure, water pressure, battery voltage, fuel consumption, and engine operating hours.

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

NOTE: Outboard position can be adjusted by pressing trim switch. This range is used while operating your boat on plane.



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

- **Pressing (DN):** Moves the outboard in closer to the boat transom, called trimming in or down.
- **Pressing (UP):** Moves the outboard further away from the boat transom, called trimming out or up.
- **The term trim** generally refers to the adjustment of the outboard within the first 20° range of travel.
- **The term tilt** generally refers to adjusting the outboard further up out of the water.

With the engine turned off, the outboard can be tilted out of the water. At low idle speed, the outboard can also be tilted up past the trim range to permit, for example, shallow water operation.

POWER TRIM OPERATION

With most boats, operating around the middle of the trim range will give satisfactory results. Trimming your outboard all the way in or out may improve performance, but cause some potential control hazards.

FEATURES AND CONTROLS

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.

Trimming in or down can:

- Lower the bow of the boat.
- Result in quicker planing off.
- Generally improve the ride in choppy water.
- Increase steering torque or pull to the right (with the normal right-hand rotation propeller).
- In excess, lower the bow to a point at which the boat begins to plow with the bow in the water while on plane. This can result in an unexpected turn in either direction called bow steering or over steering if any turn is attempted, or if a significant wave is encountered.

LIMITING TRIM IN

In rare circumstances, the owner may decide to limit the trim in to avoid unsafe handling or steering conditions at planing speeds.

WARNING

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

WARNING

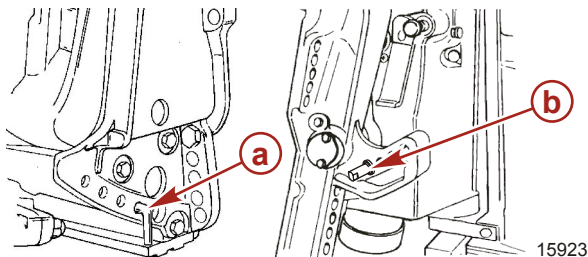
On some boats, increased trim-in range can cause handling problems at high speeds, resulting in personal injury or death. We recommend that only qualified personnel adjust the trim-in limit inserts and test the boat for handling problems.

IMPORTANT: Some boat/engine combinations not using a trim angle adjustment device, or trimmed to the full trim in position, may not exhibit any undesirable or unsafe handling or steering conditions. In these cases, a trim limiting device may not be advantageous to acceleration or planing. Always perform a water test to determine if these characteristics apply to a particular boat/engine combination.

To limit trim in on models with a three-ram trim system, purchase a stainless steel tilt pin from your dealer and insert it in whichever adjustment hole is desired.

FEATURES AND CONTROLS

To limit trim in on models with a single-ram trim system, use the cadmium plated bolt shipped with the engine.



- a** - Stainless steel tilt pin (Three-Ram trim system)
- b** - Bolt shipped with engine (Single-Ram trim system)

Trimming out or up can:

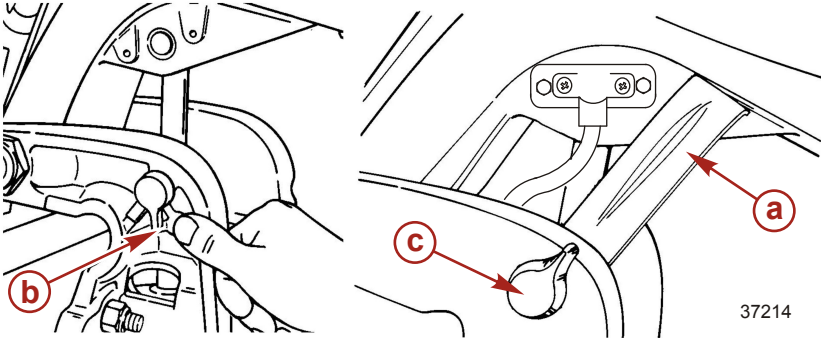
- Lift the bow higher out of the water.
- Generally increase top speed.
- Gain clearance over submerged objects or a shallow bottom.
- Increase steering torque or pull to the left at a normal installation height (with the normal right hand rotation propeller).
- In excess, cause boat porpoising (bouncing)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

POWER TILT OPERATION (THREE-RAM TRIM SYSTEMS)

To tilt the outboard, shut off the engine and press the trim/tilt switch or the auxiliary tilt switch (located on the cowl) to the up position. The outboard tilts up until the switch is released or it reaches the maximum tilt position.

FEATURES AND CONTROLS

1. Engage the tilt support lever by pushing the metal stop and rotating the knob to bring the support lever upward.



- a** - Tilt support lever
- b** - Metal stop
- c** - Knob

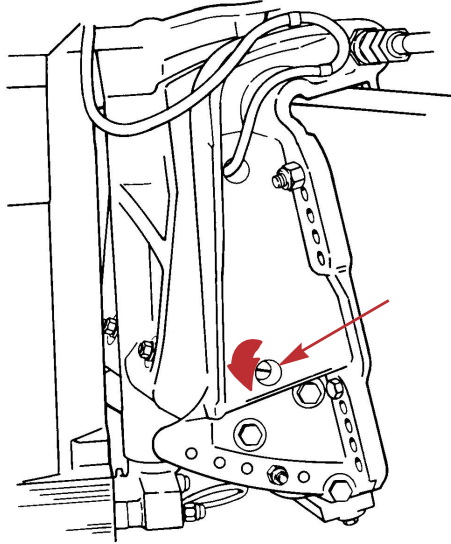
2. Lower the outboard to rest on the tilt support lever.
3. Disengage the tilt support lever by raising the outboard off the support lever and rotating the lever until it locks. Lower the outboard.

MANUAL TILT OPERATION

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

FEATURES AND CONTROLS

1. Turn out the manual tilt release valve three turns (counterclockwise). This allows manual tilting of the outboard.



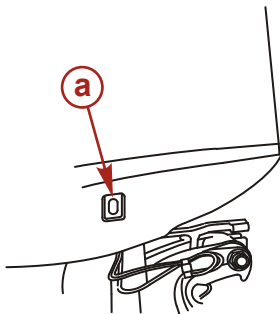
2728

2. Tilt the outboard to the desired position and tighten the manual tilt release valve.

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

AUXILIARY TILT SWITCH

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



a - Auxiliary tilt switch

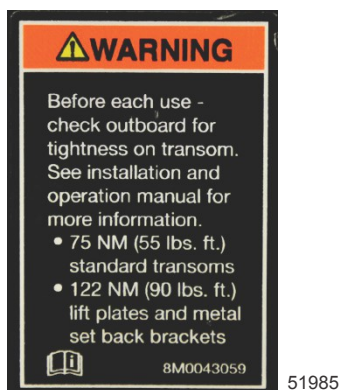
2745

OPERATION

Important Information

IMPORTANT DAILY INSPECTION BEFORE EACH USE

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



Decal on the transom bracket

BEFORE STARTING THE ENGINE

NOTICE

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

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

OIL REQUIREMENT

Required Engine Oil	Mercury Racing Multi Fuel Plus Oil 9.4 L (2.5 US gal) container 208.2 L (55 US gal) container
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Mercury Racing Multi Fuel Plus Oil is a higher grade oil that provides increased lubrication and extra resistance to carbon buildup when used with varying grades of fuel.

IMPORTANT: Use only Mercury Racing Multi Fuel Plus Oil or oil meeting Mercury Marine Specification 8M0119109-T in this engine. Using any other types of oil will void all warranties. Catastrophic failure will occur if any other oils are used.

OPERATION

Engine Break-in

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

Break-in Procedure
Vary throttle settings during break-in. Use the following suggestions.
First Hour
<ul style="list-style-type: none">• Allow the engine to warm-up for three minutes.
<ul style="list-style-type: none">• Do not idle for more than five minutes when warm.
<ul style="list-style-type: none">• Run the engine the majority of the time between 4000–5400 RPM (approximately three-quarter throttle).
<ul style="list-style-type: none">• Short bursts of wide-open throttle for 10 seconds or less are acceptable.
<ul style="list-style-type: none">• Change the engine speed approximately every two minutes.
<ul style="list-style-type: none">• Avoid trimming the outboard out (up) beyond a vertical trim position during operation.
<ul style="list-style-type: none">• Avoid using a hydraulic jack plate to raise the engine during the break-in cycle.
Next Three Hours: Change the engine speed every 10 minutes.

Engine Break-in Fuel Mixture

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

Prestarting Check List

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

Operating in Freezing Temperatures

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

OPERATION

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

Operating in Saltwater or Polluted Water

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

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

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

Operating at High Elevations

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

Effects of Elevation and Weather on Performance

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

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

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

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

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

Compensating for power robbing conditions:

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

OPERATION

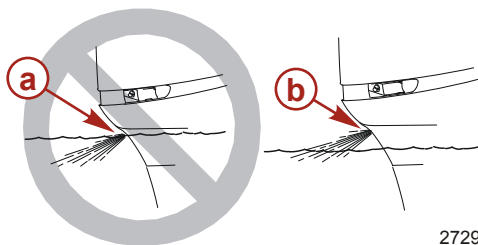
Some boat performance can be improved by dropping to a lower pitch propeller, but engine performance will still remain lower. In some cases, a gear ratio reduction may be more beneficial. To optimize engine performance, prop the engine to allow it to operate at or near the top end of the recommended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

Other advantages to propeller or gear ratio changes:

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

Setting Trim Angle While Running Engine at Idle Speed

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



- a - Relief hole submerged (wrong)
- b - Relief hole above waterline (correct)

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Operating in Shallow Water

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

NOTICE

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

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

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

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

OPERATION

Starting the Engine

NOTICE

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

INITIAL STARTING PROCEDURE

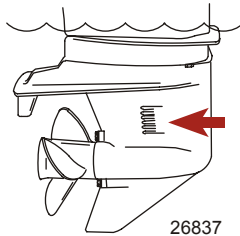
NOTE: For initial start up of a new engine, or for an engine that ran out of fuel or was drained of fuel, the fuel system should be filled according to the following procedure.

1. Squeeze the fuel line primer bulb until it feels firm.
2. Turn the ignition key switch to the on position for three seconds. This operates the electric fuel pump.
3. Turn the ignition key switch back to the off position, and squeeze the primer bulb again until it feels firm. Turn the ignition key switch to the on position again for three seconds. Continue this procedure until the fuel line primer bulb stays firm.

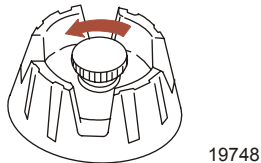
Before starting, read the **Prestarting Check List**.

COLD ENGINE STARTING PROCEDURE

1. Tilt the engine down to a vertical operating position. Verify the cooling water intake holes are submerged.

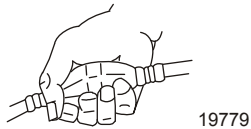


2. Open the fuel tank filler cap vent screw (manual venting fuel tanks).

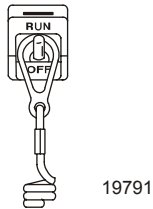


OPERATION

3. Squeeze the fuel line primer bulb several times until it feels firm.



4. Set the lanyard stop switch to the run position. Read the **Lanyard Stop Switch** safety explanation and warning in the **General Information** section.



5. Shift the remote control into the neutral position.



6. Do not advance the neutral fast idle speed feature on the remote control for starting (if equipped).

OPERATION

- Turn the key to the on position. The glow plug indicator should turn on.

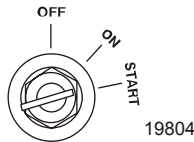


Glow plug indicator

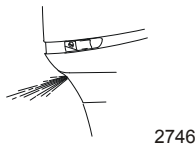
IMPORTANT: Attempting to start the engine before the glow plug indicator turns off, will require longer engine cranking time and may cause the spark plugs to foul.

IMPORTANT: The glow plug indicator duration is engine temperature dependent. A cold engine will require more time before the indicator turns off.

- When the glow plug indicator turns off, turn the ignition key to the start position. Release the key when the engine starts. If the engine fails to start within ten seconds, return the key to the off position. Turn the key to the on position and wait for the glow plug indicator to turn off before attempting to start. If the glow plug indicator does not illuminate, attempt to start the engine.



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



- Allow the engine to reach the operating temperature of 43 °C (110 °F) before shifting into gear.

NOTE: Attempting to accelerate before the engine has reached a sufficient operating temperature will significantly increase the risk of spark plug fouling. The engine may also run rough, similar to running out of fuel.

OPERATION

NOTICE

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

STARTING A WARM ENGINE

Start the engine following the procedure explained previously in **Cold Engine Starting Procedure**. If the engine is near the operating temperature, the engine can be shifted and the RPM increased immediately after starting.

Maximum Idle Duration

When idling an engine that has reached the recommended operating temperature:

- Do not idle continuously for more than 60 minutes.
- Between periods of continuous idle, accelerate the boat on plane to a minimum of 4000 RPM for a minimum of 10 minutes. The spark plugs will reach a self-cleaning temperature, burning the accumulated deposits on the spark plug. Running the engine at higher RPMs will reduce the time required to clean the spark plugs.

Gear Shifting

IMPORTANT: Never shift into gear unless the engine is at idle. Never shift into reverse without the engine running.

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

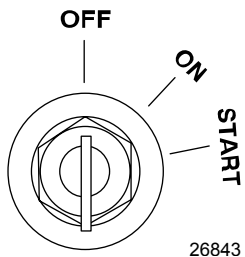


- When shifting, always stop at neutral position and allow the engine speed to return to idle.
- Always shift into gear with a quick motion.
- After shifting into gear, advance the lever further to increase speed.

OPERATION

Stopping the Engine

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



MAINTENANCE

Power Package Care

⚠ WARNING

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

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

Submerged Power Package

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

Replacement Parts for Your Power Package

Mercury recommends using original Mercury Precision replacement parts and lubricants.

Inspection and Maintenance Schedule

PRIOR TO EVERY USE

- Check that the lanyard stop switch stops the engine.
- Check the oil and overheat audio warning system.
- Check the oil level in the reservoir.
- Inspect the fuel system for deterioration or leaks.
- Check the outboard for tightness on the transom.
- Check the steering system for binding or loose components.
- Check the steering link rod fasteners for proper tightness.
- Check the propeller blades for damage.
- Inspect all hoses, clamps, fittings, tubing, sealing gaskets, and mounting hardware for wear.

AFTER EACH SALTWATER OR POLLUTED WATER USE


- Flush all internal passages with fresh water.
- Wash the power package exterior (cowl, midsection, and gearcase) with fresh water.
- Flush the propeller and gearcase exhaust outlet with fresh water.

MAINTENANCE


- Remove the cowl and wipe off any saltwater spray with a damp cloth.

AFTER THE FIRST 20 HOURS OF USE

- Check the water-separating fuel filter for water or contaminants.
- Drain and replace the gearcase lubricant.
- Inspect the battery.
- Check the control cable adjustments.
- Lubricate all lubrication points.
- Check the tightness of all bolts, nuts, and other fasteners.
- Remove the propeller. Clean and lubricate the propeller shaft with Extreme Grease.

Tube Ref No.	Description	Where Used	Part No.
	Extreme Grease	Propeller shaft	8M0071842

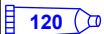
- Tighten the propeller retaining nut to the correct torque specifications. Refer to **Replacing the Propeller**.
- Spray the powerhead and the undercowl components with Corrosion Guard.

Tube Ref No.	Description	Where Used	Part No.
120 	Corrosion Guard	Powerhead	92-802878 55

EVERY 50 HOURS OR ONCE A MONTH, WHICHEVER OCCURS FIRST

- Inspect the front and side cowl latches for tightness. Tighten if necessary.
- Inspect the fuel and oil systems for deterioration or leaks.
- Check the steering link rod fasteners for wear. Check all attachment hardware for proper tightness.
- Inspect the water-separating fuel filter for water or contaminants. Replace if necessary.
- Lubricate all components listed in **Lubrication Points**.
- Lubricate the splines on the propeller shaft.
- Check the level and condition of the gearcase lubricant.
- Inspect the battery.
- Check the corrosion control anodes. Check more frequently when operating in saltwater. Refer to **Corrosion Control Anode**.
- Check the tightness of all bolts, nut, and other fasteners.
- Lubricate the starter motor shaft with a light machine oil or silicone spray. Do not overlubricate.
- Spray the powerhead and all external, unpainted metal surfaces (except anodes) with Corrosion Guard.


MAINTENANCE

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

- Inspect all belts, pulleys, and idler pulleys for deterioration.
- Check the fuel pressure.

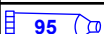
EVERY 100 HOURS OR ONCE A YEAR, WHICHEVER OCCURS FIRST

- Replace the spark plugs.
- Inspect the spark plug leads for damage or deterioration. Replace if necessary.
- Drain and replace the gearcase lubricant.
- Check the power trim fluid.
- Check the control cable adjustments.
- Lubricate the entire length of the driveshaft, the driveshaft splines, and the surface under the water pump impeller with Extreme Grease.

Tube Ref No.	Description	Where Used	Part No.
	Extreme Grease	Driveshaft, driveshaft splines, surface under the water pump impeller	8M0071842


EVERY 300 HOURS OR ONCE A YEAR, WHICHEVER OCCURS FIRST

- Replace the water pump impeller (more often if overheating occurs or reduced water pressure is noted).
- Remove the bearing carrier. Lubricate the bearing carrier and carrier nut with 2-4-C with PTFE if the outboard is used in a saltwater environment. Refer to the service manual for instructions.

Tube Ref No.	Description	Where Used	Part No.
 95	2-4-C with PTFE	Bearing carrier and carrier nut	92-802859A 1

- Clean the entire unit, including accessible powerhead parts. Touch up any paint nicks. Clean and paint corroded areas. If corrosion is severe, try to isolate the cause of corrosion and correct.
- Check the entire outboard for loose, damaged, or missing parts. Tighten or replace as required.
- Inspect the fuel lines for damage or deterioration and service the fuel filters.
- Inspect the oil pump lines to make sure they have not become hard or brittle. Replace if necessary.
- Remove and inspect the propeller. Trim propeller blade nicks and burrs with a file. Inspect for cracks or bent blades. Clean and lubricate the propeller shaft with Extreme Grease.

MAINTENANCE

Tube Ref No.	Description	Where Used	Part No.
	Extreme Grease	Propeller shaft	8M0071842

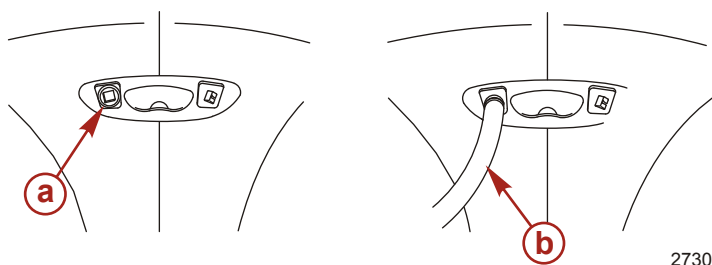
- Check the remote controls and steering. Ensure that all connections and fittings are tight and properly secured and adjusted.
- Inspect the carbon fiber reeds for chipping or cracks.

BEFORE PERIODS OF STORAGE

- Refer to **Storage**.

Flushing the Cooling System (Powerhead)

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



- a** - Plug located on fitting
- b** - Water hose

1. Remove the plug from fitting in the bottom cowl.
2. Attach a water hose to the fitting. Turn on the water and flush for three to five minutes.

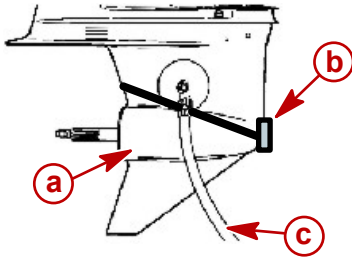
NOTE: The engine can be stopped or operated at idle speed when flushing the cooling system. Do not flush engine using a water system that exceeds 310 kPa (45 psi).

MAINTENANCE

Flushing the Cooling System (Lower Unit)

⚠ WARNING

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



- a - Fleet Master gearcase
- b - Flushing attachments
- c - Water hose

or128

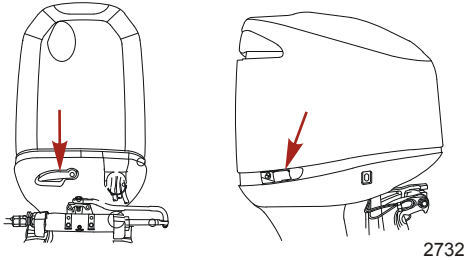
1. Remove the propeller. Refer to **Replacing the Propeller**.
2. Install the appropriate flushing attachment so the rubber cups fit tightly over the strut intake holes. Attach the dual water flush seal over the nose inlets.
3. Attach a water hose to the flushing attachment. Turn on the water and adjust the flow so water is leaking around the rubber cups to ensure the engine receives an adequate supply of cooling water.
4. Start the engine and run it at idle RPM in neutral.
5. Adjust water flow so excess water continues leaking out from around the rubber cups to ensure the engine is receiving an adequate supply of cooling water.
6. Check for water coming out of the water pump indicator hole. Continue flushing for three to five minutes, carefully monitoring water supply at all times.
7. Stop the engine, turn off the water, and remove the flushing attachments. Install the propeller.

MAINTENANCE

Top Cowl Removal and Installation

REMOVAL

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



INSTALLATION

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

Cleaning Care for Top Cowl

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

CLEANING AND WAXING PROCEDURE

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

Fuel System

FUEL SYSTEM SERVICE INFORMATION

⚠ WARNING

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

MAINTENANCE

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

Before servicing any part of the fuel system:

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

FUEL LINE INSPECTION

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

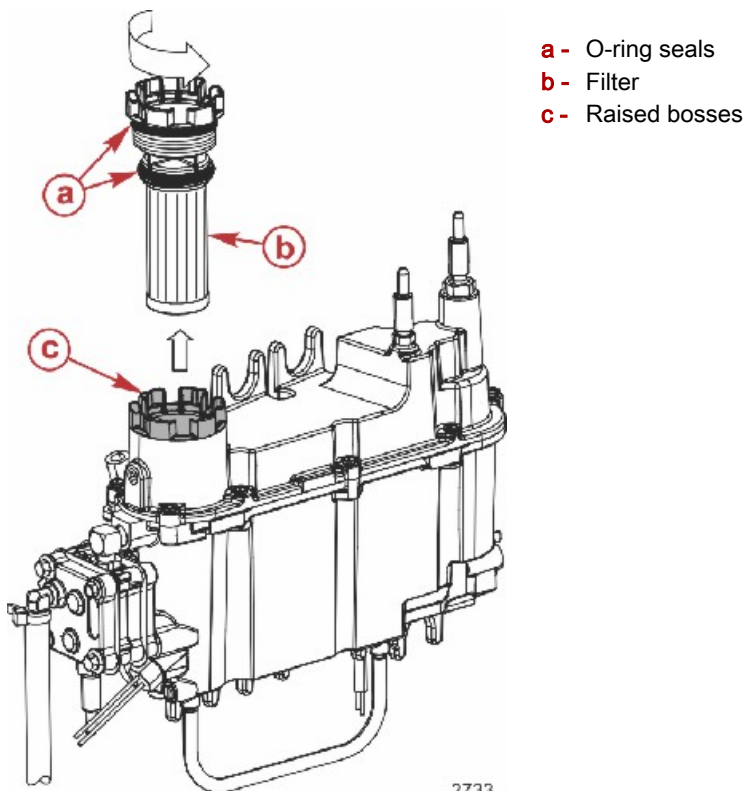
WATER SEPARATING FUEL FILTER

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

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

MAINTENANCE

Removal



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

Installation

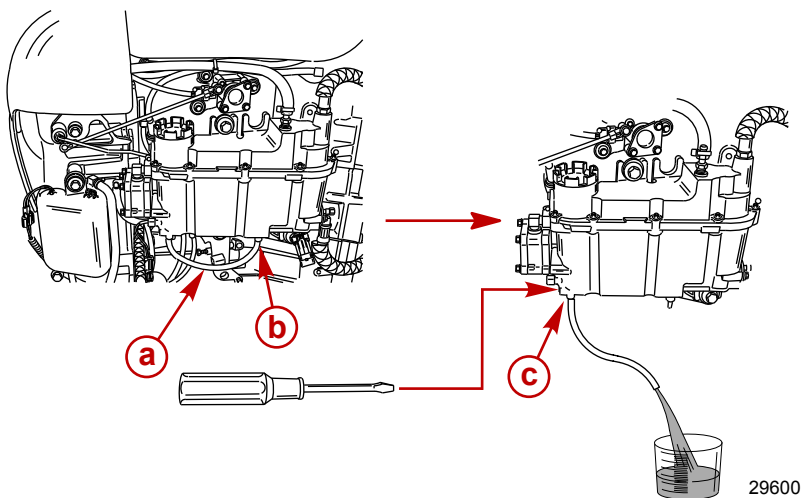
1. Lubricate the O-ring seals with oil.
2. Install the fuel filter and tighten securely.
3. Connect the link rod.

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

MAINTENANCE

DRAINING WATER FROM THE FUEL FILTER CHAMBER

NOTE: If a sufficient amount of water accumulates in the fuel filter chamber, the engine's warning system alerts the operator with the warning horn. Some SmartCraft gauges are capable of alerting the operator of this and other operating conditions/faults. Refer to **Warning System** in the **Features and Controls** section of this manual for more information. If the warning system alerts you to this condition, drain the water from the fuel filter chamber.



- a - Drain hose
- b - Aft hose fitting
- c - Filter drain screw

1. Remove the drain hose from the aft hose fitting (right side of the chamber). Hold the unattached end of the hose over a suitable container.
2. Loosen the filter drain screw (left side of the chamber) and allow the contents to drain.

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

3. Tighten the drain screw and attach the hose.

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

If you experience multiple issues with water in the fuel system over a short period of time, see your authorized Mercury dealer.

MAINTENANCE

Steering Link Rod Fasteners

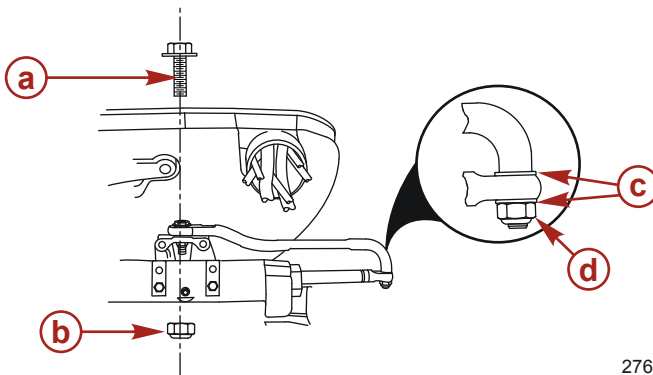
IMPORTANT: The steering link rod that connects the steering cable to the engine must be fastened using a special washer head bolt (P/N 10-849838) and self-locking nylon insert locknuts (P/N 11-826709113). Never replace locknuts with common nuts (nonlocking) as they will work loose and vibrate off, freeing the link rod to disengage.

▲ WARNING

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

▲ WARNING

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



2767

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

1. Assemble steering link rod to steering cable coupler with two flat washers "c" and a self-locking nylon insert locknut "d." Tighten the locknut until it seats, then loosen $\frac{1}{4}$ turn.
2. Assemble the steering link rod to the engine with the special washer head bolt "a" and self-locking nylon insert locknut "b."
3. Torque the head bolt, then the locknut to specifications.

MAINTENANCE

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

Fuses

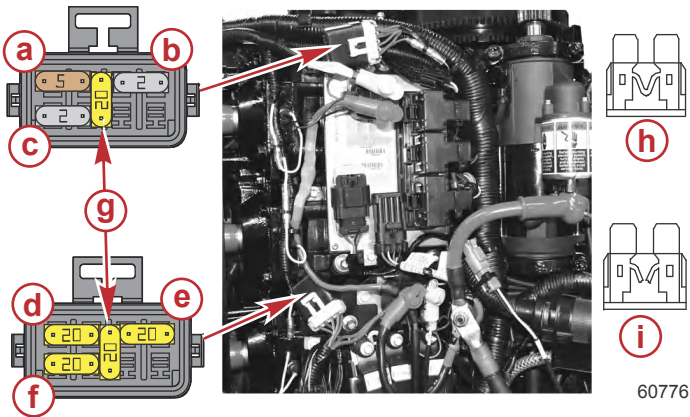
IMPORTANT: Always carry spare ATC 2-, 5-, and 20-amp fuses. Never use ATO type fuses.

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

1. There are two fuse holders on this engine. Open the fuse holder and inspect the silver colored band inside the fuse. If the band is broken, replace the fuse.
2. Replace the fuse with a new fuse with the same rating.

MAINTENANCE

The fuses and circuits are identified as follows:



Fuse location and identification

- a - SmartCraft
- b - Diagnostic circuit—2 amp
- c - Glow plug light—2 amp
- d - Ignition coil circuit—20 amp
- e - Fuel injector/direct injector/PCM and electric fuel pump circuits—20 amp
- f - Helm main power relay—20 amp
- g - Spare fuse slot
- h - Good fuse
- i - Blown fuse

Corrosion Control Anode

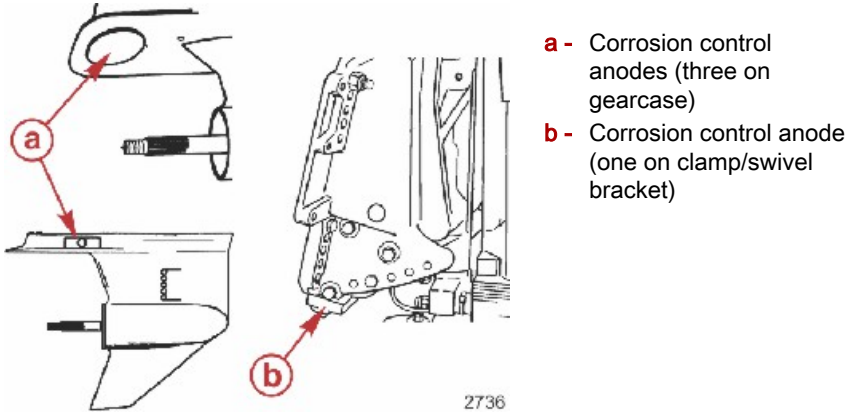
NOTICE

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

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

MAINTENANCE

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



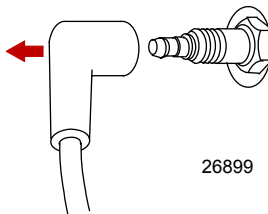
All anodes require periodic inspection, especially in saltwater (refer to the **Inspection and Maintenance Schedule**). Replace any anodes before they are 50% corroded. Never paint or apply protective coating on the anode, as effectiveness of the anode will be reduced.

Spark Plug Inspection and Indexing Installation

⚠ WARNING

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

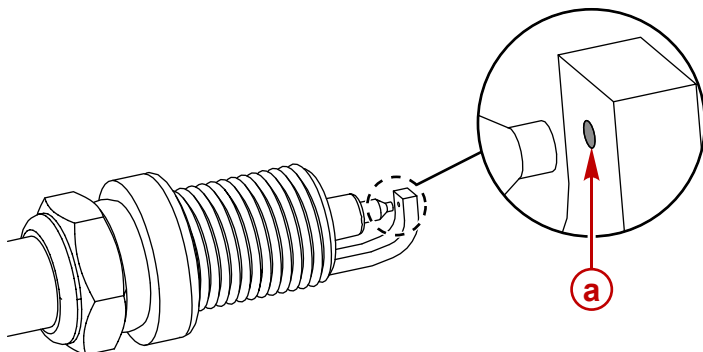
1. Remove the spark plug leads by twisting the rubber boots while pulling them off the spark plugs.



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

MAINTENANCE

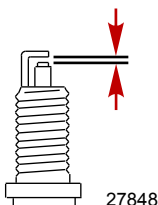
IMPORTANT: The color of the plug may not accurately reflect its condition. To accurately diagnose a faulty plug, inspect the precious metal on the plug's electrode. If no precious metal is visible, replace the plug.



9381

a - Precious metal

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



- a. All of the spark plugs should have the gap checked and corrected as necessary before installation.
 - b. Measure the gap with a feeler gauge or pin gauge. Never use a wedge-type gap checking tool to inspect or to adjust the gap.
 - c. If an adjustment is necessary, do not pry or apply any force on the center electrode. This is critical with any type of spark plug that has a wear surface, such as platinum or iridium added to either the ground electrode or the center electrode.
 - d. When it is necessary to widen the gap, use a spark gap tool that only pulls back on the ground electrode without touching the center electrode, the porcelain, or the wear portion of the ground electrode.
 - e. When it is necessary to close the gap, gently tap the plug ground electrode on a hard surface.
4. If the spark plug condition is acceptable to use, install the spark plug in the same location it was removed from.


MAINTENANCE

5. Mark the spark plug insulator with a permanent marker in line with the spark plug gap.



Mark on spark plug insulator aligned with spark plug gap

6. Lubricate the threads and sealing ring of the spark plug with Anti-Corrosion Grease and install finger-tight.

Tube Ref No.	Description	Where Used	Part No.
 94	Anti-Corrosion Grease	Spark plug threads and sealing ring	Obtain Locally

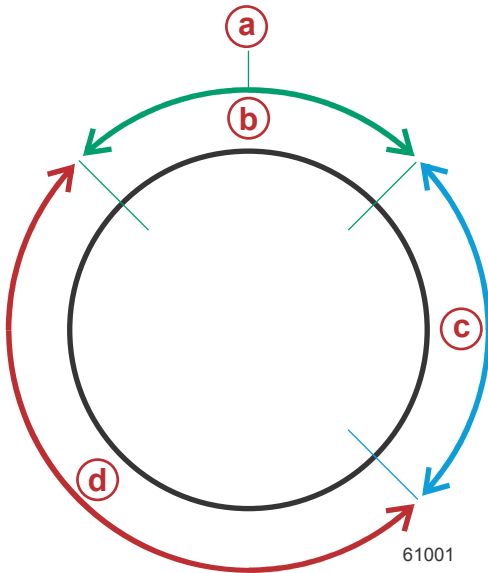
7. Set the torque wrench to 20.3 Nm (179.7 lb-in.). This is the minimum torque that should be applied.
8. Align the torque wrench handle with the index mark on the spark plug. Tighten the spark plug while attempting to align the torque wrench handle within 45° left or right of the air injector center. If the index mark is before the left side of the target window, set the torque wrench to 33.9 Nm (25 lb-ft) and tighten the spark plug while attempting to align index mark with the air injector.

NEW SPARK PLUG INDEXING INSTALLATION

IMPORTANT: All of the spark plugs must be indexed properly. The open gap of the spark plug must be within 45°, left or right of the air injector center after the spark plug has been tightened to the specified torque. This 90° window is where the spark plug gap must be for this engine to perform within design limits.

MAINTENANCE

The following diagram shows the 90° window where the spark plug gap must be for this engine to perform within design limits, the area where the spark plug gap must be after it is installed finger-tight with a socket, and the area where you must try a different spark plug.



- Spark plug index mark target**
- a** - Air injector
 - b** - 90° window where the spark plug gap must be after tightening to the specified torque
 - c** - Area where the spark plug gap must be after it is installed finger-tight with a socket
 - d** - Do not install. Try a different spark plug.

1. Mark the spark plug insulator with a permanent marker in line with the spark plug gap.


IMPORTANT: The mark on the spark plug insulator must be aligned with the center of the air injector for optimum performance. The mark on the spark plug cannot be more than 45° to the left or right of the air injector center for this engine to perform within design limits.



Mark on spark plug insulator aligned with spark plug gap

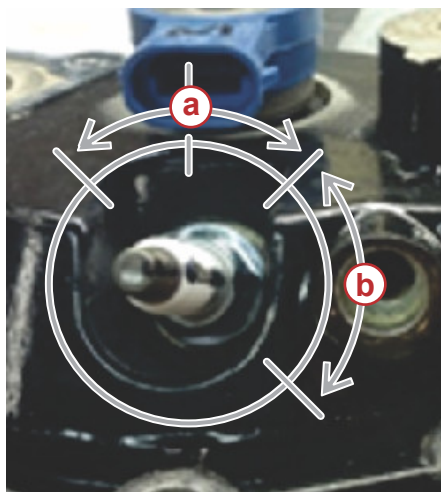
2. Clean the spark plug seat area of debris.
3. Lubricate the spark plug threads and sealing ring with Anti-Corrosion Grease.

MAINTENANCE

Tube Ref No.	Description	Where Used	Part No.
94 	Anti-Corrosion Grease	Spark plug threads and sealing ring	Obtain Locally

NOTE: Test fit the spark plug installation prior to lubricating the spark plug threads and sealing ring with Anti-Corrosion Grease.

4. Install the spark plug and tighten finger-tight.
5. Inspect where the mark on the spark plug insulator is in relation to the air injector.



61004

- a** - 90° window where the spark plug gap must be after tightening to the specified torque
- b** - Area where the spark plug gap must be after it is installed finger-tight with a socket

MAINTENANCE



55896

Example of when to try a different spark plug after installed finger-tight with a socket

6. Set the torque wrench to 20.3 Nm (179.7 lb-in.). This is the minimum torque that must be applied.
7. Align the torque wrench handle with the mark on the spark plug. Tighten the spark plug to the set torque value.
8. If the torque wrench handle is not within the 45° window, left of the air injector, set the torque wrench to 33.9 Nm (25 lb-ft). This is the maximum torque that should be applied.

MAINTENANCE

9. Align the torque wrench handle with the mark on the spark plug. Tighten the spark plug while attempting to align the mark on the insulator (torque wrench handle) with the air injector.



56176

Example of an optimal aligned spark plug

Battery Inspection

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

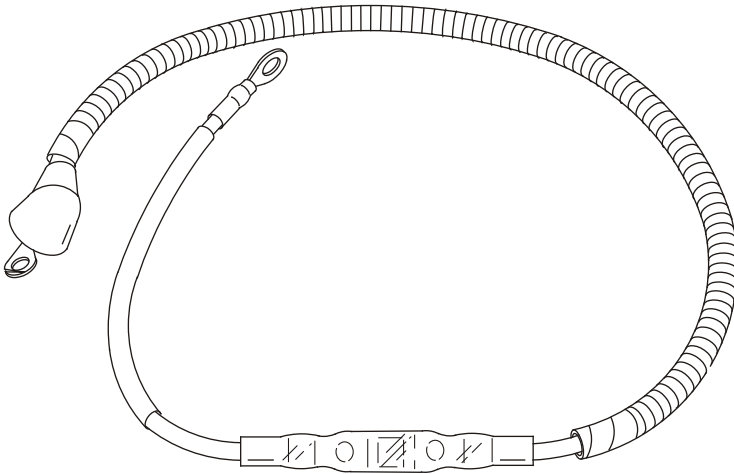
IMPORTANT: Read the safety and maintenance instructions which accompany your battery.

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

Fusible Link

This model has two fusible links; one is between the alternator and the +12 volt stud and the other is between the glow plug relay and the main power relay. These fusible links protect the components from damage due to accidental reverse battery connection. If the battery cables are reversed, the fusible link creates an open circuit, protecting the component. With the fusible link open, the engine can be started; however, the glow plugs will not heat up, causing difficult cold engine starting, or the run time is limited, because the alternator is not charging the boat battery. If the fusible link circuit becomes open, contact your authorized Mercury Marine dealer.



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Replacing the Propeller

▲ 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.

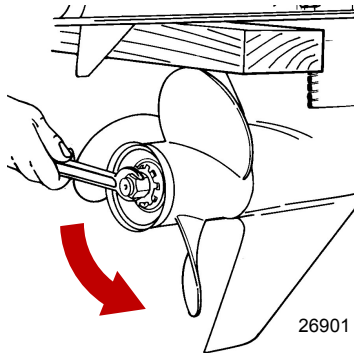
REMOVING THE PROPELLER

NOTE: If propeller is seized to the shaft and cannot be removed, consult your authorized Mercury dealer.

1. Shift the outboard to neutral.
2. Remove the keys from the ignition and engage the safety stop switch.
3. Straighten the bent tabs on the propeller nut retainer (if applicable).

MAINTENANCE

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



5. Remove the propeller and associated hardware from the propeller shaft.

INSTALLING THE PROPELLER

NOTICE

Operating the engine with the wrong propeller installed can limit power, increase fuel consumption, overheat the engine, or cause internal powerhead damage. Choose a propeller that allows the engine to operate at the specified wide open throttle RPM.

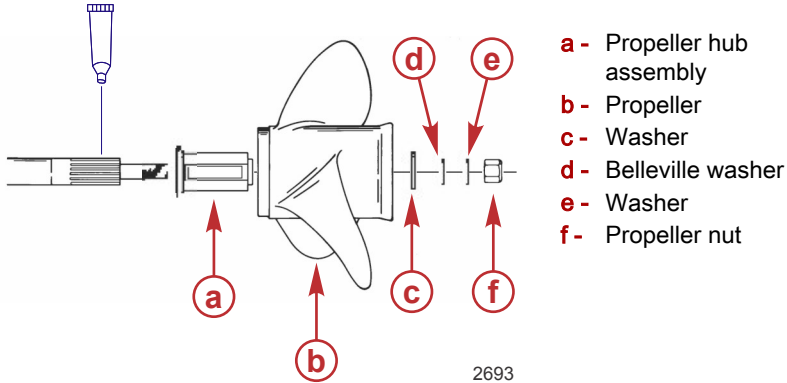
Mercury Racing applications use 19-spline propeller shafts and require installation of the Heavy-Duty Propeller Hub kit, included with most Mercury Racing propellers.


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

1. Lubricate the propeller shaft splines with Extreme Grease.

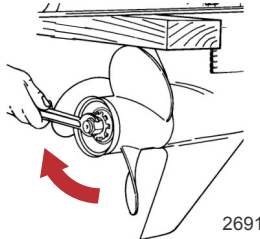
MAINTENANCE

- Install the propeller hub assembly, propeller, washer, Belleville washer, washer, and propeller nut onto the propeller shaft.



Tube Ref No.	Description	Where Used	Part No.
	Extreme Grease	Propeller shaft splines	8M0071842

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



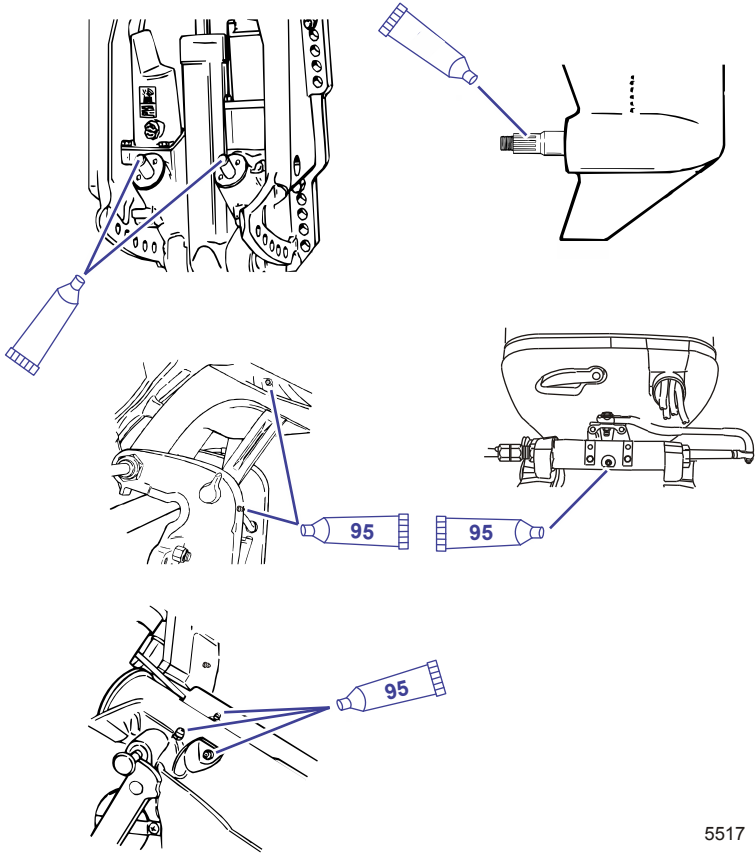
Description	Nm	lb. in.	lb. ft.
Propeller nut	75		55

- Disengage the safety stop switch by placing it in the "RUN" position and return the keys to the ignition switch.



MAINTENANCE

Lubrication Points

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



5517

Tube Ref No.	Description	Where Used	Part No.
	Extreme Grease	Trim rod ball ends, propeller shaft	8M0071842
	2-4-C with PTFE	Swivel bracket, tilt support lever, tilt tube	92-802859A 1

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

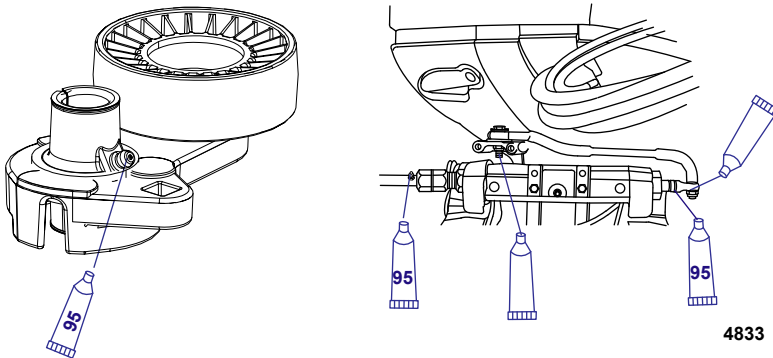
MAINTENANCE

⚠ WARNING

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

Lubricate the steering link with lightweight oil.

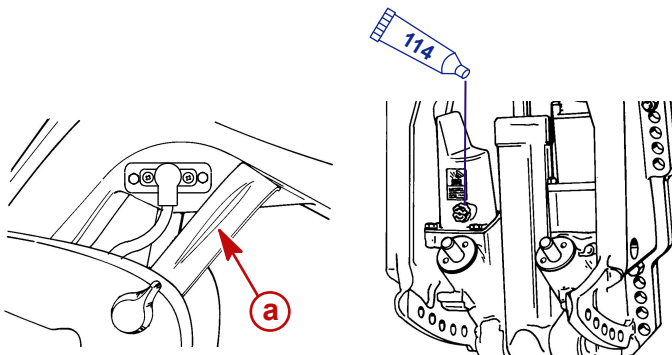
Lubricate the belt tensioner pulley and steering cable with 2-4-C with PTFE.



Tube Ref No.	Description	Where Used	Part No.
95	2-4-C with PTFE	Steering cable, grease fitting on belt tensioner pulley	92-802859A 1

Checking Power Trim Fluid (Three-Ram Trim Systems)

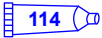
1. Tilt outboard to the full up position and engage the tilt support lock.



or47-1

a - Tilt support lock

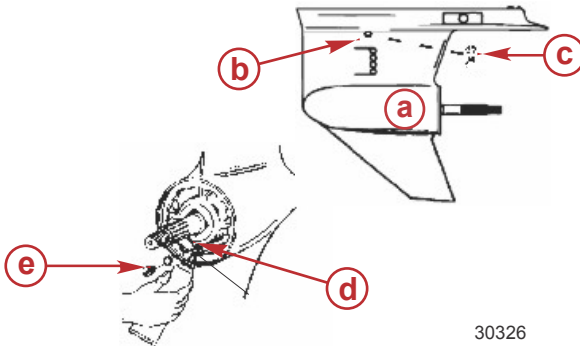
MAINTENANCE

Tube Ref. No.	Description	Where Used	Part Number
 114	Power Trim and Steering Fluid	Fill hole	92-802880A1

- Remove fill cap and check fluid level. The fluid level should be even with the bottom of the fill hole. Add fluid if required.


Gearcase Lubricant

CHECKING/FILLING GEARCASE LUBRICANT



30326

- a** - Fleet Master gearcase (vertical operating position)
- b** - Vent hole
- c** - Vent plug and sealing washer
- d** - Fill/drain hole
- e** - Fill/drain plug

Tube Ref No.	Description	Where Used	Part No.
	SAE 85W90 Mercury Racing Gear Oil	Gearcase	8M0078015

- Place the outboard in a vertical operating position.
- Remove the vent plug (upper plug) and sealing washer.
- Remove the fill/drain plug (lower plug).
- Quickly place the lubricant tube into the fill hole.
- Slowly add lubricant until it flows from the (upper) vent hole.
- Stop adding lubricant. Install the (upper) vent plug and sealing washer before removing the lubricant tube.

IMPORTANT: Replace the sealing washers if damaged.

MAINTENANCE

NOTE: Examine the magnetic fill/drain plug for metal particles. A small amount of metal filings or fine metal particles indicates normal gear wear. An excessive amount of metal filings or larger particles (chips) should be checked by an authorized dealer.

7. Remove lubricant tube and install cleaned (lower) fill/drain plug and sealing washer.

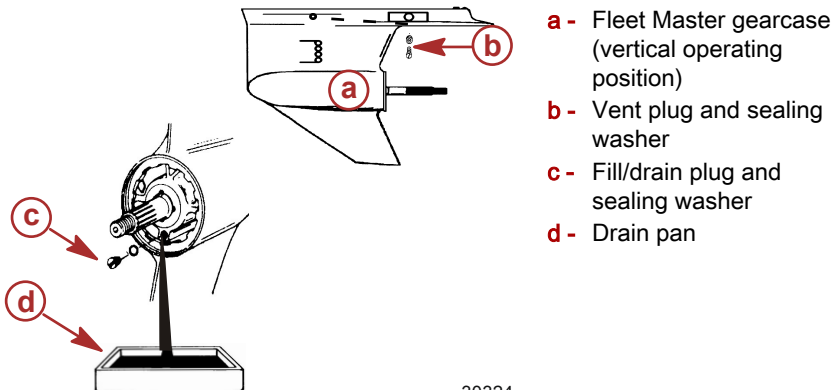
Water in gear lubricant may:

- Settle to the bottom and drain out with the lubricant
- Be mixed with the lubricant giving a milky color to the lubricant

Water in gear lubricant will:

- Result in premature bearing failure
- In freezing temperatures, turn to ice and damage the gearcase

DRAINING THE GEARCASE



30324

1. Place the outboard in a vertical operating position.
2. Place a drain pan below the outboard.
3. Remove the vent plug (upper plug) and sealing washer.
4. Remove the fill/drain plug (lower plug) and sealing washer and drain the lubricant.

GEARCASE LUBRICANT CAPACITY

Gearcase lubricant capacity is approximately 710 ml (24 oz).

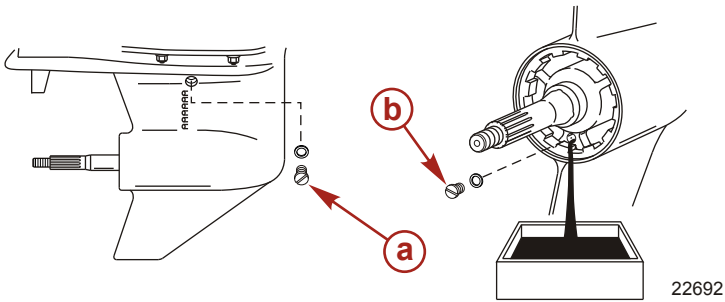
122 mm (4.8 in.) Diameter Gearcase

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

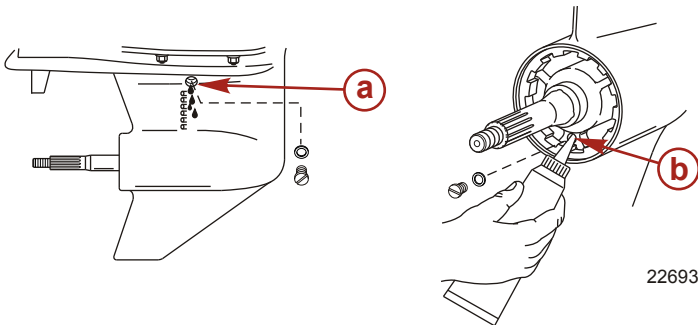
Gearcase lubricant capacity is approximately 970 ml (32.8 fl oz).

GEARCASE LUBRICANT RECOMMENDATION

Mercury or Quicksilver High Performance Gear Lubricant.

CHECKING LUBRICANT LEVEL AND REFILLING GEARCASE

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



- a - Vent hole
- b - Fill hole

IMPORTANT: Replace sealing washers if damaged.

4. Stop adding lubricant. Install the vent plug and sealing washer before removing the lubricant tube.


MAINTENANCE

5. Remove lubricant tube and reinstall cleaned fill/drain plug and sealing washer.

STORAGE

Protecting External Outboard Components

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

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

Gearcase

- Drain and refill the gearcase lubricant. Refer to **Gearcase Lubricant**.

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

TROUBLESHOOTING

Starter Motor Will Not Crank the Engine

POSSIBLE CAUSES

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

Engine Will Not Start

POSSIBLE CAUSES

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

Engine Runs Erratically

POSSIBLE CAUSES

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

TROUBLESHOOTING

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

Performance Loss

POSSIBLE CAUSES

- Throttle not opening fully.
- Damaged propeller or improper propeller size.
- Boat overloaded or load improperly distributed.
- Excessive water in bilge.
- Boat bottom is dirty or damaged.
- Warning horn failure.
- Engine block pressure sensor or coolant temperature sensor failure (Guardian is activated).

Warning Horn Activates (With Power Loss)

POSSIBLE CAUSES

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

TROUBLESHOOTING

Warning Horn Activates (No Power Loss)

POSSIBLE CAUSES

- Warning horn activates on start up. This is normal operation.
- Water is detected in the water-separating fuel filter. Refer to **Maintenance** for procedures on removing water from the filter.
- Thermostat operation fault. Inspect the thermostat for debris and that it operates within the opening and closing temperature specifications.

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.

OWNER SERVICE ASSISTANCE

Service Assistance

LOCAL REPAIR SERVICE

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

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

SERVICE AWAY FROM HOME

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

STOLEN POWER PACKAGE

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

ATTENTION REQUIRED AFTER SUBMERSION

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

REPLACEMENT SERVICE PARTS

WARNING

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

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

PARTS AND ACCESSORIES INQUIRIES

Direct any inquiries concerning genuine Mercury Precision Parts® or Quicksilver Marine Parts and Accessories® to a local authorized dealer. Dealers have the proper systems to order parts and accessories, if they are not in stock. **Engine model** and **serial number** are required to order correct parts.

OWNER SERVICE ASSISTANCE

RESOLVING A PROBLEM

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

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

The following information will be needed by the Customer Service:

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

CONTACT INFORMATION FOR MERCURY MARINE CUSTOMER SERVICE

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

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

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	

OWNER SERVICE ASSISTANCE

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

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

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

Ordering Literature

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

Model		Serial Number	
Horsepower		Year	

UNITED STATES AND CANADA

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

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

OUTSIDE THE UNITED STATES AND CANADA

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

OWNER SERVICE ASSISTANCE

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

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

OUTBOARD INSTALLATION

Mercury Marine Validated Engine Mounting Hardware

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

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



51965

Accessories Mounted to the Transom Clamp Bracket

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

OUTBOARD INSTALLATION

⚠ WARNING

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

ACCEPTABLE ACCESSORY MOUNTING TO THE TRANSOM CLAMP BRACKET

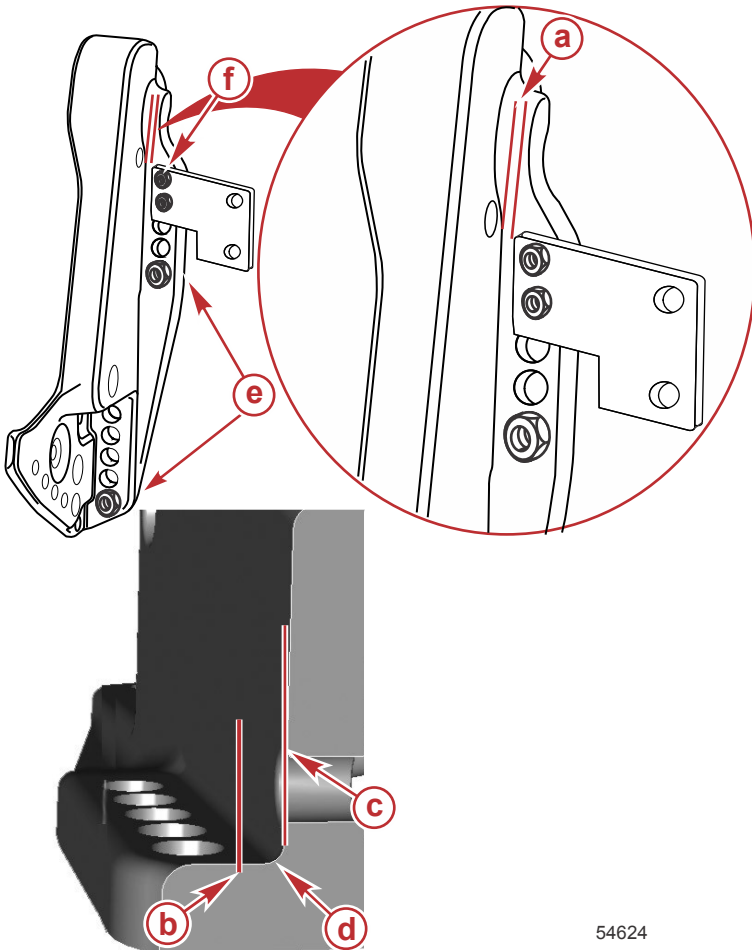
After the engine is mounted to the transom or jack plate in accordance with the engine installation instructions, it is acceptable to attach an accessory to the boat by use of the unused bolt holes in the transom clamp bracket as shown in Figure 1.

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

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

OUTBOARD INSTALLATION

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



54624

Figure 1

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

OUTBOARD INSTALLATION

UNACCEPTABLE ACCESSORY MOUNTING

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

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

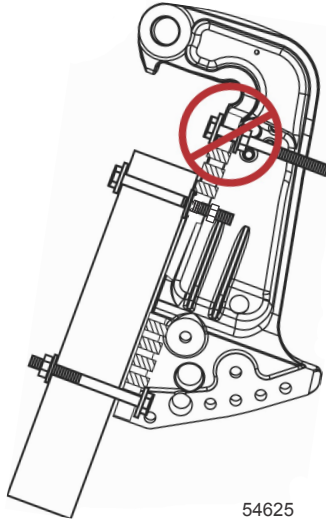


Figure 2

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

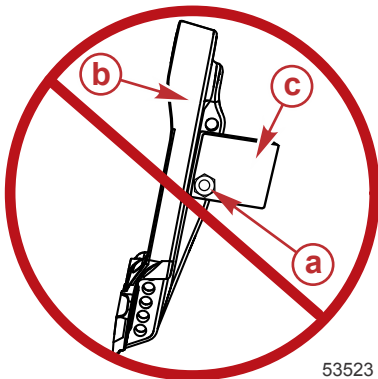


Figure 3

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

OUTBOARD INSTALLATION

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

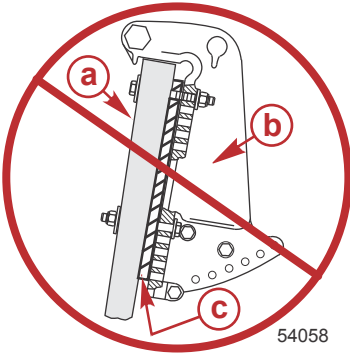


Figure 4

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

Boat Horsepower Capacity

▲ WARNING

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

Do not overpower or overload your boat. Most boats will carry a required capacity plate indicating the maximum acceptable power and load as determined by the manufacturer following certain federal guidelines. If in doubt, contact your dealer or the boat manufacturer.

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

26777

Start in Gear Protection

▲ WARNING

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

OUTBOARD INSTALLATION

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

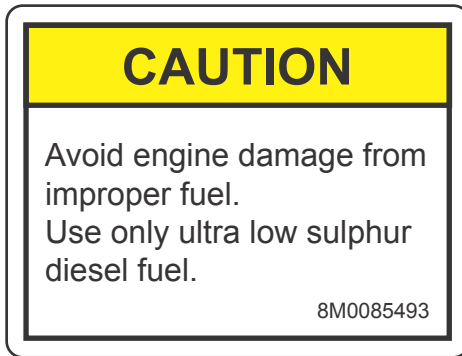
Genuine Mercury Precision or Quicksilver Accessories have been specifically designed and tested for this outboard.

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

3.0L DIESEL FUEL DECAL

This engine is manufactured for diesel fuel use only. A decal supplied with this engine, must be placed near the fuel fill area. The area where the decal will be placed, must be clean and dry for the decal to properly adhere to the surface. Use a solvent or soap that will not leave a residue when dry.



55893

AVOIDING FUEL FLOW RESTRICTION

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

ELECTRIC FUEL PUMP

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

LOW PERMEATION FUEL HOSE REQUIREMENT

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

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 g/m²/24 h with CE 10 fuel at 23 °C as specified in SAE J 1527 - marine fuel hose.

EPA PRESSURIZED PORTABLE FUEL TANK REQUIREMENTS

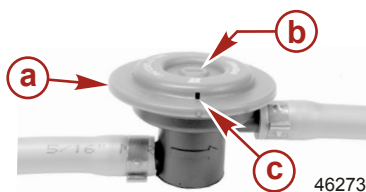
The Environmental Protection Agency (EPA) requires portable fuel systems that are produced after January 1, 2011, for use with outboard engines to remain fully sealed (pressurized) up to 34.4 kPa (5.0 psi). These tanks may contain the following:

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

FUEL DEMAND VALVE (FDV) REQUIREMENT

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

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



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

FUEL TANKS

Portable Fuel Tank

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

Permanent Fuel Tank

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

FILLING THE FUEL SYSTEM

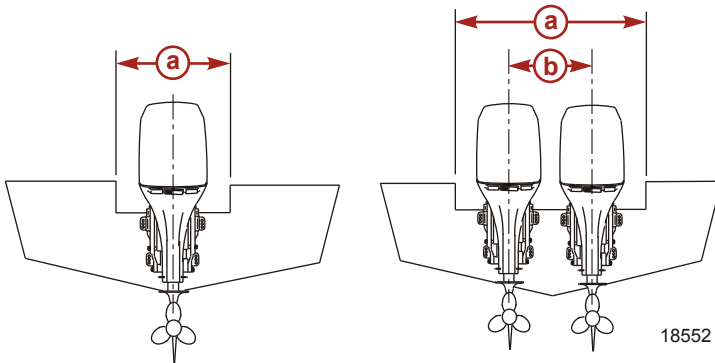
For the initial start of a new engine, or for an engine that ran out of fuel or was drained of fuel, the fuel system should be filled as follows:

1. Squeeze the fuel line primer bulb until it feels firm.

OUTBOARD INSTALLATION

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

Installation Specifications



- a** - Minimum transom opening
- b** - Engine centerline for dual engine - 66.0 cm (26 in.)

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

Lifting the Outboard

⚠ WARNING

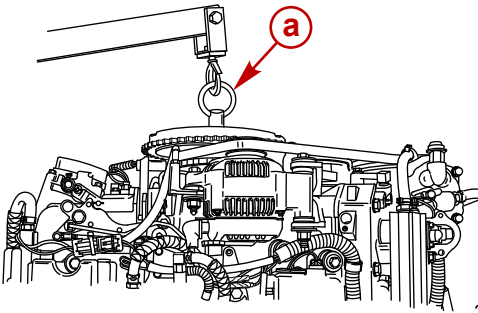
Improperly supporting an engine during lifting can result in the engine falling, causing serious injury or death. Before lifting the engine, verify that the lifting ring is threaded into the flywheel for a minimum of five turns and that the hoist has the correct lifting capacity for the engine weight.

To lift the outboard:

1. Remove the cowl from the outboard.

OUTBOARD INSTALLATION


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



a - Lifting eye

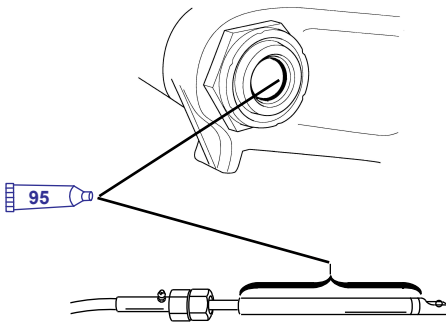
28495

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


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

Steering Cable - Starboard Side Routed Cable

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

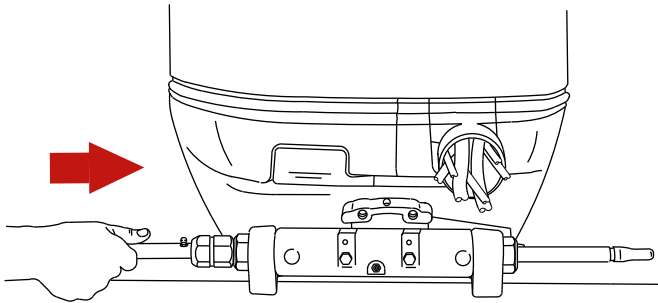


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Tube Ref No.	Description	Where Used	Part No.
 95	2-4-C with PTFE	O-ring seal and entire cable end	92-802859A 1

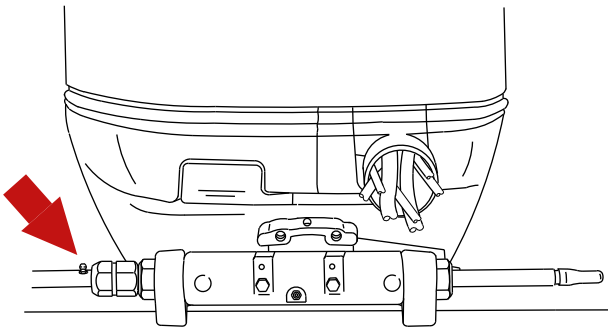
OUTBOARD INSTALLATION

2. Insert the steering cable into the tilt tube.



3725

3. Tighten the nut to the specified torque.



3727

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

Steering Link Rod Fasteners

IMPORTANT: The steering link rod that connects the steering cable to the engine must be fastened using a special washer head bolt (P/N 10-849838) and self-locking nylon insert locknuts (P/N 11-826709113). Never replace locknuts with common nuts (nonlocking) as they will work loose and vibrate off, freeing the link rod to disengage.

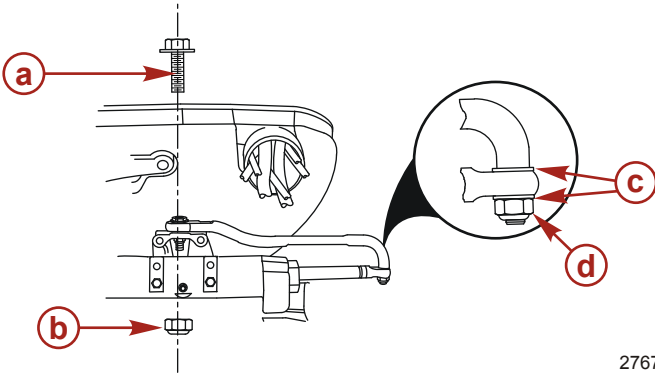
⚠ WARNING

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

OUTBOARD INSTALLATION

⚠ WARNING

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



2767

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

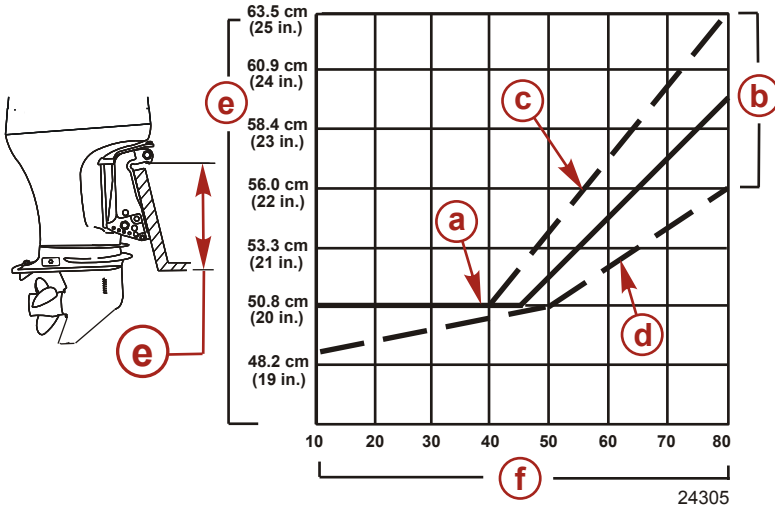
1. Assemble steering link rod to steering cable coupler with two flat washers "c" and a self-locking nylon insert locknut "d." Tighten the locknut until it seats, then loosen $\frac{1}{4}$ turn.
2. Assemble the steering link rod to the engine with the special washer head bolt "a" and self-locking nylon insert locknut "b."
3. Torque the head bolt, then the locknut to specifications.

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

OUTBOARD INSTALLATION

Recommended Mounting Height

DETERMINING OUTBOARD MOUNTING HEIGHT FOR A STANDARD GEAR HOUSING



Standard 20-inch (L) mounting bracket graph

- 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 piercing the water surface is usually preferred.
- f** - Maximum boat speed anticipated.

OUTBOARD INSTALLATION

NOTICE

1. The outboard should be mounted high enough on the transom so that 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.

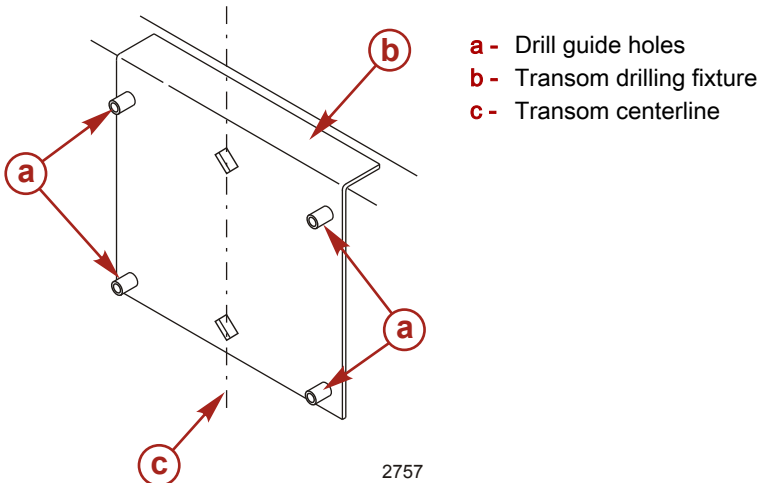
Increasing the mounting height will usually:

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

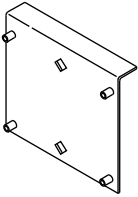
Drilling Outboard Mounting Holes

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

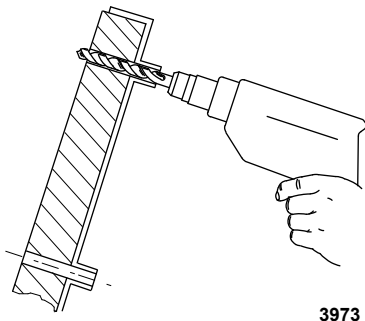
1. Mark four mounting holes on the transom using the transom drilling fixture.



OUTBOARD INSTALLATION

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

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



Fastening the Outboard to the Transom

MOUNTING BOLTS

Outboard Transom Mounting Hardware - Supplied with Outboard		
Part Number	Part Name	Description
8M0071543	Outboard mounting bolt	1/2-20 x 5.00 in. long (3.25 in. thread)
826711-17	Nylon insert locknut	1/2-20
28421	Flat washer	1.50 in. diameter
54012	Flat washer	0.875 in. diameter

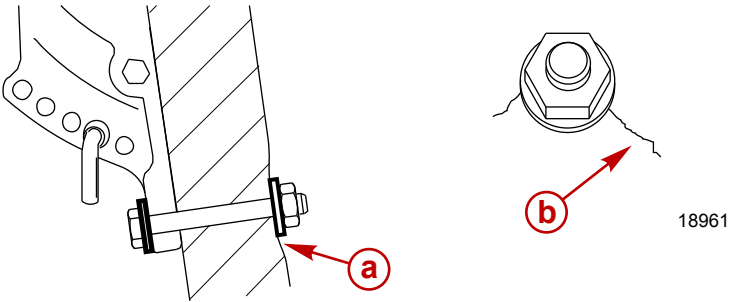
Available Outboard Mounting Bolts	
Part Number	Description
67755005	1/2-20 x 2.50 in. long (1.25 in. thread)
67755006	1/2-20 x 3.50 in. long (1.25 in. thread)
814259	1/2-20 x 4.00 in. long (2.25 in. thread)
67755-1	1/2-20 x 4.50 in. long (2.25 in. thread)
8M0071543	1/2-20 x 5.00 in. long (3.25 in. thread)
8M0038370	1/2-20 x 5.50 in. long (3.25 in. thread)
67755-2	1/2-20 x 6.50 in. long (2.75 in. thread)
8M0028080	1/2-20 x 7.50 in. long (2.75 in. thread)

OUTBOARD INSTALLATION

Available Outboard Mounting Bolts	
Part Number	Description
8M0032860	1/2-20 x 8.00 in. long (2.75 in. thread)

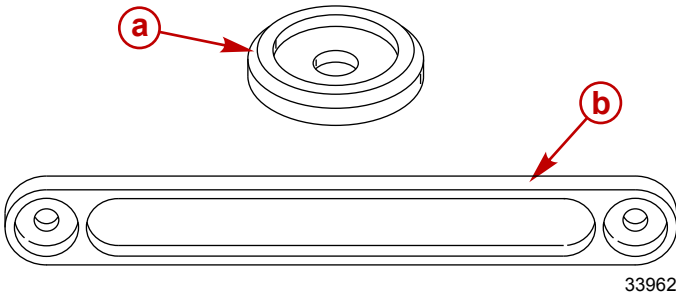
CHECKING BOAT TRANSOM CONSTRUCTION

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

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

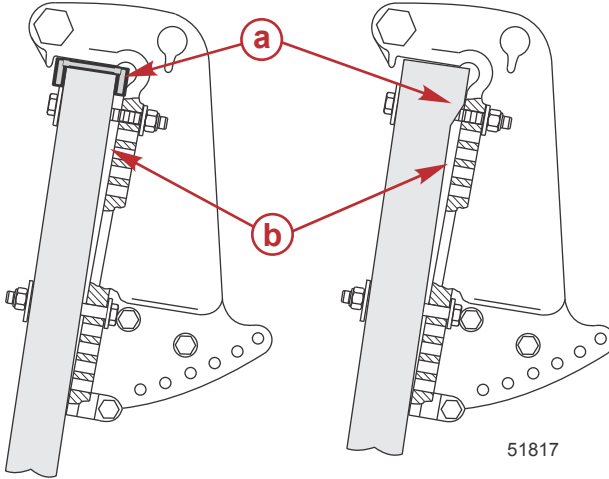


- a** - Large transom washer
- b** - Transom reinforcement plate

OUTBOARD INSTALLATION

FASTENING THE OUTBOARD TO THE TRANSOM

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

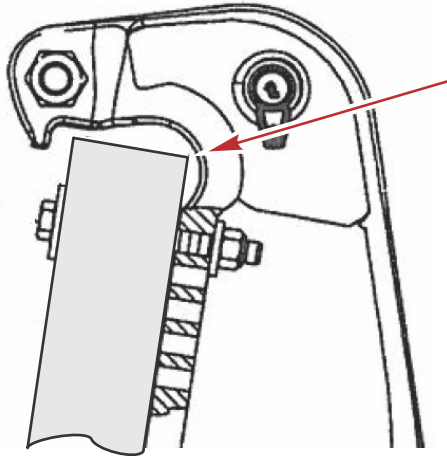


a - Step (not allowed)

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

OUTBOARD INSTALLATION

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



51867

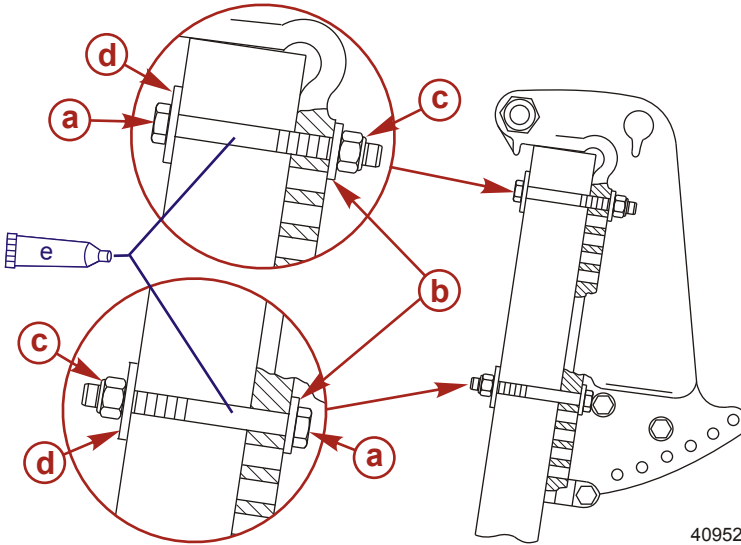
Installation

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

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

OUTBOARD INSTALLATION

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



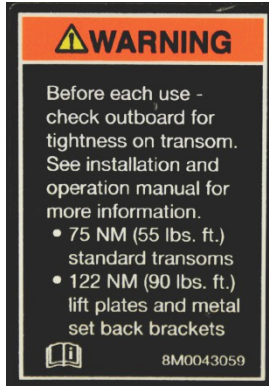
40952

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

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

OUTBOARD INSTALLATION

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



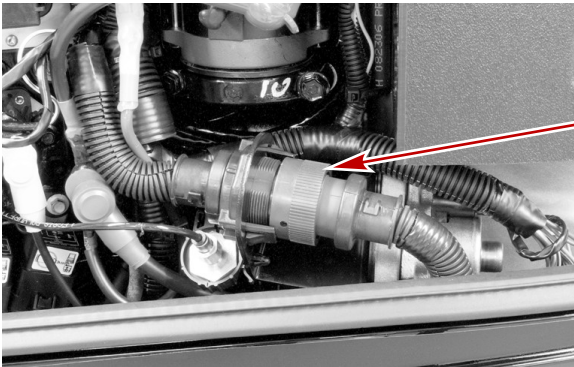
51985

Decal on the transom bracket

Electrical, Hoses, Control Cables, and Front Clamp

REMOTE WIRING HARNESS

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



28742

a - 14 pin connector

BATTERY INFORMATION (DIESEL SPARK IGNITION MODEL)

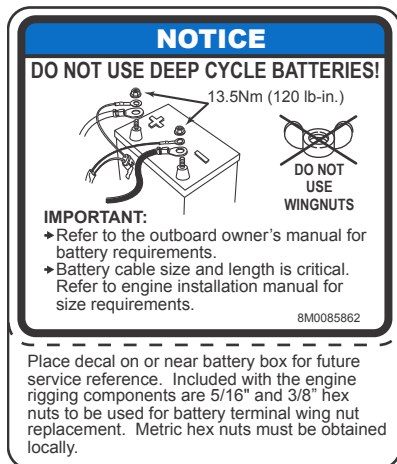
- Do not use deep cycle batteries. This engine must use an AGM 31 series starting battery with 1050 marine cranking amps and a reserve capacity of 105 amp hour rating.

OUTBOARD INSTALLATION

- When connecting the engine battery, use hex nuts to secure the battery leads to the battery posts. Tighten the nuts to the specified torque.

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

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



54395

BATTERY CABLES

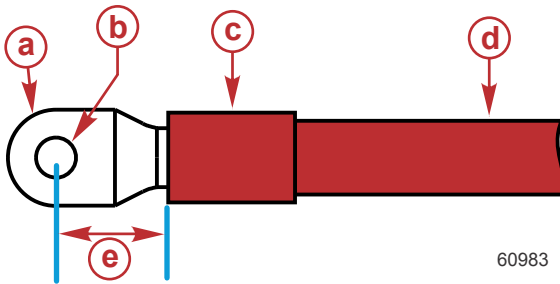
IMPORTANT: This outboard requires the use of battery cables specified in the following table. The battery cable ends must be crimped onto the cable to ensure power transfer from the battery to the engine. The vessel manufacturer or installing technician is responsible for determining the battery cable length and preparing the battery cable termination at the engine side and battery side.

Required Battery Cable Specifications				
Marine Wire Per SAE J378 and J1127				
AWG	Diameter		Turns of wire	
	mm	inch	per cm	per inch
00 (2/0)*	9.266	0.3648	1.08	2.74

* The closest metric equivalence is 70 mm²

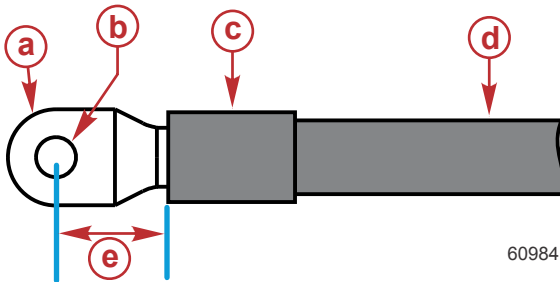
OUTBOARD INSTALLATION

Battery Cable Drawings



Positive cable—engine side

- a** - Ring terminal—2/0 gauge, tin plated copper
- b** - Eyelet 8 mm (0.313 in.)
- c** - Red heat shrink—adhesive-lined, 38 mm (1.5 in.), dielectric strength 700v/mil
- d** - Red battery cable
- e** - 24 mm (0.95 in.) minimum



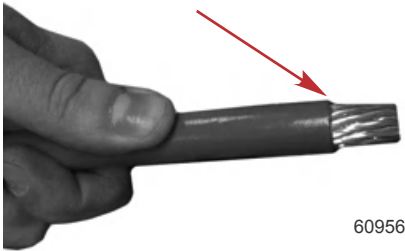
Negative cable—engine side

- a** - Ring terminal—2/0 gauge, tin plated copper
- b** - Eyelet 8 mm (0.313 in.)
- c** - Black heat shrink—adhesive-lined, 38 mm (1.5 in.), temperature rating -40 to 54 °C (-40 to 130 °F)
- d** - Black battery cable
- e** - 24 mm (0.95 in.) minimum

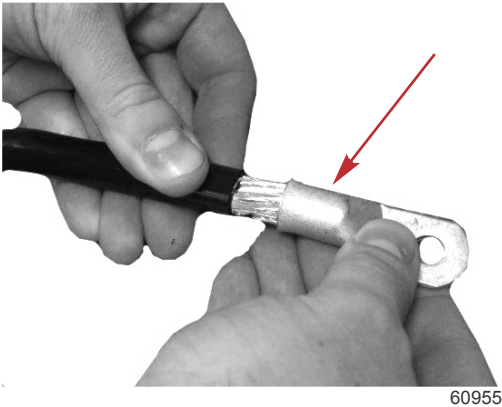
OUTBOARD INSTALLATION

Battery Cable Preparation

1. Remove the insulation from the end of the cable.



2. Install the terminal protection boot on the positive battery cable.
3. Slide shrink tubing over the cable.
4. Install the cable ring terminal.



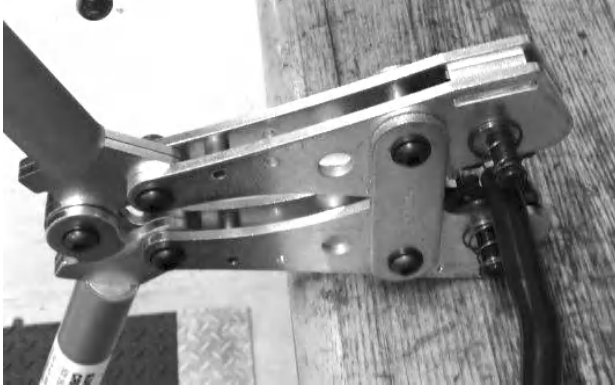
Ring terminal

5. Secure the ring terminal to the cable with the recommended crimp tool.

NOTE: *The crimp tool can be purchased locally.*

OUTBOARD INSTALLATION

IMPORTANT: The ring terminal must be secured to the cable with two crimps that are offset.



60957

Crimping tool

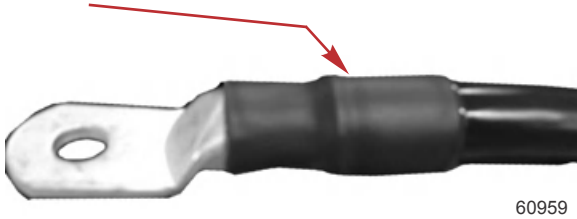


60958

Correct crimp

OUTBOARD INSTALLATION

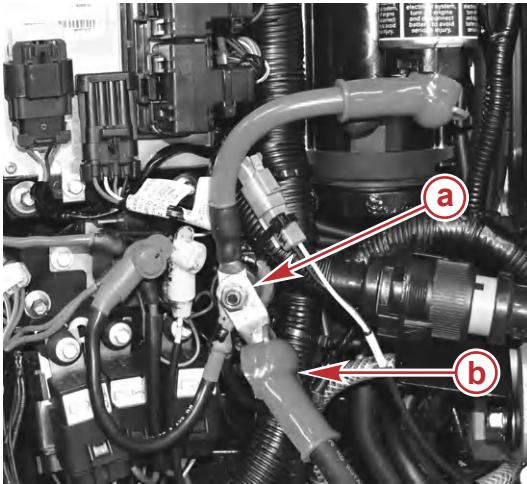
- Slide the shrink tubing over the crimped area and apply heat to seal the crimp area and prevent corrosion.



Shrink tubing

BATTERY CABLE CONNECTIONS

- Verify the terminal protection boot is installed onto the positive (+) battery cable.
- Connect the positive (+) battery cable to the engine power stud and secure with a lockwasher and 8M nut. Tighten the nut to the specified torque.




- a** - Positive (+) battery cable secured to the engine power stud
- b** - Terminal protection boot

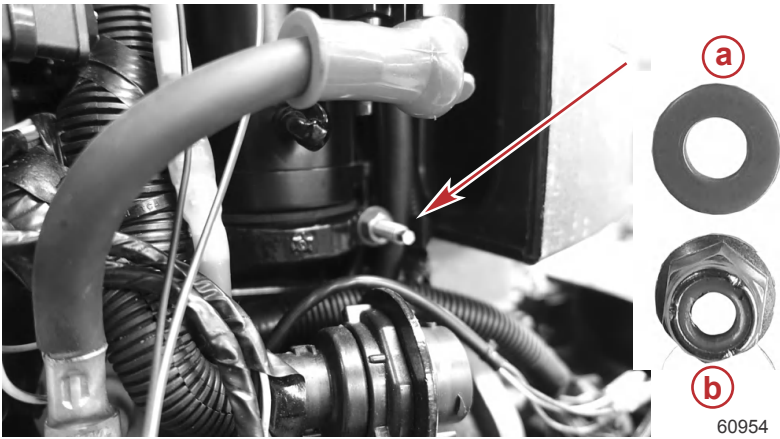
Description	Nm	lb-in.	lb-ft
M8 nut	13.6	120	–

- Apply Liquid Neoprene to the connection to prevent corrosion.

OUTBOARD INSTALLATION

Tube Ref No.	Description	Where Used	Part No.
 25	Liquid Neoprene	Battery cable connections on power head	92- 25711 3

4. Allow the Liquid Neoprene to dry. Cover the connection with the terminal protection boot.
5. Install the negative battery cable to the stud on the lower starter mount. Secure the battery cable with a washer and 8M flange nut. Tighten the nut to the specified torque. Apply Liquid Neoprene to the connection to prevent corrosion.



Negative battery cable connection location

- a** - Washer
- b** - 8M flange nut

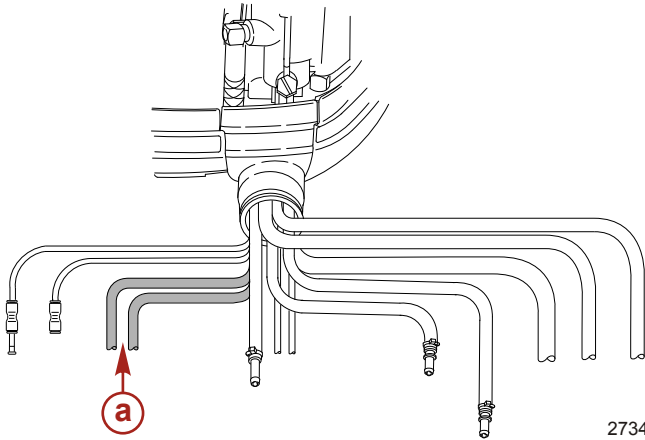
Description	Nm	lb-in.	lb-ft
8M nut	31.2	-	23

Connecting the Battery

Route the battery cables through the rigging hose (if equipped) and the cowl fitting.

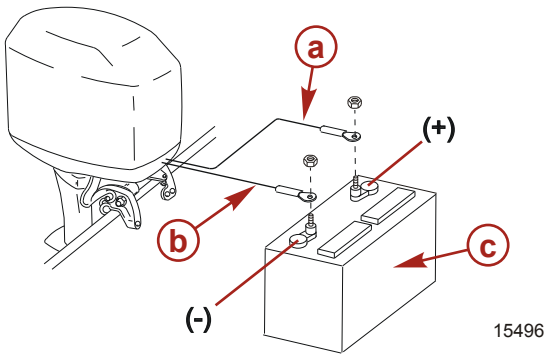
OUTBOARD INSTALLATION

NOTE: The rigging hose is removed from the following illustration for part descriptions only. Mercury Marine recommends routing all wires, hoses, and control cables through a rigging hose from the engine to the boat's gunnel or motor well. This helps protect components from water contamination. Follow the instructions included with the rigging hose kit to install the rigging hose.



a - Battery cables

Single Outboard

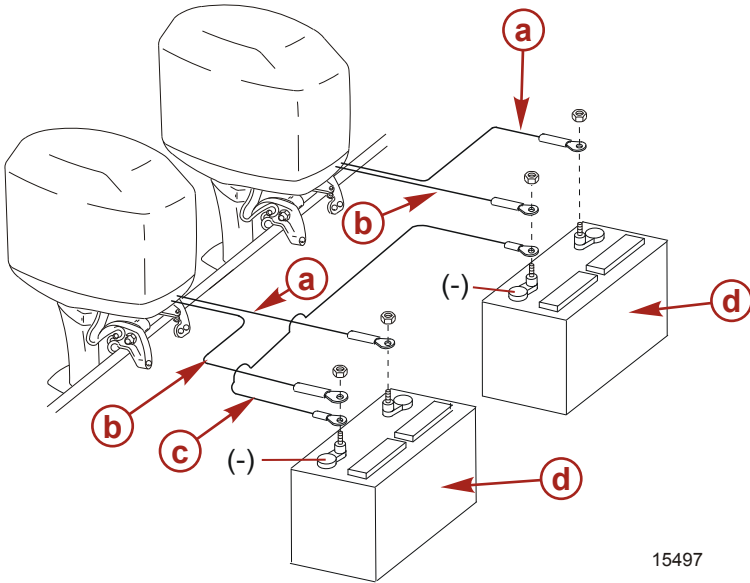


- a** - Red sleeve - positive (+)
- b** - Black sleeve - negative (-)
- c** - Cranking battery

OUTBOARD INSTALLATION

Dual Outboards

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



15497

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

HOSE AND TUBING CONNECTIONS

Fuel Hose

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

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

Oil Hoses

Connect the remote oil hoses to the engine hose connections. Fasten hose connections with cable ties.

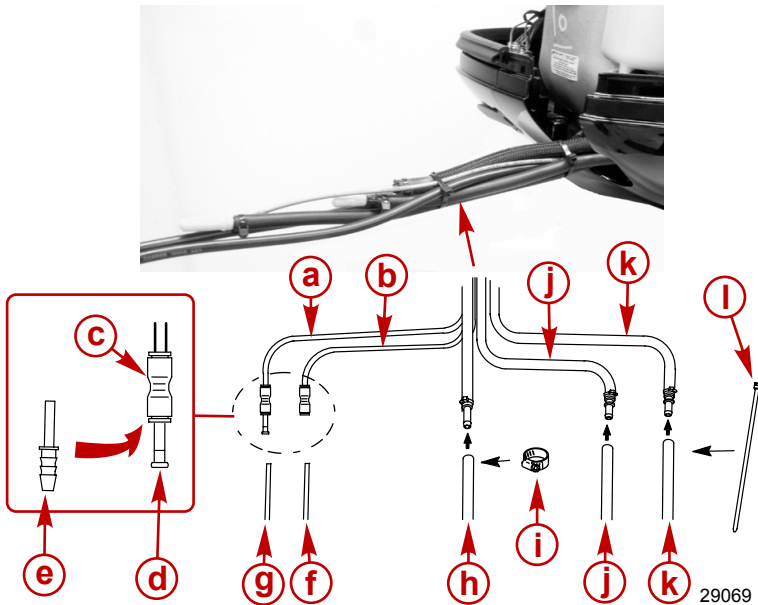
Water Pressure and Speedometer Hose or Tubing

NOTE: This applies to models without SmartCraft gauges.

OUTBOARD INSTALLATION

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

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



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

INSTALLING THE SHIFT CABLE

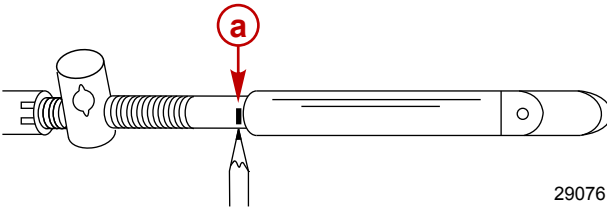
IMPORTANT: The shift cable is the first cable to move when the remote control handle is moved out of neutral, so install/connect it to the engine first.

OUTBOARD INSTALLATION

Locating the Center Point of the Shift Cable

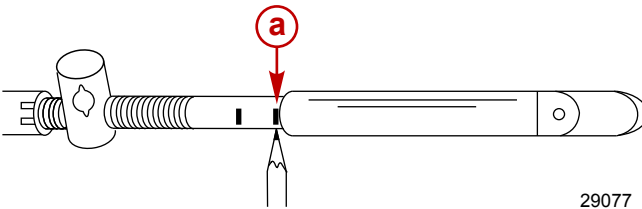
IMPORTANT: Locate the center point of the slack or lost motion that exists in the shift cable for proper adjustment of the shift cable.

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



a - Forward position mark

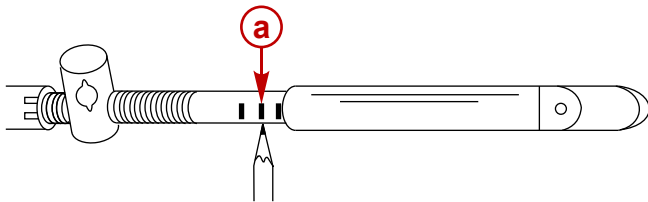
2. Mark the reverse position as follows:
 - a. Move the remote control handle into reverse and advance the handle to the full speed position. Ensure the throttle control lever is touching the throttle control lever stop screw.
 - b. Slowly return the handle back to the neutral detent position.
 - c.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



a - Reverse position mark

OUTBOARD INSTALLATION

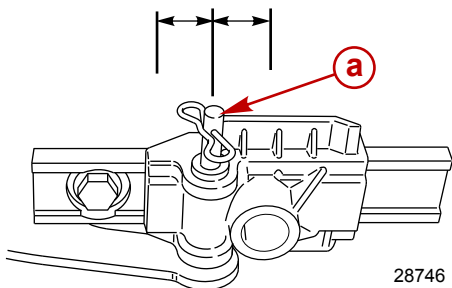
3. Mark the center on the shift cable midway between the forward and reverse marks.



4361

a - Center mark

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

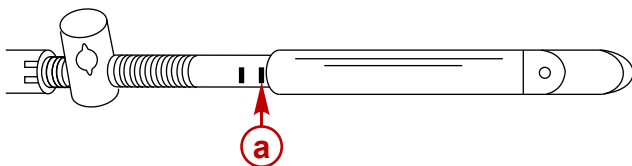


a - Anchor pin

28746

Adjusting the Shift Cable

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



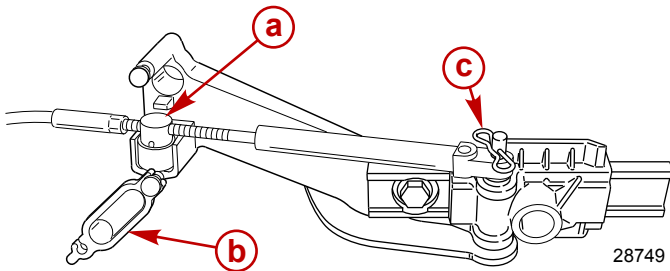
4362

a - Center mark

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

OUTBOARD INSTALLATION

- Secure the shift cable to the anchor pin with the retainer clip.



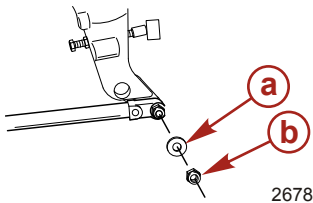
- a** - Cable barrel
- b** - Shift cable retainer
- c** - Retainer clip

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

INSTALLING THE THROTTLE CABLE

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

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

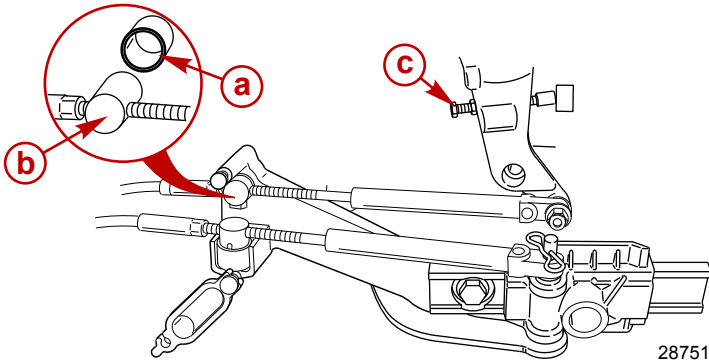


- a** - Nylon washer
- b** - Locknut

OUTBOARD INSTALLATION

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

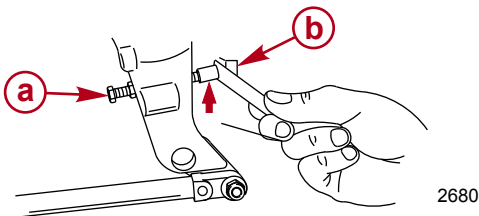
- Adjust the cable barrel so the installed throttle cable will hold the idle stop screw against the stop.



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

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

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

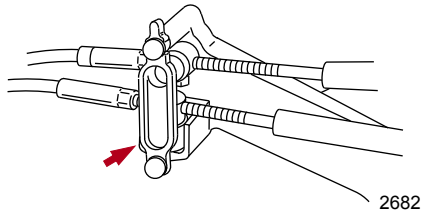


- a - Idle stop screw
- b - Idle stop

- Adjust the cable barrel if necessary.

OUTBOARD INSTALLATION

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



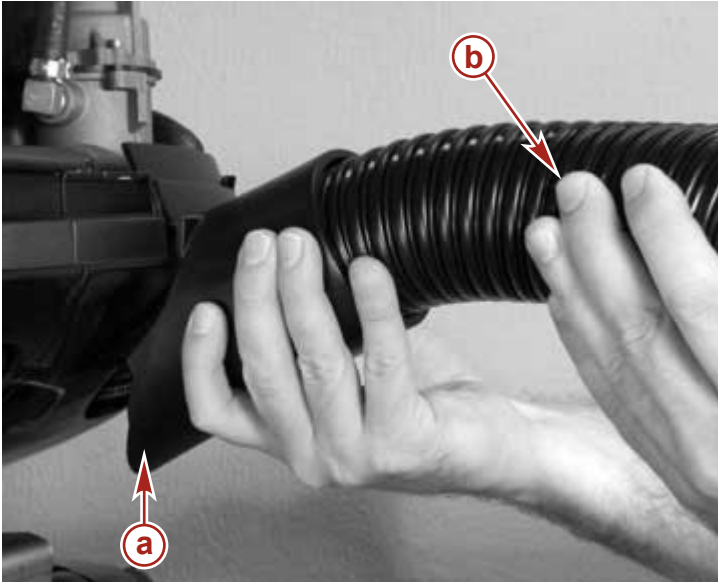
BOTTOM COWL RIGGING TUBE

Observe the following guidelines when installing the rigging hose and assembling the bottom cowl:

- Follow the instructions in the rigging hose kit.
 - Position the transom housing ahead of the engine to create sufficient slack in the wires, hoses, and control cables routed through the rigging hose.
 - Position the rigging hose to allow large, sweeping bends during steering. Ensure enough slack exists throughout the full trim and steering ranges.
 - Choose an unobstructed path for the wires, hoses, and control cables. Make the path as straight as possible with no sharp bends.
1. Route all wires, hoses, and control cables through the rigging hose and cowl coupler.
 2. Attach the cowl coupler to the bottom cowl as follows:

OUTBOARD INSTALLATION

- a. With one hand supporting the rigging hose, tilt the cowl coupler up at a 30° angle as shown.



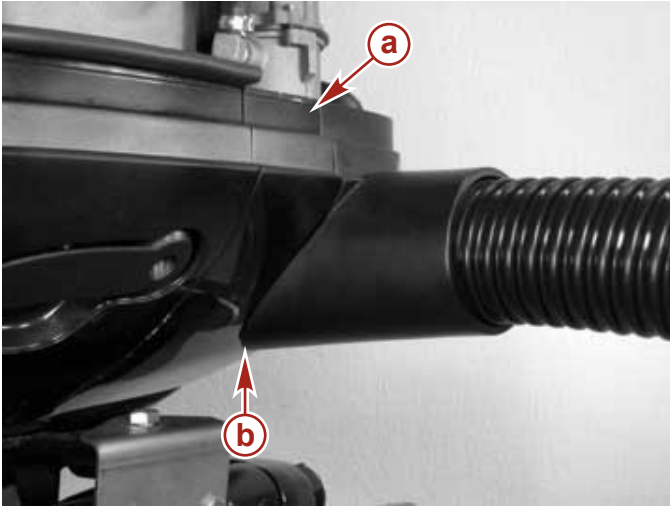
2708

- a** - Cowl coupler tilted up
- b** - One hand supports the rigging hose

NOTE: If necessary, loosen the rigging hose from the coupler to align the coupler with the cowl.

OUTBOARD INSTALLATION

- b. Align the tab on the coupler with the notch on the cowl. Tilt the coupler down and attach the coupler to the cowl. Ensure the tab engages with the notch in the cowl and that the coupler is flush with the bottom cowl.

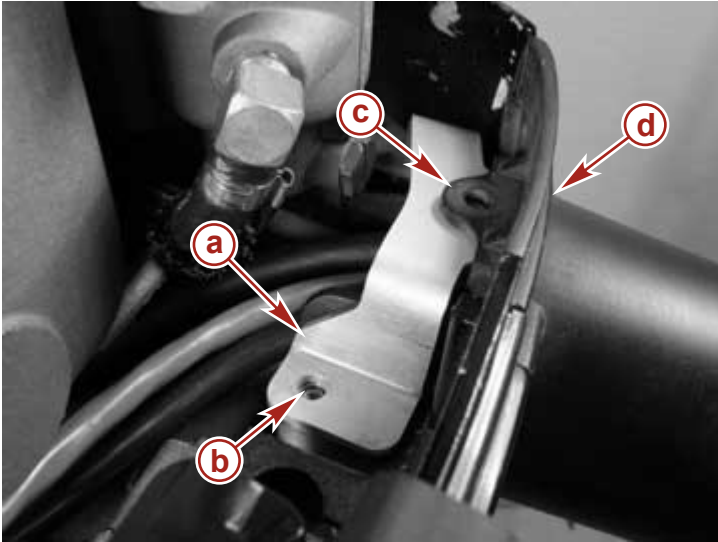


2709

- a** - Coupler tab and cowl notches engaged
b - Coupler flush with bottom cowl
- c. Lower the rigging bracket over the wires, hoses, and control cables.

OUTBOARD INSTALLATION

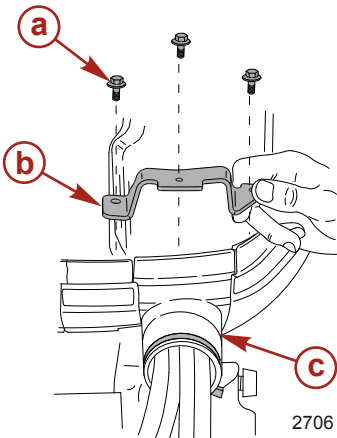
d. Install the bracket between the slots on the coupler and align the mounting holes.



2710

- a** - Rigging bracket
- b** - Mounting holes
- c** - Slots
- d** - Cowl coupling

e. Secure the bracket with three mounting screws. Tighten the screws securely.



- a** - Screws (3)
- b** - Bracket
- c** - Cowl coupler

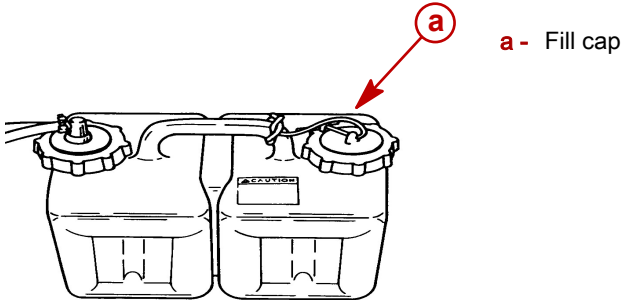
2706

OUTBOARD INSTALLATION

Oil Injection Set-Up

FILLING OIL SYSTEM

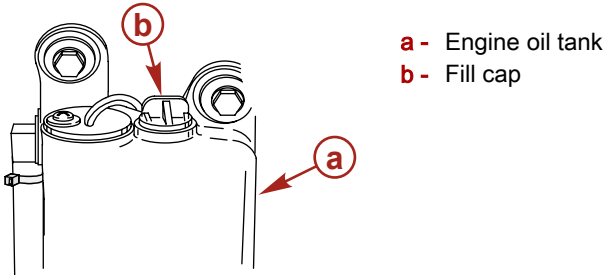
1. Fill the remote oil tank with the required engine oil and tighten the fill cap.



2683

Required Engine oil	Mercury Racing Multi Fuel Oil Plus or Oil meeting Mercury Marine Specification 8M0119109-T
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2. Remove the fill cap and fill the engine oil tank with oil. Install the fill cap.

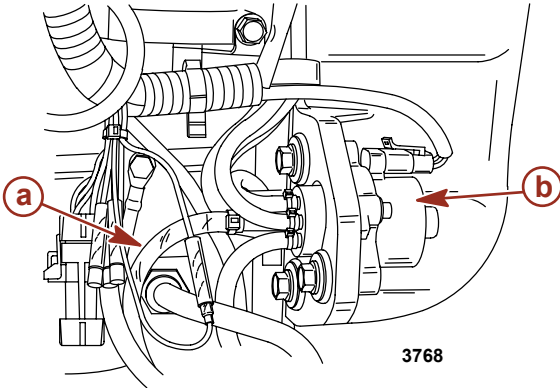


7745

OUTBOARD INSTALLATION

PRIMING OIL INJECTION PUMP

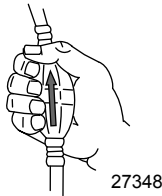
Before starting the engine for the first time, prime the oil injection pump. Priming will remove any air that may be in the pump, oil supply hose, or internal passages.



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

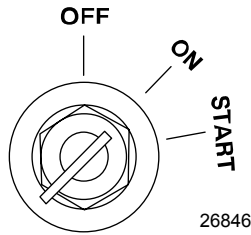
IMPORTANT: Fill the engine fuel system with fuel before priming the oil injection pump. Otherwise, the fuel pump will run without fuel during the priming process and may be damaged.

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



OUTBOARD INSTALLATION

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



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

PURGING AIR FROM THE ENGINE OIL TANK

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

Trim In Pin

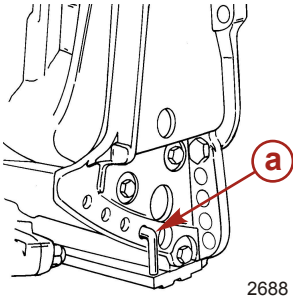
▲ WARNING

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

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

OUTBOARD INSTALLATION

However, once on plane, the engine should be trimmed to a more intermediate position to avoid a bow-down planing condition called plowing. Plowing can cause bow steering or oversteering and inefficiently consumes horsepower.



a - Tilt pin (not included with engine)

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

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

