MERCURY®

GO BOLDLY.™

8M0231124 724 eng

Operation Maintenance and Installation Manual

30/40/50/60 FourStroke

Scan for service and support information

Welcome

You have selected one of the finest marine power packages 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 before operating the outboard.

The Operation and Maintenance Manual contains specific instructions for using and maintaining your product. Keep this manual with the product for ready reference whenever you are on the water. This manual should stay with the outboard engine, if it is sold.

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

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

Read This Manual Thoroughly

IMPORTANT: If you do not understand any portion of this manual, contact your dealer. Your dealer can also provide a demonstration of actual starting and operating procedures.

Safety Alerts

Throughout this publication and on your power package, safety alerts labeled WARNING and CAUTION (accompanied by the symbol ⚠), are used to alert you to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. Observe these alerts carefully.

These safety alerts alone cannot eliminate the hazards that they signal. Strict compliance to these special instructions when performing the service, plus common sense operation, are major accident prevention measures.

⚠ 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.

Additional Alerts

Additional alerts provide information that requires special attention:

NOTICE

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

IMPORTANT: Identifies information essential to the successful completion of the task.

NOTE: *Indicates information that helps in the understanding of a particular step or action.*

California Proposition 65

California Proposition 65

WARNING: This product can expose you to chemicals including gasoline engine exhaust, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Notice to Users of This Manual

IMPORTANT: The operator (driver) is responsible for the correct and safe operation of the boat, the equipment aboard, and the safety of all occupants aboard. We strongly recommend that the operator read this Operation and Maintenance Manual and thoroughly understand the operational instructions for the power package and all related accessories before the boat is used.

Descriptions and specifications contained herein were in effect at the time this was approved for printing. Mercury Marine, whose policies are based on continuous improvement, reserves the right to discontinue models at any time or to change specifications or designs without notice and without incurring obligation.

Warranty Message

The product you have purchased comes with a **Mercury Marine Limited Warranty**. The terms of the warranty are set forth in the Warranty Manual, which can be accessed any time on the Mercury Marine website, at http://www.mercurymarine.com/warranty-manual. The Warranty Manual contains a description of what is covered, what is not covered, the duration of coverage, how to best obtain warranty coverage, **important disclaimers, limitations, and waivers**, and other related information. Please review this important information.

Mercury Marine products are designed and manufactured to comply with our own high quality standards, applicable industry standards and regulations, and certain emissions regulations. At Mercury Marine every engine is operated and tested before it is boxed for shipment to make sure that the product is ready for use. In addition, certain Mercury Marine products are tested in a controlled and monitored environment, for up to 10 hours of engine run time, in order to verify and make a record of compliance with applicable standards and regulations. All Mercury Marine product, sold as new, receives the applicable limited warranty coverage, whether the engine participated in one of the test programs described above or not.

This manual contains information required for the safe and proper operation, installation, and maintenance of the product. Use of the product not in accordance with any and all instructions for operation and maintenance outlined in this manual will be considered as improper, abnormal, abusive or non-acceptable use of the product and may result in the Mercury Marine Limited Warranty or legal guarantee (if and where applicable) being fully or partly void.

Copyright and Trademark Information

Identification Records

The serial numbers are the manufacturer's keys to numerous engineering details that apply to your Mercury Marine power package. When contacting Mercury Marine about service, **always specify model and serial numbers.**

Please record the following applicable information:

Outboard		
Engine Model and Horsepower		
Engine Serial Number		
Gear Ratio		
Propeller Number	**Pitch**	**Diameter**
Watercraft Identification Number (WIN) or **Hull Identification Number (HIN)**		**Purchase Date**
Boat Manufacturer	**Boat Model**	**Length**
Exhaust Gas Emissions Certification Number (Europe Only)		

Important Safety Information

General Information

Outboard Installation

Transporting

Fuel and Oil

Features and Controls

Operation

Maintenance

Storage

Troubleshooting

Owner Service Assistance

Maintenance Log

IMPORTANT SAFETY 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.

The operator may be subject to local boating license requirements, which may vary according to boating location.

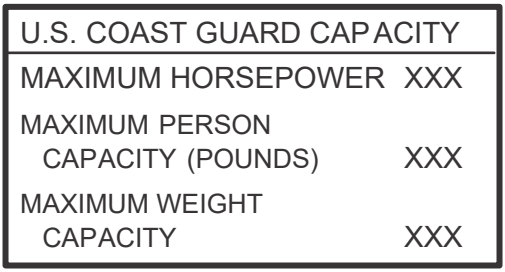
Be sure that at least one additional person onboard is instructed in the basics of starting and operating the outboard and boat handling in case the driver is unable to operate the boat.

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.

Most boats have a capacity plate to indicate the maximum power and boat load, as determined by the manufacturer and based on federal guidelines and applicable regulations. Never exceed these maximums.



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For clarification of horsepower or loading restrictions, contact the boat dealer or the boat manufacturer.

Exhaust Emissions

⚠ 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.

IMPORTANT SAFETY INFORMATION

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 whenever engine exhaust can be tasted or smelled, CO is being inhaled.

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

Boats with enclosed cabins should have one or more CO sensors installed.

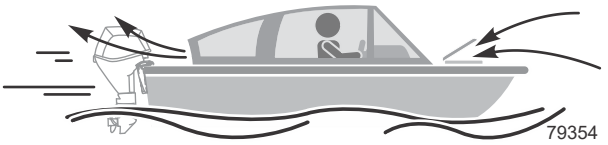
Stay Clear of Exhaust Areas

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 anyone to be positioned immediately behind the boat (platform dragging, teak/body surfing). This practice not only poses the risk of extreme physical harm, but also places that person in an area of high engine exhaust concentration.

Good Ventilation

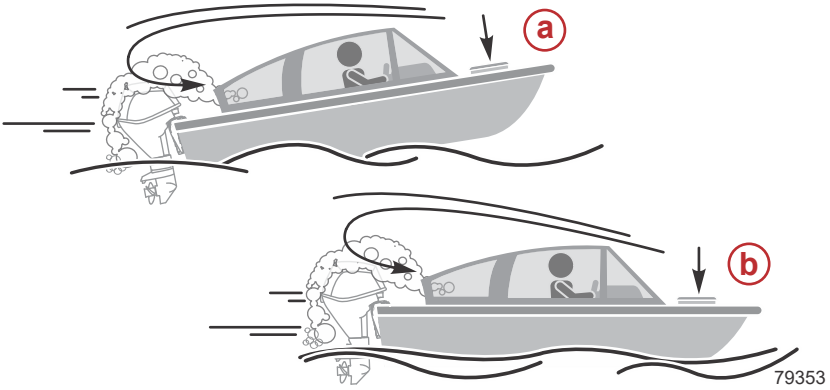
Ventilate the passenger area by opening side curtains or forward hatches.

The following image shows an example of desired air flow through the boat.



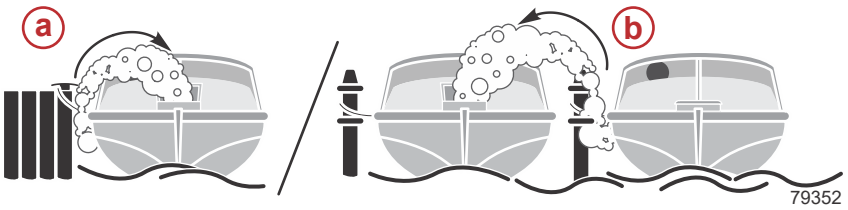
Poor Ventilation

- **Boat in Motion**: Under certain running or wind conditions, permanently enclosed or canvas enclosed cabins or cockpits with insufficient ventilation may draw in carbon monoxide. The following shows 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

- **Stationary Boat**: Although the occurrence is rare, on a calm day, persons 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. The following shows 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

Outboard Remote Control Models

⚠ WARNING

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

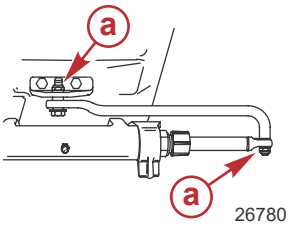
The outboard's remote control must be equipped with a start-in-neutral-only protection device. The device prevents the engine from starting when the shift control is in any position other than neutral.

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.



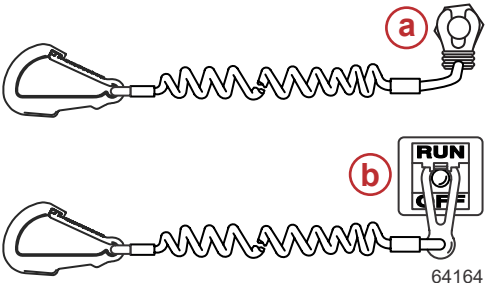
a - Self-locking nuts

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 provides a visual reminder for the operator to attach the lanyard to their personal flotation device (PFD) or wrist.

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 a shorter lanyard is desired, wrap the lanyard around the operator's wrist or leg, or tie a knot in the lanyard.



Lanyard stop switch and cord examples

a – Tiller handle lanyard

b – Remote control lanyard

Lanyard Stop Switch and Safe Operation

⚠ 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.

IMPORTANT: Instruct at least one other boat occupant on proper starting and operating procedures, should they be required to operate the boat in an emergency.

Activation of the lanyard stop switch will stop the engine immediately. However, a boat will continue to coast for some distance depending upon the velocity and degree of any turn at shutdown. While the boat is coasting, it can cause injury to anyone in the boat's path as seriously as it would when under power.

The lanyard stop switch stops the engine whenever the operator moves far enough away from the operator's position to activate the switch. This occurs if:

- The operator accidentally falls overboard, or
- The operator moves within the boat away 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
- 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
- Riding in forward seating (such as in a bow rider) at planing speeds in rough water
- Operating at planing speeds in shallow or obstacle infested waters
- Releasing a steering wheel or tiller handle that is pulling in one direction
- Drinking alcohol or consuming drugs
- Performing high-speed boat maneuvers

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.

To avoid accidental switch activation, the operator should always be aware of their position in relation to the lanyard stop switch and should:

- Never move away from the operating position while the boat is in motion.
- Never move away from the operating position while the boat is stationary without first disconnecting the lanyard from their person.

Keep the Lanyard Stop Switch and Lanyard Cord in Good Operating Condition

Before each use, check to ensure that 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.

Staying Safe Around the Outboard

Even when it is not operating, an outboard engine can present hazards to people in the boat and in the water.

- Always ensure that all passengers stay clear of the engine, whether the boat is in motion or stationary and whether the engine is operating or is shut off.
- Never use the outboard as a seat.
- Never use the outboard as a step.
- Never climb on any part of the outboard or use any portion of it as a handhold.

Safe Operating Practices

High-Speed and High-Performance Boat Operation

Unless already familiar with the boat, do not operate a boat at its high-speed capability without first requesting an initial orientation and familiarization demonstration with an authorized dealer or operator experienced with the boat/outboard combination.

For additional information, obtain a copy of the **Guide to Hi-Performance Boat Operation** booklet from Mercury Marine, at https://publications.brunswick.com/product-p/ob-om-hp.htm.

Passenger Safety - 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.

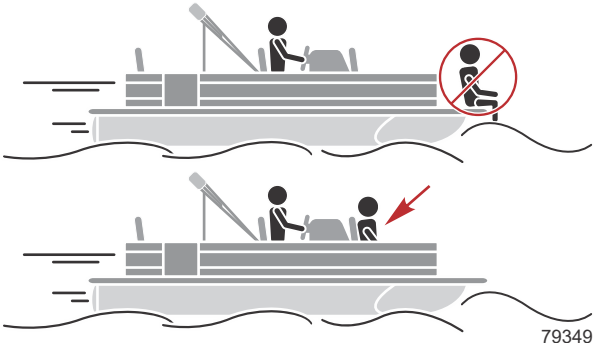
Boats with an Open Front Deck

⚠ 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.

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

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



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.

Protecting People in the Water

While Boat is in Operation

People in the water cannot take quick action to avoid a boat heading in their direction.

Approach slowly and exercise extreme caution when boating in areas where people may be in the water.

When a boat is moving 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 the Boat is Stationary

⚠ WARNING

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

Shift into neutral and shut down the engine before allowing people in the water near the boat.

Safe Boating Recommendations

To safely enjoy the waterways, boat operators must be familiar with local and all other governmental boating regulations and restrictions. Boaters should also consider the following suggestions.

- **Know and obey all nautical rules and laws of the waterways.**
  - All powerboat operators are advised to complete a boating safety course. In the U.S., the U.S. Coast Guard Auxiliary, the Power Squadron, the Red Cross, and the state or provincial boating law enforcement agency provide courses. For more information, visit the Boat U.S. Foundation website at https://boatus.org/.
  - Some locations (states, territories, etc.) *require* a boating license or certificate. Always confirm licensing and certification requirements prior to boating in a new location.
- **Perform safety checks and required maintenance.** Follow a regular schedule and ensure that all repairs are properly made.

- **Check onboard safety equipment.** Regulating bodies in most areas **require** specific safety equipment on every powered boat. Even if not required, consider carrying the following on board, and always check the condition before each outing:
  - Personal flotation device (one per person onboard)
  - Approved fire extinguishers
  - Paddle or oar
  - Two-way radio
  - Weather radio
  - Signal devices: flashlight, rockets or flares, flag, and whistle or horn
  - Tools necessary for minor repairs
  - Anchor and extra anchor line
  - Manual bilge pump and extra drain plugs
  - Drinking water
  - Spare propeller (or propellers, if applicable), 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
- **Watch for signs of weather change and avoid foul weather and rough-sea boating.**
- **Tell someone of the boating plans, including the expected route and estimated time of 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.**
  - U.S. 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. It is strongly advised that everyone wear a life jacket at all times while in the boat.
  - U.S. federal law *requires* children 13 years of age and younger to wear a U.S. Coast Guard-approved personal flotation device while the boat is underway.
  - Use of personal flotation devices may be *mandatory* in areas outside of the U.S. Always check local laws and regulations before embarking.
- **Prepare other boat operators.** Instruct at least one person onboard on the basics of starting and operating the engine and boat handling in case the driver becomes disabled or falls overboard.

- **Do not overload the boat.** Most boats are rated and certified for maximum load (weight) capacities (refer to the boat's capacity plate). Know the boat's operating and loading limitations. Know if the boat will float if it is full of water. When in doubt, contact a Mercury Marine Authorized 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:
  - Backs of seats
  - Gunwales
  - Transom
  - Bow
  - Decks
  - Raised fishing seats
  - 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 them to be thrown overboard or into the boat. Ensure that all passengers have a proper seat and are in it before any boat movement.
- **Never operate a boat while under the influence of alcohol or drugs. It is the law.** Alcohol or drugs can impair human judgment and greatly reduce the ability to react quickly.
- **Know the 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 the wake.
- **Never drive the boat directly behind a water-skier.** A boat traveling at 40 km/h (25 mph) will overtake a fallen skier who is 61 m (200 ft) in front of the boat in only five seconds.
- **Observe safe practices for using the boat for skiing, wake-boarding, or similar activity.**
  - A minimum of two persons should be onboard the boat whenever a skier is in the water: one to drive the boat and one to act as a spotter (facing the skier at all times).
  - 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.

- Some U.S. states and Canadian provinces require a "skier down" flag, have restrictions on spotter age, have rearview mirror requirements, and so forth. Know and obey all federal, state (provincial), and local laws and regulations.

- **Report accidents.**
  - In the U.S., 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:
    i. There is loss of life or probable loss of life.
    ii. There is personal injury requiring medical treatment beyond first aid.
    iii. There is damage to boats or other property where the damage value exceeds $2,000.00 (lower amounts in some states and territories).
    iv. There is complete loss of the boat.

    Seek further assistance from local law enforcement.
  - Accident reporting requirements may vary in areas outside the U.S.

Wave and Wake Jumping

⚠ WARNING

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

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

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

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

Impact with Underwater Hazards

⚠ 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 a Mercury Marine Authorized Dealer inspect and repair the vessel or power package.

This outboard is equipped with a hydraulic trim and tilt system that also contains a shock absorbing feature. This feature helps the outboard withstand damage in the case of impact with an underwater object at low to moderate speeds. At higher speeds, the force of the impact may exceed the system's ability to absorb the energy of the impact and cause serious product damage.

No impact protection exists while in reverse. Use extreme caution when operating in reverse to avoid striking underwater objects.

Reduce speed and proceed with caution when driving a boat in shallow water areas or in areas where underwater obstacles may exist that could be struck by the outboard or the boat bottom. **The most significant action that can 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 the minimum planing speed, typically 24 to 40 km/h (15 to 25 mph).**

⚠ WARNING

Avoid serious injury or death from all or part of an outboard or drive unit coming into the boat after striking a floating or underwater object. When operating in waters where objects may be at the surface or just under the surface of the water, reduce speed and keep a vigilant lookout.

Examples of objects that can cause engine damage are dredging pipes, bridge supports, wing dams, trees, stumps, and rocks.

Striking a floating or underwater object could result in any of a number of situations. Some of these situations could yield 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. A sharp change in direction can cause occupants to be thrown out of their seats or out of the boat.
- The boat's speed could rapidly reduce. This will cause occupants to be thrown forward or even out of the boat.
- The outboard or boat could sustain impact damage.

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. If water leaks are discovered after an impact, immediately activate the bilge pump.

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.

Safety Instructions for Hand-Tiller Outboards

No person or cargo should occupy the area directly in front of the outboard while the boat is in motion. If an underwater obstacle is struck, the outboard will tilt up and could seriously injure anyone occupying this area.

Models with Clamp Screws:

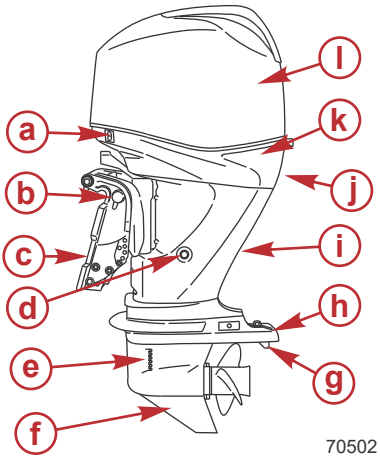
⚠ WARNING

Failure to correctly fasten the outboard could result in the outboard propelling off the boat transom resulting in property damage, serious injury, or death. Before operation, the outboard must be correctly installed with the required mounting hardware.

Some outboards come with transom bracket clamp screws. The use of clamp bracket screws alone is insufficient to properly and safely secure the outboard to the transom. Proper installation of the outboard includes bolting the engine to the boat through the transom. Refer to **Outboard Installation** for complete installation information.

If an obstacle is struck at planing speed and the outboard is not securely fastened to the transom, it is possible the outboard could lift off the transom and land in the boat.

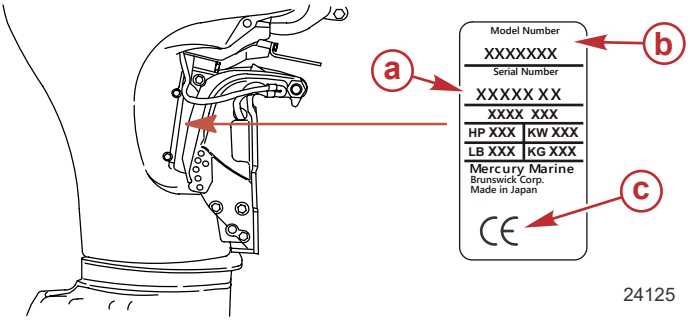
Component Identification



a - Auxiliary tilt switch
b - Tilt support knob
c - Transom brackets
d - Oil drain plug
e - Primary cooling water intake
f - Gearcase
g - Trim tab
h - Anti-ventilation plate
i - Driveshaft housing
j - Water pump indicator hole
k - Bottom cowl
l - Top cowl

Recording Serial Number

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



a - Serial number
b - Model designation
c - Certified Europe Insignia (as applicable)

Selecting Outboard Accessories

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

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

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

Refer to additional information regarding mounting accessories to the transom clamp bracket, in the **Outboard Installation** section.

30/40/50/60 FourStroke Specifications

Parameter		Specification
Rated power	30 hp models	22 kW (30 hp)
	40 hp models	29.4 kW (40 hp)
	50 hp models	37 kW (50 hp)
	60 hp models	44 kW (60 hp)
Full throttle range		5500–6000 RPM
Number of cylinders		4
Idle speed in forward gear		Controlled by ECM
Piston displacement		995 cc (60.8 in^3)
Cylinder bore		65 mm (2.559 in.)
Stroke		75 mm (2.953 in.)
Recommended spark plug		Champion RA8HC
Spark plug gap		1.0 mm (0.040 in.)
Gear ratio	83 mm (3-1/4 in.) diameter gearcase	1.83:1
	108 mm (4-1/4 in.) diameter gearcase	2.31:1
Gearcase lubricant capacity	83 mm (3-1/4 in.) diameter gearcase	340 ml (11.5 fl oz)
	108 mm (4-1/4 in.) diameter gearcase	710 ml (24.0 fl oz)
Recommended gasoline		Refer to **Fuel and Oil**
Recommended oil		Refer to **Fuel and Oil**
Engine oil capacity		3.0 L (3 US qt)
Battery rating*	Operation above 0 °C (32 °F)	465 MCA, 350 CCA, 70 Ah
	Operation below 0 °C (32 °F)	1000 MCA, 750 CCA, 100 Ah
Emission control system		Electronic engine control (EC)
Sound at drivers ear (ICOMIA 39-94)		81.1 dBA

Parameter	Specification
Tiller handle vibration (ICOMIA 38-94)	3.5 m/s²

*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.

Notes:

Important Installation Information

The process of rigging boats—including proper engine installation—has become more complex over the years. As a result, Mercury Marine recommends that engines be installed only by Mercury Marine authorized dealers.

Any consumers opting to install an outboard engine on their own are hereby advised to read and comply with the following instructions in their entirety. Failure to comply with these installation instructions could void the product warranty and could lead to serious injury or death.

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 Mercury Outboard Engines

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 can be mounted to the boat by use of the same fasteners that secure the outboard to the transom (or jack plate). The multiple uses of these fasteners (securing both an accessory and the engine to the boat) compromises the ability of the fasteners to maintain the proper clamp load. The use of a boat with loose engine mounting fasteners creates the possibility of performance, durability, and safety issues.

⚠ WARNING

Avoid serious injury or death resulting from a loss of boat control. Loose engine fasteners could cause the transom clamp 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.

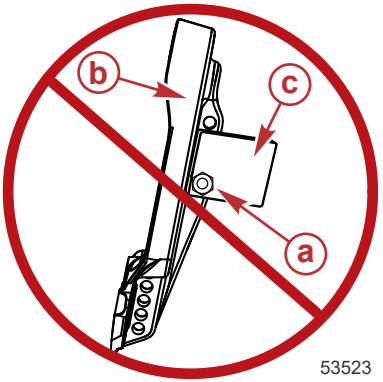
Unacceptable Accessory Mounting

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.

Examples:

- Do not attach an accessory to the boat by use of the engine mounting hardware. See Figure 1.

Figure 1



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

Exceptions to the Unacceptable Accessory Mounting

On some boats the outside of the transom area does not provide a completely flat surface to mount the engine (see Figure 2). No gap is permitted between the transom clamp bracket and the transom. An example of this is a thick cap, or other feature that prevents the engine transom clamp brackets from sitting on a flat surface [within 3.2 mm (0.125 in.)].

In those circumstances it is permissible to insert a flat plate between the engine and the transom to provide a flat mounting surface.

The plates must not be thicker than is necessary to permit a flat surface for the engine. The plate must be a 6061-T651 aluminum or stainless steel 302. See Figure 3:

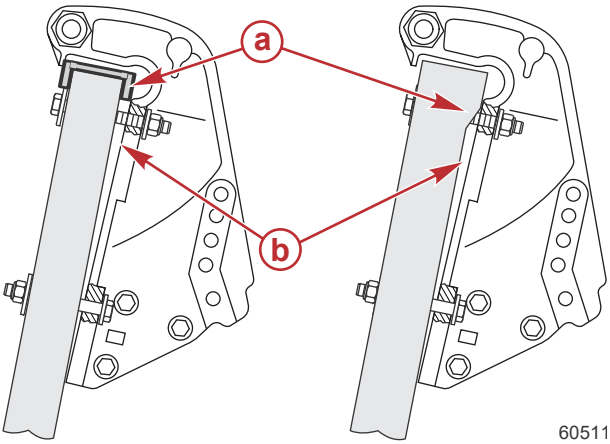
- On conventional transom clamp brackets, the entire surface of the bracket must be supported by the spacer plate.

Both sides of the boat transom or setback bracket/jack plate must be parallel to the engine mounting surface, and attaching hardware must be perpendicular (90 degrees) to the engine mounting brackets.

IMPORTANT: No sealant or grease is allowed on the mounting surfaces. The transom mounting surface must be flat within 3.2 mm (0.125 in.). No step in the transom mounting surface is allowed. The inside transom mounting bolt washer surface must be flat within 3.2 mm (0.125 in.).

IMPORTANT: A spacer plate must support the entire surface of the mounting bracket on conventional transom mounting brackets.

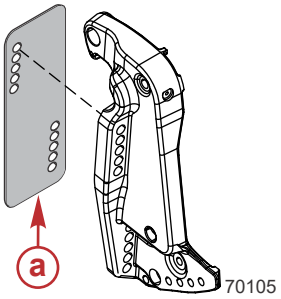
Figure 2



a - Cap or step is not recommended

b - No gap is permitted between transom clamp bracket and boat transom

Figure 3



a - Conventional spacer plate—must support the entire surface of each transom clamp bracket

Acceptable Installations

After the engine is mounted to the transom or jack plate, consistent 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 5, but only if:

- The accessory fasteners pass through the boat transom or jack plate.
- The accessory devices are not mounted to the transom clamp bracket in an unsupported condition. See Figure 4.
- The installation does not create interference issues, such as an accessory mounting plate resting in the radius of the transom clamp bracket. See Figure 5.

NOTE: *No accessory is permitted to be attached to the spacer plate; the plate serves only to provide a flat mounting surface for the engine.*

Figure 4

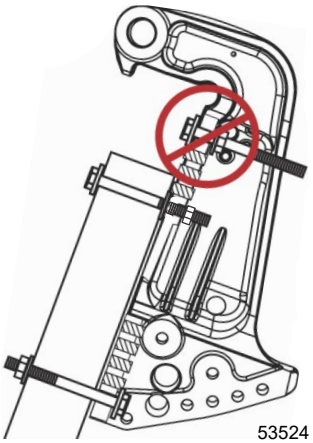
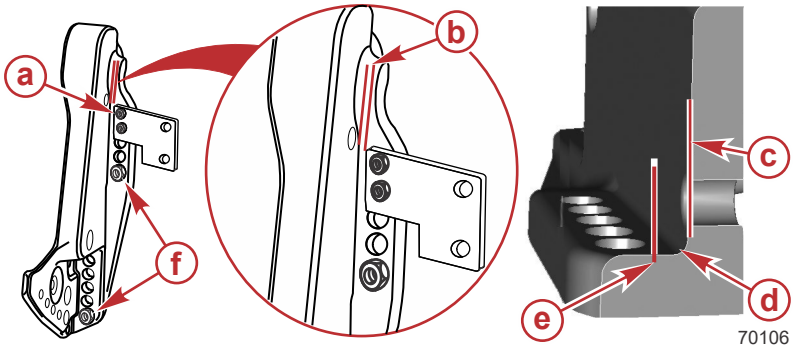
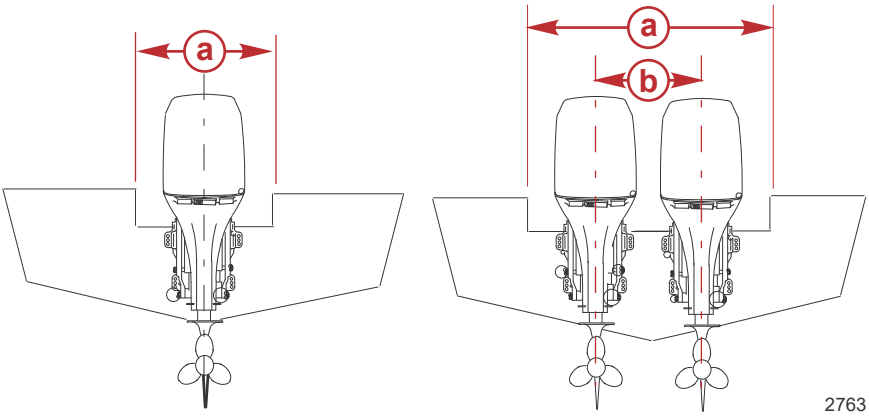


Figure 5



- **a -** Accessory manufacturer supplied fasteners through unused transom clamp bracket holes
- **b -** Minimum clearance 3.2 mm (0.125 in.)
- **c -** Transom clamp bracket wall
- **d -** Radius
- **e -** Edge of accessory bracket
- **f -** Engine supplied mounting fasteners

Installation Specifications



- **a -** Minimum transom opening
- **b -** Engine centerline for dual engines

Minimum Transom Opening	
Single engine (remote)	48.3 cm (19 in.)

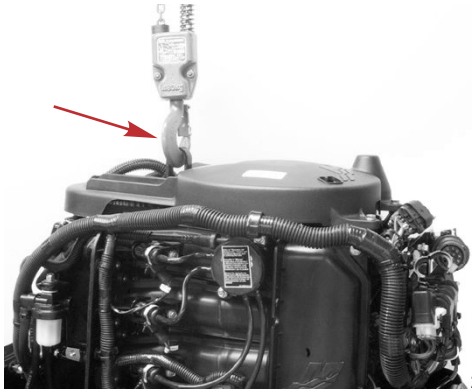
Minimum Transom Opening	
Single engine (tiller)	76.2 cm (30 in.)
Dual engines	101.6 cm (40 in.)

Engine Centerline	
Minimum	66 cm (26 in.)

Installing the Outboard

Lifting Outboard

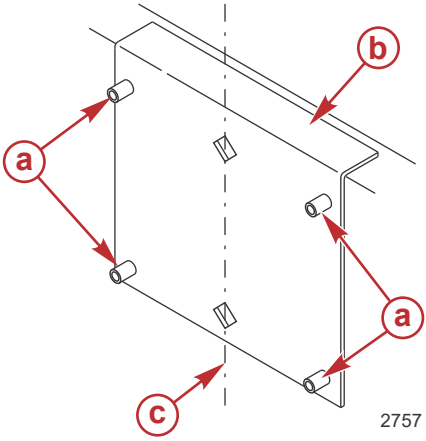
Use the lifting eye on the engine.



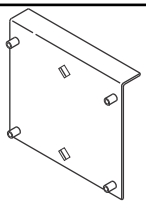
Installing Outboard

Drilling Outboard Mounting Holes

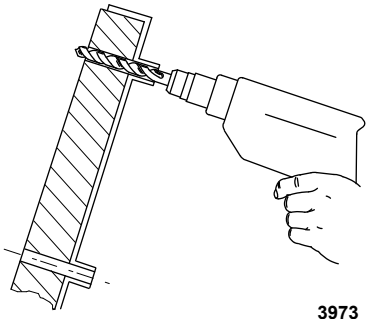
1. Mark four mounting holes on the transom using the transom drill fixture.



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

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

2. Drill four 13.5 mm (17/32 in.) mounting holes.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Fastening the Outboard to the Transom

Mounting Bolts

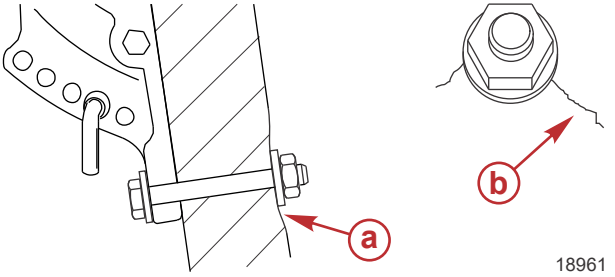
Outboard Transom Mounting Hardware - Supplied with Outboard		
Part Number	**Part Name**	**Description**
8M0071543	Outboard mounting bolt	½-20 x 5.00 in. long (3.25 in. thread)
826711-17	Nylon insert locknut	½-20
28421	Flat washer	1.50 in. diameter
54012	Flat washer	0.875 in. diameter

Available Outboard Mounting Bolts	
Part Number	**Description**
67755005	½-20 x 2.50 in. long (1.25 in. thread)
67755006	½-20 x 3.50 in. long (1.25 in. thread)
814259	½-20 x 4.00 in. long (2.25 in. thread)
67755-1	½-20 x 4.50 in. long (2.25 in. thread)
8M0071543	½-20 x 5.00 in. long (3.25 in. thread)
8M0038370	½-20 x 5.50 in. long (3.25 in. thread)
67755-2	½-20 x 6.50 in. long (2.75 in. thread)

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

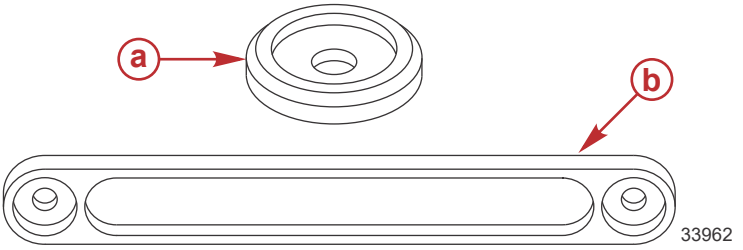
Checking Boat Transom Construction

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



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

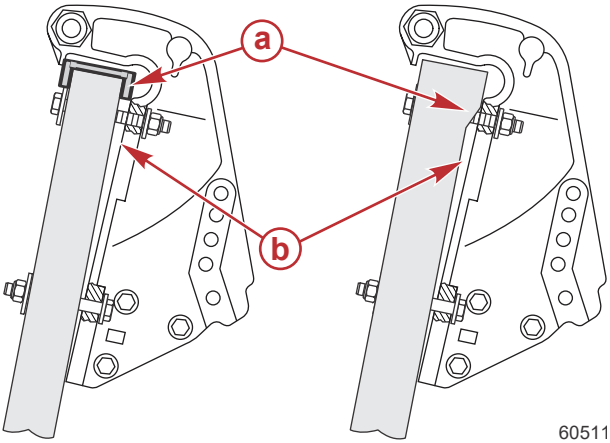
Use a dial torque wrench to determine transom strength. If the bolt or nut continues to turn without the torque reading on the dial increasing, it is an indication that the transom is yielding. The load area can be increased by using a larger washer or a transom reinforcement plate.



a - Large transom washer
b - Transom reinforcement plate

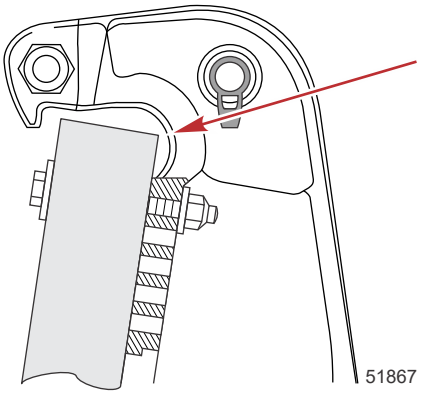
Fastening the Outboard to the Transom

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



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

IMPORTANT: Clearance must be maintained between the vessel transom and the outbound 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.

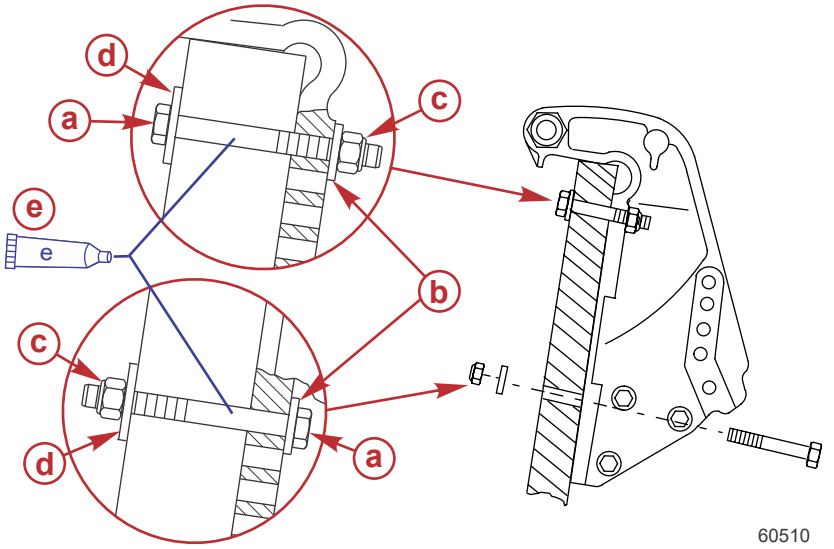


Installation

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.

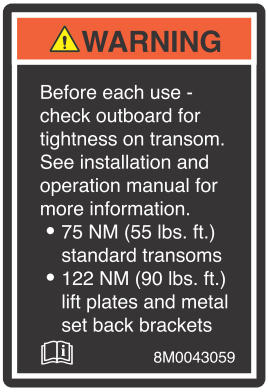
NOTE: *For a more accurate torque reading, tighten the mounting locknuts rather than the outboard mounting bolts.*



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

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

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



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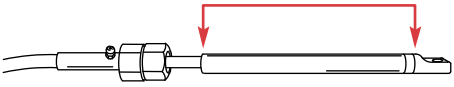
Decal on the transom bracket

Steering Cable

Steering Cable - Starboard Side Routed Cable

1. Lubricate the entire cable end.



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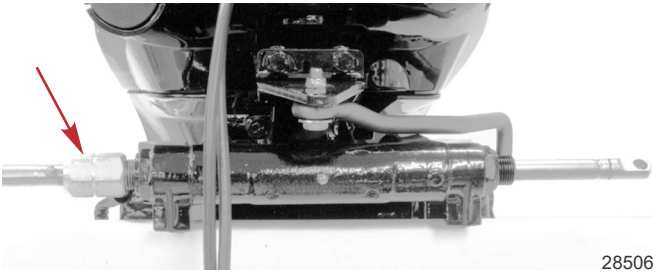
Description	Where Used	Part No.
Extreme Grease	Steering cable end	8M0190472

2. Insert the steering cable into the tilt tube.

28507

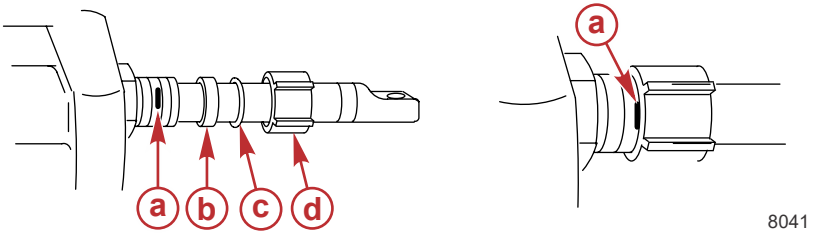
3. Tighten the nut to the specified torque.



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

Steering Cable Seal

1. Mark tilt tube 6.4 mm (0.25 in.) from end. Install seal components.
2. Thread cap to the mark.



a - 6.4 mm (1/4 in.)
b - Plastic spacer
c - O-ring seal
d - Cap

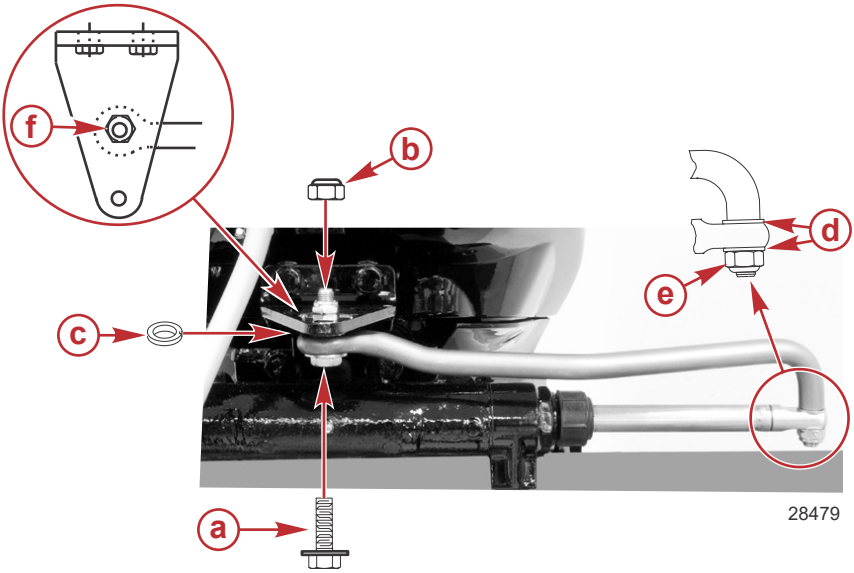
Steering Link Rod Installation

⚠ WARNING

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

OUTBOARD INSTALLATION

IMPORTANT: The steering link rod that connects the steering cable to the engine must be fastened using a special washer head screw and self-locking nylon insert locknuts as shown in the following illustration. These locknuts must never be replaced with common nuts (nonlocking) as they will work loose and vibrate off, freeing the link rod to disengage.



- **a -** Special washer head bolt (856680)
- **b -** Nylon insert locknut (8M0204726)
- **c -** Spacer (8M0109680)
- **d -** Flat washer (2)
- **e -** Nylon insert locknut (8M0204726)
- **f -** Use middle hole - steer outboard to the side to gain hole access

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

Description	Nm	lb-in.	lb-ft
Nylon insert locknut at the steering cable	Tighten until it seats, then back off 1/4 turn		

2. Attach the steering link rod to the steering bracket with the special washer head screw, locknut, and spacer.
3. Tighten the special washer head screw to the specified torque.

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

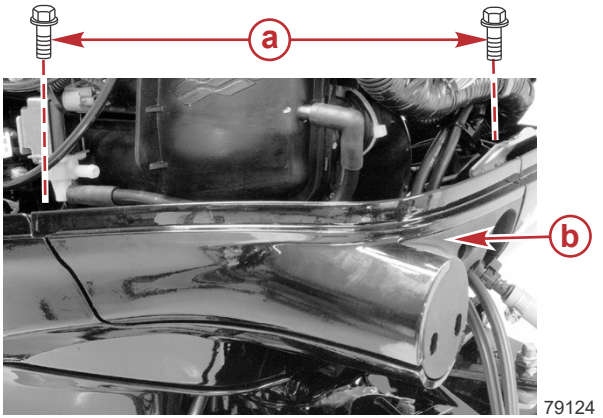
4. Tighten the locknut at the steering bracket to the specified torque.

Description	Nm	lb-in.	lb-ft
Nylon insert locknut at the steering bracket	27	–	20

Connections Through the Rigging Grommet

Remote Wiring Harness Installation

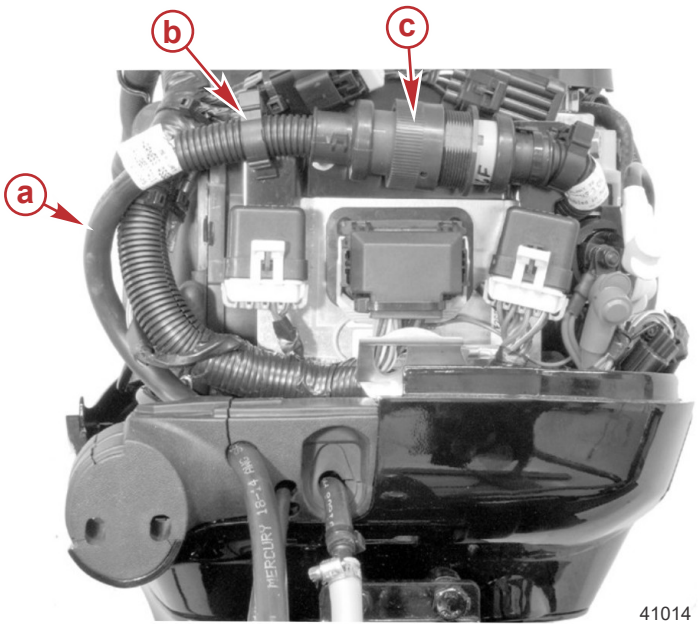
1. Remove two screws and remove the access cover.



a - Screws
b - Access cover

2. Route the remote wiring harness through the rubber grommet.

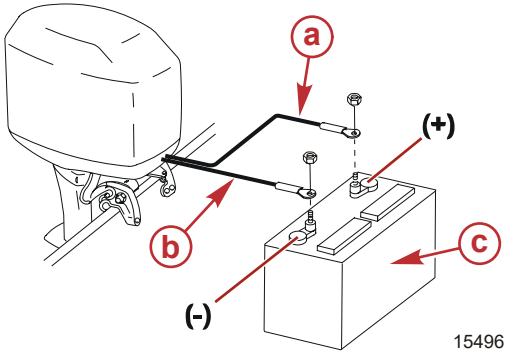
3. Connect the 14-pin connector to the engine harness and fasten the harness with the retainer.



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

Battery Cable Connections

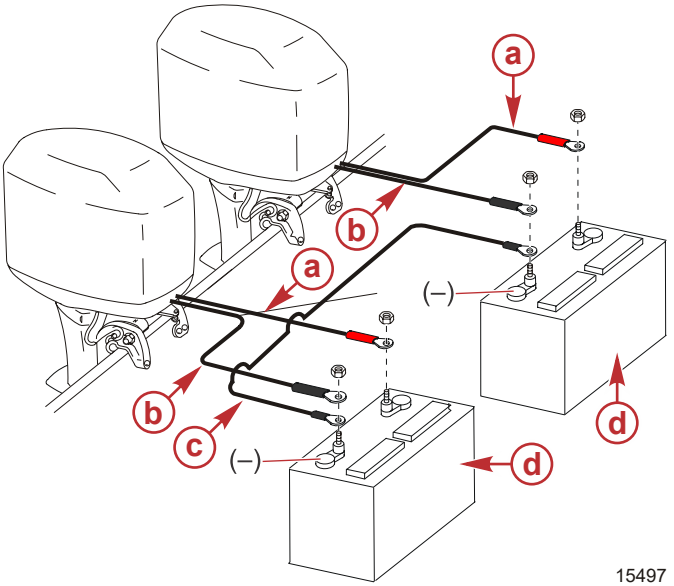
Single Outboard



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

Dual Outboards

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



- **a –** Red sleeve - Positive (+)
- **b –** Black sleeve - Negative (–)
- **c –** Ground cable
- **d –** Cranking battery

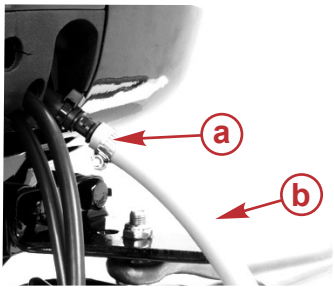
Fuel Hose Connection - Remote Control Models

Remote Fuel Hose Size

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

Fuel Hose Connection

Fasten the remote fuel hose to the fitting with a metal hose clamp or the plastic type hose clamp that is provided with the outboard.

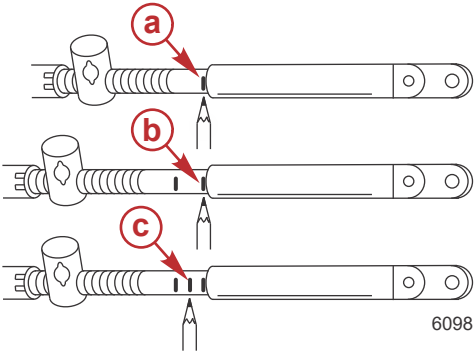


a - Hose clamp
b - Remote fuel hose

Shift Cable Installation

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

1. Locate the center point of the slack or lost motion that exists in the shift cable as follows:
   a. Move the remote control handle from neutral into forward and advance the handle to full speed position. Slowly return the handle back to neutral. Place a mark on the cable next to the cable end guide.
   b. Move the remote control handle from neutral into reverse and advance the handle to full speed position. Slowly return the handle back to neutral. Place a mark on the cable next to the cable end guide.
   c. Make a center mark, midway between the first two marks. Align the cable end guide with this center mark when installing cable to the engine.

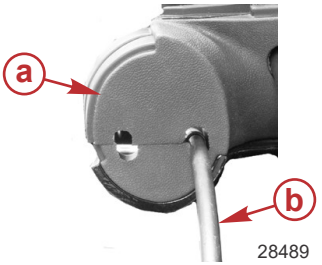


a - First mark
b - Second mark
c - Center mark

2. Manually shift the outboard into neutral. The propeller will rotate freely.

3. Position the remote control handle into neutral.

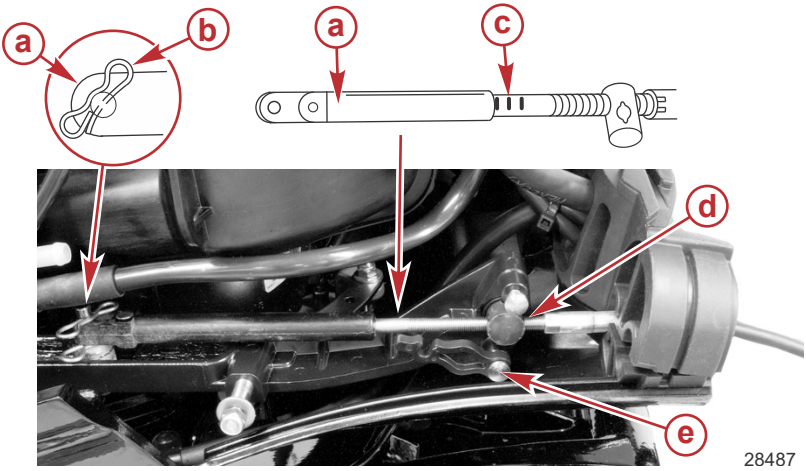
4. Fit the shift cable through the rubber grommet.



a - Rubber grommet
b - Shift cable

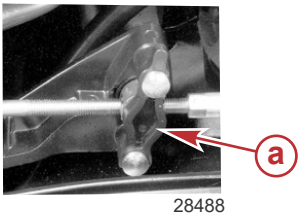
5. Attach the shift cable to the shift lever with a bow tie clip retainer.

6. Adjust the cable barrel so the center mark on the cable is aligned with the end guide when the cable barrel is placed in the barrel receptacle.



a - Cable end guide
b - Bow tie clip retainer
c - Center mark
d - Cable barrel
e - Barrel latch

7. Place the cable barrel into the barrel receptacle.
8. Lock the barrel in place with the barrel latch.



a - Barrel latch

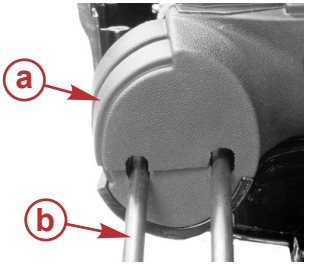
9. Check shift cable adjustments as follows:
   a. Shift the remote control into forward. The propeller shaft should be locked in gear. If not, adjust the barrel closer to the cable end guide.
   b. Shift the remote control into reverse while turning propeller. The propeller shaft should be locked in gear. If not, adjust the barrel away from the cable end guide. Repeat steps a through c.
   c. Shift the remote control back to neutral. The propeller shaft should turn freely without drag. If not, adjust the barrel closer to the cable end guide. Repeat steps a through c.

Throttle Cable Installation

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

1. Position the remote control into neutral.

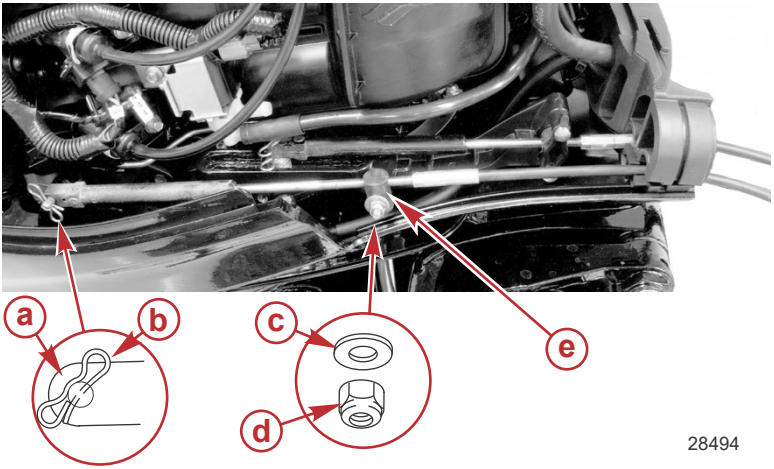
2. Fit the throttle cable through the rubber grommet.



a - Rubber grommet
b - Throttle cable

3. Attach the throttle cable to the throttle lever with a bow tie clip retainer.
4. Adjust the cable barrel until the barrel slips onto the mounting stud.

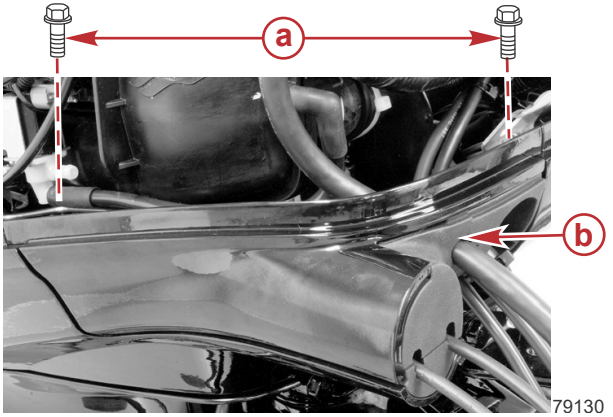
5. Fasten the throttle cable to the mounting stud with a flat washer and locknut. Tighten the locknut to the specified torque.



a - Cable end guide
b - Bow tie clip retainer
c - Flat washer
d - Locknut
e - Cable barrel

Description	Nm	lb-in.	lb-ft
Throttle cable locknut	6	53	–

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



a - Screws
b - Access cover

Description	Nm	lb-in.	lb-ft
Access cover screw	10	89	–

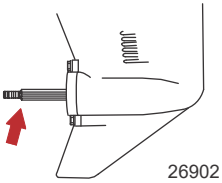
Propeller Installation

Propeller Installation - 108 mm (4-1/4 in.) Diameter Gearcase

⚠ 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 activate the lanyard stop switch to prevent the engine from starting. Place a block of wood between the propeller blade and the anti-ventilation plate.

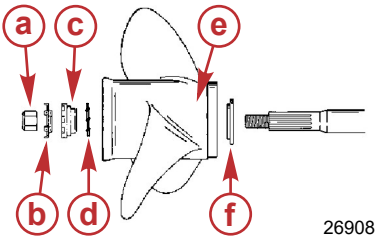
1. Apply Quicksilver or Mercury Precision Lubricants Extreme Grease to the propeller shaft.



Description	Where Used	Part No.
Extreme Grease	Propeller shaft	8M0190472

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

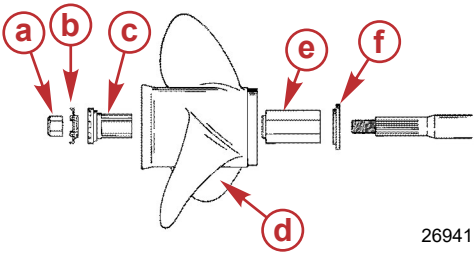
2. Flo-Torq I drive hub propellers - Install the thrust washer, propeller, continuity washer, thrust hub, propeller nut retainer, and propeller nut onto the shaft.



26908

a - Propeller nut
b - Propeller nut retainer
c - Thrust hub
d - Continuity washer
e - Propeller
f - Thrust washer

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

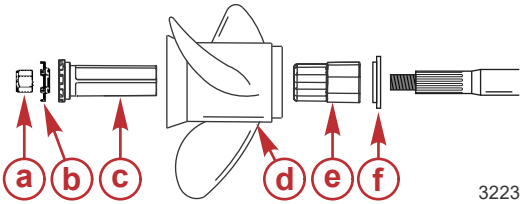


26941

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

NOTE: *Stainless steel applications - Installation of a Flo-Torq III drive hub propeller is recommended.*

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

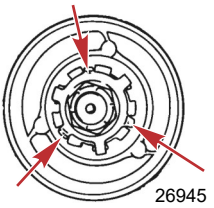


a - Propeller nut
b - Propeller nut retainer
c - Rear thrust hub
d - Propeller
e - Replaceable drive sleeve
f - Forward thrust hub

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

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

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



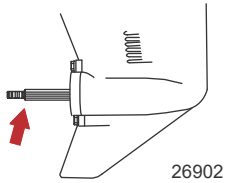
Propeller Installation - 87.3 mm (3-7/16 in.) Diameter Gearcase

⚠ 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 activate the lanyard stop switch to prevent the engine from starting. Place a block of wood between the propeller blade and the anti-ventilation plate.

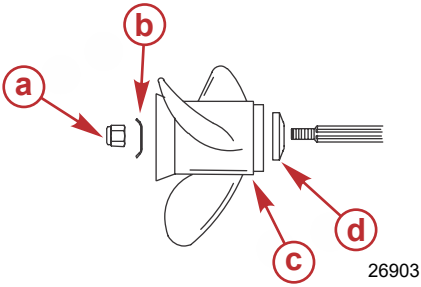
IMPORTANT: To prevent the propeller hub from corroding and seizing to the propeller shaft (especially in saltwater), always apply a coat of the recommended lubricant to the entire propeller shaft at the recommended maintenance intervals, and also each time the propeller is removed.

1. Coat the propeller shaft with Quicksilver or Mercury Precision Lubricants Extreme Grease.



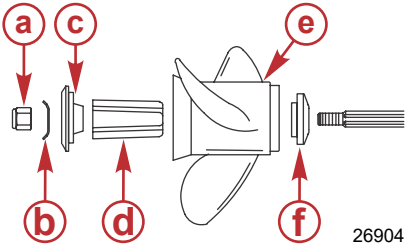
Description	Where Used	Part No.
Extreme Grease	Propeller shaft	8M0190472

2. Flo-Torq I drive hub propellers - Install the forward thrust hub, propeller, propeller nut retainer, and propeller nut onto the shaft.



a - Propeller nut
b - Propeller nut retainer
c - Propeller
d - Forward thrust hub

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

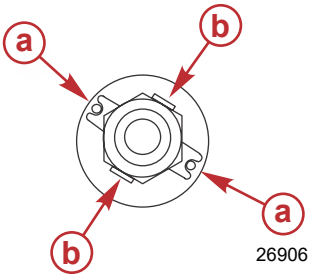


a - Propeller nut
b - Propeller nut retainer
c - Rear thrust hub
d - Replaceable drive sleeve
e - Propeller
f - Forward thrust hub

4. Place the propeller nut retainer over the pins. Place a block of wood between the gearcase and the propeller, and tighten the propeller nut to the specified torque.

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

5. Align the flat sides of the propeller nut with the tabs on the propeller nut retainer. Secure the propeller nut by bending the tabs up and against the flats on the propeller nut.

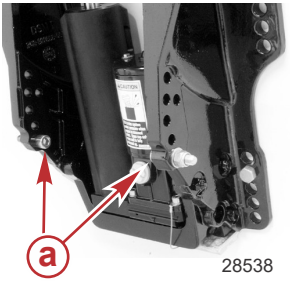


a - Pins
b - Tabs

6. Install the spark plug leads.

Trim-In Stop Adjustment - Power Trim Models

If an adjustment is required to the trim-in stop, reposition the tilt stop pins in the desired holes. Tighten the tilt stop pins to the specified torque.



a - Tilt stop pins

Description	Nm	lb-in.	lb-ft
Tilt stop pins	24.4	–	18

Aquatic Invasive Species (AIS)

STOP AQUATIC HITCHHIKERS!™
Be A Good Steward. Clean. Drain. Dry.

For additional information, visit StopAquaticHitchhikers.org.

About AIS

AIS and their spread can detrimentally impact the boating experience and the future of the boating lifestyle. Reducing the spread of AIS has led to significant national efforts to inspect boats moving between water bodies or across state and federal boundaries and could lead to delayed or denied access if AIS are suspected or found on board.

AIS include plant life such as Eurasian watermilfoil and water hyacinth, and animals such as spiny water flea, quagga, and zebra mussels. AIS may vary in size from microscopic, to easily visible to the naked eye, and can live in residual water or mud. These species damage ecosystems and negatively impact fishing by depleting natural food resources, altering the water environment, and changing the structure of the ecosystem.

The impact of AIS has already resulted in the limiting of boating access to many waterways throughout North America, the closure of public boat ramps, and the reduction of availability for fishing and boating across the United States. Many federal, state, and local agencies have enacted laws and regulations for inspections, permits, launch availability, and water access for vessels entering public waterways.

Boats and associated equipment are major contributors to the spread of AIS. Boats that have come into contact with AIS can become a means of transportation through attachment and entrapment.

Boat Cleaning and AIS

Water passes in and out of the space under the engine's lower cowls during normal operation of the boat. When flushing and cleaning the boat to control the spread of AIS, pay attention to this space by directing flushing water into the spaces under the lower cowl.

The engine cooling system can be flushed by operating the engine with the appropriate flushing attachment and introducing heated water to the engine.

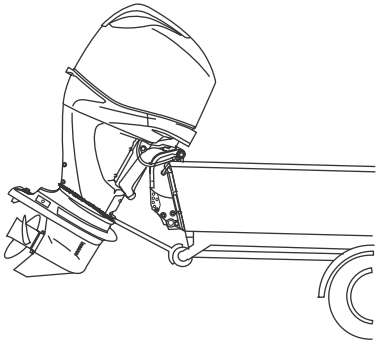
Region-Specific Information

For more information about the control of AIS in a specific region, please contact the local area wildlife conservation office or local governmental natural resources office.

Trailering Boat/Outboard

Trailer the boat with the outboard tilted down, so it is in a vertical operating position.

Additional clearance may be required for railroad crossings, driveways, and trailer bouncing. If additional clearance is required, tilt the outboard up by using an accessory outboard support device. Refer to an authorized dealer for recommendations.


28517

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.

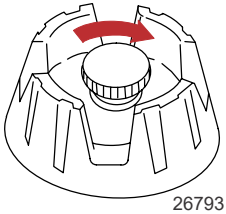
Transporting Portable Fuel Tanks

⚠ WARNING

Avoid serious injury or death from a gasoline fire or explosion. Follow the transporting instructions supplied with the portable fuel tank. Transport the fuel tank in a well ventilated area away from open flame or sparks.

Manual Venting Type Fuel Tank

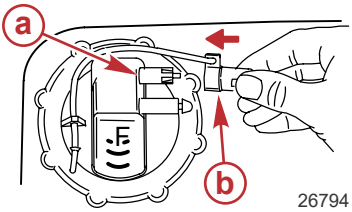
Close the fuel tank air vent when transporting tank. This will prevent escape of fuel or vapors from tank.


26793

Auto-Venting Type Fuel Tank

1. Disconnect the remote fuel line from tank. This will close the air vent and prevent escape of fuel or vapors from tank.

2. Install tether cap over the fuel line connector stem. This will protect the connector stem from being accidentally pushed-in, allowing fuel or vapor to escape.



a - Connector stem
b - Tether cap

Notes:

Fuel Requirements

IMPORTANT: Use of improper gasoline can damage an engine. Engine damage resulting from the use of improper gasoline is considered misuse of the engine and will not be covered under the Limited Warranty or legal guarantee (if applicable).

Fuel Ratings

Mercury outboard engines will operate satisfactorily with any major brand of unleaded gasoline that meets the following specifications:

- **USA and Canada** - A posted pump octane rating of 87 (R+M)/2, minimum, for most models. Premium gasoline 91 (R+M)/2 octane is also acceptable for most models. **Do not** use leaded gasoline.
- **Outside USA and Canada** - A posted pump octane rating of 91 RON, minimum, for most models. Premium gasoline (95 RON) is also acceptable for all models. **Do not** use leaded gasoline.

Using Reformulated (Oxygenated) Gasoline (USA Only)

Reformulated gasoline is required in certain areas of the USA and is acceptable for use in Mercury Marine engines. The only oxygenate currently in use in the USA is alcohol (ethanol, methanol, or butanol).

Gasoline Containing Alcohol

Bu16 Butanol Fuel Blends

Fuel blends of up to 16.1% butanol (Bu16) that meet the published Mercury Marine fuel rating requirements are an acceptable substitute for unleaded gasoline. Contact the boat manufacturer for specific recommendations on the boat's fuel system components (fuel tanks, fuel lines, and fittings).

Methanol and Ethanol Fuel Blends

IMPORTANT: The fuel system components on Mercury Marine engines will withstand up to 10% alcohol (methanol or ethanol) content in the gasoline. Some boat fuel systems may not be capable of withstanding the same percentage of alcohol. Contact the boat manufacturer for specific recommendations for boat-specific fuel system components (fuel tanks, fuel lines, and fittings).

Be aware that gasoline containing methanol or ethanol may cause increased:

- Corrosion of metal parts
- Deterioration of rubber or plastic parts
- Fuel permeation through the rubber fuel lines
- Likelihood of phase separation (water and alcohol separating from the gasoline in the fuel tank)

⚠ WARNING

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

IMPORTANT: When using gasoline that contains or might contain methanol or ethanol, increase the frequency of inspection for leaks and abnormalities.

IMPORTANT: When operating a Mercury Marine engine on gasoline containing methanol or ethanol, do not store the gasoline in the fuel tank for long periods. Cars normally consume these blended fuels before they can absorb enough moisture to cause trouble; boats often sit idle long enough for phase separation to take place. Internal corrosion may occur during storage if alcohol has washed protective oil films from internal components.

Fuel Additives

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

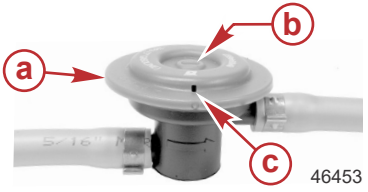
Electric Fuel Pump

If an electric fuel pump is used, the fuel pressure must not exceed 27.58 kPa (4 psi) at the engine. If necessary, install a pressure regulator to regulate the pressure.

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 Tank

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).

Mercury Marine's Pressurized Portable Fuel Tank

Mercury Marine has created a portable pressurized fuel tank that meets the preceding EPA requirements. This fuel tank is available as an accessory and is provided with certain portable outboard models.

Special Features of the Portable Fuel Tank

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

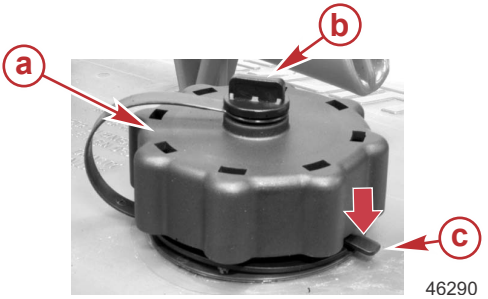
Since sealed fuel tanks are not vented, they will expand and contract as the fuel expands and contracts during heating and cooling cycles of the outside air. This is normal.

Removing the Fuel Cap

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

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

4. Press down on the tab lock again and remove the cap.



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

Using the Pressurized Portable Fuel Tank

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

Filling Fuel Tank

⚠ WARNING

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

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

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

Always stop the engine before filling the tanks.

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

Portable Fuel Tank Placement in the Boat

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

Low Permeation Fuel Hose Requirement

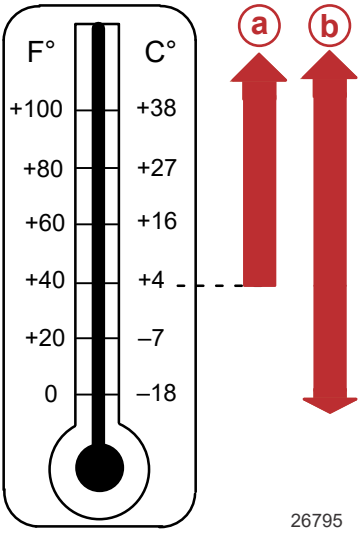
Required for outboards manufactured for sale, sold, or offered for sale in the United States.

- 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.

Engine Oil Recommendations

Mercury or Quicksilver NMMA FC-W certified SAE 10W-30 4-Stroke Marine Engine Oil is recommended for general, all-temperature use. If NMMA certified synthetic blend oil is preferred, use Mercury or Quicksilver SAE 25W-40 Synthetic Blend Marine 4-Stroke Engine Oil. If the recommended Mercury or Quicksilver NMMA FC-W certified outboard oils are not available, a major FC-W certified 4-stroke outboard oil may be used.

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



Recommended SAE viscosity for engine oil

a - Mercury or Quicksilver SAE 25W-40 Synthetic Blend Marine 4-Stroke Engine Oil may be used at temperatures above 4 °C (40 °F)

b - Mercury or Quicksilver SAE 10W-30 4-Stroke Marine Engine Oil is recommended for use in all temperatures

Checking and Adding Engine Oil

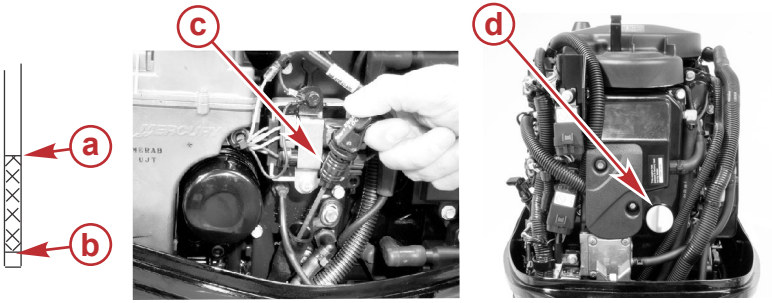
IMPORTANT: Do not overfill. Be sure that the outboard is upright (not tilted) when checking oil.

1. Turn the engine off. Have the outboard in a level operating position. Remove the top cowl.
2. Flip the handle up and pull out the dipstick. Wipe it with a clean rag or towel and push it back in all the way.

3. Pull the dipstick back out again and observe the oil level. If the oil level is low, remove the oil filler cap and fill to (but not over) the upper oil level with the recommended oil.

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

4. Push the dipstick back in all the way, then flip the handle down to lock the dipstick in place. Reinstall the oil filler cap and hand tighten securely.



28412

a - Full mark
b - Add mark
c - Dipstick
d - Oil filler cap

Remote Control Features

The following image highlights the features of some common Mercury Precision and Quicksilver remote controls.

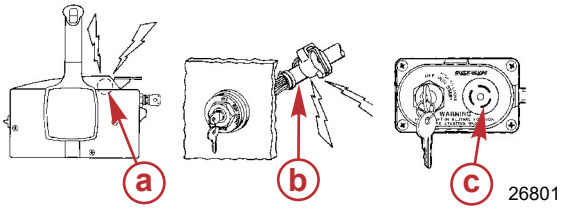
- **a -** Trim/tilt switch – Refer to **Power Trim and Tilt**
- **b -** Ignition key switch – **OFF**, **ON**, **START**
- **c -** Throttle only button – Refer to **Operation – Starting the Engine**
- **d -** Safety lanyard switch

For other controls, consult the boat dealer for a description of the functions and operations of the remote control.

Warning System

Warning Horn Signals

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



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

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

1. **Continuous six second beep:** Indicates a **critical** engine condition. Depending on the condition, the Engine Guardian system may engage and protect the engine by limiting its power. Return to port immediately and contact an authorized dealer.
2. **Intermittent short beeps for six seconds:** Indicates a **noncritical** engine condition. This condition does not require immediate attention. Continue boating. Depending on the nature of the problem, the engine's power may be limited by the Engine Guardian system to protect the engine (refer to **Engine Guardian System** following). Contact an authorized dealer at the first convenience.

It is important to note that in either of the above scenarios, the horn will sound only one time. The horn signal will sound again, upon shut down and restart, if the fault that triggered the signal is still present.

Some engine conditions can be corrected by the operator. These include:

- Cooling system (water pressure or engine temperature) problem (noncritical condition). Stop the engine and check the water intake holes in the lower unit for obstruction.
- Low engine oil pressure (critical condition). Refer to **Fuel and Oil – Checking and Adding Engine Oil**.

Engine Guardian System

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

- If Engine Guardian has been activated, reduce the engine speed.
- 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 determines that the reset has not corrected the problem, Engine Guardian will remain activated, continuing to limit the throttle. The problem must be corrected before Engine Guardian will allow the engine to reach a normal operating speed.

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.

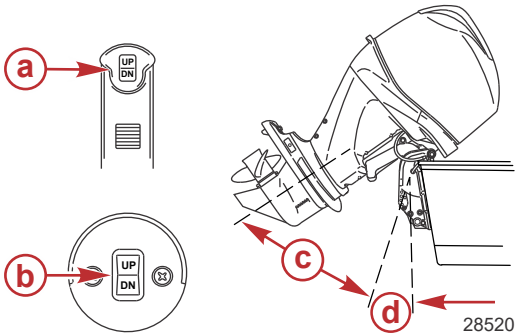
The SmartCraft instrument package will also aid in Engine Guardian diagnostics. The SmartCraft instrument package will display critical engine alarm data and potential problems.

Power Trim and Tilt

The outboard has a trim/tilt control called power trim. This enables the operator to easily adjust the position of the outboard by pressing the trim switch. Moving the outboard in closer to the boat transom is called trimming in or down. Moving the outboard further away from the boat transom is called trimming out or up.

Trim refers to the adjustment of the outboard within the first 20° range of travel. This is the range used while operating the boat on plane.

Tilt refers to adjusting the outboard further up and out of the water. With the engine turned off and ignition switch turned on, the outboard can be tilted out of the water. At low idle speed, the outboard can also be tilted up past the trim range to permit, for example, shallow water operation.



a - Remote control trim switch
b - Panel mount trim switch
c - Tilt range of travel
d - Trim range of travel

Power Trim Operation

⚠ 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.

⚠ 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.

Typically, operating around the middle of the trim range will give satisfactory results. In certain situations, trimming the outboard all the way in or out will improve performance, but not without side effects.

The most significant side effect of changing the trim away from the middle of the range is a pull or torque that can be felt on the steering wheel or tiller handle. This steering torque results from the propeller shaft no longer being parallel to the water surface.

Before adjusting the trim from the middle of the range, consider the following benefits and detriments of changing the trim angle.

- Trimming in or down can:
  - Lower the bow
  - Result in quicker planing off, especially with a heavy load or a stern heavy boat
  - Generally improve the ride in choppy water
  - Increase steering torque or pull to the right (with the normal right-hand rotation propeller)
  - In excess, can lower the bow of some boats to a point where they begin to plow with their bow in the water while on plane. This can result in an unexpected turn in either direction (called bow steering or oversteering) if any turn is attempted, or if a significant wave is encountered.
- Trimming out or up can:
  - Lift the bow higher out of the water
  - Generally increase top speed
  - Increase clearance over submerged objects or a shallow bottom
  - Increase steering torque or pull to the left at a normal installation height (with the normal right-hand rotation propeller)
  - Cause engine overheating if any cooling water intake holes are above the waterline
  - In excess, can cause boat porpoising (bouncing) or propeller ventilation

In rare circumstances, the owner may decide to limit the trim in. This is accomplished by repositioning the tilt stop pins into the desired adjustment holes in the transom brackets.

Tilting Operation

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

The hydraulic system used for power trim and tilt will not maintain an outboard's tilt over sustained periods. The tilt support lever prevents a tilted outboard from slowly creeping back down.

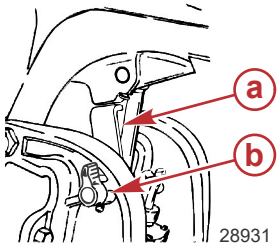
To engage the tilt support lever:

- Tilt the outboard up.
- Rotate the knob to bring the support lever upward.

- Lower the outboard to rest on the tilt support lever.

To disengage the tilt support lever:

- Tilt the outboard up slightly.
- Rotate the knob to bring the support lever down.
- Lower the outboard.



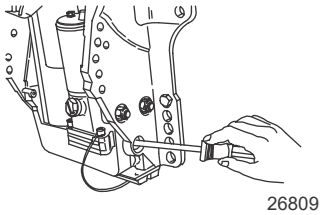
a - Tilt support lever
b - Knob

Manual Tilting

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

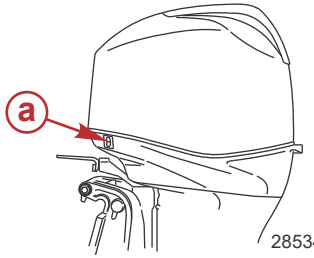
Turn out the manual tilt release valve three turns counterclockwise. This allows manual tilting of the outboard. Tilt the outboard to the desired position and tighten the manual tilt release valve.

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

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

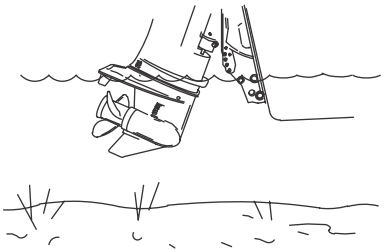


a - Auxiliary tilt switch

Shallow Water Operation

When operating the boat in shallow water, the outboard can be tilted beyond the maximum trim range to prevent hitting bottom.

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



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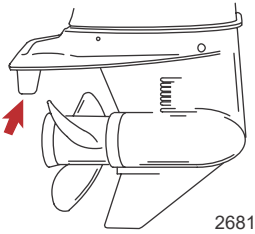
Trim Tab Adjustment

Propeller steering torque may cause a boat to pull in one direction. Steering torque normally occurs at or above planing speeds. Higher speed causes higher steering torque loads. The trim tab can compensate for normal steering torque in many cases and can be adjusted within limits to reduce any unequal steering effort.



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

Models Without Power Trim

Operate the boat at normal cruising speed trimmed to desired position by installing the tilt pin in the desired tilt pin hole. Turn the boat left and right and note the direction the boat turns more easily.

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

Models With Power Trim

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

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

Notes:

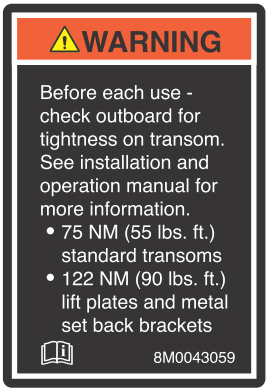
Engine Break-in Procedure

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

1. For the first hour of operation, run the engine at varied throttle settings up to 3500 RPM or at approximately half throttle.
2. For the second hour of operation, run the engine at varied throttle settings up to 4500 RPM or at three-quarter throttle, and during this period of time, run it at full throttle for approximately one minute every ten minutes.
3. For the next eight hours of operation, avoid continuous operation at full throttle for more than five minutes at a time.

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.



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Decal on the transom bracket

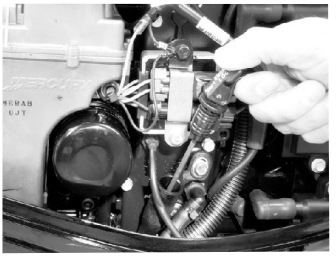
Prestarting Checklist

Before starting the outboard:

- Review the **Safe Boating Recommendations** in the **Important Safety Information** section of this manual.
- Perform all additional daily inspections and checks listed in **Maintenance - Inspection and Maintenance Schedule.**
- If the engine has less than 10 hours of operation, review the **Engine Break-in Procedure**.
- Ensure that the fuel supply is OK.

Prestarting Instructions

1. Check the engine oil level.



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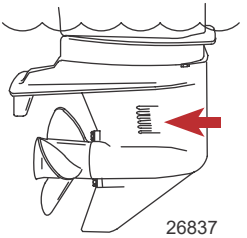
2. Make sure the cooling water intake is submerged.

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.



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Starting the Engine - Remote Control Models

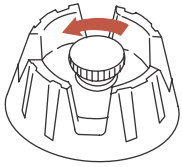
NOTICE

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.

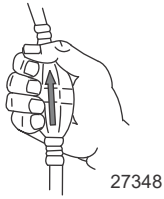
IMPORTANT: These instructions apply only to remote control models. For tiller models, refer to the instructions that were supplied with the tiller handle.

Before starting, read the **Prestarting Checklist**.

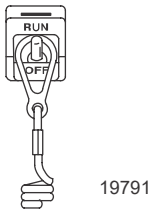
1. Open the fuel tank vent screw (in filler cap) on manual venting type fuel tanks.



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

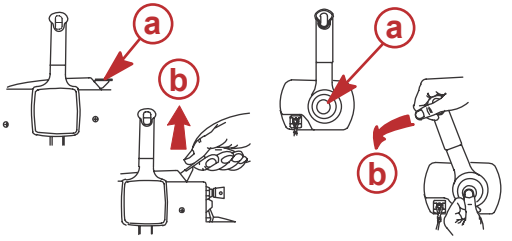


3. Set the lanyard stop switch to the **RUN** position. Refer to **Important Safety Information - Lanyard Stop Switch**.



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

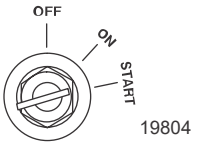
5. Move the throttle-only lever to the fully closed position or press the throttle-only button.



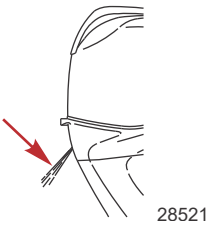
a - Fully closed position

b - Maximum fast idle speed position

6. **Starting a flooded engine**: Advance the throttle-only lever or control handle to the maximum throttle-only position, and continue to crank the engine for starting. Immediately reduce the engine speed after the engine starts.
7. Turn ignition key to the **START** position. If the engine fails to start in ten seconds, return the key to the **ON** position, wait 30 seconds and try again.



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



IMPORTANT: If no water is coming out of the water pump indicator hole, STOP the engine and check the hole for obstruction. Next, check the cooling water intake for obstruction. If no obstruction is found, there may be a blockage within the cooling system or the water pump may have failed. Either of these conditions will cause the engine to overheat, and operating the engine while overheated will cause engine damage. Have the outboard checked by an authorized dealer.

Warming Up the Engine

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

Emergency Starting

⚠ WARNING

The neutral-speed-protection device is inoperative when starting the engine with the emergency starter rope. Set the engine speed at idle and the gear shift in neutral to prevent the outboard from starting in gear.

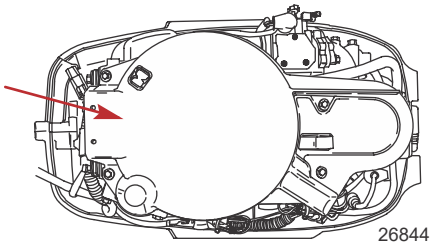
⚠ WARNING

The exposed moving flywheel can cause serious injury. Keep hands, hair, clothing, tools, and other objects away from the engine when starting or running the engine. Do not attempt to reinstall the flywheel cover or top cowl when the engine is running.

If the starter system fails, use the spare starter rope (provided) and follow this procedure.

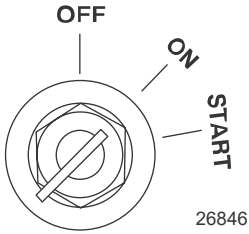
NOTE: *The engine must have a fully charged battery to start the engine.*

1. Remove the flywheel cover.

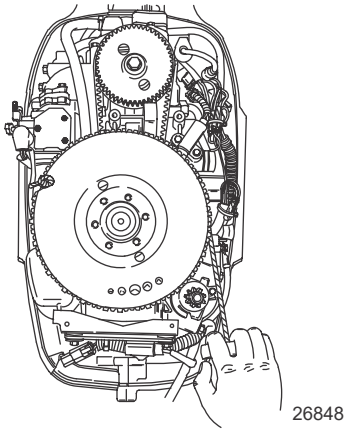


2. Shift the outboard into neutral (N).

3. Turn the ignition key to the **ON** position.



4. Place the starter rope knot into the flywheel notch and wind the rope clockwise around the flywheel.
5. Pull the starter rope to start the engine.



Gear Shifting

IMPORTANT: Observe the following:

- **Never shift the outboard into or out of gear unless the engine speed is at idle. Shifting at higher than engine idle speed could cause damage to the gearcase.**
- **Do not shift the outboard into reverse when the forward motion of the boat is greater than a no wake speed. Shifting into reverse at higher boat speeds could cause the engine to stall, and in some situations, this could cause water to be drawn into the cylinders, resulting in severe engine damage.**
- **Do not shift the outboard into reverse when the engine is not running. Damage to the shift linkage could occur.**

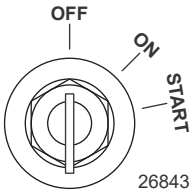
- The outboard has three gear positions: forward, neutral (out of gear), and reverse.

- **Remote control models** - When shifting, always stop at the neutral position and allow the engine speed to return to idle.

- Always shift the outboard into gear with a quick motion.
- After shifting the outboard into gear, advance the remote control lever or rotate the throttle grip (tiller handle) to increase speed.

Stopping the Engine

1. Reduce the engine speed.
2. Shift the outboard into neutral.
3. Turn the ignition key to the **OFF** position.



Operating in Freezing Temperatures

When an outboard is used or moored in freezing or near freezing temperatures, keep the outboard tilted down, with the gearcase submerged. This prevents any water trapped in the gearcase from freezing and causing possible damage to the water pump and other components.

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

Operating in Saltwater or Polluted Water

Flush the outboard's internal water passages with fresh water after each use in salty or polluted water. This will prevent a buildup of deposits from clogging the water passages. Refer to **Maintenance - Flushing the Cooling System**.

If the boat is kept moored in the water, always (except in freezing temperatures) tilt the outboard up so the gearcase is completely out of water 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.

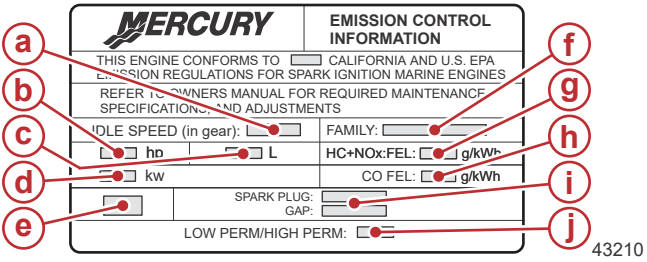
Each month, spray Mercury Precision or Quicksilver Corrosion Guard on external metal surfaces. Exercise care to not spray the corrosion control anodes, as this will reduce the anodes' effectiveness.

EPA Emissions Regulations

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

Emission Certification Label

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



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

Owner Responsibility

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

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

Cleaning Care Recommendations

Outboard Care

To keep the outboard in the best operating condition, it is important that it receives the periodic inspections and maintenance listed in the **Inspection and Maintenance Schedule**. Proper maintenance helps ensure the safety of the operator and passengers and retains the engine's dependability.

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

Selecting Outboard Replacement Parts

For best results, use only original Mercury Precision or Quicksilver replacement parts and Genuine Lubricants.

Do Not Use Caustic Cleaning Chemicals

IMPORTANT: Do not use caustic cleaning chemicals on the outboard power package. Some cleaning products contain strong caustic agents such as hull cleaners with hydrochloric acid. These cleaners can degrade some of the components they come in contact with including critical steering fasteners.

Damage to steering fasteners may not be obvious during visual inspection and this damage may lead to catastrophic failure. Some caustic cleaning chemicals may cause or accelerate corrosion. Exercise caution when using cleaning chemicals around the engine and follow the recommendations on the packaging of the cleaning product.

Cleaning Gauges

IMPORTANT: Never use high-pressure water to clean gauges.

Routine cleaning of the gauges is recommended to prevent a buildup of salt and other environmental debris. Crystalized salt can scratch the gauge display lens when using a dry or damp cloth. Ensure that the cloth has a sufficient amount of fresh water to dissolve and remove salt or mineral deposits. Do not apply aggressive pressure on the display lens while cleaning.

When water marks cannot be removed with a damp cloth, mix a 50/50 solution of warm water and isopropyl alcohol to clean the display lens. **Do not** use acetone, mineral spirits, turpentine type solvents, or ammonia based cleaning products. The use of strong solvents or detergents may damage the coating, the plastics, or the rubber keys on the gauges.

If the gauge has a sun cover available, install the cover when the unit is not in use to prevent UV damage to the plastic bezels and rubber keys.

Cleaning Remote Controls

IMPORTANT: Never use high-pressure water to clean remote controls.

Routine cleaning of the remote control external surfaces is recommended to prevent a buildup of salt and other environmental debris. Use a cloth towel that has a sufficient amount of fresh water to dissolve and remove salt or mineral deposits.

When water marks cannot be removed with a damp cloth, mix a 50/50 solution of warm water and isopropyl alcohol to clean the remote control. **Do not** use acetone, mineral spirits, turpentine type solvents, or ammonia based cleaning products. The use of strong solvents or detergents may damage the coating, the plastics, or the rubber components on the remote control.

Cleaning Care for Top and Bottom Cowls

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

Cleaning and Waxing Procedure

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

Cleaning Care for the Powerhead (Saltwater Use)

If the outboard is operated in saltwater, remove the top cowl and flywheel cover. Inspect the powerhead and powerhead components for salt buildup. Wash off any salt buildup from the powerhead and powerhead components with fresh water. Keep water spray out of the air intake and alternator.

After washing, allow the powerhead and components to dry. Apply Quicksilver or Mercury Precision Lubricants Corrosion Guard spray on the external metal surfaces of the powerhead and powerhead components. Do not allow the Corrosion Guard spray to come in contact with the alternator drive belt or belt pulleys.

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

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

Exterior Care

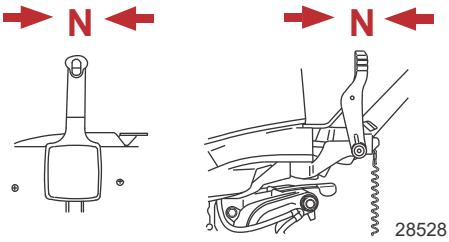
Your outboard is protected with a durable baked enamel finish. Clean and wax often using marine cleaners and waxes.

Propeller Replacement - 87.3 mm (3-7/16 in.) Diameter Gearcase

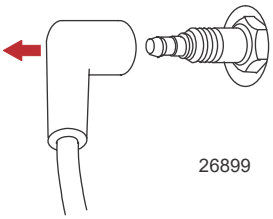
⚠ WARNING

Rotating the propeller shaft may cause the engine to crank over and start. To prevent this type of accidental engine starting and possible serious injury caused from being struck by a rotating propeller, always turn the ignition key or lanyard stop switch to the OFF position and remove the spark plug leads from the spark plugs while servicing.

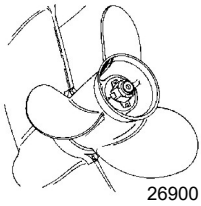
1. Shift the outboard to the neutral (N) position.



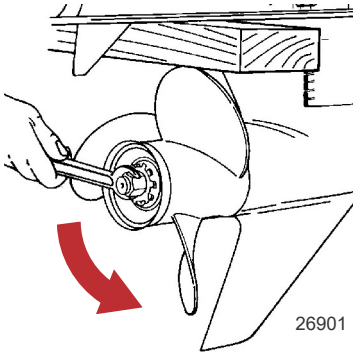
2. Remove the spark plug leads to prevent the engine from starting.



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

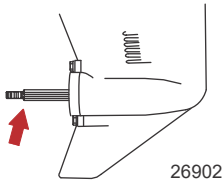


4. Place a block of wood between the gearcase and the propeller to keep the propeller from turning. Remove the propeller nut.
5. Pull the propeller straight off the shaft. If the propeller is seized to the shaft and cannot be removed, have the propeller removed by an authorized dealer.



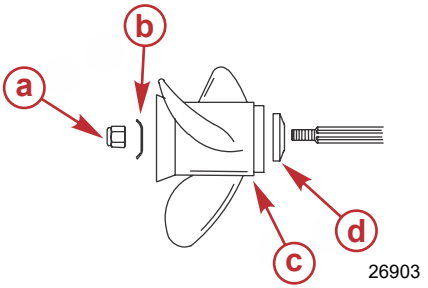
IMPORTANT: To prevent the propeller hub from corroding and seizing to the propeller shaft (especially in saltwater), always apply a coat of the recommended lubricant to the entire propeller shaft at the recommended maintenance intervals, and each time the propeller is removed.

6. Apply Quicksilver or Mercury Precision Lubricants Extreme Grease to the propeller shaft.



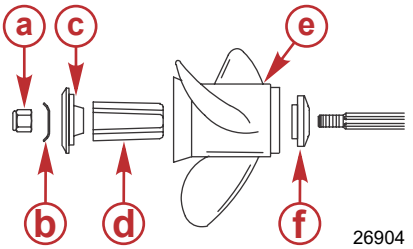
Description	Where Used	Part No.
Extreme Grease	Propeller shaft	8M0190472

7. Flo-Torq I drive hub propellers - Install the forward thrust hub, propeller, propeller nut retainer, and propeller nut onto the shaft.



a - Propeller nut
b - Propeller nut retainer
c - Propeller
d - Forward thrust hub

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

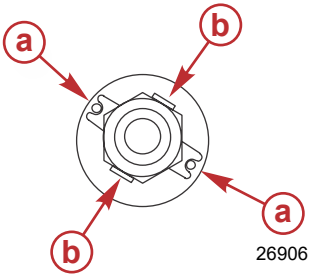


a - Propeller nut
b - Propeller nut retainer
c - Rear thrust hub
d - Replaceable drive sleeve
e - Propeller
f - Forward thrust hub

9. Place the propeller nut retainer over the pins. Place a block of wood between the gearcase and the propeller, and tighten the propeller nut to the specified torque.

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

10. Align the flat sides of the propeller nut with the tabs on the propeller nut retainer. Secure the propeller nut by bending the tabs up and against the flats on the propeller nut.



a - Pins
b - Tabs

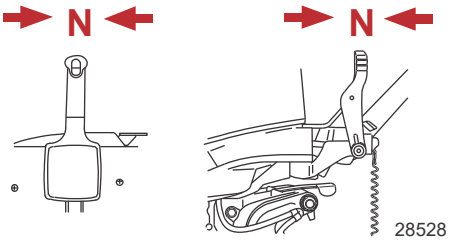
11. Install the spark plug leads.

Propeller Replacement - 108 mm (4-1/4 in.) Diameter Gearcase

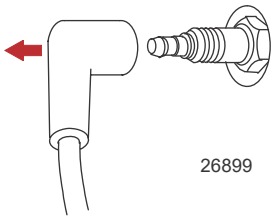
⚠ WARNING

Rotating the propeller shaft may cause the engine to crank over and start. To prevent this type of accidental engine starting and possible serious injury caused from being struck by a rotating propeller, always turn the ignition key or lanyard stop switch to the OFF position and remove the spark plug leads from the spark plugs while servicing.

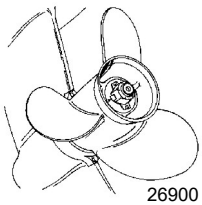
1. Shift the outboard to the neutral (N) position.



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

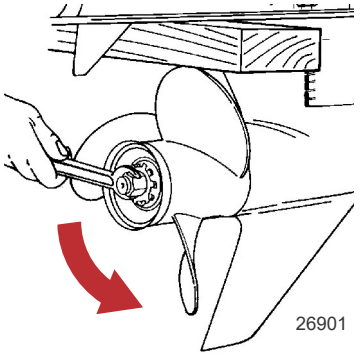


3. Straighten the bent tabs on the propeller nut retainer.



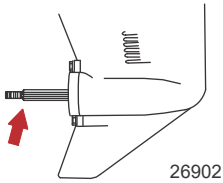
4. Place a block of wood between gearcase and propeller to keep the propeller from turning. Remove the propeller nut.

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



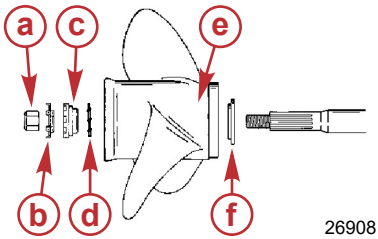
IMPORTANT: To prevent the propeller hub from corroding and seizing to the propeller shaft (especially in saltwater), always apply a coat of the recommended lubricant to the entire propeller shaft at the recommended maintenance intervals, and each time the propeller is removed.

6. Apply Quicksilver or Mercury Precision Lubricants Extreme Grease to the propeller shaft.



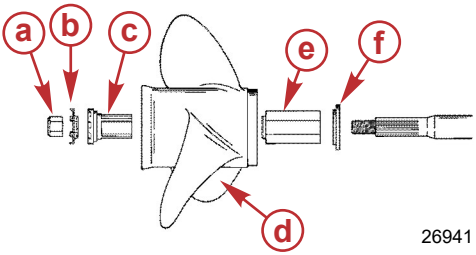
Description	Where Used	Part No.
Extreme Grease	Propeller shaft	8M0190472

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



a - Propeller nut
b - Propeller nut retainer
c - Thrust hub
d - Continuity washer
e - Propeller
f - Thrust washer

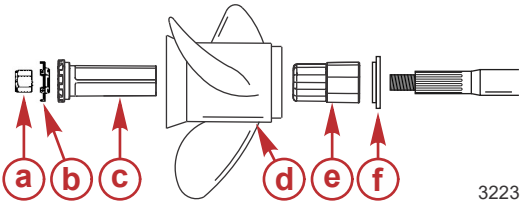
8. Flo-Torq II drive hub propellers - Install the forward thrust hub, replaceable drive sleeve, propeller, thrust hub, propeller nut retainer, and propeller nut onto the shaft.



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

NOTE: *For stainless steel applications, install a Flo-Torq III drive hub propeller .*

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

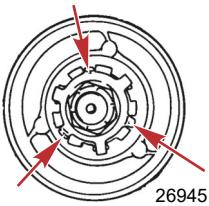


a - Propeller nut
b - Propeller nut retainer
c - Rear thrust hub
d - Propeller
e - Replaceable drive sleeve
f - Forward thrust hub

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

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

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



Top Cowl Removal and Installation

Removal

Pull out the rear lock lever and remove the top cowl.

Installation

1. Lower the top cowl over the engine.
2. Bring the front of the cowl down first and engage the front hook. Lower the cowl into its seated position and apply downward pressure to the back of the cowl to lock it in place. Gently pull up on the back of cowl to make sure it is securely fastened.

Inspection and Maintenance Schedule

Refer to the tables below for proper inspection and maintenance intervals.

Before Each Use
Check the engine oil level. Refer to **Fuel and Oil - Checking and Adding Engine Oil**.
Check that the lanyard stop switch stops the engine. Refer to **Safety - Lanyard Stop Switch**.
Inspect the fuel system for leaks. Refer to **Fuel System**.
Inspect the engine tightness on the transom. Refer to **Transom Tightness Inspection**.

Before Each Use
Check the steering system for binding.
Check the propeller for damage.
Inspect the hydraulic steering fittings and hoses for leaks or damage, if equipped.
Check the hydraulic steering fluid level, if equipped.

After Each Use
Wash the power package exterior with fresh water.
Flush the outboard cooling system if operating in saltwater or brackish water. Refer to **Flushing the Cooling System**.

100 Hour Maintenance (Every 100 Hours of Use or Once Yearly, Whichever Occurs First)	Dealer Item
Lubricate all applicable points on the engine. Refer to **Lubrication Points**.	
Change the engine oil and filter, if equipped. Refer to **Changing Engine Oil**.	
Saltwater or brackish water use: Inspect the thermostat.	
Add Quickleen to the fuel tank.	
Apply anti-seize to the spark plug threads. Refer to **Spark Plug Inspection and Replacement**.	
Change the gearcase lubricant. Refer to **Gearcase Lubricant**.	
Inspect the corrosion control anodes. Refer to **Corrosion Control Anode**.	
Replace all filters on the suction side of the fuel system.	X
Lubricate the driveshaft splines	X
Lubricate the propeller shaft splines.	X
Check the tightness on all fasteners.	X
Check the torque of the outboard mounting hardware.	X
Check the battery condition and tightness of the battery cable connection, if equipped.	X

300 Hour Maintenance (Every 300 Hours of Use or Three Years, Whichever Occurs First)	Dealer Item
Replace the spark plugs. Refer to **Spark Plug Inspection and Replacement**.	
Replace the water pump impeller.	X
Check the wire harness connectors.	X
Check the remote control cable adjustment, if applicable.	X

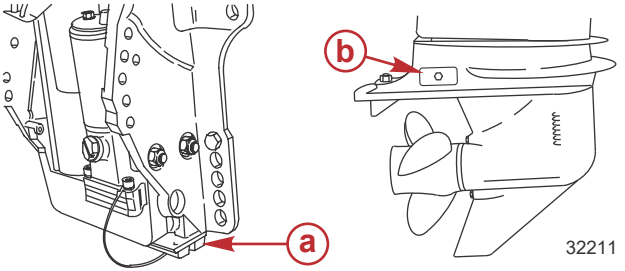
300 Hour Maintenance (Every 300 Hours of Use or Three Years, Whichever Occurs First)	Dealer Item
Replace the high-pressure fuel filter.	X
Replace the accessory drive belt.	X
Check the power trim fluid level.	X
Inspect the engine motor mounts.	X

Corrosion Control Anode

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

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

This model has an anode installed on each side of the gearcase and one on the bottom of the transom bracket assembly.



a – Anode on transom bracket assembly
b – Gearcase anodes

Oil Change Kits

Mercury Marine offers convenient oil change kits for several outboard models ranging from 9.9 hp to 150 hp. These kits contain a new filter, oil, and any additional parts required for a complete oil change. The kits are available in both Mercury Marine and Quicksilver brands. Refer to the following chart for details.

Models	Mercury P/N	Quicksilver P/N
9.9/15/20 hp EFI	8M0081914	8M0081910
15/20 hp carbureted	8M0081914	8M0081910
25/30 hp EFI	8M0081915	8M0081911
30/40/50/60 hp EFI (4-cyl)	8M0081916	8M0081912

Models	Mercury P/N	Quicksilver P/N
1.7L 75/90/115 hp EFI	8M0081917	8M0081913
2.1L 75/90/115 hp	8M0107510	8M0107511
150 hp	8M0188357	8M0107513

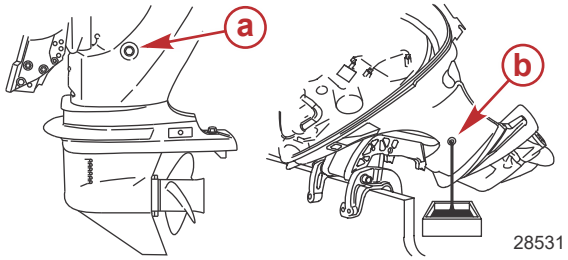
Changing Engine Oil

Engine Oil Capacity

	Capacity	Fluid Type
Engine oil	3.0 Liter (3 U.S. Quarts)	Mercury or Quicksilver SAE 25W-40 Synthetic Blend Marine 4-Stroke Engine Oil
		Mercury or Quicksilver SAE 10W-30 4-Stroke Marine Engine Oil

Oil Changing Procedure

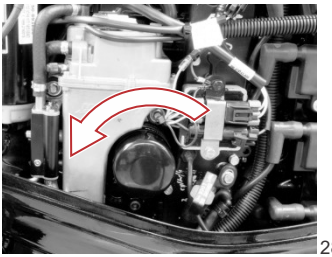
1. Tilt the outboard up to the trailer position.
2. Turn the outboard so the drain hole is facing downward. Remove the drain plug and drain the engine oil into an appropriate container. Lubricate the seal on the drain plug with oil and reinstall.



a - Drain plug
b - Drain hole

Changing Oil Filter

1. Place a rag or towel below the oil filter to absorb any spilled oil.
2. Unscrew the old filter by turning the filter to the left.
3. Clean the mounting base. Apply a film of clean oil to the filter gasket. Do not use grease. Screw the new filter on until the gasket contacts the base, then tighten 3/4 to 1 turn.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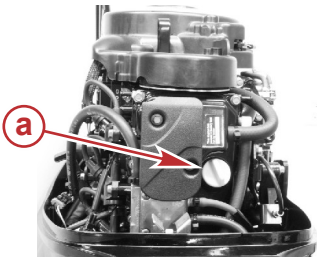
Oil Filling

1. Remove the oil fill cap and add oil to the proper operating level.
2. Idle the engine for five minutes and check for leaks. Stop the engine and check the oil level on the dipstick. Add oil if necessary.



28418

a - Oil fill cap

Flushing the Cooling System

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

IMPORTANT: The engine must be run during flushing in order to open the thermostat and circulate water through the water passages.

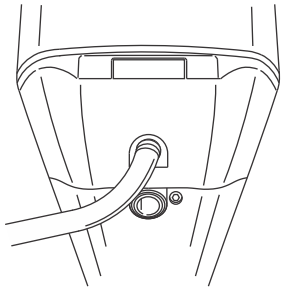
⚠ WARNING

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 activate the lanyard stop switch to prevent the engine from starting. Place a block of wood between the propeller blade and the anti-ventilation plate.

1. Place the outboard in either the operating position (vertical) or in a tilted position.
2. Remove the propeller. Refer to **Propeller Replacement**.
3. Thread a water hose into the rear fitting. Partially open the water tap (1/2 maximum). Do not open the water tap all the way as this allows a high pressure flow of water.

IMPORTANT: Do not run engine above idle when flushing.

4. Shift the outboard into neutral. Start the engine and flush the cooling system for at least five minutes. Keep the engine speed at idle.
5. Stop the engine. Turn off the water and remove the hose. Reinstall the propeller.



28518

Fuel System

⚠ WARNING

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

Before servicing any part of the fuel system, stop the engine and disconnect the battery. Drain the fuel system completely. Use an approved container to collect and store the fuel. Wipe up any spillage immediately. Material used to contain spillage must be disposed of in an approved receptacle. Any fuel system service must be performed in a well-ventilated area. Inspect any completed service work for sign of fuel leakage.

Fuel Line Inspection

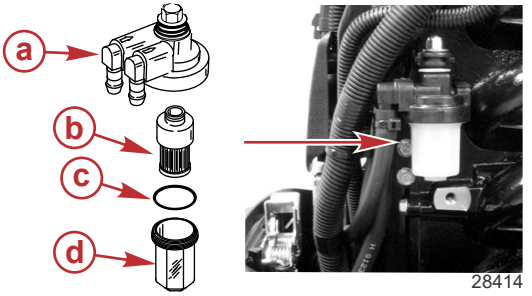
Visually inspect the fuel line and primer bulb for cracks, swelling, leaks, hardness, or other signs of deterioration or damage. If any of these conditions are found, the fuel line or primer bulb must be replaced.

Engine Fuel Filter

Check the fuel filter for water accumulation or sediment. If water is in the fuel, remove the sight bowl and drain the water. If the filter appears to be contaminated, remove and replace.

Removal

1. Read the preceding fuel system servicing information and warning.
2. Pull out the filter assembly from the mount. Hold onto the cover to prevent it from turning and remove the sight bowl. Empty contents into an approved container.
3. Inspect the filter element. If replacement is necessary, replace the filter assembly.



28414

a - Cover
b - Filter element
c - O-ring seal
d - Sight bowl

Installation

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

1. Push the filter element into the cover.
2. Place the O-ring seal into its proper position on the sight bowl and screw the sight bowl hand-tight into the cover.
3. Push the filter assembly back into the mount.

Gearcase Lubricant

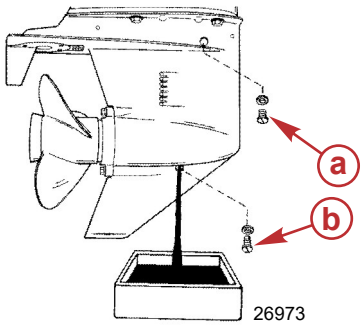
Gearcase Lubrication - For 87.3 mm (3-7/16 in.) Diameter Gearcase

When adding or changing gearcase lubricant, visually check for the presence of water in the lubricant. If water is present, it may have settled to the bottom and will drain out prior to the lubricant, or it may be mixed with the lubricant, giving it a milky colored appearance. If water is noticed, have the gearcase checked by your dealer. Water in the lubricant may result in premature bearing failure or, in freezing temperatures, will turn to ice and damage the gearcase.

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

Draining Gearcase

1. Place the outboard in a vertical operating position.
2. Place a drain pan below the outboard.
3. Remove the vent plug and fill/drain plug and drain the lubricant.



a - Vent plug
b - Fill/drain plug

Gearcase Lubricant Capacity

Gearcase lubricant capacity is approximately 340 ml (11.5 fl oz).

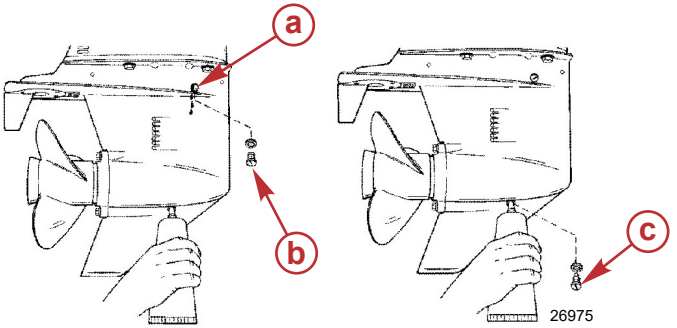
Checking Gearcase Lubricant Level and Refilling Gearcase

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

IMPORTANT: Replace sealing washers if damaged.

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

5. Remove the lubricant tube and install a cleaned fill/drain plug and sealing washer.



a - Vent hole
b - Vent plug
c - Fill/drain plug

Gearcase Lubrication - For 108 mm (4-1/4 in.) Diameter Gearcase

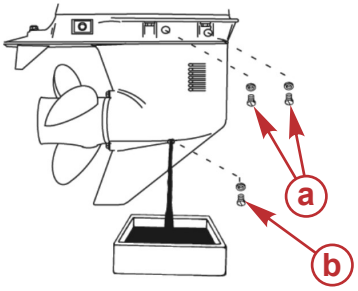
When adding or changing gearcase lubricant, visually check for the presence of water in the lubricant. If water is present, it may have settled to the bottom and will drain out prior to the lubricant, or it may be mixed with the lubricant, giving it a milky colored appearance. If water is noticed, have the gearcase checked by your dealer. Water in the lubricant may result in premature bearing failure or, in freezing temperatures, will turn to ice and damage the gearcase.

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

Draining Gearcase

1. Place the outboard in a vertical operating position.
2. Place a drain pan below the outboard.

3. Remove the vent plugs and fill/drain plug and drain the lubricant.



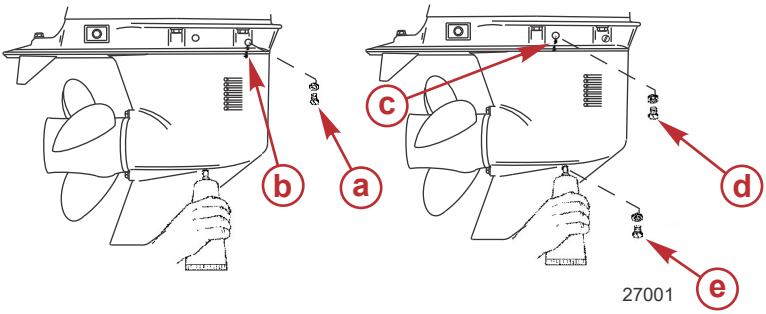
a - Vent plugs
b - Fill/drain plug

Gearcase Lubricant Capacity

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

Checking Lubricant Level and Filling Gearcase

1. Place the outboard in a vertical operating position.
2. Remove the front vent plug and rear vent plug.
3. Place the lubricant tube into the fill hole and add lubricant until it appears at the front vent hole. At this time install the front vent plug and sealing washer.
4. Continue adding lubricant until it appears at the rear vent hole.
5. Stop adding lubricant. Install the rear vent plug and sealing washer before removing the lubricant tube.
6. Remove the lubricant tube and install a cleaned fill/drain plug and sealing washer.



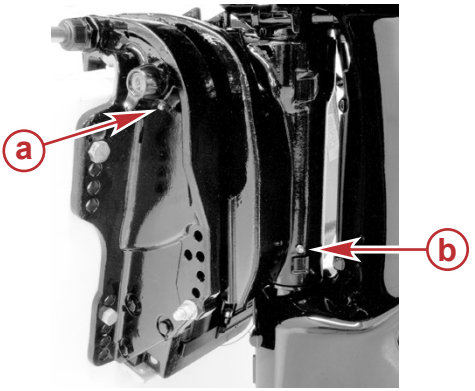
a - Front vent plug
b - Front vent hole
c - Rear vent hole
d - Rear vent plug
e - Fill/drain plug and sealing washer

Lubrication Points

1. Lubricate the following with Quicksilver or Mercury Precision Lubricants Extreme Grease.

Description	Where Used	Part No.
Extreme Grease	Propeller shaft, tilt support lever, swivel bracket, tilt tube, steering cable grease fitting	8M0190472

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



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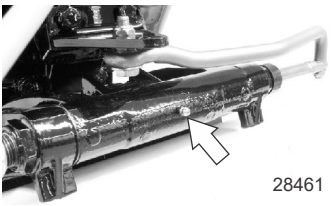
a - Tilt support lever
b - Swivel bracket

- Tilt tube - Lubricate through fitting.



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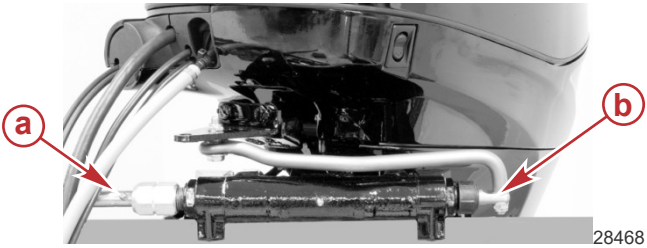
⚠ WARNING

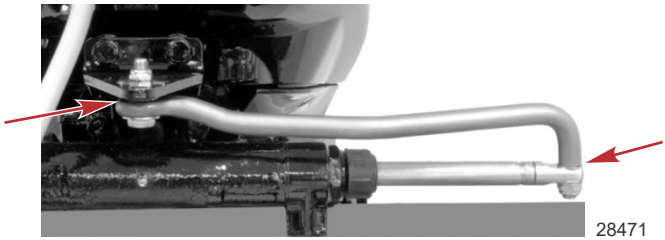
Incorrect cable lubrication can cause hydraulic lock, leading to serious injury or death from loss of boat control. Completely retract the end of the steering cable before applying lubricant.

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



a - Fitting
b - Steering cable end

2. Lubricate the steering link rod pivot points with lightweight oil.



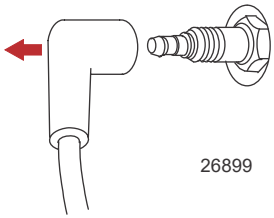
Steering link rod pivot points

Spark Plug Inspection and Replacement

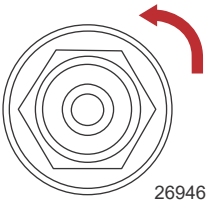
⚠ WARNING

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

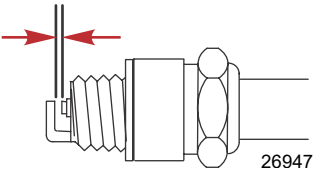
1. Remove the spark plug boots. Twist the rubber boots slightly and pull off.



2. Remove the spark plugs to inspect. Replace spark plug if electrode is worn or the insulator is rough, cracked, broken, blistered, or fouled.



3. Set the spark plug gap to specification.



Spark Plug	
Spark plug gap	1.0 mm (0.040 in.)

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

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

Transom Tightness Inspection

Inspect the outboard for tightness to the boat transom. If any looseness of the outboard or mounting fasteners exist, tighten the outboard mounting fasteners to the specified torque.

Description	Nm	lb-in.	lb-ft
Outboard mounting locknuts and bolts - standard boat transom	75	–	55.3
Outboard mounting locknuts and bolts - metal lift plates and setback brackets	122	–	90

When looking for signs of looseness, look for loss of outboard transom bracket material or paint caused by movement between the outboard mounting fasteners and the outboard transom brackets. Also look for signs of movement between the outboard transom brackets and the boat transom (lift plate/setback bracket).

Storage Preparation

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

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

Protecting the Fuel System

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.

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

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

- Portable fuel tank - Pour the required amount of Quickstor Fuel Stabilizer (follow instructions on container) into the fuel tank. Tip the fuel tank back and forth to mix the stabilizer with the fuel.
- Permanently installed fuel tank - Pour the required amount of Quickstor Fuel Stabilizer (follow instructions on container) into a separate container and mix it with approximately one liter (one quart) of gasoline. Pour this mixture into the fuel tank.
- Remove the fuel filter sight bowl and empty contents in a suitable container. Refer to **Maintenance - Fuel System** for removal and installation of filter. Add 3 cc (1/2 tsp.) of Quickstor Fuel Stabilizer into the fuel filter sight bowl and install.

Description	Where Used	Part No.
Quickstor Fuel Stabilizer	Fuel tank, fuel filter sight bowl	92-8M0047932

- Place the outboard in the water or connect the flushing attachment for circulating cooling water. Run the engine at idle speed for 15 minutes to fill the engine fuel system with stabilized fuel.

Protecting External Outboard Components

- Lubricate all outboard components listed in **Maintenance - Inspection and Maintenance Schedule**.
- Touch up any paint nicks. See a Mercury Marine Authorized Dealer for touch-up paint.

- Spray Quicksilver or Mercury Precision Lubricants Corrosion Guard on external metal surfaces (except corrosion control anodes).

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

Protecting Internal Engine Components

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

Gearcase

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

Positioning Outboard for Storage

NOTICE

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

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

Battery Storage

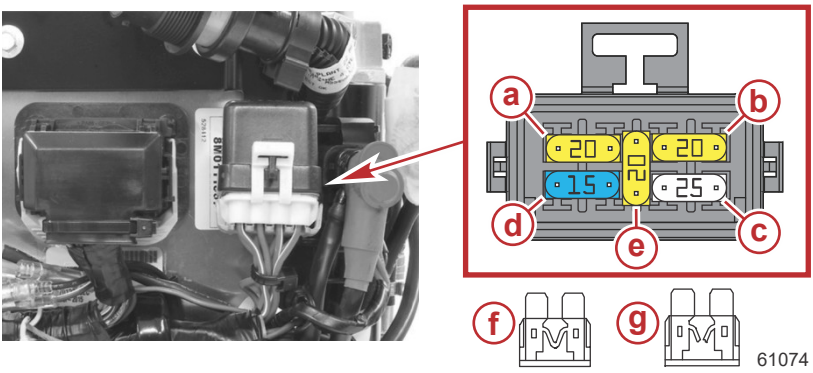
- Follow the battery manufacturer's instructions for storage and charging.
- Remove the battery from the boat and check the charge. Charge if necessary.
- Store the battery in a cool, dry place.
- Periodically check the battery voltage during storage. Charge if necessary.

Fuse Replacement

IMPORTANT: Always carry spare fuses.

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

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



- **a -** Ignition coil circuit—20-amp
- **b -** Fuel pump/idle air control/fuel injector circuits—20-amp
- **c -** Voltage regulator—25-amp
- **d -** Main power relay/accessories/remote control—15-amp
- **e -** Spare—20-amp
- **f -** Good fuse
- **g -** Blown fuse

Starter Motor Will Not Crank the Engine (Electric Start Models)

Possible Causes

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

Engine Will Not Start

Possible Causes

- Lanyard stop switch not in the **RUN** position.

- Incorrect starting procedure. Refer to **Operation** section.
- Old or contaminated gasoline.
- Engine flooded. Refer to **Operation** section.
- Fuel is not reaching the engine.
  a. Fuel tank is empty.
  b. Fuel tank vent not open or restricted.
  c. Fuel line is disconnected or kinked.
  d. Primer bulb not squeezed.
  e. Primer bulb check valve is faulty.
  f. Fuel filter is obstructed. Refer to **Maintenance** section.
  g. Fuel pump failure.
  h. Fuel tank filter obstructed.
- Blown fuse. Refer to **Fuse Replacement**.
- Ignition system component failure.
- Spark plugs fouled or defective. Refer to **Maintenance** section.

Engine Runs Erratically

Possible Causes

- Guardian System activated. Refer to **Features and Controls - Warning System**.
- 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 anti-siphon valve located on permanently built-in type fuel tanks.
  d. Fuel line is kinked or pinched.
- Fuel pump failure.
- Ignition system component failure.
- Fuel injection component failure (EFI models).

Performance Loss

Possible Causes

- Engine Guardian System activated. Refer to **Features and Controls - Warning System**.
- Throttle not fully open.
- Damaged or improper size propeller.
- Incorrect engine timing, adjustments, or setup.

- Boat overloaded or load improperly distributed.
- Excessive water in bilge.
- Boat bottom is dirty or damaged.

Battery Will Not Hold Charge

Possible Causes

- Battery connections are loose or corroded.
- Worn out or inefficient battery.
- Excessive use of electrical accessories.
- Defective rectifier, alternator, or voltage regulator.

Submerged Outboard

A submerged outboard will require service within a few hours by an authorized dealer once the outboard is recovered from the water. This immediate attention by a servicing dealer is necessary once the engine is exposed to the atmosphere to minimize internal corrosion damage to the engine.

Notes:

Service Assistance

Local Repair Service

If your Mercury-outboard-powered boat needs service, take it to a Mercury Marine 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 for service arises, 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 a Mercury Marine Authorized Dealer.
2. After recovery, immediate service by a Mercury Marine Authorized 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 Marine 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 Mercury Marine Authorized Dealer. 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	

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	

Asia, Singapore, Japan		
Telephone	+65 68058100	Mercury Marine Singapore Pte Ltd 11 Changi South Street 3, #01-02 Singapore, 486122
Fax	+65 68058138	

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	(920) 929-4894	Mercury Marine Attn: Publications Department P.O. Box 1939 Fond du Lac, WI 54936-1939

Outside the United States and Canada

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

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

OWNER SERVICE ASSISTANCE

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

Maintenance Log

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

Date	Maintenance Performed	Engine Hours