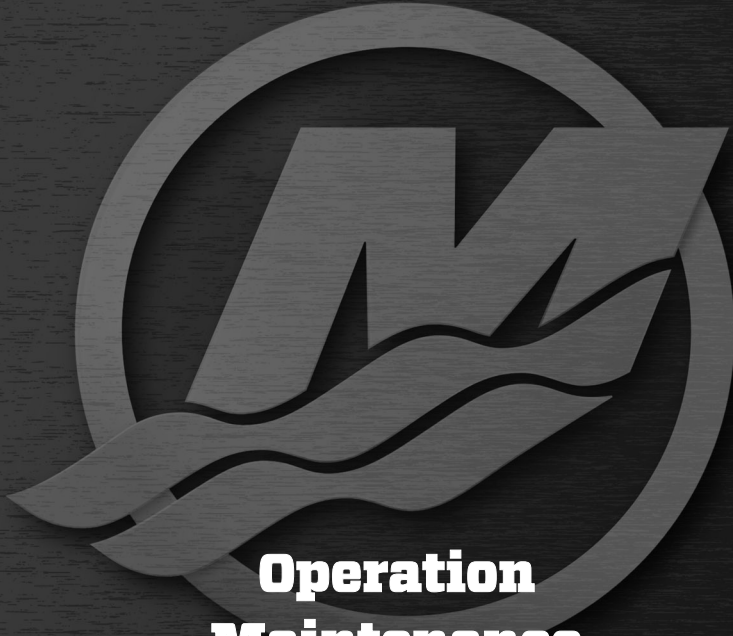




MERCURY[®]
GO BOLDLY.™

8M0186412 322 eng



**Operation
Maintenance
and
Installation
Manual**

25/30 EFI FourStroke

© 2022 Mercury Marine



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.

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.

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.

Name / function:

Christopher D. Drees, President,
Mercury Marine




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.

Notice

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 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.*

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.

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.

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.

Copyright and Trademark Information

© **MERCURY MARINE. All rights reserved. Reproduction in whole or in part without permission is prohibited.**

Alpha, Axis, Bravo One, Bravo Two, Bravo Three, Circle M with Waves Logo, GO BOLDLY, K-planes, Mariner, MerCathode, MerCruiser, Mercury, Mercury with Waves Logo, Mercury Marine, Mercury Precision Parts, Mercury Propellers, Mercury Racing, MotorGuide, OptiMax, Pro XS, Quicksilver, SeaCore, Skyhook, SmartCraft, Sport-Jet, Verado, VesselView, Zero Effort, Zeus, #1 On the Water and We're Driven to Win are registered trademarks of Brunswick Corporation. Mercury Product Protection is a registered service mark of Brunswick Corporation. All other marks are the property of their respective owners.

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)		

General Information

Boater's Responsibilities.....	1
Outboard Remote Control Models	1
Exhaust Emissions.....	1
Lanyard Stop Switch.....	3
Protecting People in the Water.....	5
Passenger Safety Message - Pontoon Boats and Deck Boats.....	6
Wave and Wake Jumping.....	7
High-Speed and High-Performance Boat Operation.....	8
Impact with Underwater Hazards.....	8
Safety Instructions for Hand-Tilled Outboards.....	10
Safe Boating Recommendations.....	11
Conditions Affecting Performance.....	13
Recording Serial Number.....	16
Model Year Production Code.....	17
Component Identification.....	18
Specifications.....	23

Installation

Installation Information.....	25
Installing the Outboard.....	28
Remote Control Connections.....	34
Steering Control Connections.....	39
Battery Cable Connections.....	42
Installing the Propeller.....	44

Transporting

Aquatic Invasive Species (AIS).....	46
Trailerling Boat/Outboard.....	46
Carrying, Storing, and Transporting the Outboard when Removed from Boat	47

Fuel and Oil

Low Permeation Fuel Hose Requirement	49
Fuel Demand Valve (FDV) Requirement.....	49
EPA Pressurized Portable Fuel Tank Requirements.....	49
Mercury Marine's Pressurized Portable Fuel Tank.....	49
Filling Fuel Tank.....	51
Fuel Requirements.....	51
Engine Oil Recommendations.....	52

Features and Controls

Tiller Handle Features.....	54
Remote Control Features.....	59
Tiller Handle Models with Manual Gas Assist Tilt.....	60
Tiller Handle Models with Manual Tilt.....	64
Power Trim and Tilt (if Equipped).....	67
Warning System.....	70
Trim Tab Adjustment.....	72

Operation

Engine Break-in Procedure.....	73
Prestarting Check List.....	73
Prestarting Instructions.....	73
Starting the Engine - Remote Control Models.....	74
Starting the Engine - Tiller Handle Models.....	76
Gear Shifting.....	79
Stopping the Engine.....	80
Emergency Starting Procedure.....	81
Operating in Freezing Temperatures.....	84
Operating in Saltwater or Polluted Water.....	84

Maintenance

Cleaning Care.....	85
EPA Emissions Regulations.....	87
Inspection and Maintenance Schedule.....	88
Maintenance Schedule Decal Icons	89
Maintenance Schedule Decal.....	90
Top Cowl Removal and Installation.....	90
Cooling System.....	90
Corrosion Control Anode.....	92
Engine Oil.....	94
Fuel System.....	98
Gearcase Lubrication.....	103
Lubrication Points.....	104
Propeller Replacement.....	107
Spark Plug Inspection and Replacement.....	111

Storage

Storage Preparation.....	113
Protecting External Outboard Components.....	113
Protecting Internal Engine Components.....	114
Gearcase.....	114
Positioning Outboard for Storage.....	114
Battery Storage.....	114

Troubleshooting

Fuse Replacement.....	115
Starter Motor Will Not Crank the Engine (Electric Start Models).....	116
Engine Will Not Start.....	116
Engine Runs Erratically.....	117
Performance Loss.....	117
Battery Will Not Hold Charge.....	117
Submerged Outboard.....	118

Owner Service Assistance

Service Assistance.....	119
Ordering Literature.....	121

Maintenance Log

Maintenance Log.....	123
----------------------	-----

GENERAL INFORMATION

Boater's Responsibilities

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

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

Outboard Remote Control Models

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

⚠ WARNING

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



Exhaust Emissions

BE ALERT TO CARBON MONOXIDE POISONING

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

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

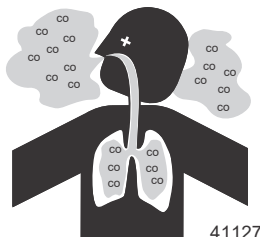
GENERAL INFORMATION

⚠ WARNING

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

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

STAY CLEAR OF EXHAUST AREAS

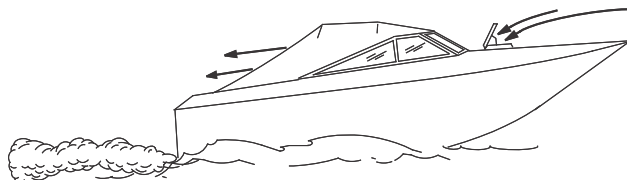


Engine exhaust gases contain harmful carbon monoxide. Avoid areas of concentrated engine exhaust gases. When the engines are running, keep swimmers away from the boat, and do not sit, lie, or stand on swim platforms or boarding ladders. While underway, do not allow passengers to be positioned immediately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

GOOD VENTILATION

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

Example of desired air flow through the boat:



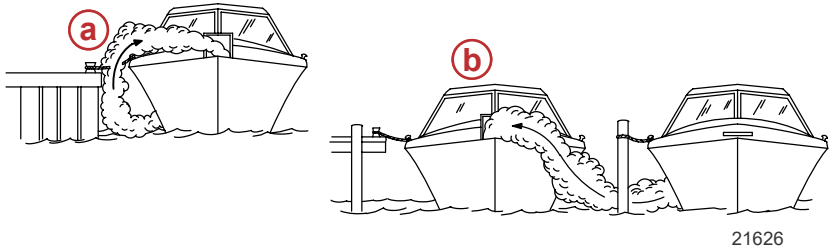
POOR VENTILATION

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

GENERAL INFORMATION

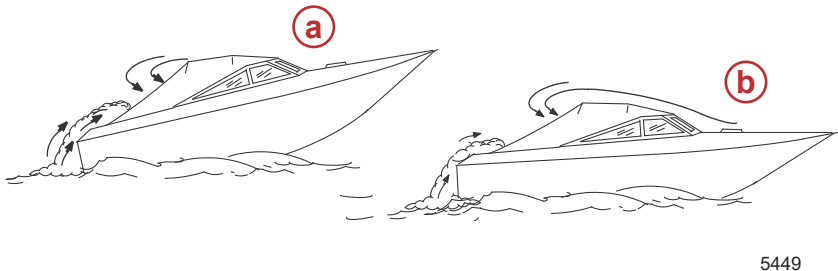
Although the occurrence is rare, on a calm day, swimmers and passengers in an open area of a stationary boat that contains, or is near, a running engine may be exposed to a hazardous level of carbon monoxide.

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



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

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



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

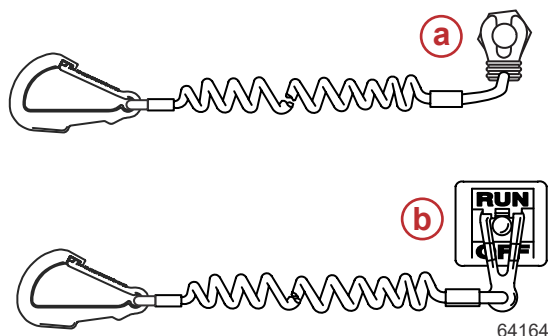
Lanyard Stop Switch

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

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

GENERAL INFORMATION

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



Lanyard stop switch and cord examples

- a - Tiller handle lanyard
- b - Remote control lanyard

64164

Read the following Safety Information before proceeding.

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

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

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

GENERAL INFORMATION

⚠ WARNING

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

⚠ WARNING

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

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

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

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

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

Before each use, visually inspect the lanyard cord to ensure it is in good working condition and that there are no breaks, cuts, or wear to the cord.

Check that the clips on the ends of the cord are in good condition. Replace any damaged or worn lanyard cords.

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.



21604

GENERAL INFORMATION

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 your boat.

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

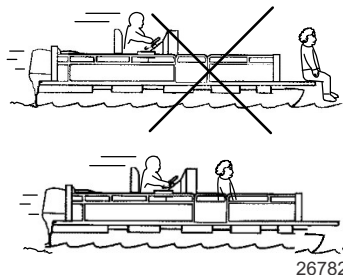
Passenger Safety Message - Pontoon Boats and Deck Boats

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

BOATS HAVING AN OPEN FRONT DECK

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

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.



GENERAL INFORMATION

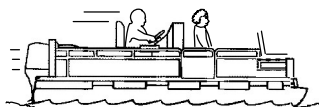
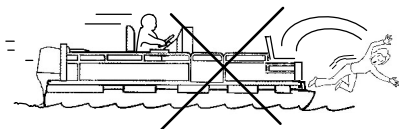
⚠ WARNING

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

BOATS WITH FRONT MOUNTED, RAISED PEDESTAL FISHING SEATS

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

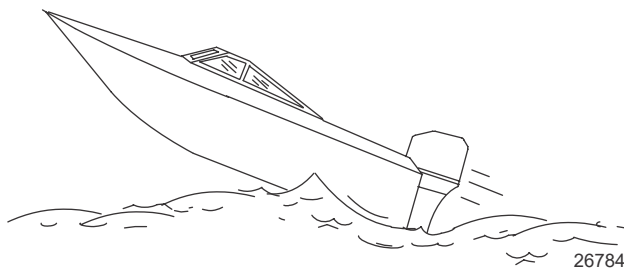
Any unexpected, sudden reduction in boat speed could result in the elevated passenger falling over the front of the boat.



26783

Wave and Wake Jumping

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



26784

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

GENERAL INFORMATION

⚠ WARNING

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

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

High-Speed and High-Performance Boat Operation

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

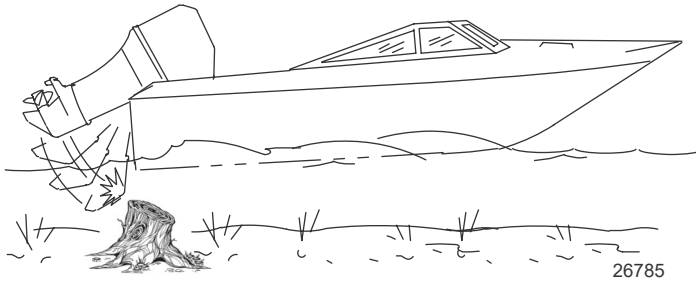
Impact with Underwater Hazards

Your outboard may be 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.

GENERAL INFORMATION

Reduce speed and proceed with caution whenever you drive a boat in shallow water areas or in areas where you suspect underwater obstacles may exist that could be struck by the outboard or the boat bottom. **The most significant action you can take to help reduce injury or impact damage from striking a floating or underwater object is to control the boat speed. Under these conditions, boat speed should be kept to 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 your 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 an infinite 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.

GENERAL INFORMATION

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

⚠ WARNING

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

Safety Instructions for Hand-Tilted 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:

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 **Engine Installation - Installing Outboard** for more complete installation information.

⚠ 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.

This product must be secured to the transom with the required mounting hardware. If the outboard strikes an underwater object, the required mounting hardware prevents the outboard from propelling off the transom. A decal on the swivel bracket reminds the installer of the potential hazard.



52375

GENERAL INFORMATION

Safe Boating Recommendations

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

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

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

Perform safety checks and required maintenance.

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

Check safety equipment onboard.

- Here are some suggestions of the types of safety equipment to carry when boating:

- Approved fire extinguishers
- Signal devices: flashlight, rockets or flares, flag, and whistle or horn
- Tools necessary for minor repairs
- Anchor and extra anchor line
- Manual bilge pump and extra drain plugs
- Drinking water
- Radio
- Paddle or oar
- Spare propeller, thrust hubs, and an appropriate wrench
- First aid kit and instructions
- Waterproof storage containers
- Spare operating equipment, batteries, bulbs, and fuses
- Compass and map or chart of the area
- Personal flotation device (one per person onboard)

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

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

Passenger boarding.

GENERAL INFORMATION

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

Use personal flotation devices.

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

Prepare other boat operators.

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

Do not overload your boat.

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

Ensure that everyone in the boat is properly seated.

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

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

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

Know your boating area and avoid hazardous locations.

Be alert.

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

Never drive your boat directly behind a water-skier.

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

Watch fallen skiers.

GENERAL INFORMATION

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

Report accidents.

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

Conditions Affecting Performance

WEATHER

It is a known fact that weather conditions exert a profound effect on the power output of internal combustion engines. Established horsepower ratings refer to the power the engine will produce at its rated RPM under a specific combination of weather conditions.

Corporations internationally have settled on adoption of International Standards Organization (ISO) engine test standards, as set forth in ISO 3046, standardizing the computation of horsepower from data obtained on the dynamometer. All values are corrected to the power the engine will produce at sea level, at 30% relative humidity, at 25 °C (77 °F) temperature, and a barometric pressure of 29.61 inches of mercury (in. Hg).

Summer conditions of high temperature, low barometric pressure, and high humidity all combine to reduce the engine power. This, in turn, is reflected in decreased boat speeds as much as 3 to 5 km/h (2 to 3 mph) in some cases. Nothing will regain this speed for the boater but cooler, dry weather.

Pointing out the consequences of weather effects, an engine running on a hot, humid day may encounter a loss of as much as 14% of the horsepower it would produce on a dry, brisk day. The horsepower that any internal combustion engine produces, depends upon the density of the air that it consumes. The density of air is dependent upon the ambient air temperature, the barometric pressure, and the humidity (water vapor) content.

WEIGHT DISTRIBUTION (PASSENGERS AND GEAR) INSIDE THE BOAT

Shifting weight to rear (stern):

- Generally increases speed and engine RPM
- Causes bow to bounce in choppy water
- Increases danger of following wave splashing into the boat when coming off plane

GENERAL INFORMATION

- At extremes, can cause the boat to porpoise

Shifting weight to front (bow):

- Improves ease of planing
- Improves rough water ride
- At extremes, can cause the boat to veer back and forth (bow steer)

BOTTOM OF BOAT

For maximum speed, a boat bottom should be nearly a flat plane where it contacts the water and particularly straight and smooth in fore and aft direction.

- **Hook:** Exists when bottom is concave in fore and aft direction when viewed from the side. When boat is planing, hook causes more lift on bottom near transom and allows bow to drop, thus greatly increasing wetted surface and reducing boat speed. Hook frequently is caused by supporting boat too far ahead of transom while hauling on a trailer or during storage.
- **Rocker:** The reverse of hook and much less common. Rocker exists if bottom is convex in fore and aft direction when viewed from the side, and boat has strong tendency to porpoise.
- **Surface roughness:** Moss, barnacles, etc., on boat or corrosion of outboard's gear housing increase skin friction and cause speed loss. Clean surfaces when necessary.

WATER ABSORPTION

It is imperative that all through-the-hull fasteners be coated with a quality marine sealer at time of installation. Water intrusion into the transom core and/or inner hull will result in additional boat weight (reduced boat performance), hull decay, and eventual structural failure.

CAVITATION

Cavitation occurs when water flow cannot follow the contour of a fast-moving underwater object, such as a gear housing or a propeller. Cavitation increases propeller speed while reducing boat speed. Cavitation can seriously erode the surface of the gear housing or the propeller. Common causes of cavitation are:

- Weeds or other debris snagged on the propeller
- Bent propeller blade
- Raised burrs or sharp edges on the propeller

ELEVATION AND CLIMATE

Elevation and climate changes will affect the performance of your power package. Loss of performance can be caused by:

- Higher elevations
- Higher temperatures
- Low barometric pressures

GENERAL INFORMATION

- High humidity

For you to have optimum engine performance under changing weather conditions, it is essential that the engine be propped to allow the engine to operate at or near the top end of the specified maximum RPM range with a normal boat load during your normal boating weather conditions.

In most cases, recommended RPM can be achieved by changing to a lower pitch propeller.

DETONATION

Detonation in a 4-cycle engine resembles the pinging heard in an automobile engine. It can be otherwise described as a tin-like rattling or plinking sound.

Detonation is the explosion of the unburned fuel/air charge after the spark plug has fired. Detonation creates severe shock waves in the engine. These shock waves often find or create a weakness: the dome of a piston, cylinder head or gasket, piston rings or piston ring lands, piston pin, and roller bearings.

A few of the most common causes of detonation in a marine 4-cycle application are as follows:

- Over-advanced ignition timing
- Use of low octane gasoline
- Propeller pitch too high: engine RPM below recommended maximum range
- Lean fuel mixture at, or near, wide-open throttle
- Spark plugs: heat range too hot, incorrect reach, cross-firing
- Deteriorated or inadequate engine cooling system
- Combustion chamber deposits: result in higher compression ratio

Detonation usually can be prevented if:

- The engine is correctly set up
- Regular maintenance is scheduled

PROPELLER SELECTION

IMPORTANT: The engines covered in this manual are equipped with an RPM rev-limiter that is set to an upper RPM limit. This limit, which is slightly above the normal operating range of the engine, helps prevent damage from excessive engine RPM. Once the RPM returns to the recommended operating RPM range, normal engine operation resumes.

The boat manufacturer and the selling dealer are responsible for equipping the power package with the correct propeller. Refer to Mercury Marine's web page <https://www.mercurymarine.com/en/us/propellers/selector/#/step-one>.

Select a propeller that will allow the engine power package to operate at or near the top end of the recommended WOT operating RPM range with a normal load.

GENERAL INFORMATION

If full-throttle operation is below the recommended range, the propeller must be changed to prevent loss of performance and possible engine damage. On the other hand, operating an engine above the recommended operating RPM range will cause higher than normal wear and damage.

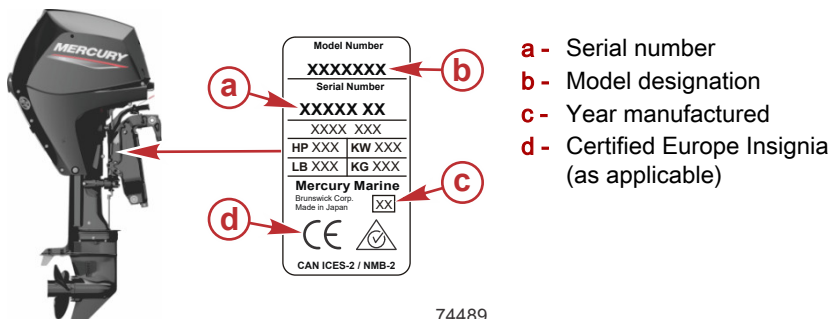
After initial propeller selection, the following common problems may require that the propeller be changed to a lower pitch.

- Warmer weather and greater humidity cause a loss of RPM.
- Operating in a higher elevation causes a loss of RPM.
- Operating with a dirty boat bottom causes a loss of RPM.
- Operating with increased load (additional passengers, pulling skiers) causes a loss of RPM.

For better acceleration, such as is needed for waterskiing, use the next lower pitch propeller. When not pulling skiers, do not operate at full throttle when using the lower pitch propeller.

Recording Serial Number

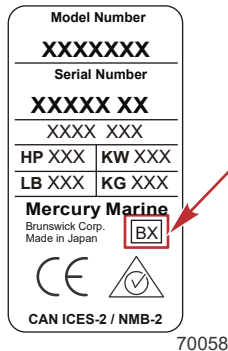
Record the engine's serial number for future reference. The serial number is located on the outboard as shown.



GENERAL INFORMATION

Model Year Production Code

The serial number decal lists the year of manufacture as an alpha code. This code can be deciphered into a corresponding number using the following table.



Serial number decal alpha code

Model Year Manufactured Code										
Alpha Production Code	A	B	C	D	E	F	G	H	K	X
Corresponding Number	1	2	3	4	5	6	7	8	9	0

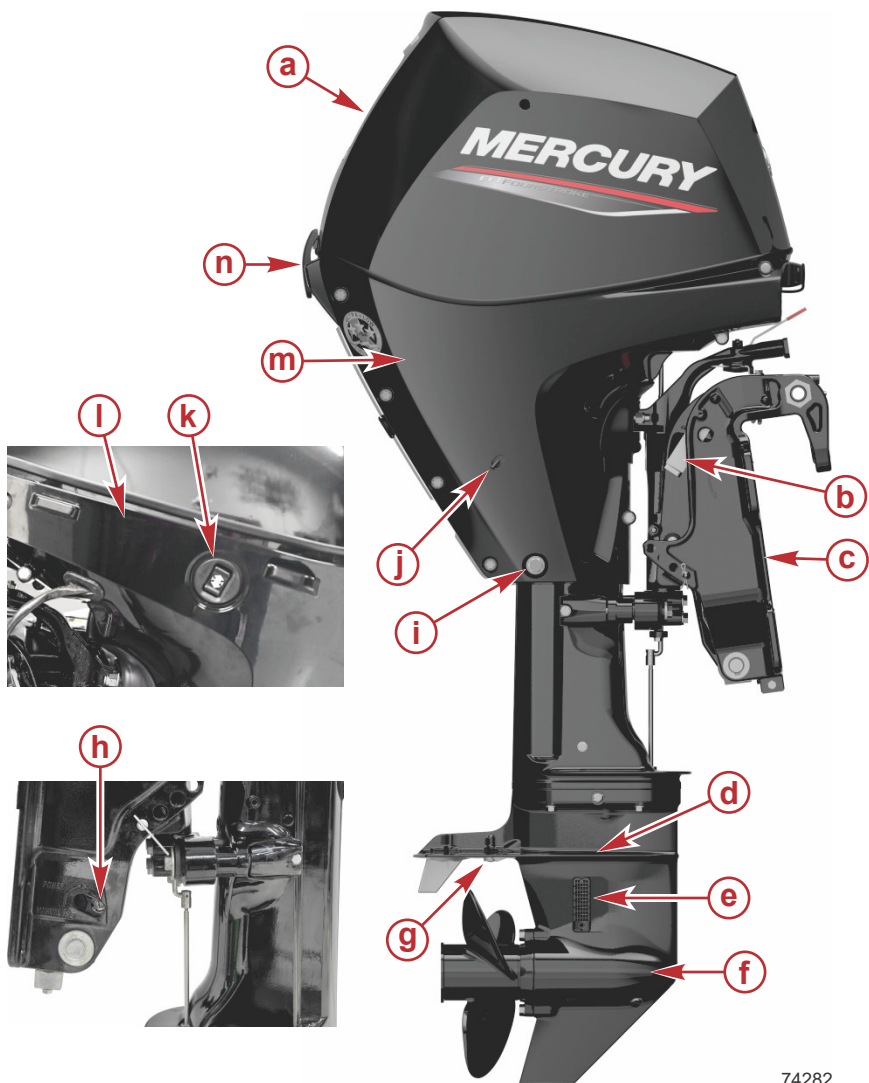
Examples:

- BX = 2020
- HK = 2089
- AG = 2017

GENERAL INFORMATION

Component Identification

POWER TRIM MODEL



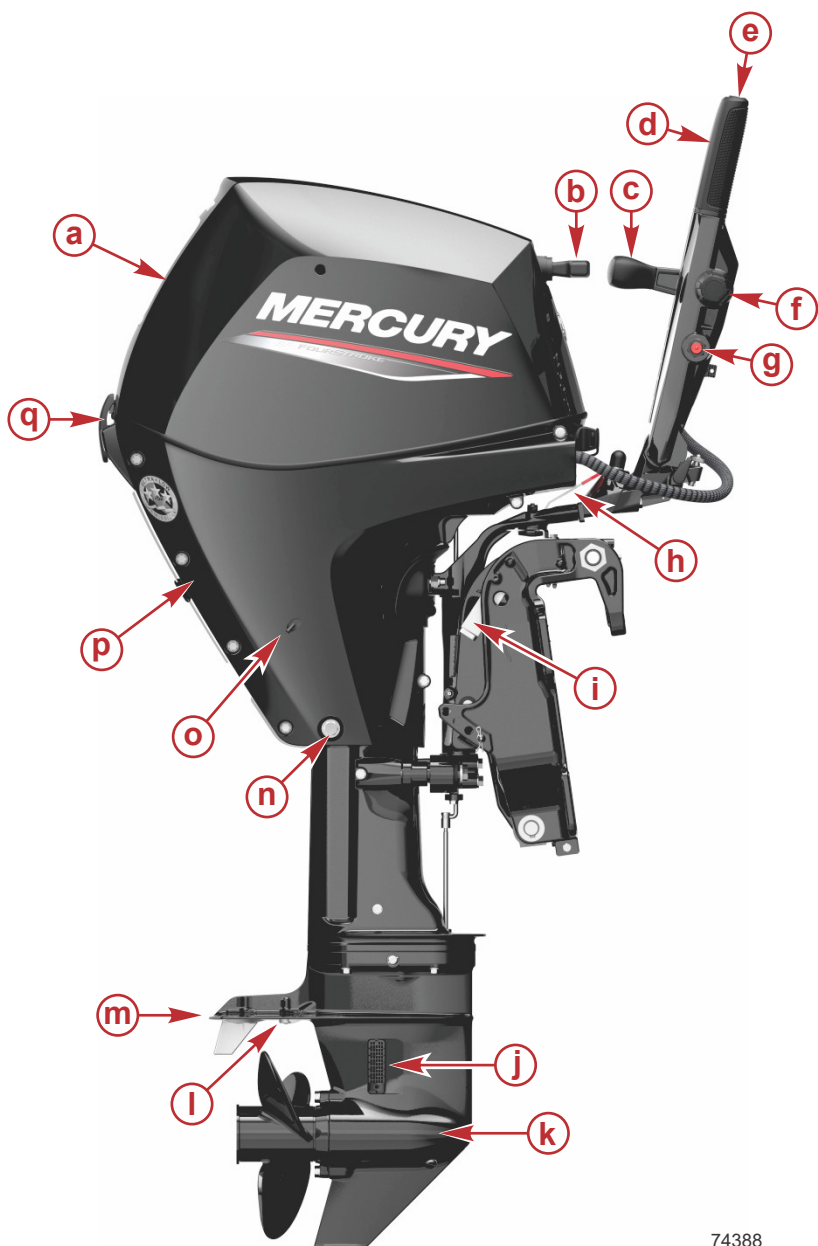
74282

GENERAL INFORMATION

- a** - Top cowl
- b** - Tilt support lever
- c** - Transom brackets
- d** - Anti-ventilation plate
- e** - Primary cooling water intake
- f** - Gearcase
- g** - Secondary cooling water intake
- h** - Manual tilt release valve
(accessible through port transom bracket)
- i** - Oil drain screw
- j** - Water pump indicator hole
- k** - Auxiliary trim/tilt switch
- l** - Port lower cowl
- m** - Starboard lower cowl
- n** - Cowl latch

GENERAL INFORMATION

MANUAL GAS ASSIST TILT MODEL



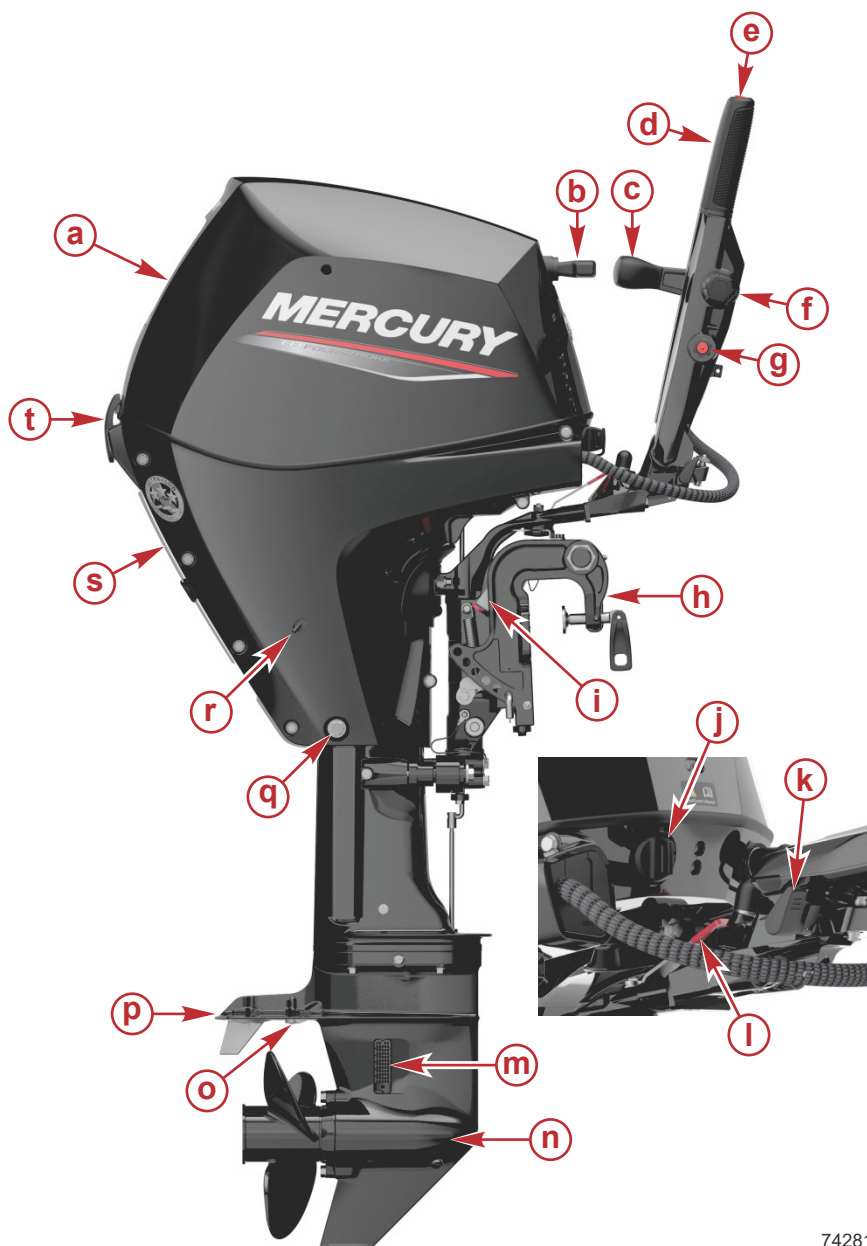
74388

GENERAL INFORMATION

- a** - Top cowl
- b** - Manual start handle
- c** - Shift lever
- d** - Throttle grip
- e** - Engine stop switch
- f** - Throttle friction adjustment knob
- g** - Lanyard stop switch (lanyard cord not shown)
- h** - Steering friction adjustment lever
- i** - Tilt support lever
- j** - Primary cooling water intake
- k** - Gearcase
- l** - Secondary cooling water intake
- m** - Anti-ventilation plate
- n** - Oil drain screw
- o** - Water pump indicator hole
- p** - Lower cowls
- q** - Cowl latch

GENERAL INFORMATION

MANUAL TILT MODEL



74281

GENERAL INFORMATION

- a** - Top cowl
- b** - Manual start handle
- c** - Shift lever
- d** - Throttle grip
- e** - Engine stop switch
- f** - Throttle friction adjustment knob
- g** - Lanyard stop switch (lanyard cord not shown)
- h** - Transom brackets
- i** - Tilt lock lever
- j** - Ignition key switch (electric start models)
- k** - Tiller handle tilt lock lever
- l** - Steering friction adjustment lever
- m** - Primary cooling water intake
- n** - Gearcase
- o** - Secondary cooling water intake
- p** - Anti-ventilation plate
- q** - Oil drain screw
- r** - Water pump indicator hole
- s** - Lower cowl
- t** - Cowl latch

Specifications

Parameter		Specification
Power rating		18.6 kW (25 hp)
		22.4 kW (30 hp)
Weight	25 MH	59.9 kg (132 lb)
	25 MLH	60.3 kg (133 lb)
	25/30 EPT	65.8 kg (145 lb)
	25/30 ELPT	66.7 kg (147 lb)
	30 ELH GA	69.4 kg (153 lb)
	25/30 ELHPT	70.3 kg (155 lb)
Engine idle speed in forward gear		875 ± 25 RPM
WOT range	25 hp models	5400–5800 RPM
	30 hp models	5800–6200 RPM
Number of cylinders		3
Piston displacement		500 cc (30.5 cid)
Cylinder bore		61.0 mm (2.402 in.)
Stroke		57.0 mm (2.244 in.)
Recommended spark plug		NGK DCPR6E
Spark plug gap		0.9 mm (0.035 in.)
Battery rating		465 MCA or 350 CCA
Recommended fuel		Refer to Fuel and Oil
Recommended engine oil		Refer to Fuel and Oil
Engine oil capacity		1.4 L (1.5 U.S. qt)
Power tilt fluid		Power Trim and Steering Fluid or Automatic Transmission Fluid (ATF) (Type Dexron III)

GENERAL INFORMATION

Parameter	Specification
Gear ratio	2.17:1
Gear lubricant type	Premium Gear Lubricant or SAE 80W-90 API GL-4
Gearcase lubricant capacity	460 ml (15.6 fl oz)
Emission control system	Electronic engine control (EC) Multiport fuel injection (MFI)

INSTALLATION

Installation Information

BOAT HORSEPOWER CAPACITY

⚠ WARNING

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

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

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

26777

START IN GEAR PROTECTION

⚠ WARNING

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

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

SELECTING ACCESSORIES FOR YOUR OUTBOARD

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

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

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

INSTALLATION

FUEL TANKS

Portable Fuel Tank

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

Permanent Fuel Tank

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

FUEL SYSTEM REQUIREMENTS

When installing the boat's fuel system, refer to **Fuel and Oil** for fuel system requirements:

- Low Permeation Fuel Hose Requirement
- Fuel Demand Valve (FDV) Requirement
- EPA Pressurized Portable Fuel Tank Requirements
- Mercury Marine's Pressurized Portable Fuel Tank

INSTALLATION

MERCURY MARINE VALIDATED ENGINE MOUNTING HARDWARE

IMPORTANT: Mercury Marine provides validated fasteners and installation instructions, including torque specifications, with all of our outboards so they can be properly secured to boat transoms. Improper installation of the outboard can cause performance and reliability issues that can lead to safety concerns. Follow all of the instructions relating to the outboard installation. **DO NOT** mount any other accessory onto the boat with the fasteners provided with the outboard. For example, do not mount TowSport 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.

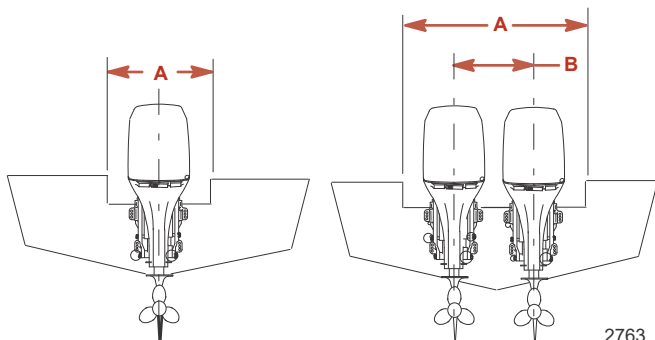


51965

INSTALLATION

Installing the Outboard

INSTALLATION SPECIFICATIONS



a - Minimum transom opening

b - Engine centerline for dual engines

Minimum Transom Opening	
Single engine (remote)	48.3 cm (19 in.)
Single engine (tiller)	76.2 cm (30 in.)
Dual engines	101.6 cm (40 in.)

Engine Centerline	
Minimum	66 cm (26 in.)

LIFTING THE OUTBOARD

Use the lifting eye located aft of the recoil starter to support the engine when installing the outboard.



INSTALLATION

INSTALLING THE OUTBOARD ON THE TRANSOM (MANUAL TILT MODELS)

⚠ 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.

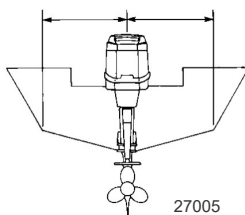
This product must be secured to the transom with the required mounting hardware. If the outboard strikes an under water object, the required mounting hardware prevents the outboard from propelling off the transom. A decal on the swivel bracket reminds the installer of the potential hazard.



52375

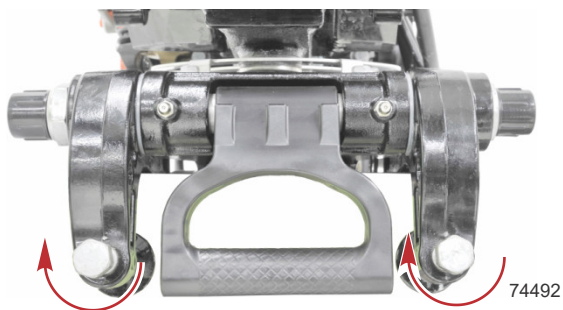
IMPORTANT: Models not equipped with power trim or gas assist must have the transom clamps contacting the top of the transom and the clamp screws tightened, prior to drilling the mounting bolt holes through the transom.

1. Place the outboard on the centerline of the transom.

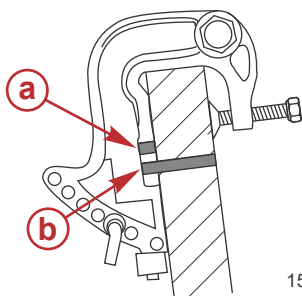


INSTALLATION

2. Tighten the transom clamp bolts.

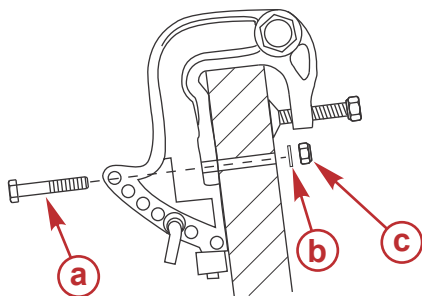


3. Use a long drill bit to drill the two lower 8 mm (0.315 in.) holes through the transom, using the transom clamps as a template for the bolt hole pattern.



- a - Upper transom clamp hole
- b - Lower transom clamp hole

4. Apply marine sealer to the shanks of the bolts. Do not apply marine sealer to the threads of the bolts.
5. Secure the engine to the transom with the mounting hardware supplied with the engine. Tighten the mounting hardware securely.



- a - Bolt (2)
- b - Washer (2)
- c - Locknut (2)

INSTALLATION

INSTALLING THE OUTBOARD ON THE TRANSOM (POWER TRIM AND GAS ASSIST)

⚠ WARNING

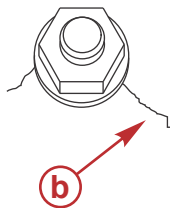
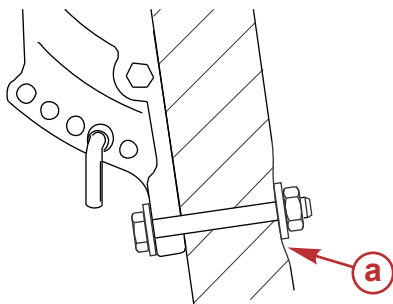
Failure to correctly fasten the outboard could result in the outboard propelling off the boat transom resulting in property damage, serious injury, or death. Before operation, the outboard must be correctly installed with the required mounting hardware.

This product must be secured to the transom with the required mounting hardware. If the outboard strikes an under water object, the required mounting hardware prevents the outboard from propelling off the transom. A decal on the swivel bracket reminds the installer of the potential hazard.



52375

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.



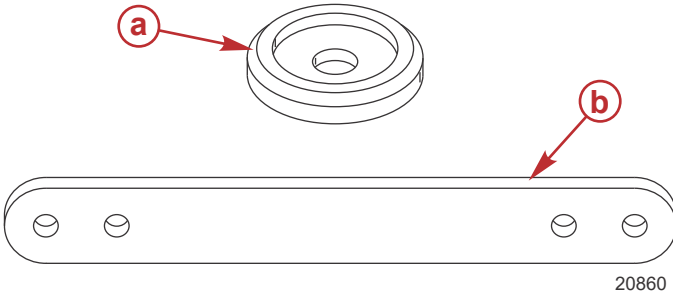
18961

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

INSTALLATION

When first determining transom strength, use a dial torque wrench. 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.

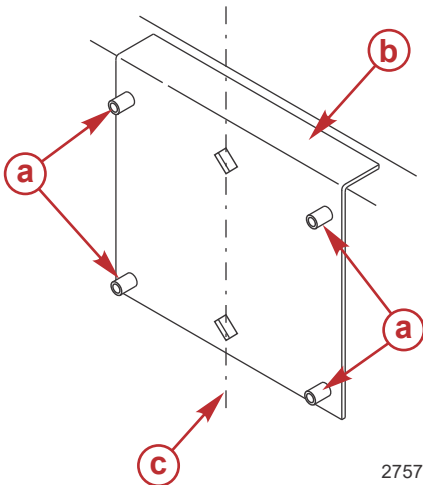
NOTE: The inside holes on the transom reinforcement plate are for the lower transom bolts and the outside holes are for the upper transom bolts.



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

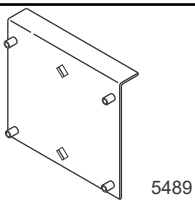
Description	Part Number
Large transom washer	896392
Transom reinforcement plate	896305001

1. Use the transom drilling fixture for drilling the transom mounting holes.

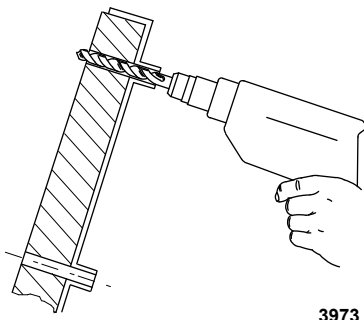


- a - Drill guide holes
- b - Transom drilling fixture
- c - Transom centerline

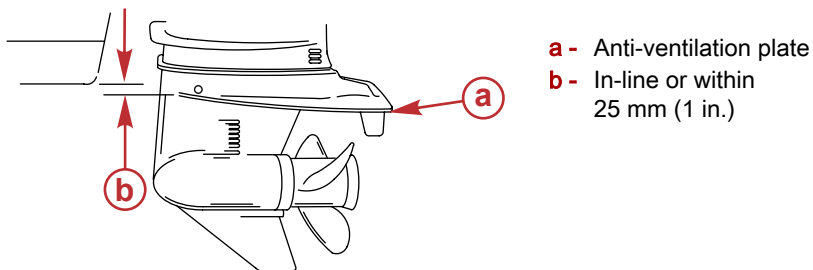
INSTALLATION

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

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



3. Install the outboard so that the anti-ventilation plate is in-line or within 25 mm (1 in.) of the bottom of the boat.

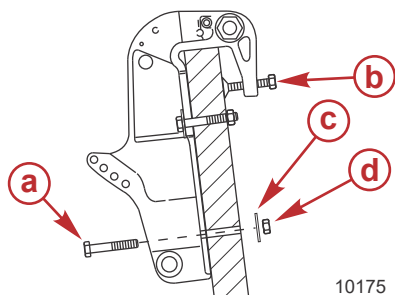


8045

4. Apply marine sealer to shanks of bolts. Do not apply marine sealer to the threads of the bolts.
5. Fasten outboard with provided mounting hardware shown. Tighten the locknuts to the specified torque.

INSTALLATION

The outboard must be secured to the transom with the two transom bracket clamp screws and four 13 mm (1/2 in.) diameter mounting bolts and locknuts provided. Install two bolts through the upper set of mounting holes and two bolts through the lower set of mounting slots.



- a** - Bolt (4)
- b** - Transom clamp bolt
- c** - Washer (4)
- d** - Locknut (4)

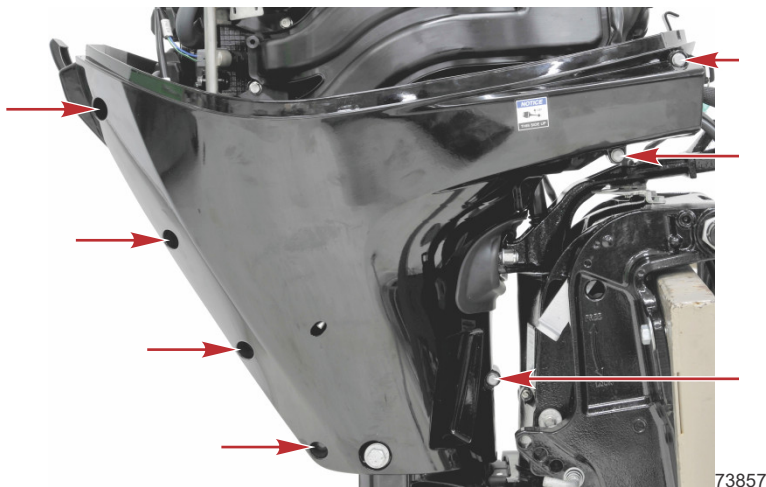
10175

Description	Nm	lb-in.	lb-ft
Outboard mounting locknuts and bolts	75	-	55

Remote Control Connections

REMOTE WIRING HARNESS INSTALLATION

1. Loosen seven captive screws and remove the starboard cowl.



73857

2. Connect the remote harness to the engine harness 14-pin connector at the top aft of the engine.

INSTALLATION

3. Route the harness along the top and forward sides of the intake runner, and secure the harness with cable ties in three locations.



- a** - 14-pin connector
- b** - Cable ties
- c** - Remote harness

THROTTLE CABLE INSTALLATION - RC MODELS

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

1. Move the remote control handle from neutral into forward and advance the handle to full speed position.

NOTE: *The throttle cable is the second cable to move when moving the control box out of neutral.*

2. Install the throttle cable onto the throttle actuating lever. Secure with a plastic washer and cotter pin.

INSTALLATION

3. Adjust the throttle cable barrel so that when the barrel is installed into the barrel support bracket, no play can be felt when lightly pushing the throttle cam with a finger.



- a** - Throttle actuating lever
- b** - Cotter pin
- c** - Plastic washer
- d** - Throttle cam (no play can be felt when lightly pushing)
- e** - Throttle cable barrel
- f** - Barrel support bracket

4. Slowly return the remote control handle back to the neutral detent position.
5. Move the throttle control back and forth, to check for proper operation.

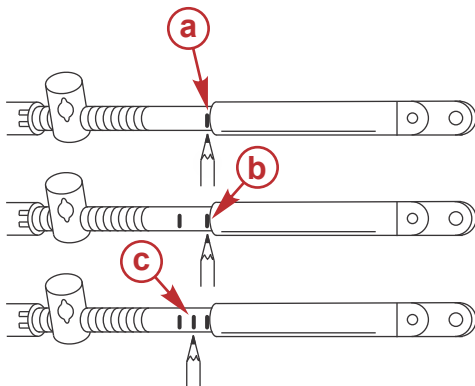
SHIFT CABLE INSTALLATION - NON-JET MODELS

Connect cables to 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 the neutral. Place a mark ("a") on the cable end guide.
 - b. Move the remote control handle from neutral into reverse and advance the handle to full speed position. Slowly return the handle back to the neutral. Place a mark ("b") on the cable end guide.

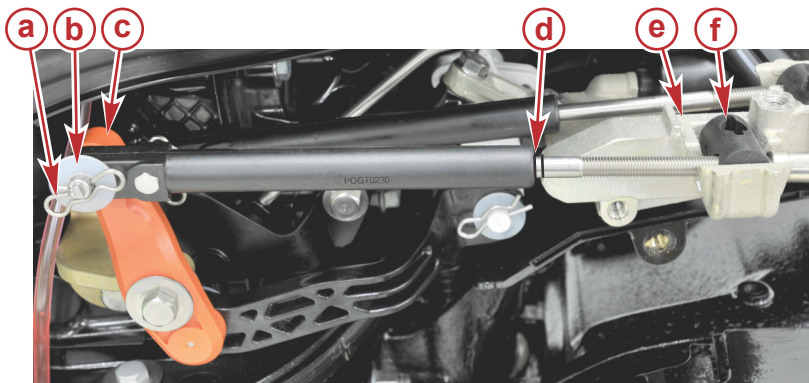
INSTALLATION

- c. Make a center mark ("c"), midway between marks "a" and "b". Align the cable end guide with this center mark when connecting the cable to the engine.



6098

2. Ensure that both the outboard engine and the remote control are in neutral.
3. Install the shift cable onto the shift actuating lever. Secure the connection with a plastic washer and cotter pin.
4. Adjust the cable barrel so the center mark on the cable guide is aligned, when the shift cable barrel is in the barrel support bracket.



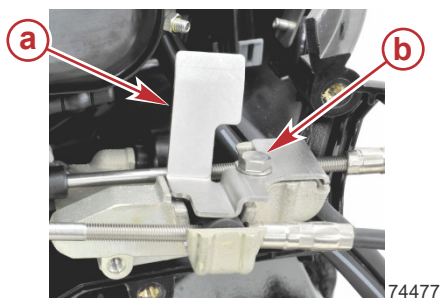
74355

- a** - Cotter pin
- b** - Plastic washer
- c** - Shift lever
- d** - Center mark on shift cable, aligned with end of shift cable sleeve
- e** - Barrel support bracket
- f** - Barrel

5. Check shift cable adjustments as follows:

INSTALLATION

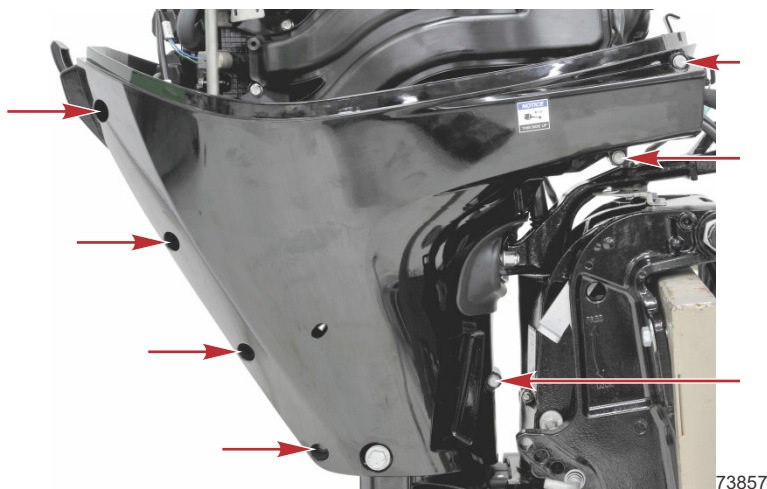
- a. Shift remote control into forward. The propeller shaft should be locked in gear. If not, adjust the cable end accordingly.
 - b. Shift remote control into reverse while turning propeller. The propeller shaft should be locked in gear. If not, adjust the cable end accordingly. Repeat steps a through c.
 - c. Shift remote control back to neutral. The propeller shaft should turn freely without drag. If not, adjust the cable end accordingly. Repeat steps a through c.
6. Install the throttle and shift cable retaining bracket, and secure it with a single screw with washer. Tighten the screw to the specified torque.



- a** - Throttle and shift cable retaining bracket
b - Screw with washer

Description	Nm	lb-in.	lb-ft
Screw	10	88.5	—

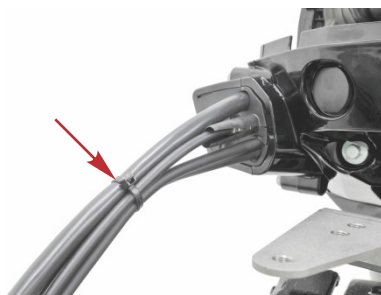
7. Install the rigging grommet.
8. Install the starboard cowl and secure it with the seven captive screws. Tighten the screws to the specified torque.



INSTALLATION

Description	Nm	lb-in.	lb-ft
Captive screw (7)	8.5	75	–

- Use cable ties to secure the throttle, shift, and battery cables to the boat harness, to prevent contact with the steering components.



74478

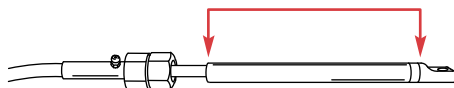
Steering Control Connections

STEERING BRACKET, STEERING CABLE INSTALLATION

- Install the steering bracket with two washers and two 30 x 80 mm bolts. Tighten the steering bracket bolts to the specified torque.

Description	Nm	lb-in.	lb-ft
Steering bracket bolt	30	–	22

- Lubricate entire steering cable end with 2-4-C with PTFE.



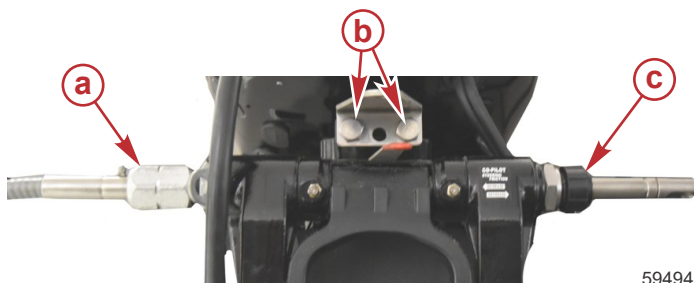
10261

Description	Where Used	Part No.
2-4-C with PTFE	Steering cable end	92-802859A 1

- Install the steering cable seal onto the end of the tilt tube.

INSTALLATION

4. Insert the steering cable into the tilt tube and secure with the steering cable nut. Tighten the steering cable nut to the specified torque.



- a - Steering cable nut
- b - Steering bracket bolt and washer (2)
- c - Steering cable seal

Description	Nm	lb-in.	lb-ft
Steering cable nut	47.5	-	35

STEERING LINK ROD FASTENERS

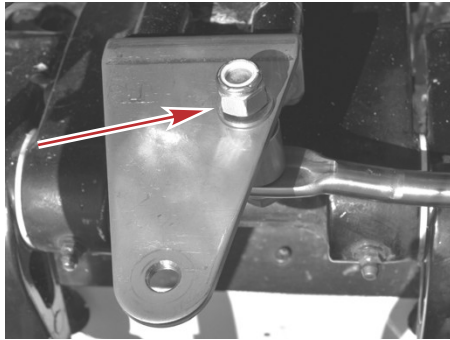
⚠ WARNING

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.

IMPORTANT: The steering link rod that connects the steering cable to the engine must be fastened using the steering link rod fastening hardware supplied with the engine. Never replace the locknuts with non-locking nuts. Non-locking nuts may loosen and vibrate off, allowing the link rod to disengage.

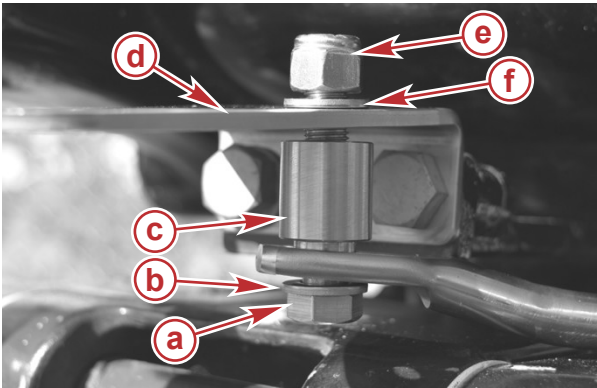
INSTALLATION

1. Install the steering link rod onto the steering bracket aft threaded hole.



59496

2. Assemble the steering link rod onto the steering bracket with the screw, two washers, spacer, and a locknut. Do not tighten the screw or locknut.

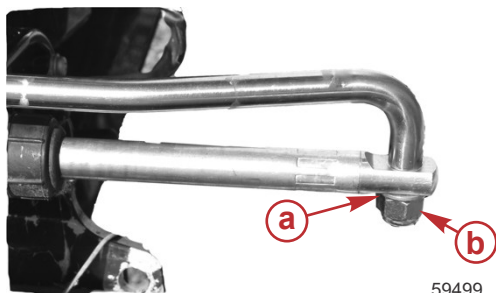


59497

- a** - Screw
- b** - Washer
- c** - Spacer
- d** - Steering bracket
- e** - Locknut
- f** - Washer

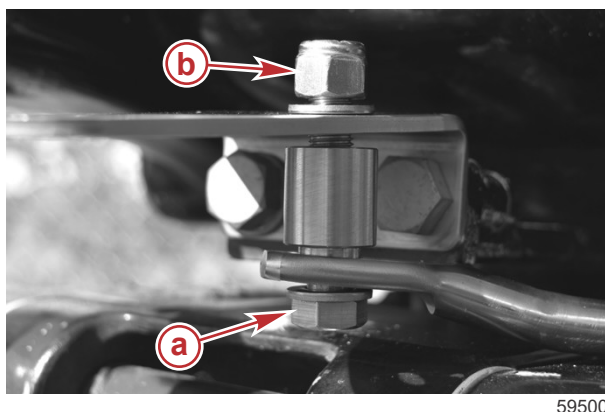
INSTALLATION

3. Install the loose end of the steering link onto the steering cable and secure with a washer and locknut. Tighten the locknut securely and then back the nut off 1/4 turn.



- a - Washer
- b - Locknut

4. Tighten the link rod screw to the specified torque.
5. Secure the link rod screw so it does not loosen and tighten the locknut to the specified torque.



- a - Link rod screw
- b - Locknut

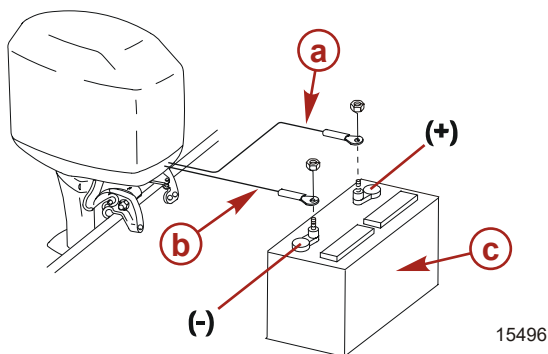
Description	Nm	lb-in.	lb-ft
Link rod screw	27.1	–	20
Locknut	27.1	–	20

Battery Cable Connections

IMPORTANT: To prevent damage to the engine charging system when the battery cables are not connected to a battery, ensure the battery cable ends are thoroughly insulated.

INSTALLATION

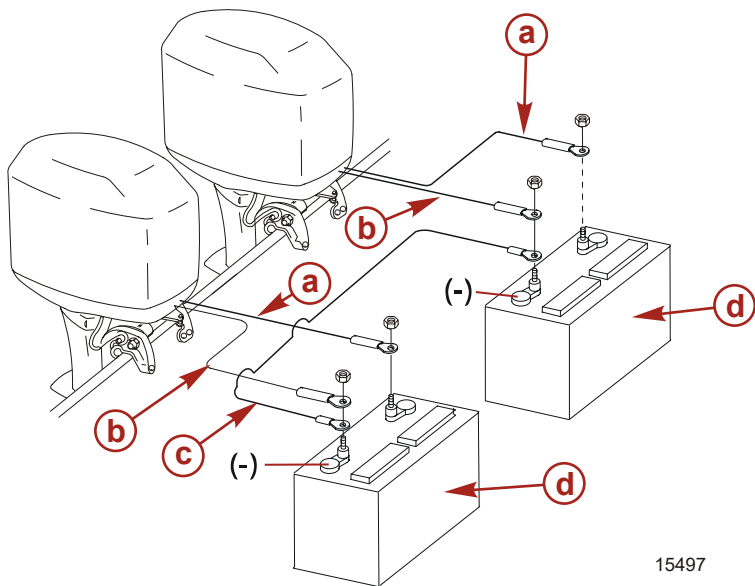
SINGLE OUTBOARD



- 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

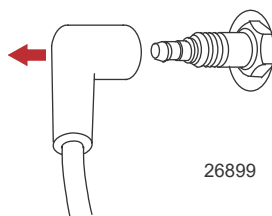
INSTALLATION

Installing the Propeller

⚠ WARNING

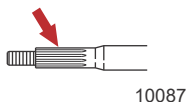
Rotating propellers can cause serious injury or death. Never operate the boat out of the water with a propeller installed. Before installing or removing a propeller, place the drive unit in neutral and activate the lanyard stop switch to prevent the engine from starting. Place a block of wood between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

1. Shift the outboard to neutral (N) position.
2. Remove the spark plug leads to prevent the engine from starting.



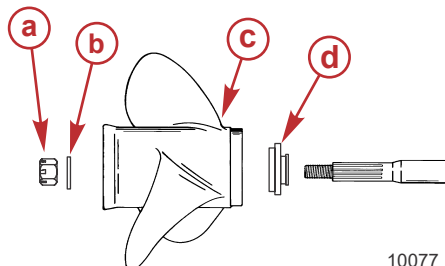
3. Coat the propeller shaft with Extreme Grease or 2-4-C with PTFE.

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.



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

4. Install the front thrust hub, propeller, rear thrust washer and propeller nut onto the shaft.



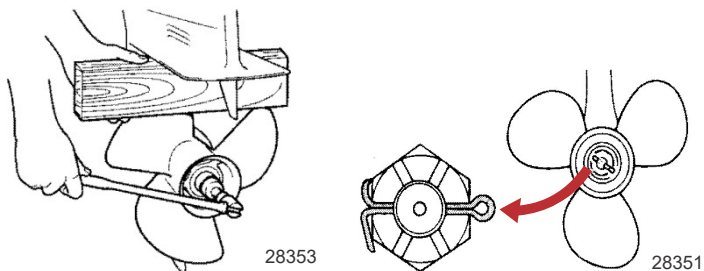
- a - Propeller nut
- b - Rear thrust washer
- c - Propeller
- d - Forward thrust hub

INSTALLATION

5. Place a block of wood between the gearcase and the propeller and torque the propeller nut to specification.

NOTE: If the propeller nut does not align with the propeller shaft hole after tightening to the specified torque, then tighten the nut further to align it with the hole in the propeller shaft.

6. Align the propeller nut with the propeller shaft hole. Insert a new cotter pin in the hole and bend the cotter pin ends.



Description	Nm	lb-in.	lb-ft
Propeller nut	25	–	18

TRANSPORTING

Aquatic Invasive Species (AIS)



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

For additional information, visit StopAquaticHitchhikers.org.

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.

You should be aware that water passes in and out of the space under the lower cowls on your engine during normal operation of the boat. When flushing and cleaning your 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.

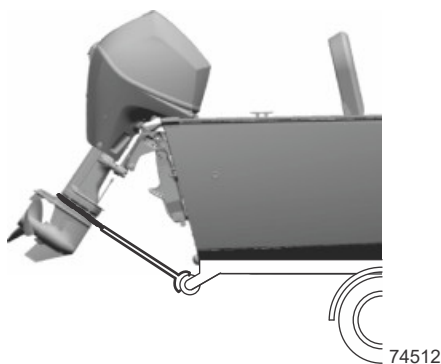
For more information about the control of AIS in your area, please contact your area wildlife conservation office or local governmental natural resources office.

Trailing Boat/Outboard

Trailer your boat with the outboard tilted down in a vertical operating position.

TRANSPORTING

If additional ground clearance is required, the outboard should be tilted up using an accessory outboard support device. Refer to your local dealer for recommendations. Additional clearance may be required for railroad crossings, driveways, and trailer bouncing.



IMPORTANT: Do not rely on the power tilt system or the 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 into reverse gear. This prevents the propeller from spinning.

Carrying, Storing, and Transporting the Outboard when Removed from Boat

IMPORTANT: Ensure that the proper procedures are followed for transportation and storage of the outboard to avoid the possibility of oil leaks.

1. With the outboard in the water, disconnect the remote fuel line and run the engine until it stops.
2. Remove the outboard and hold it upright until the water has drained out.
3. Carry, transport, or store the outboard in:

TRANSPORTING

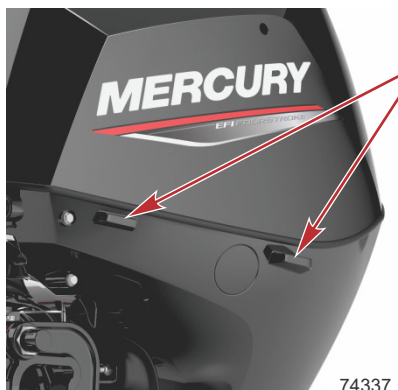
- An upright position



74336

Upright position

- On the port side. The port side lower cowl has two bumpers to help reduce damage to the cowl when the engine is stored laying down. Storing the engine on the port side will prevent oil from draining out of the crankcase into the cylinders or crankcase ventilation system.



74337

Port side lower cowl bumpers

- Horizontal, with the front of the engine facing up (tiller handle facing up). The aft side of the cowl has two bumpers to reduce damage to the cowl when the engine is stored in this position.

FUEL AND OIL

Low Permeation Fuel Hose Requirement

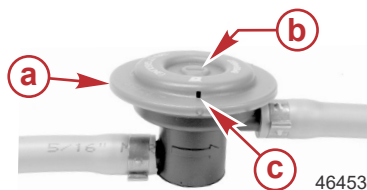
Required for outboards manufactured for sale, sold, or offered for sale in the United States.

- The Environmental Protection Agency (EPA) requires that any outboard manufactured after January 1, 2009, must use low permeation fuel hose for the primary fuel hose connecting the fuel tank to the outboard.
- Low permeation hose is USCG Type B1-15 or Type A1-15, defined as not exceeding 15 g/m²/24 h with CE 10 fuel at 23 °C as specified in SAE J 1527 - marine fuel hose.

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

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

SPECIAL FEATURES OF THE PORTABLE FUEL TANK

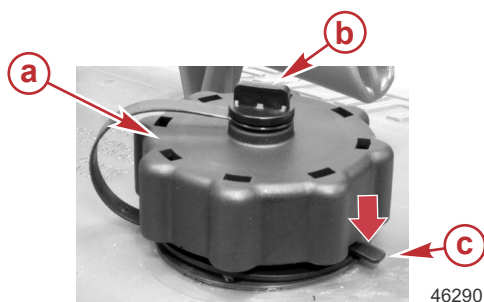
- The fuel tank has a two-way valve which allows air to enter the tank as the fuel is drawn to the engine, and also opens to vent to the atmosphere if internal pressure in the tank exceeds 34.4 kPa (5.0 psi). A hissing noise may be heard as the tank vents to the atmosphere. This is normal.

FUEL AND OIL

- The fuel tank includes a fuel demand valve that prevents pressurized fuel from entering the engine and causing a fuel system overflow or possible fuel spillage.
- When installing the fuel tank cap, turn the cap to the right until you hear a click. This signals that the fuel cap is fully seated. A built-in device prevents overtightening.
- The fuel tank has a manual vent screw which should be closed for transportation and open for operation and cap removal.

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

REMOVING THE FUEL CAP



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

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

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

DIRECTIONS FOR USING THE PRESSURIZED PORTABLE FUEL TANK

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

FUEL AND OIL

Filling Fuel Tank

⚠ WARNING

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

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

Remove the portable fuel tanks from the boat to 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.

Fuel Requirements

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

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 your Mercury Marine engine. 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 your boat manufacturer for specific recommendations on your boat's fuel system components (fuel tanks, fuel lines, and fittings).

FUEL AND OIL

Methanol and Ethanol Fuel Blends

IMPORTANT: The fuel system components on your Mercury Marine engine will withstand up to 10% alcohol (methanol or ethanol) content in the gasoline. Your boat's fuel system may not be capable of withstanding the same percentage of alcohol. Contact your boat manufacturer for specific recommendations on your boat's 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: If you use gasoline that contains or might contain methanol or ethanol, you must increase the frequency of inspection for leaks and abnormalities.

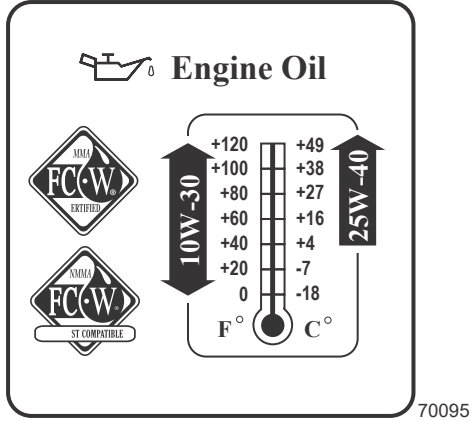
IMPORTANT: When operating a Mercury Marine engine on gasoline containing methanol or ethanol, do not store the gasoline in the fuel tank for long periods. Cars normally consume these blended fuels before they can absorb enough moisture to cause trouble; boats often sit idle long enough for phase separation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

Engine Oil Recommendations

Mercury or Quicksilver NMMA™ FC-W® or NMMA FC-W catalyst compatible certified SAE® 10W-30 Mineral Marine 4-Stroke Engine Oil or SAE 10W-30 Synthetic Blend Marine 4-Stroke Engine Oil is recommended for general all-temperature use. As an optional choice, Mercury or Quicksilver SAE 25W-40 Mineral Marine 4-Stroke Engine Oil or SAE 25W-40 Synthetic Blend Marine 4-Stroke engine oil may be used. If the recommended Mercury or Quicksilver NMMA FC-W certified oils are not available, a major outboard manufacturer's brand of NMMA FC-W certified 4-Stroke outboard oil of similar viscosity may be used.

FUEL AND OIL

IMPORTANT: Nondetergent oils, multiviscosity oils (other than Mercury or Quicksilver NMMA FC-W certified oil or a major brand NMMA FC-W certified oil), full synthetic oils, low quality oils, and oils that contain solid additives are not recommended.



FEATURES AND CONTROLS

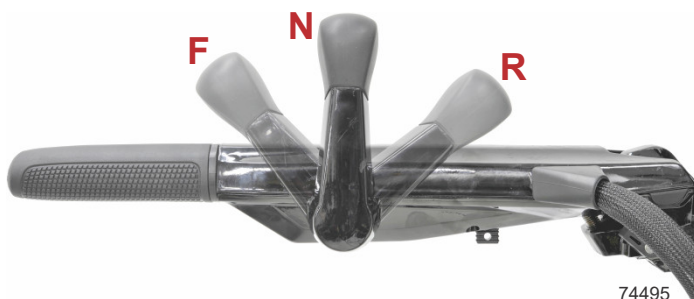
Tiller Handle Features

- A decal on the tiller handle provides a quick reference for starting the engine.
- Throttle grip friction knob - Turn the friction knob to set and maintain the throttle at desired speed. Turn the knob clockwise to increase the friction or turn the knob counterclockwise to decrease the friction.



- a** - Quick reference decal
- b** - Shift lever
- c** - Throttle grip friction knob

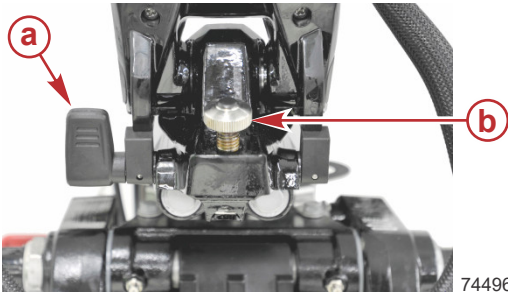
- Shift lever - The outboard has three gear shift positions to provide operation: forward (F), neutral (N), and reverse (R).



- Tiller handle tilt - Handle can be tilted for convenient handling during transportation and storage.
- Tiller lock release lever - Push the lock release lever down to allow the tiller handle to be raised or lowered.

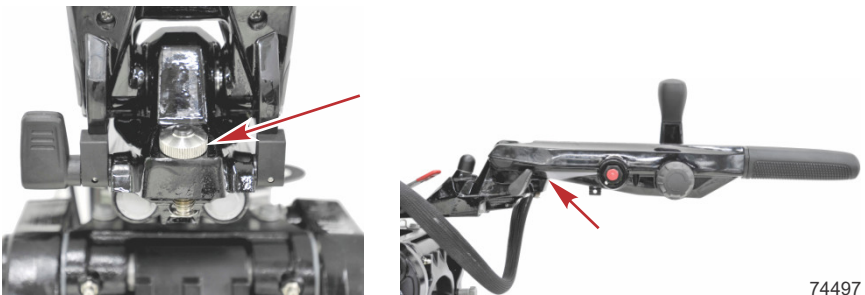
FEATURES AND CONTROLS

- Tiller handle adjustment knob - Turn the adjustment knob to raise or lower the tiller handle in its operating position.



- a** - Tiller lock release lever
- b** - Tiller handle adjustment knob

a. Adjustment knob at the lowest setting.



b. Adjustment knob at the highest setting.

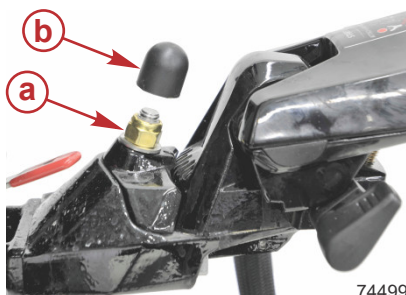


- Tiller handle yaw - The tiller handle yaw allows the operator to change the angle of the handle up to 18° left or right of center. Each increment demarcation is 6°.

- a. Remove the rubber boot covering the clamp screw nut.

FEATURES AND CONTROLS

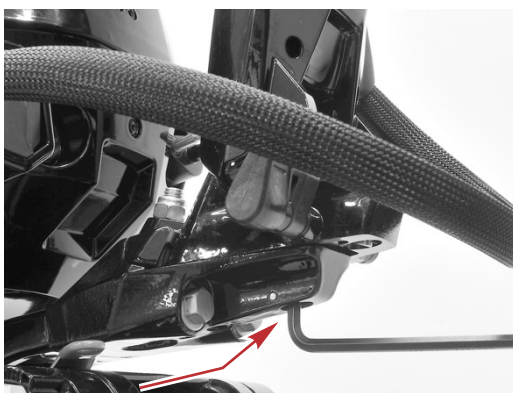
b. Loosen the 15 mm nut so it is almost completely off.



- a** - Clamp screw nut
- b** - Rubber boot

74499

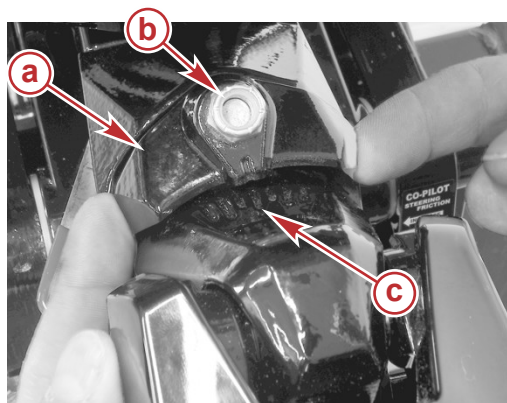
c. Loosen the 6 mm Allen socket head pivot screw.



63259

6 mm Allen socket head pivot screw

d. Lift the clamp with your fingers and rotate the tiller handle to the desired angle.



- a** - Clamp
- b** - Clamp screw nut
- c** - Center demarcation

63260

FEATURES AND CONTROLS

- e. Tighten the clamp screw nut to the specified torque and install the rubber boot.

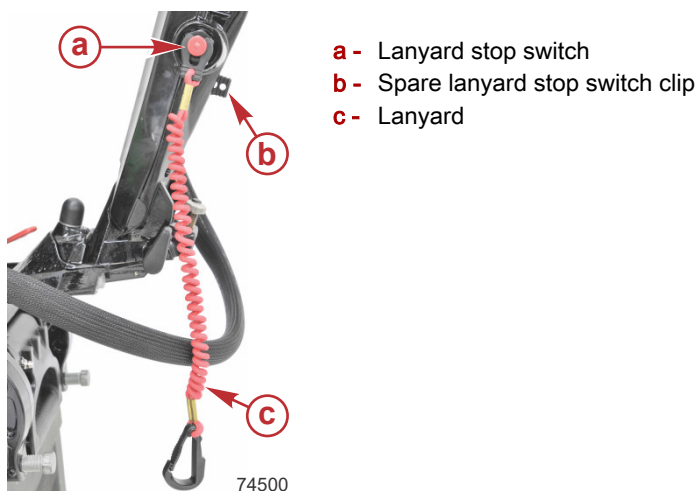
Description	Nm	lb-in.	lb-ft
Clamp screw nut	50	–	36.8

- f. Tighten the 6 mm Allen socket head pivot screw to the specified torque.

Description	Nm	lb-in.	lb-ft
6 mm Allen socket head pivot screw	24	–	17.7

- Lanyard stop switch - Refer to **General Information - Lanyard Stop Switch**.

NOTE: A spare lanyard stop switch clip is stored on the tiller handle.



- Engine stop switch - Push the button in to stop the engine.

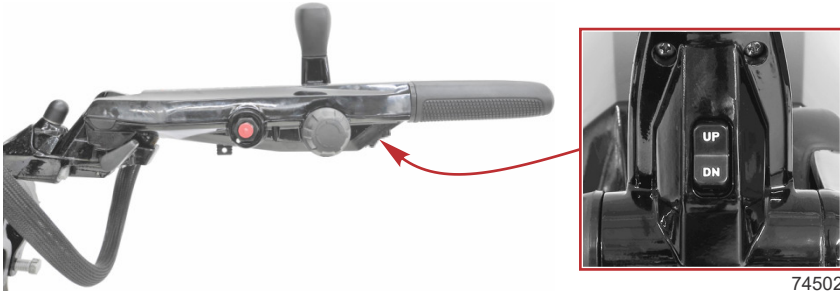


FEATURES AND CONTROLS

- Throttle grip - Controls the engine speed. Align the throttle grip with the idle mark on the tiller handle when starting or shifting into or out of gear. Twist the throttle grip to increase the engine speed.



- Power tilt switch (if equipped) - Tiller handle models equipped with power tilt have a switch located on the underside of the tiller handle. Press the switch to raise (UP) or lower (DN) the engine.



FEATURES AND CONTROLS

Remote Control Features

Your boat may be equipped with one of the Mercury Precision or Quicksilver remote controls shown. Consult your dealer for a description of the functions and operations of other remote controls.



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

- **Trim switch** - Used to trim the drive during operation or to raise the drive for trailering, launching, beaching, or shallow water operation. Refer to **Power Trim and Tilt (If Equipped)**.
- **Throttle only button** - Allows throttle advancement without shifting the engine. The throttle only button disengages the shifting mechanism from the control handle. With the remote control in neutral, press and hold the throttle only button to increase the engine's RPM.
- **Lanyard stop switch (if equipped)** - The purpose of a lanyard stop switch is to shut off the engine when the operator moves away from the boat controls. Refer to **General Information - Lanyard Stop Switch**. A lanyard stop switch can be installed as an accessory, adjacent to the operator's position.
- **Control handle** - Push the control handle forward from neutral with a quick firm motion to the first detent for forward gear. Continue pushing forward to increase speed. Pull the control handle back from neutral with a quick firm motion to the first detent for reverse gear. Continue pulling back to increase speed.

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

FEATURES AND CONTROLS

Tiller Handle Models with Manual Gas Assist Tilt

⚠ WARNING

Operating the engine without engaging the tilt lock lever can cause serious injury or death. The outboard can tilt upwards when decelerating or operating in reverse, causing loss of boat control. Always lock the outboard in its run position before operating.

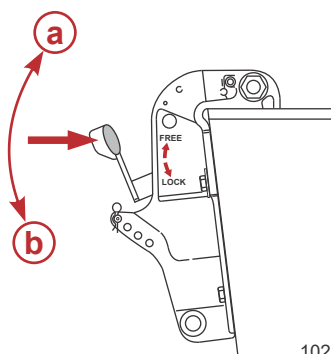
Models equipped with a gas assisted tilt system allow the operator to lock the outboard at any tilt position, from full down to full up.

This tilt system is designed to be adjusted when the outboard is idling in neutral or with the engine turned **OFF**.

Before operating, the outboard must be locked in its tilt position by moving the lock lever to the lock position.

BASIC TILTING OPERATION

Move the lock lever to the free position. Tilt the outboard to the desired position, and lock it in place by moving the tilt lock lever back to the lock position.



a - Free position

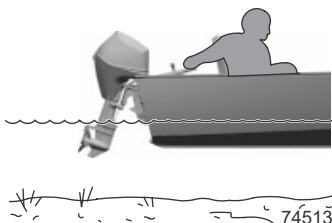
b - Lock position

10257

FEATURES AND CONTROLS

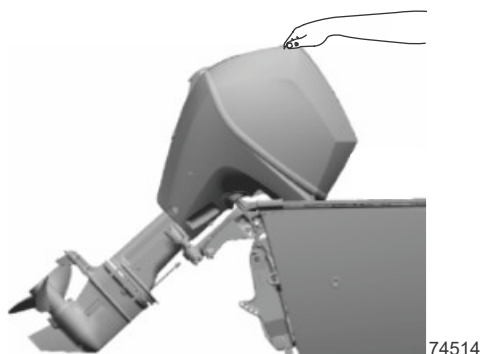
SHALLOW WATER OPERATION

When operating the boat in shallow water, the outboard can be adjusted and locked at a higher tilt angle. Operate the outboard at slow speed while tilted up for shallow water operation. Keep the cooling water intake holes submerged in the water, and continue to check for water discharge from the water pump indicator hole.



TILTING OUTBOARD TO FULL UP POSITION

1. Stop the engine. Move the lock lever to the free position. Take a hold of the top cowl grip, and raise the outboard to the full tilt-up position. Lock the outboard in place by moving the lock lever to the lock position.



2. Engage the tilt support lever.
3. Lower the outboard to rest on the tilt support lever.

LOWERING OUTBOARD TO RUN POSITION

1. Move the lock lever to the free position. Tilt the outboard up slightly, and release the tilt support lever. Lower the outboard to the run position.

FEATURES AND CONTROLS

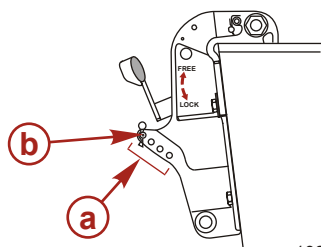
2. Move the lock lever to the lock position.



9703

OPERATING ANGLE ADJUSTMENT

The transom brackets have four holes for adjusting the vertical operating angle (forward stop movement) of the outboard. Use the tilt pin for adjustments in the four holes.



a - Transom bracket holes

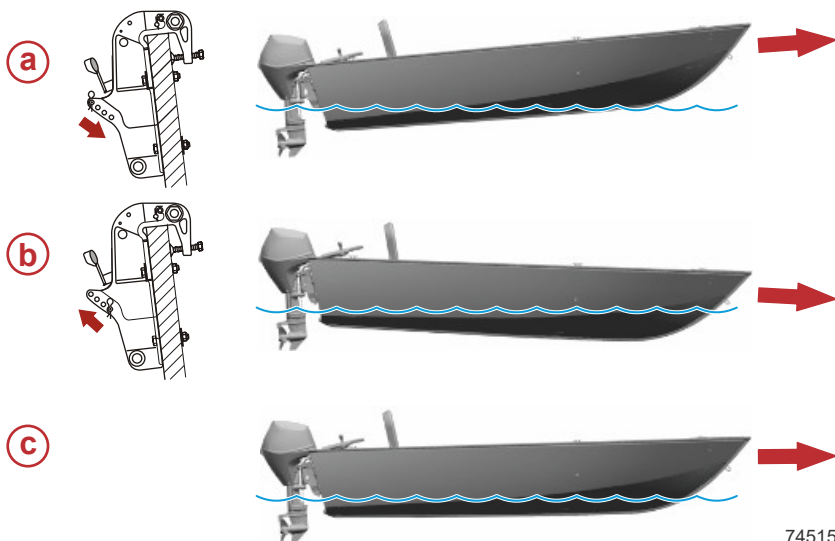
b - Tilt pin

10290

Adjust the operating angle of the outboard so that the outboard runs perpendicular to the water when the boat is at full speed.

FEATURES AND CONTROLS

Arrange passengers and the load in the boat so the weight is distributed evenly.



74515

- a** - Too much angle (bow up) - adjust in
- b** - Not enough angle (bow down) - adjust out
- c** - Angle adjusted properly (bow slightly up)

NOTE: The outboard should be locked against the tilt pin during operation, by setting the tilt lock lever to the lock position.

Consider the following items carefully when adjusting the operating angle of your outboard.

Adjusting the outboard close to the boat transom 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, 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.

Adjusting the outboard away from the boat transom can:

- Lift the bow out of the water
- Generally increase top speed

FEATURES AND CONTROLS

- Increase clearance over submerged objects or a shallow bottom
- Increase steering torque or pull to the left at a normal installation height (with the normal right-hand rotation propeller)
- In excess, cause boat porpoising (bouncing) or propeller ventilation

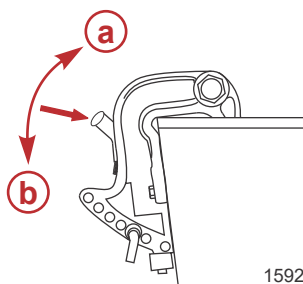
Tiller Handle Models with Manual Tilt

BASIC TILTING OPERATION

The tilt feature allows the operator to tilt the outboard to a higher tilt angle for operation in shallow water or tilt the outboard to the full up position.

When running the outboard, keep the tilt lever in the release position. This allows the outboard to return to the running position if the outboard should ever hit an underwater obstacle and be lifted up.

Moving the tilt lever to the tilt position will allow the outboard to lock into the shallow water drive position or the full up position.



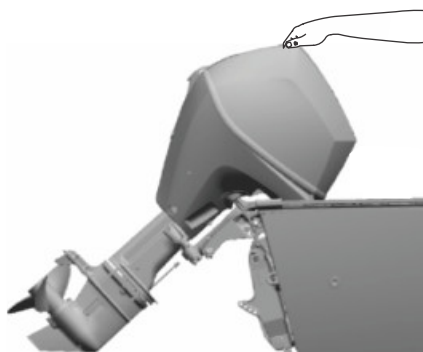
a - Release position

b - Tilt position

15920

TILTING OUTBOARD TO FULL UP POSITION

1. Stop the engine.
2. Shift the outboard to forward gear position.
3. Position the tilt lever to the tilt position.
4. Take hold of the top cowl grip, and tilt the outboard all the way up until it locks in place.



74514

FEATURES AND CONTROLS

LOWERING OUTBOARD DOWN TO RUN POSITION

Position the tilt lever in the release position. Raise the outboard slightly, to release it from its locked position, and gently lower it.

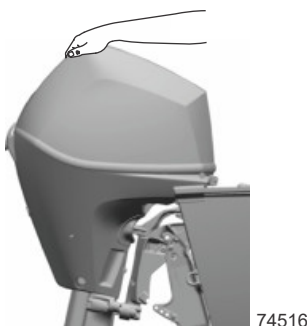
SHALLOW WATER OPERATION

The shallow water drive position on the outboard allows the outboard to be positioned at a higher tilt angle, to prevent hitting bottom.

IMPORTANT: Before tilting the outboard into the shallow water drive position, reduce the engine speed to idle and shift the engine into forward gear.

IMPORTANT: While in shallow water drive position, do not operate the outboard in reverse. Operate the outboard at slow speed, and keep the cooling water intake submerged.

1. Reduce the engine speed to idle.
2. Shift the engine into forward gear position.
3. Position the tilt lever to the tilt position.
4. Take hold of the top cowl grip, and tilt up the outboard until it locks in the shallow water running position.
5. To release the outboard out of shallow water drive, position the tilt lever to the release position, slightly lift up the outboard, and then gently lower it down.



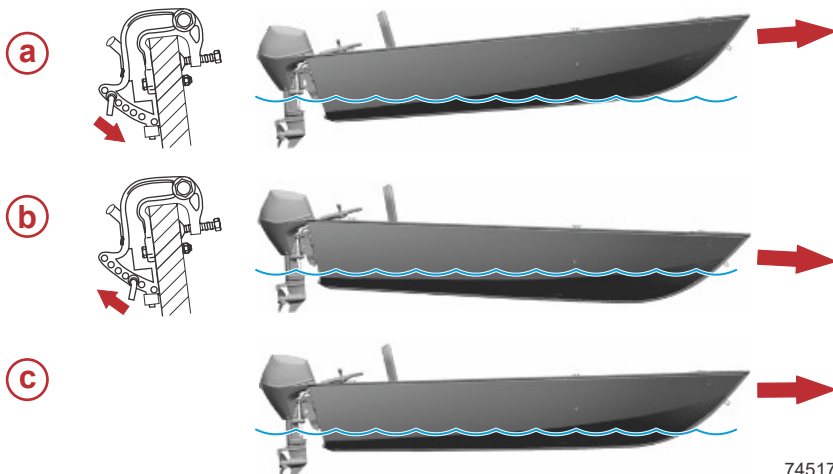
SETTING THE OPERATION ANGLE OF THE OUTBOARD

The vertical operating angle of the outboard is adjusted by changing the position of the tilt pin in the six adjustment holes provided. Proper adjustment allows the boat to run stable, achieve optimum performance, and minimize steering effort.

The tilt pin should be adjusted so the outboard is positioned to run perpendicular to the water, when the boat is running at full speed. This allows the boat to be driven parallel to the water.

FEATURES AND CONTROLS

Arrange the passengers and load in the boat so the weight is distributed evenly.



74517

- a** - Too much angle (stern down - bow up)
- b** - Not enough angle (stern up - bow down)
- c** - Angle adjusted properly (bow slightly up)

Consider the following items carefully, when adjusting the operating angle of your outboard.

Adjusting the outboard close to the boat transom 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, 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.

Adjusting the outboard away from the boat transom can:

- Lift the bow 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)

FEATURES AND CONTROLS

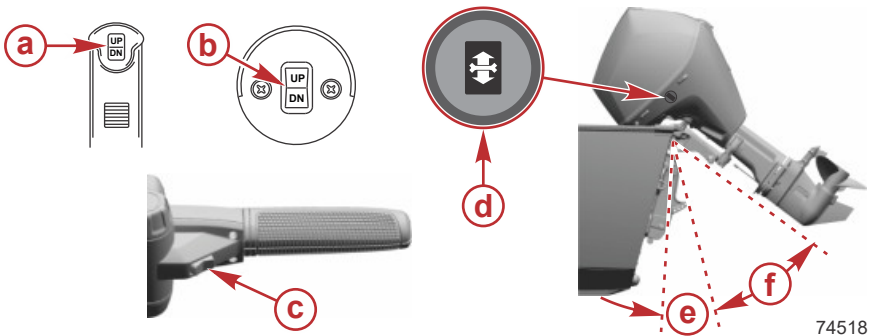
- In excess, cause boat porpoising (bouncing) or propeller ventilation

Power Trim and Tilt (if Equipped)

Power trim allows the operator to easily adjust the position of the outboard by pressing the trim switch.

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

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



74518

- a** - Remote control trim switch
- b** - Panel mount trim switch
- c** - Tiller handle trim switch
- d** - Cowl mounted trim switch (option)
- e** - Trim range of travel
- f** - Tilt range of travel

POWER TRIM OPERATION

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

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

FEATURES AND CONTROLS

⚠ WARNING

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

Consider the following lists carefully.

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

⚠ WARNING

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

- In rare circumstances, the owner may decide to limit the trim in. This can be accomplished by repositioning the tilt stop pin into whatever adjustment hole in the transom bracket is desired.
2. Trimming out or up can:
 - Lift the bow higher out of the water.
 - Generally increase top speed.
 - Increase clearance over submerged objects or a shallow bottom.
 - Increase steering torque or pull to the left at a normal installation height (with the normal right-hand rotation propeller).
 - In excess, can cause boat porpoising (bouncing) or propeller ventilation.
 - Cause engine overheating if any cooling water intake holes are above the waterline.

TILTING OPERATION

To tilt 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.

FEATURES AND CONTROLS

1. Engage the tilt support lever by rotating the lever down.
2. Lower the outboard to rest on the tilt support lever.
3. Disengage the tilt support lever, by slightly tilting up the outboard and releasing the tilt support bracket. Lower the outboard.



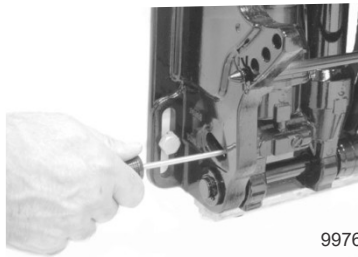
9703

MANUAL TILTING

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

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

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

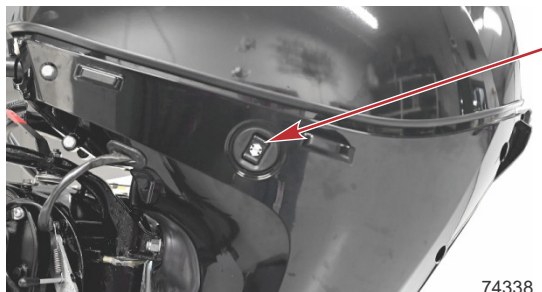


9976

FEATURES AND CONTROLS

AUXILIARY TILT SWITCH

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



74338

SHALLOW WATER OPERATION

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

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

Warning System

WARNING HORN

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 engine cowl.

WARNING SYSTEM OPERATION

The warning horn will emit either a continuous beep or intermittent short beeps and engine speed will be limited. This will alert the operator and help identify the following listed situations.

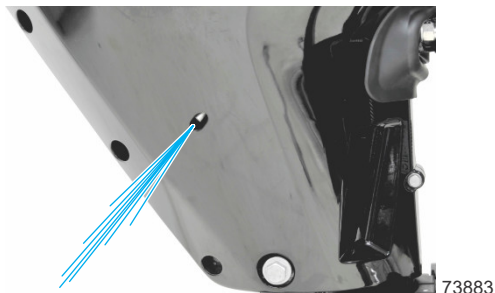
Function	Warning Horn	Description	Rev Limit
Start up	One beep	Normal system test	n/a
Engine overheat	Continuous	Engine overheat	2800 RPM
Low oil pressure	Continuous	Low oil pressure	2800 RPM
Engine overspeed	Continuous	Engine speed exceeds maximum allowable RPM	n/a

FEATURES AND CONTROLS

Function	Warning Horn	Description	Rev Limit
Sensor (ECT or MAP) error	Intermittent short beep	Engine speed will be limited. Consult your dealer for assistance.	2800 RPM

ENGINE OVERHEAT

If the engine overheats, immediately reduce throttle speed to idle. Shift outboard into neutral and check for a steady stream of water coming out of the water pump indicator hole.



If no water is coming out of the water pump indicator hole, or flow is intermittent, stop engine and check cooling water intake holes for obstruction. If no obstruction is found, this may indicate a blockage in the cooling system or a water pump problem. Have the outboard checked by your dealer. Operating the engine while overheated will cause engine damage.

If a steady flow of water is coming out of the water pump indicator hole and the engine continues to overheat, consult your dealer. Operating an overheated engine will cause engine damage.

NOTE: *Should overheating occur and you are stranded, stop the engine and allow it to cool down. This will usually allow some additional low speed (idle) running time before the engine starts to overheat again.*

LOW OIL PRESSURE

The warning system will be activated if the oil pressure drops too low. First, stop the engine and check the oil level. Add oil if necessary. If the oil is at the recommended level and the warning horn continues to sound, consult your dealer. Engine speed will be limited to 2800 RPM, however, you should not continue to run engine.

ENGINE OVERSPEED LIMITER

Some causes of engine overspeed are as follows:

- Propeller ventilation
- A propeller that has an incorrect pitch or diameter
- Propeller hub slippage
- Outboard mounted too high on the transom

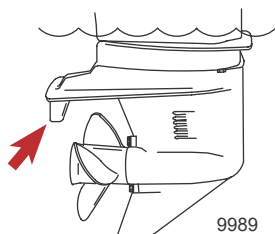
FEATURES AND CONTROLS

- Tilting the outboard out beyond a vertical position
- Cavitation of the propeller due to rough water or obstruction in the boat hull

When the engine overspeed limiter is activated, the engine timing will be momentarily retarded to decrease the engine speed. Excessive overspeed (above 6300 RPM) will result in cutout of the cylinders to prevent operation above this limit.

Trim Tab Adjustment

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



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

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

MODELS WITH POWER TRIM

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

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

OPERATION

Engine Break-in Procedure

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

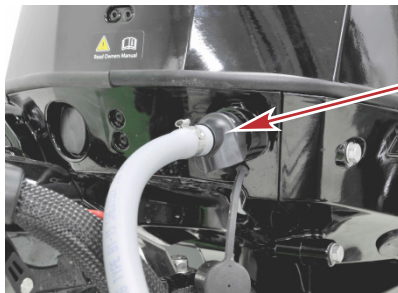
1. For the first two hours of operation, run the engine at varied throttle settings up to 4500 RPM or three-quarter throttle. Changes in throttle should be gradual and extended time at idle should be avoided.
2. For the next eight hours of operation, avoid continuous operation at full throttle for more than five minutes at a time.

Prestarting Check List

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

Prestarting Instructions

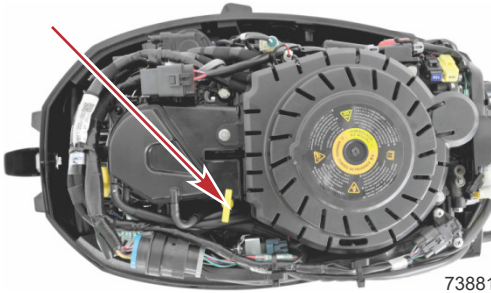
1. Connect the remote fuel line to fuel inlet fitting at the front of the outboard. Make sure the connector is snapped into place.



74339

OPERATION

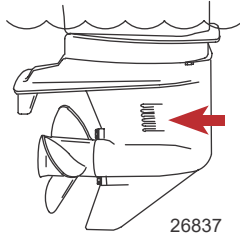
2. Check the engine oil level.



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.

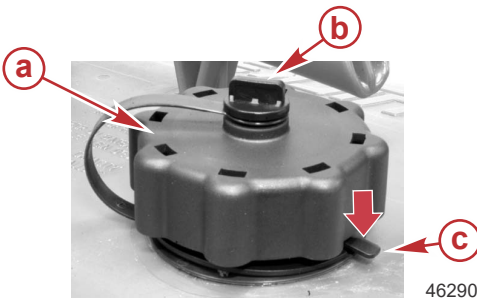
3. Make sure the cooling water intake is submerged.



Starting the Engine - Remote Control Models

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

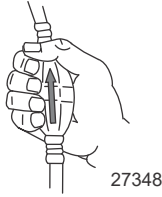
1. Open the fuel tank vent screw on the manual venting type tanks.



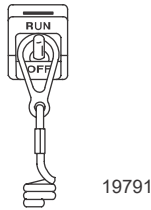
- a - Fuel cap
- b - Manual vent screw
- c - Tab lock

OPERATION

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 **General Information - Lanyard Stop Switch**.



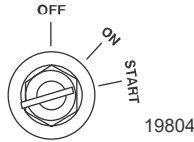
4. Verify the remote control handle is in the neutral position.



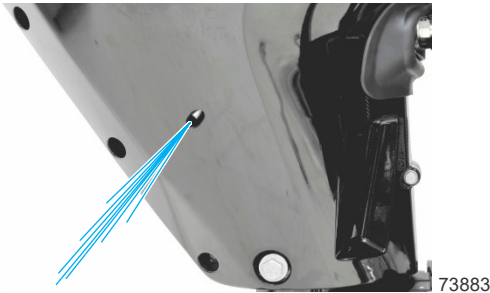
IMPORTANT: Outboards with battery charging capabilities must not be operated with battery cables disconnected from the battery. Damage to the charging system may result.

OPERATION

5. Turn the ignition key to the **START** position and start the engine. If the engine fails to start in ten seconds, wait 30 seconds and try again. If the engine begins to stall, use the throttle-only feature and advance the throttle. Do not exceed 2000 RPM.



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



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

WARMING UP THE ENGINE

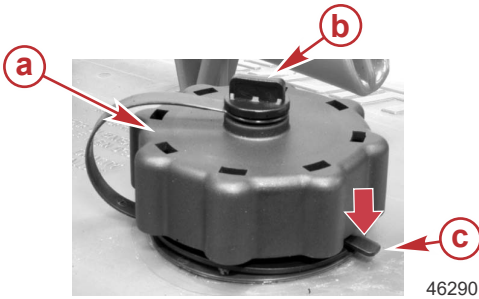
Before beginning operation, allow the engine to warm up at idling speed for three minutes.

Starting the Engine - Tiller Handle Models

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

OPERATION

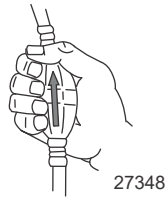
1. Open the fuel tank vent screw on the manual venting type tanks.



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

IMPORTANT: To prevent engine flooding, do not squeeze the primer bulb after the engine has warmed up.

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.



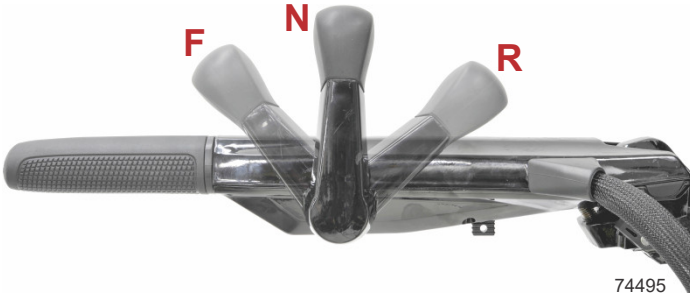
3. Insert the lanyard clip into the stop switch. This is the operating position.



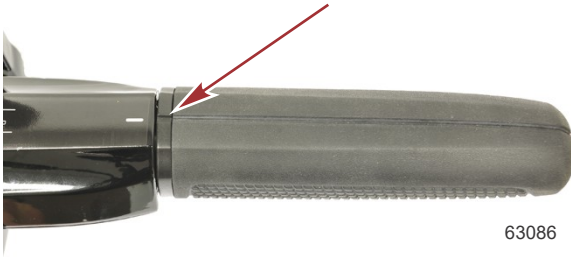
- a - Lanyard stop switch
- b - Spare lanyard stop switch clip
- c - Lanyard

OPERATION

4. Verify the shift handle is in the neutral (N) position.



5. Verify the throttle grip is set to the idle position.



6. **Manual starting models** - Pull the starter rope slowly until you feel the starter engage, then pull rapidly to crank the engine. Allow rope to return slowly. Repeat until the engine starts.

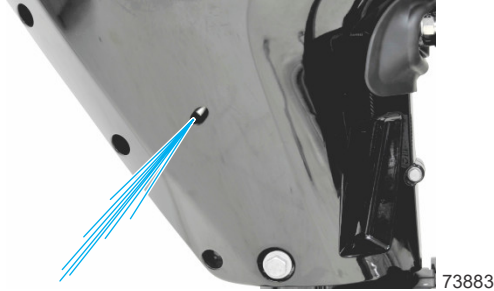
IMPORTANT: Outboards with battery charging capabilities must not be operated with battery cables disconnected from the battery. Damage to the charging system may result.



7. **Electric starting models** - Turn the ignition key to crank the engine. Release the key when the engine starts. Do not operate the starter motor continuously for longer than ten seconds at a time. If the engine fails to start, wait 30 seconds and try again.

OPERATION

8. **Flooded engine** - If the engine will not start, advance the throttle grip slightly and attempt to start the engine. After the engine has started, immediately reduce the throttle speed to idle.
9. Check for a steady stream of water flowing out of the water pump indicator.



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

WARMING UP THE ENGINE

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

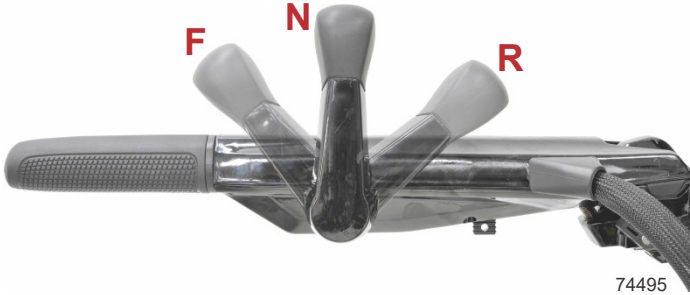
Gear Shifting

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.

OPERATION

- **Tiller handle models** - Three gear shift positions provide boat operation: forward (F), neutral (N), and reverse (R). When shifting, always stop at the neutral position and allow the engine speed to return to idle.



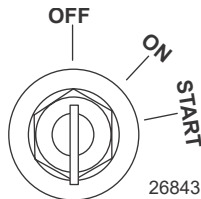
- **Remote control models** - Three gear shift positions provide boat operation: forward (F), neutral (N), and reverse (R). When shifting, always stop at the neutral position and allow the engine speed to return to idle.



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

Stopping the Engine

- **Remote control models** - Reduce the engine speed, and shift the outboard to neutral. Turn the ignition key **OFF**.



OPERATION

- **Tiller handle models** - Reduce the engine speed, and shift the outboard to neutral. Push in the engine stop button or turn the ignition key **OFF**.



74501

Emergency Starting Procedure

If the starter system fails, use the tools provided with the engine to remove the recoil assembly (manual start models) or the flywheel cover (electric start models), and then use the provided emergency starter rope to start the engine. Read the following procedure before attempting to remove the recoil assembly.

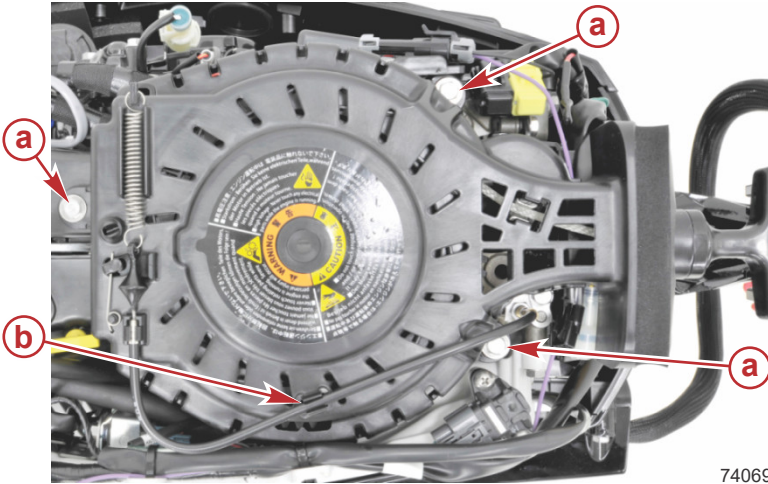
⚠ WARNING

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.

1. Manual start models:
 - a. Remove the three screws with washers securing the recoil assembly to the engine.

OPERATION

b. Lift the neutral interlock cable out of the clip on the recoil housing.

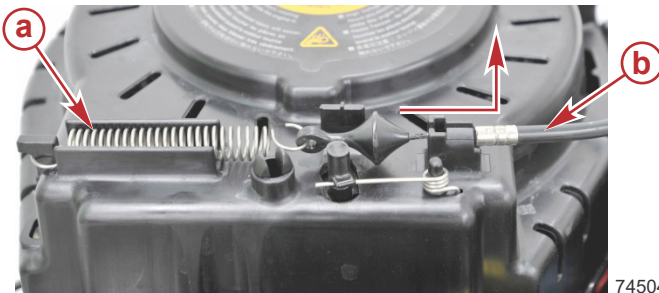


74069

- a** - Screws with washers (3)
- b** - Clip securing neutral interlock cable

c. Pull and lift the neutral interlock cable to disengage it from the recoil housing.

d. Remove the neutral interlock cable tension spring and the interlock cable from the recoil housing.



74504

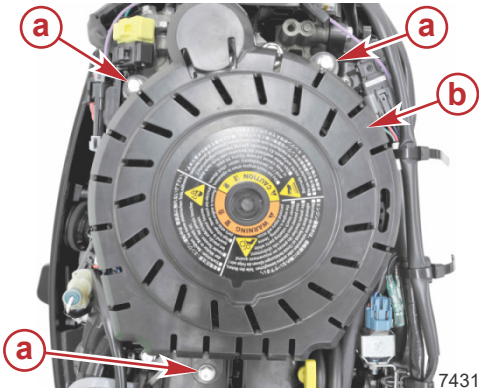
- a** - Neutral interlock cable tension spring
- b** - Neutral interlock cable - pull and lift

e. Carefully remove the recoil starter assembly.

2. Electric start models:

OPERATION

- a. Remove the three screws with washers securing the flywheel cover to the top of the engine.



- a - Screws with washers (3)
- b - Flywheel cover

- b. Remove the flywheel cover from the engine.
3. Shift the outboard into neutral.
4. Ensure that the lanyard stop switch is in the **RUN** position.
5. Electric start models - Ensure that the key switch is in the **ON** position.

⚠ WARNING

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

6. Tie one end of the emergency starter rope into a knot, place the knot into one of the two flywheel cup notches, and wind the rope clockwise around the flywheel cup.



Emergency starter rope on flywheel cup (typical)

7. Pull the rope quickly.

NOTE: Several attempts to start the engine with the emergency starter rope may be required.

OPERATION

Operating in Freezing Temperatures

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

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

Operating in Saltwater or Polluted Water

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

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

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

MAINTENANCE

Cleaning Care

OUTBOARD CARE

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

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

Selecting Replacement Parts For Your Outboard

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

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. Crystallized 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, it is recommended that the cover be installed 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.

MAINTENANCE

Routine cleaning of the remote control external surfaces is recommended to prevent a buildup of salt and other environmental debris. Use a cloth towel which 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 filter/intake and alternator. After washing, allow the powerhead and components to dry. Apply Quicksilver or Mercury Precision Lubricants Corrosion Guard spray on the external metal surfaces of the powerhead and powerhead components. Do not allow the Corrosion Guard spray to come in contact with the alternator drive belt or belt pulleys.

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

MAINTENANCE

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

EPA Emissions Regulations

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

EMISSION CERTIFICATION LABEL

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

The diagram shows a rectangular label with the Mercury logo and the title "EMISSION CONTROL INFORMATION". The label contains several fields for engine specifications and emission limits. Red circles with letters a through j are placed around the label, with arrows pointing to specific fields: a points to the Idle Speed field, b to the hp field, c to the L field, d to the kw field, e to the Date of Manufacture field, f to the Family field, g to the HC+NOx:FEL field, h to the CO FEL field, i to the Spark Plug and Gap fields, and j to the Low Perm/High Perm field.

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

43210

- a - Idle speed
- b - Engine horsepower
- c - Piston displacement
- d - Engine power - kilowatts
- e - Date of manufacture
- f - 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.

MAINTENANCE

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

Inspection and Maintenance Schedule

Refer to the table below for proper inspections and maintenance intervals.

After each use of the outboard be sure to:

- Wash the power package exterior with fresh water. For precaution information, refer to **Cleaning Care**.
- Flush the outboard cooling system, if operating in salty, polluted, or muddy water. Refer to **Flushing the Cooling System**.

Daily Check
Check that pulling the stop switch lanyard stops the engine.
Check the tightness of the transom clamp bolts (manual tilt models).
Check the steering system for binding.
Inspect the propellers for damage.
Inspect the fuel lines for leaks. Refer to Fuel Line Inspection .
Check the engine oil level. Refer to Checking and Adding Engine Oil .





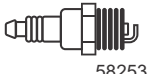





100 Hour Maintenance (100 Hours or Before Long-Term Storage)	Dealer Item
Add Quickleen to the fuel tank (once per year). Follow the instructions on the Quickleen bottle.	
Check the water-separating fuel filter for contaminants. Replace the filter if required. Refer to Fuel System .	
Inspect the corrosion control anodes. Refer to Corrosion Control Anodes .	
Apply anti-seize to the spark plug threads. Refer to Spark Plug Inspection and Replacement .	
Lubricate all applicable points on the engine identified in Lubrication Points .	
Change the engine oil and filter. Refer to Changing Engine Oil and Filter .	
Change the gearcase lubricant. Refer to Gearcase Lubricant .	
Inspect the engine starting battery and cables, if equipped.	X
Inspect the tightness of the outboard mounting hardware.	X
Inspect the thermostat, if operating in salty or brackish water.	X
Replace all filters on the suction side of the fuel system.	X
Lubricate the driveshaft splines.	X

MAINTENANCE

3 Year or 300 Hour Maintenance	Dealer Item
Replace the spark plugs. Refer to Spark Plug Inspection and Replacement .	
Inspect the timing belt.	X
Inspect the wire harness connectors.	X
Check the remote control cable adjustment, if equipped.	X
Check the power trim fluid level, if equipped.	X
Inspect the engine mounts.	X
Replace the water pump impeller. <i>NOTE: Replace the water pump impeller more often, if overheating occurs or reduced water pressure is noted.</i>	X

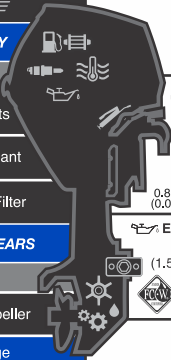








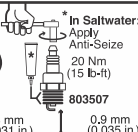

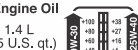


Maintenance Schedule Decal Icons

A maintenance schedule decal is located on the engine to remind the owner or operator when the power package important maintenance items require attention. The following table shows the icons and a general description of the scheduled maintenance items.

Icon	Definition	Icon	Definition
 58249	Replace	 58250	Inspect
 58251	Engine oil and filter	 58252	Gearcase lubricant
 58253	Spark plugs	 58254	Thermostat
 58255	Low-pressure fuel filter	 58256	Anodes
 58257	Accessory drive belt	 58258	Water pump impeller

MAINTENANCE

Maintenance Schedule Decal

MAINTENANCE SCHEDULE		Specifications	
FOURSTROKE		Full Throttle RPM: 25HP: 5400-5800 30HP: 5800-6200 Neutral Idle RPM: 850-900	
EVERY 100 HOURS OF USE OR ONCE YEARLY			
INSPECT	REPLACE		
 Anodes	 Lubrication Points		
 Fuel Filter	 Gearcase Lubricant		
 Thermostat	 Engine Oil and Filter		
EVERY 300 HOURS OF USE OR THREE YEARS			
REPLACE			
 Spark Plugs*	 Water Pump Impeller	    	
For additional maintenance and storage preparation see Owner's Manual			

74462

Top Cowl Removal and Installation

TOP COWL REMOVAL

1. Unlock the cowl latch located at the rear of the engine by lifting the latch up.
2. Lift up on the rear of the cowl and disengage the front hook.



74510

TOP COWL INSTALLATION

1. Engage the front hook and push the top cowl onto the lower cowl.
2. Push the cowl latch down to lock the cowl in place.

Cooling System

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.

MAINTENANCE

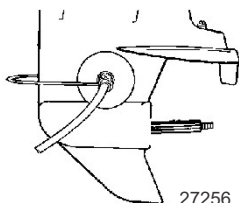
Use a Mercury Precision or Quicksilver accessory (or equivalent) flushing attachment.


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.

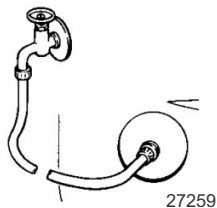
1. Remove the propeller. Refer to **Propeller Replacement**. Install the flushing attachment so the rubber cups fit tightly over the cooling water intake.



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

MAINTENANCE

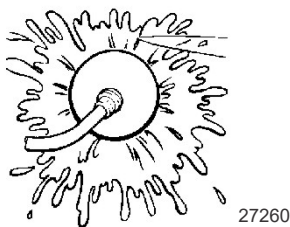
2. Attach a water hose to the flushing attachment. Turn on the water and adjust the flow so water is leaking around the rubber cups to ensure the engine receives an adequate supply of cooling water.



3. Start the engine and run it at idle speed in neutral shift position.

IMPORTANT: Do not run the engine above idle when flushing.

4. Adjust the water flow (if necessary) so excess water continues leaking out from around the rubber cups to ensure the engine is receiving an adequate supply of cooling water.



5. Check for a steady stream of water flowing out of the water pump indicator hole. Continue flushing the outboard for 3 to 5 minutes, carefully monitoring water supply at all times.
6. Stop the engine, turn off the water, and remove the flushing attachment. Install the propeller.

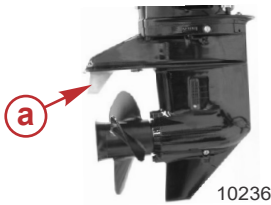
Corrosion Control Anode

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

Each anode requires periodic inspection, especially in saltwater, which will accelerate the erosion. To maintain 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 the effectiveness of the anode.

MAINTENANCE

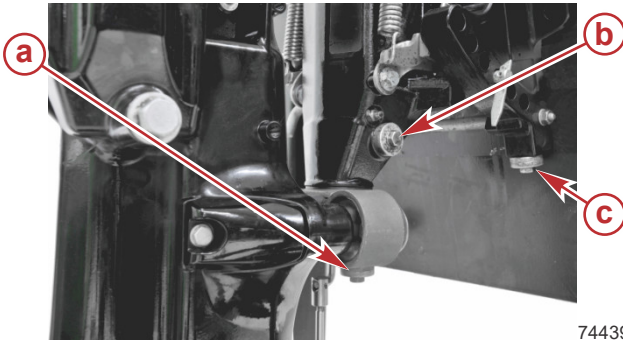
The trim tab is an anode.



a - Trim tab

Additional anodes are located on the transom bracket, lower engine mount, and swivel bracket. The number and location of the anodes depends on the model.

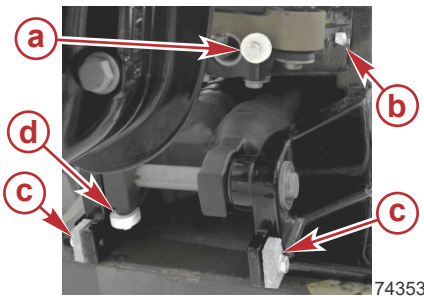
- Manual tilt models have three additional anodes.



Manual tilt model

- a** - Anode on lower engine mount
- b** - Anode on swivel bracket
- c** - Anode on transom bracket

- Power trim models have five additional anodes.



Power tilt model, bottom view of transom

- a** - Anode on lower engine mount
- b** - Anode on swivel bracket
- c** - Anodes (2) on transom bracket
- d** - Anode on power trim cylinder

MAINTENANCE

Engine Oil

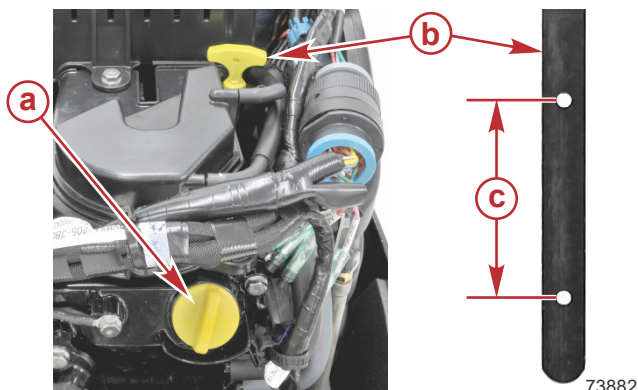
CHECKING AND ADDING ENGINE OIL

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

NOTE: Under certain conditions, the operating temperature of 4-stroke outboard engines may not get hot enough to evaporate the normal fuel and moisture that accumulate in the crankcase. These conditions include operating at idle for long periods, repeated short trips, slow speed or quick stop-and-go operation, and operating in cooler climates. This additional fuel and moisture that collects in the crankcase eventually ends up in the oil sump and will add to the total volume of oil that appears on the dipstick reading. This increase in oil volume is known as oil dilution.

Outboard engines can typically handle large amounts of oil dilution without causing durability problems. However, to ensure extended life of the outboard engine, change the oil and filter regularly, following the oil change interval and using the recommended oil quality. Additionally, if the outboard is operated frequently in the conditions described above, more frequent oil change intervals should be considered.

1. Turn the engine **OFF**. Ensure that the outboard is in a level operating position. Remove the top cowl.
2. 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. Oil must be within the operating range. If the oil level is low, remove the oil fill cap and fill to the midpoint of the oil level operating range.



- a** - Oil fill cap
- b** - Dipstick
- c** - Oil level operating range

MAINTENANCE

4. Push the dipstick back in all the way. Install the oil fill cap hand-tight.

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
40/50/60 hp EFI	8M0081916	8M0081912
1.7L 75/90/115 hp EFI	8M0081917	8M0081913
2.1L 75/90/115 hp	8M0107510	8M0107511
150 hp	8M0107512	8M0107513

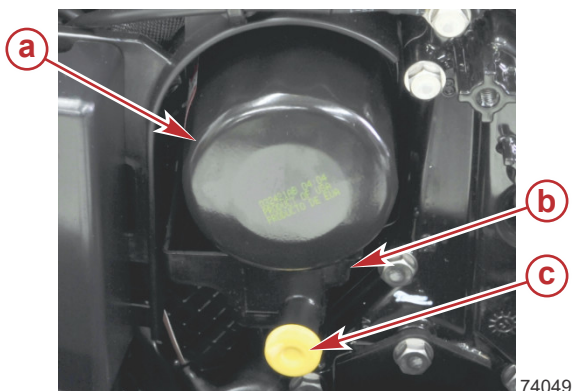


CHANGING THE OIL FILTER

1. Remove the cap from the oil filter drain, and attach an appropriate hose.
2. Route the hose into an approved container.

MAINTENANCE

3. Remove the oil filter by turning the filter counterclockwise.



- a - Oil filter
- b - Oil filter drain
- c - Cap

4. Clean the mounting base. Apply a film of clean oil to the filter gasket. Do not use grease. Install the new filter. When the gasket contacts the base, tighten the filter an additional 3/4 to 1 turn.
5. Remove the drain hose, and place the cap on the end of the oil filter drain fitting.
6. Wipe up any spilled oil.

DRAINING THE ENGINE OIL

1. Lock the outboard in the full tilt up position.
2. Position the outboard so the drain plug is facing downward.
3. Remove the drain plug and drain the engine oil into an appropriate container.

IMPORTANT: Do not use a crankcase oil pump when changing the oil or engine damage may occur.

4. After the initial oil has been drained, temporarily install the drain plug. Disengage the tilt lock and lower the outboard. Wait a minute to allow the remaining oil that was trapped in the engine to return to the drain. Return the outboard to the full tilt position and drain the remaining oil.

MAINTENANCE

5. Inspect the drain plug seal and replace it if it is damaged. Lubricate the seal on the drain plug with oil and install. Tighten to the specified torque.



Description	Nm	lb-in.	lb-ft
Drain plug	24.0	–	17.7

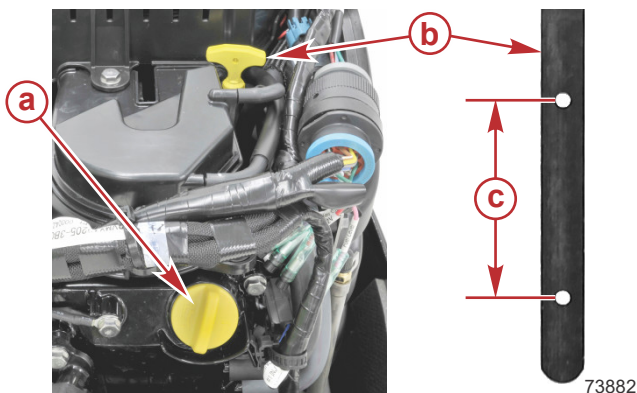
FILLING THE CRANKCASE WITH OIL

IMPORTANT: Do not try to fill the oil level to the top of the operating range (upper hole). The oil level is correct as long as it appears in the operating range between the upper and lower hole.

1. Position the outboard in a level operating position.
2. Remove the oil fill cap and add the recommended oil to the midpoint of the oil level operating range, as indicated on the dipstick. Adding approximately 1.8 liter (1.9 U.S. quart) of oil to an empty crankcase will bring the oil level to the midpoint of the oil level range.

MAINTENANCE

3. Install the oil fill cap.



- a** - Oil fill cap
- b** - Dipstick
- c** - Oil level operating range

4. With cooling water properly supplied, 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.

Fuel System

FUEL SYSTEM PRECAUTIONS

⚠ WARNING

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

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

FUEL LINE INSPECTION

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

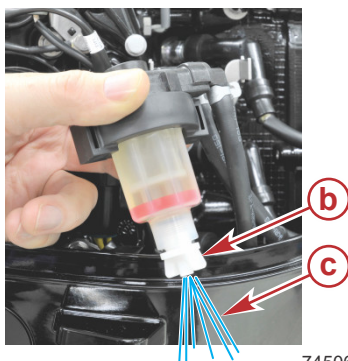
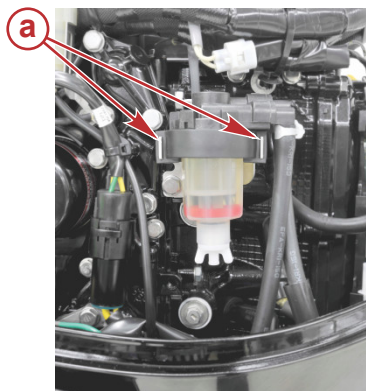
MAINTENANCE

DRAINING WATER FROM THE FUEL FILTER

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

1. Read **Fuel System Precautions**, preceding.
2. Inspect the water-separating fuel filter. If water is present, the red ring inside the filter assembly should float at the water level.
3. Pull the filter assembly—including the rubber mount—off of the mounting bracket on the engine, and swing the assembly over the edge of the engine.
4. Loosen the drain valve until liquid flows out of the bottom. Empty the filter bowl's contents into an approved container. To protect the environment, immediately clean up spilled fluids and dispose according to local laws and regulations.

NOTE: A drain hose can be temporarily installed onto the center drain port of the drain fitting to assist emptying the contents into an approved container.



74506

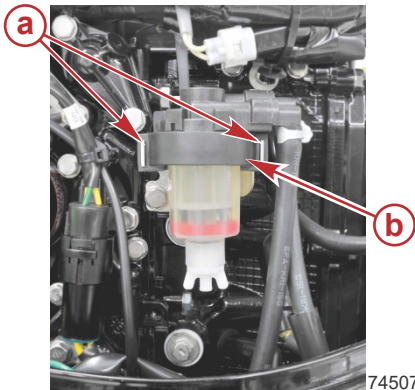
- a - Mounting bracket
- b - Drain valve
- c - Empty contents into an approved container

MAINTENANCE

FUEL FILTER REPLACEMENT

Filter Removal

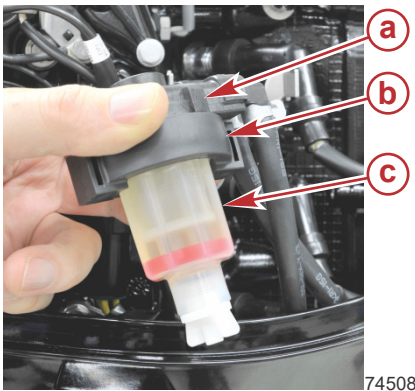
1. Pull the filter assembly—including the rubber mount—off of the mounting bracket on the engine, and swing the assembly over the edge of the engine cowl.



Fuel filter assembly installed on engine

- a** - Mounting bracket
- b** - Rubber mount

2. Pull the rubber mount downward, to remove it from the filter assembly.
3. Remove the sight bowl from the filter housing.

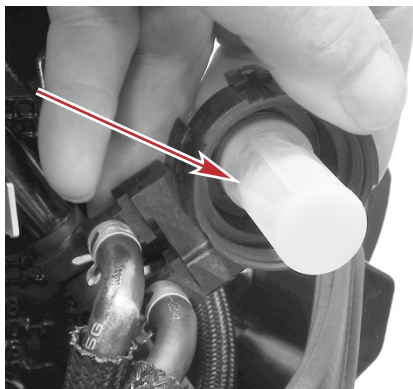


- a** - Filter housing
- b** - Rubber mount
- c** - Sight bowl

4. Pull the filter element off the filter housing.

MAINTENANCE

IMPORTANT: The filter is secured and sealed to the filter housing with an O-ring. The O-ring may remain on the filter housing. The O-ring should be removed before installing the fuel filter.



63112

Fuel filter

Filter Installation



63113

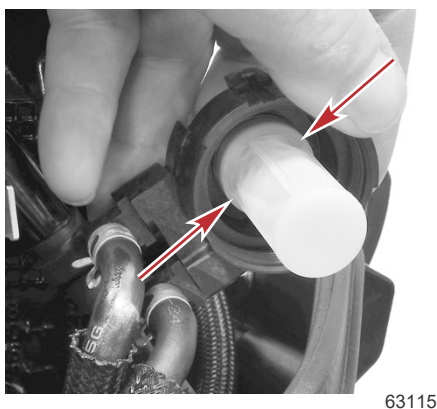
- a** - Fuel filter O-ring seal
- b** - Fuel filter
- c** - Red ring
- d** - Sight bowl O-ring seal
- e** - Sight bowl

MAINTENANCE

1. Install the fuel filter O-ring seal into the fuel filter. Verify the O-ring does not have any folds or kinks.



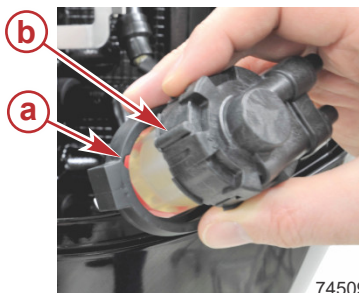
2. Lubricate the O-ring with clean engine oil.
3. Push the fuel filter element onto the filter housing. Verify the filter is completely installed by pushing on the filter in the locations shown in the following illustration.



4. Install the sight bowl O-ring seal onto the sight bowl and place the red ring into the sight bowl.
5. Install the sight bowl onto the filter housing hand-tight.

MAINTENANCE

6. Align the notch in the rubber mount with the rib on the filter housing, and install the rubber mount.



- a - Notch in rubber mount
- b - Rib on filter housing

7. Install the filter assembly onto the mounting bracket.
8. Connect the fuel line to the engine and prime the engine fuel system. Inspect the fuel filter area for fuel leaks. Repair as needed.

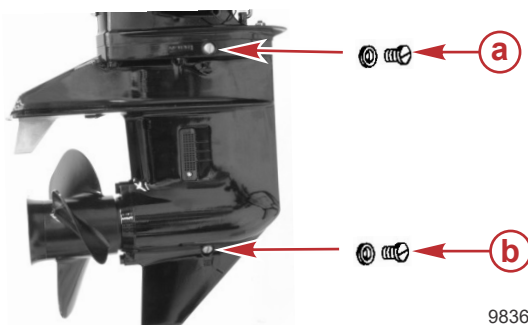
Gearcase Lubrication

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

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

DRAINING GEARCASE

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



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

MAINTENANCE

GEARCASE LUBRICANT CAPACITY

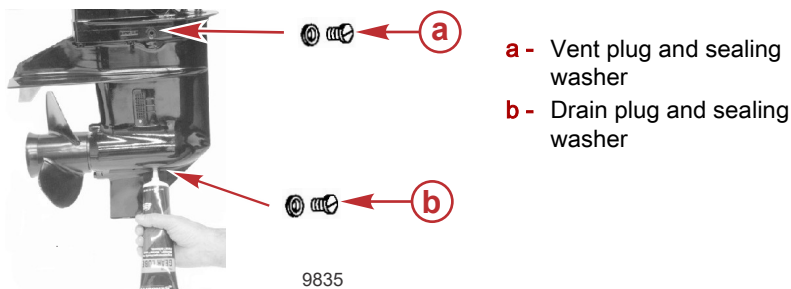
Gearcase lubricant capacity is approximately 460 ml (15.6 fl oz).

GEARCASE LUBRICANT RECOMMENDATION

Mercury or Quicksilver Premium or High-Performance Gear Lubricant.

CHECKING LUBRICANT LEVEL AND REFILLING GEARCASE

1. Place the outboard in a vertical operating position.
2. Remove the vent plug.
3. Remove the drain plug. Place 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 cleaned fill/drain plug and sealing washer.

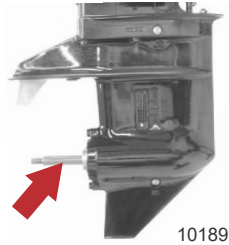
Lubrication Points

1. Lubricate the propeller shaft with Extreme Grease or 2-4-C with PTFE. Refer to **Propeller Replacement** for removal and installation of the propeller.

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

MAINTENANCE

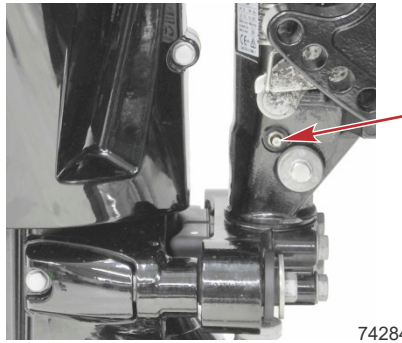
Coat the entire propeller shaft with lubricant to prevent the propeller hub from corroding and seizing to the shaft.



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

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

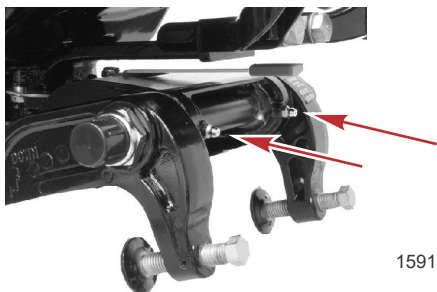
- Swivel bracket - Lubricate through fitting.



Swivel bracket grease fitting (manual tilt model shown, others similar)

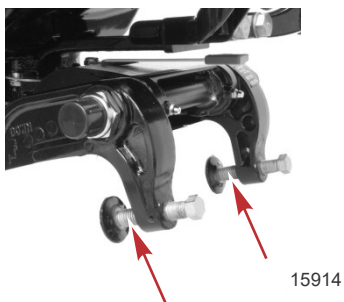
MAINTENANCE

- Tilt tube - Lubricate through fittings.

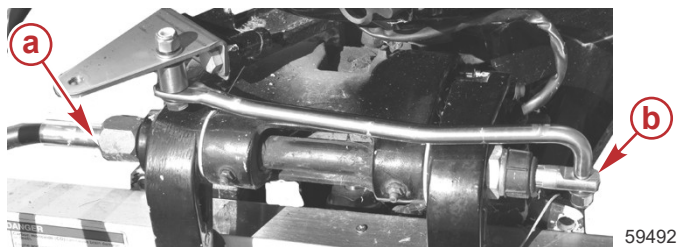


Tilt tube grease fittings (manual tilt model shown, others similar)

- Lubricate threads on the transom clamp screws (if equipped).



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



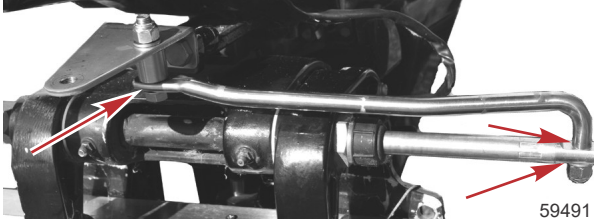
- a** - Fitting
- b** - Steering cable end

MAINTENANCE

⚠ WARNING

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

3. Lubricate the steering link rod pivot points (if equipped) with lightweight oil.



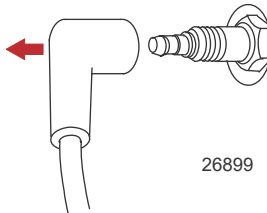
Propeller Replacement

PROPELLER REMOVAL

⚠ WARNING

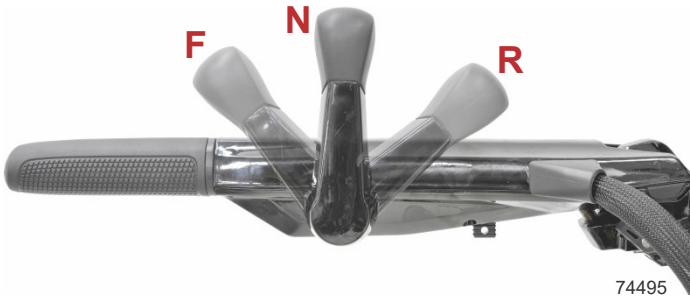
Rotating propellers can cause serious injury or death. Never operate the boat out of the water with a propeller installed. Before installing or removing a propeller, place the drive unit in neutral and activate the lanyard stop switch to prevent the engine from starting. Place a block of wood between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

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



MAINTENANCE

2. Shift the outboard into neutral (N).



74495

Tiller handle models



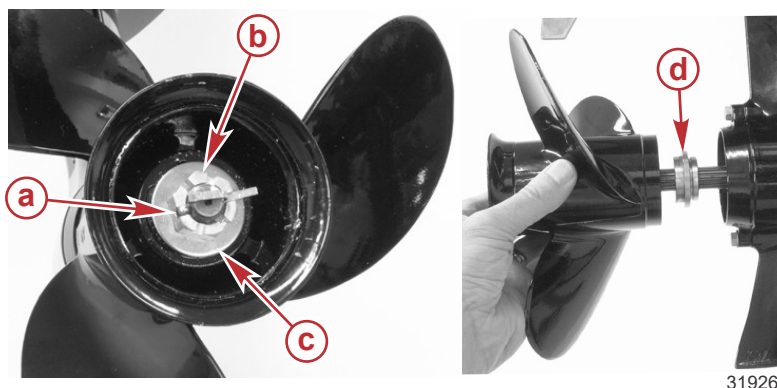
63103

Remote control models

3. Straighten the cotter pin, and pull it out using a pair of pliers.
4. Place a block of wood between the gearcase and the propeller to prevent rotation, and remove the propeller nut.

MAINTENANCE

5. Pull the propeller straight off the shaft.



- a - Cotter pin
- b - Nut
- c - Rear thrust washer
- d - Front thrust hub

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

PROPELLER INSTALLATION

⚠ 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. To aid in the future removal of the propeller, liberally apply one of the following Mercury/Quicksilver products to the propeller shaft splines:

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

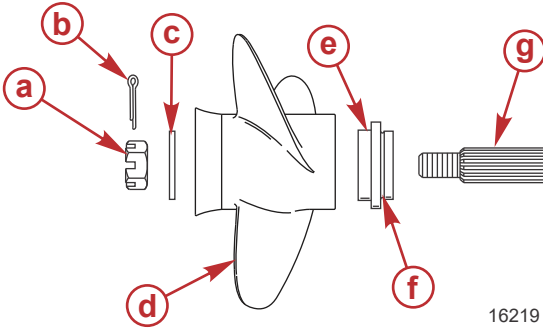
IMPORTANT: The ring on the front thrust hub must face toward the gearcase in order for the hub to be fully installed on the propeller shaft.

2. Install the front thrust hub, propeller, rear thrust washer, and the propeller nut onto the shaft.

MAINTENANCE

- Place a block of wood between the gearcase and the propeller to prevent rotation and tighten the propeller nut. Tighten the propeller nut to specified torque, and secure the nut to the shaft with a cotter pin.

NOTE: If the propeller nut does not align with the propeller shaft hole after tightening to the specified torque, then tighten the nut further to align it with the hole.



16219

- a** - Nut
- b** - Cotter pin
- c** - Rear thrust washer
- d** - Propeller
- e** - Front thrust hub
- f** - Ring (faces toward gearcase)
- g** - Propeller shaft

Description	Nm	lb-in.	lb-ft
Propeller nut	25	–	18.4

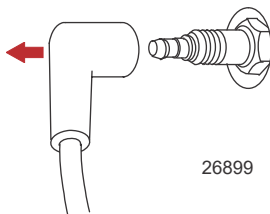
MAINTENANCE

Spark Plug Inspection and Replacement

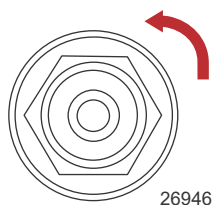
⚠ WARNING

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.

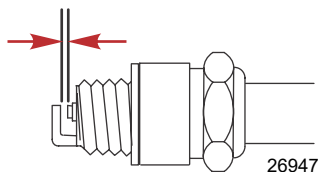
1. Remove the spark plug boots. Twist the rubber boots slightly and pull off.



2. Remove the spark plugs for inspection. Replace the spark plug if the 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

0.9 mm (0.035 in.)

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

MAINTENANCE

Description	Nm	lb-in.	lb-ft
Spark plug	18.0	159.3	–

STORAGE

Storage Preparation

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

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

NOTICE


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

FUEL SYSTEM

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

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 gasoline stabilizer (follow instructions on container) into fuel tank. Tip fuel tank back and forth to mix stabilizer with the fuel.
- Permanently installed fuel tank - Pour the required amount of gasoline stabilizer (follow instructions on container) into a separate container and mix with approximately 1 liter (1 U.S. quart) of gasoline. Pour this mixture into fuel tank.
- Place the outboard in water or connect flushing attachment for circulating cooling water. Run the engine for ten minutes to fill the engine fuel system.

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

Protecting External Outboard Components

- Lubricate all outboard components listed in **Maintenance - Inspection and Maintenance Schedule**.

STORAGE

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

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 inside of each cylinder.
- Rotate the flywheel manually several times to distribute the oil in the cylinders. Install spark plugs.
- Change the engine oil.

Gearcase

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

Positioning Outboard for Storage

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

NOTICE

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

Battery Storage

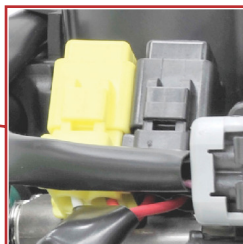
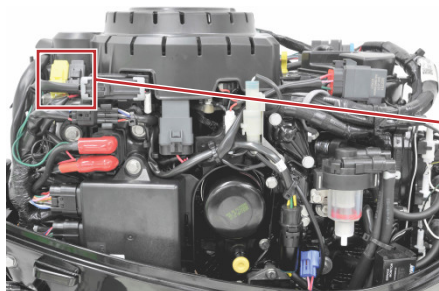
- Follow the battery manufacturer's instructions for storage and charging.
- Remove the battery from the boat and check water level. Charge if necessary.
- Store the battery in a cool, dry place.
- Periodically check the water level and charge the battery during storage.

TROUBLESHOOTING

Fuse Replacement

LOCATION OF FUSES

The engine fuses are located at the top of the port side of the engine, near the front.

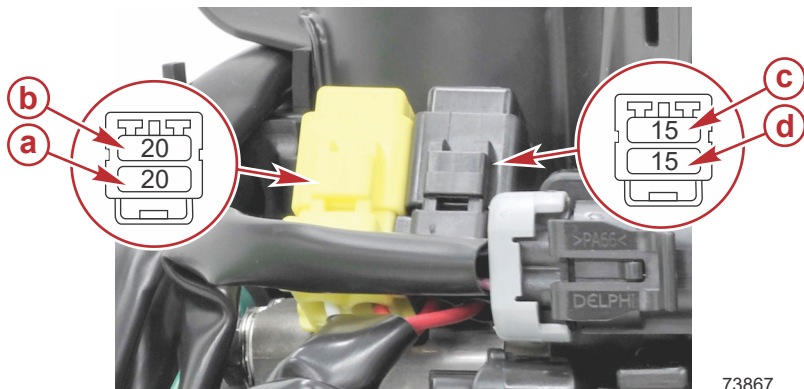


73868

FUSE IDENTIFICATION AND REPLACEMENT

IMPORTANT: Both fuse housings have a space for a spare fuse. Always carry spare fuses.

The voltage regulator circuit and the electric starting circuit are protected from overload by 20-amp and 15-amp fuses, respectively. If a fuse opens, try to locate and correct the cause of the overload. If the cause is not found, the fuse may open again.

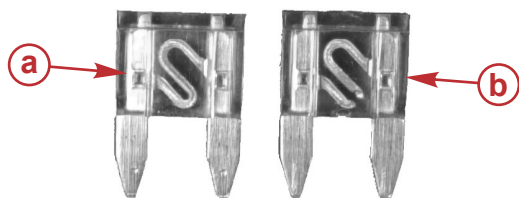


73867

- a** - Voltage regulator circuit - 20-amp fuse
- b** - Spare 20-amp fuse
- c** - Spare 15-amp fuse
- d** - Electric starting circuit - 15-amp fuse

TROUBLESHOOTING

Remove the fuse and examine 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.



28619

Identifying an open fuse

- a - Good fuse
- b - Open (blown) fuse

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

POSSIBLE CAUSES

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

Engine Will Not Start

POSSIBLE CAUSES

NOTE: *If the outboard has run out of fuel, or has been in storage for an extended period of time, additional attempts to start the engine will be required to purge the fuel system of air.*

- Lanyard stop switch is not in the operating position.
- Incorrect starting procedure. Refer to **Operation** section.
- Old or contaminated gasoline.
- Engine flooded. Refer to **Operation** section.
- Fuel is not reaching the engine.
 - Fuel tank is empty.
 - Fuel tank vent not open or restricted.
 - Fuel line is disconnected or kinked.
 - Primer bulb not squeezed.
 - Primer bulb check valve is faulty.
 - Fuel filter is obstructed. Refer to **Maintenance** section.
 - Fuel pump failure.
 - Fuel tank filter obstructed.
- Open 20-amp fuse. Refer to **Maintenance** section.

TROUBLESHOOTING

- Ignition system component failure.
- Wiring or electrical connection faulty.
- Spark plugs fouled or defective. Refer to **Maintenance** section.

Engine Runs Erratically

POSSIBLE CAUSES

- Overheating - Warning horn not working.
- Low oil pressure. Check oil level.
- Spark plugs fouled or defective. Refer to **Maintenance** section.
- Incorrect setup and adjustments.
- Fuel is being restricted to the engine.
 - a. Engine fuel filter is obstructed. Refer to **Maintenance** section.
 - b. Fuel tank filter obstructed.
 - c. Stuck anti-siphon valve located on permanently built-in type fuel tanks.
 - d. Fuel line is kinked or pinched.
- Fuel pump failure.
- Ignition system component failure.

Performance Loss

POSSIBLE CAUSES

- Low oil pressure. Check the oil level.
- 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.
- Low electrolyte level in battery.
- Worn out or inefficient battery.
- Excessive use of electrical accessories.
- Defective rectifier, alternator, or voltage regulator.

TROUBLESHOOTING

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.

OWNER SERVICE ASSISTANCE

Service Assistance

LOCAL REPAIR SERVICE

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

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

SERVICE AWAY FROM HOME

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

STOLEN POWER PACKAGE

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

ATTENTION REQUIRED AFTER SUBMERSION

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

REPLACEMENT SERVICE PARTS

WARNING

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

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

PARTS AND ACCESSORIES INQUIRIES

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

OWNER SERVICE ASSISTANCE

RESOLVING A PROBLEM

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

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

The following information will be needed by the Customer Service:

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

CONTACT INFORMATION FOR MERCURY MARINE CUSTOMER SERVICE

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

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

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

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

OWNER SERVICE ASSISTANCE

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

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	.

