YAMAHA

F100F

OWNER'S MANUAL

⚠ **Read this manual carefully before operating this outboard motor.**

6FP-28199-70-E0 ●

Read this manual carefully before operating this outboard motor. Keep this manual onboard in a waterproof bag when boating. This manual should stay with the outboard motor if it is sold.

EMU25108

To the owner

Thank you for selecting a Yamaha outboard motor. This Owner's Manual contains information needed for proper operation, maintenance and care. A thorough understanding of these simple instructions will help you obtain maximum enjoyment from your new Yamaha. If you have any question about the operation or maintenance of your outboard motor, please consult a Yamaha dealer.

In this Owner's Manual particularly important information is distinguished in the following ways.

⚠ : This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

EWM00782

⚠ WARNING

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

ECM00702

NOTICE

A NOTICE indicates special precautions that must be taken to avoid damage to the outboard motor or other property.

TIP:

A TIP provides key information to make procedures easier or clearer.

Yamaha continually seeks advancements in product design and quality. Therefore, while this manual contains the most current product information available at the time of printing, there may be minor discrepancies between your machine and this manual. If there is any question concerning this manual, please consult your Yamaha dealer.

To ensure long product life, Yamaha recommends that you use the product and perform the specified periodic inspections and maintenance by correctly following the instructions in the owner's manual. Any damage resulting from neglect of these instructions is not covered by warranty.

Some countries have laws or regulations restricting users from taking the product out of the country where it was purchased, and it may be impossible to register the product in the destination country. Additionally, the warranty may not apply in certain regions. When planning to take the product to another country, consult the dealer where the product was purchased for further information.

If the product was purchased used, please consult your closest dealer for customer re-registration, and to be eligible for the specified services.

TIP:

The F100FET and the standard accessories are used as a base for the explanations and illustrations in this manual. Therefore some items may not apply to every model.

EMU25122

F100F
OWNER'S MANUAL
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EMU33623

Outboard motor safety

Observe these precautions at all times.

EMU36502

Propeller

People can be injured or killed if they come in contact with the propeller. The propeller can keep moving even when the motor is in neutral, and sharp edges of the propeller can cut even when stationary.

- Stop the engine when a person is in the water near you.
- Keep people out of reach of the propeller, even when the engine is off.

EMU40272

Rotating parts

Hands, feet, hair, jewelry, clothing, personal flotation device (PFD) straps, etc., can become entangled with internal rotating parts of the engine, resulting in serious injury or death.

Keep the top cowling in place whenever possible. Do not remove or replace the top cowling with the engine running.

Only operate the engine with the top cowling removed according to the specific instructions in the manual. Keep hands, feet, hair, jewelry, clothing, PFD straps, etc., away from any exposed moving parts.

EMU33641

Hot parts

During and after operation, engine parts are hot enough to cause burns. Avoid touching any parts under the top cowling until the engine has cooled.

EMU33651

Electric shock

Do not touch any electrical parts while starting or operating the engine. They can cause shock or electrocution.

EMU33661

Power trim and tilt

Body parts can be crushed between the motor and the clamp bracket when the motor is trimmed or tilted. Keep body parts out of this area at all times. Be sure no one is in this area before operating the power trim and tilt mechanism.

The power trim and tilt switches operate even when the main switch is off. Keep people be away from the switches whenever working around the motor.

Never get under the lower unit while it is tilted, even when the tilt support lever is locked. Severe injury could occur if the outboard motor accidentally falls.

EMU33672

Engine shut-off cord (lanyard)

Attach the engine shut-off cord so that the engine stops if the operator falls overboard or leaves the helm. This prevents the boat from running away under power and leaving people stranded, or running over people or objects.

Always attach the engine shut-off cord to a secure place on your clothing or your arm or leg while operating. Do not remove it to leave the helm while the boat is moving. Do not attach the cord to clothing that could tear loose, or route the cord where it could become entangled, preventing it from functioning.

Do not route the cord where it is likely to be accidentally pulled out. If the cord is pulled during operation, the engine will shut off and you will lose most steering control. The boat could slow rapidly, throwing people and objects forward.

EMU33811
Gasoline
Gasoline and its vapors are highly flammable and explosive. Always, refuel according to the procedure on page 50 to reduce the risk of fire and explosion.

EMU33821
Gasoline exposure and spills
Take care not to spill gasoline. If gasoline spills, wipe it up immediately with dry rags. Dispose of rags properly.

If any gasoline spills onto your skin, immediately wash with soap and water. Change clothing if gasoline spills on it.

If you swallow gasoline, inhale a lot of gasoline vapor, or get gasoline in your eyes, get immediate medical attention. Never siphon fuel by mouth.

EMU33901
Carbon monoxide
This product emits exhaust gases which contain carbon monoxide, a colorless, odorless gas which may cause brain damage or death when inhaled. Symptoms include nausea, dizziness, and drowsiness. Keep cockpit and cabin areas well ventilated. Avoid blocking exhaust outlets.

EMU33781
Modifications
Do not attempt to modify this outboard motor. Modifications to your outboard motor may reduce safety and reliability, and render the outboard unsafe or illegal to use.

EMU33741
Boating safety
This section includes a few of the many important safety precautions that you should follow when boating.

EMU33711
Alcohol and drugs
Never operate after drinking alcohol or taking drugs. Intoxication is one of the most common factors contributing to boating fatalities.

EMU40281
Personal flotation devices (PFDs)
Have an approved PFD on board for every occupant. Yamaha recommends that you must wear a PFD whenever boating. At a minimum, children and non-swimmers should always wear PFDs, and everyone should wear PFDs when there are potentially hazardous boating conditions.

EMU33732
People in the water
Always watch carefully for people in the water, such as swimmers, skiers, or divers, whenever the engine is running. When someone is in the water near the boat, shift into neutral and stop the engine.

Stay away from swimming areas. Swimmers can be hard to see.

The propeller can keep moving even when the motor is in neutral. Stop the engine when a person is in the water near you.

EMU33752
Passengers
Consult your boat manufacturer's instructions for details about appropriate passenger locations in your boat and be sure all passengers are positioned properly before accelerating and when operating above an idle speed. Standing or sitting in non-designated locations may result in being thrown either overboard or within the boat due to waves, wakes, or sudden changes in speed or direction. Even when people are positioned properly, alert your passengers if you must make any unusual maneuver. Always avoid jumping waves or wakes.

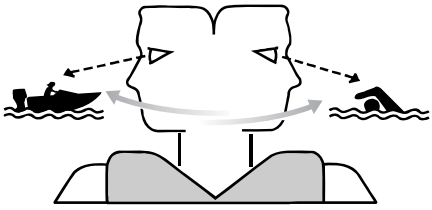
EMU33762
Overloading
Do not overload the boat. Consult the boat capacity plate or boat manufacturer for maximum weight and number of passengers. Be sure that weight is properly distributed according to the boat manufacturer's instruc-

tions. Overloading or incorrect weight distribution can compromise the boats handling and lead to an accident, capsizing or swamping.

EMU33773

Avoid collisions

Scan constantly for people, objects, and other boats. Be alert for conditions that limit your visibility or block your vision of others.



ZMU06025

Operate defensively at safe speeds and keep a safe distance away from people, objects, and other boats.

- Do not follow directly behind other boats or waterskiers.
- Avoid sharp turns or other maneuvers that make it hard for others to avoid you or understand where you are going.
- Avoid areas with submerged objects or shallow water.
- Ride within your limits and avoid aggressive maneuvers to reduce the risk of loss of control, ejection, and collision.
- Take early action to avoid collisions. Remember, boats do not have brakes, and stopping the engine or reducing throttle can reduce the ability to steer. If you are not sure that you can stop in time before hitting an obstacle, apply throttle and turn in another direction.

EMU33791

Weather

Stay informed about the weather. Check weather forecasts before boating. Avoid boating in hazardous weather.

EMU33881

Passenger training

Make sure at least one other passenger is trained to operate the boat in the event of an emergency.

EMU33891

Boating safety publications

Be informed about boating safety. Additional publications and information can be obtained from many boating organizations.

EMU33602

Laws and regulations

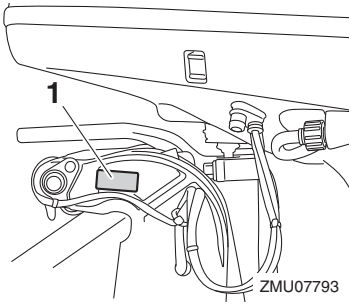
Know the marine laws and regulations where you will be boating—and obey them. Several sets of rules prevail according to geographic location, but all are basically the same as the International Rules of the Road.

EMU25172
Identification numbers record

EMU25186
Outboard motor serial number

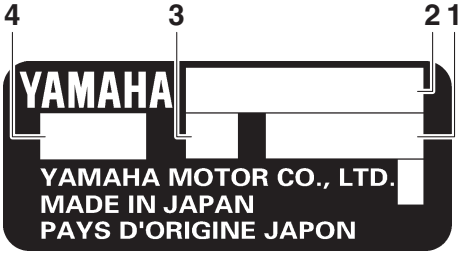
The outboard motor serial number is stamped on the label attached to the port side of the clamp bracket.

Record your outboard motor serial number in the spaces provided to assist you in ordering spare parts from your Yamaha dealer or for reference in case your outboard motor is stolen.



ZMU07793

1. Outboard motor serial number location

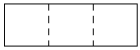


ZMU01692

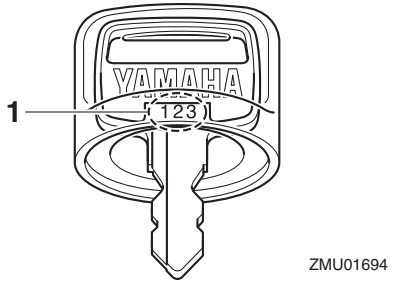
1. Serial number
2. Model name
3. Motor transom height
4. Approved model code

EMU25192
Key number

If a main key switch is equipped with the motor, the key identification number is stamped on your key as shown in the illustration. Record this number in the space provided for reference in case you need a new key.



ZMU01693



ZMU01694

1. Key number

EMU38981
EC Declaration of Conformity (DoC)

This declaration is included with outboard motors that conform to European regulations.

This outboard motor conforms to certain portions of the European Parliament directive relating to machinery.

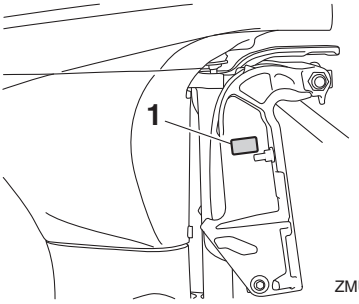
Each conformed outboard motor accompanied with EC DoC.EC DoC contains the following information;

- Name of Engine Manufacture
- Model name
- Product code of model (Approved model code)
- Code of conformed directives

EMU38995
CE Marking

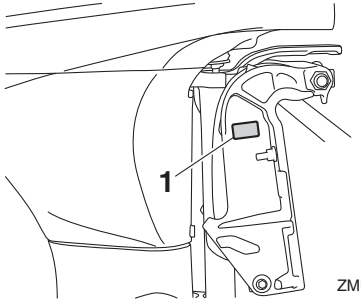
This label is affixed to outboard motors that conform to European regulations.

Outboard motors affixed with this “CE” marking conform with the directives of; 2006/42/EC, 94/25/EC - 2003/44/EC, 2014/30/EU, and 2004/108/EC, 2013/53/EU.



ZMU08137

1. CE marking location



ZMU08071

1. Compliance mark and manufactured date label location

Regulatory Compliance Mark (RCM)

Engines affixed with this mark conform to certain portion(s) of the Australian Radio Communications Act.

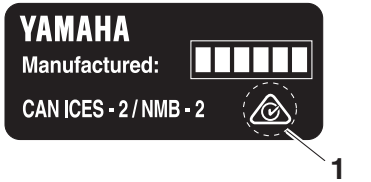
ZMU06040

EMU46132

Compliance mark and manufactured date label

Engines affixed with this label conform to the regulations for each country.

This label is affixed to the clamp bracket or swivel bracket.

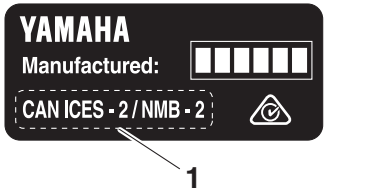


ZMU08190

1. Regulatory Compliance Mark (RCM)

ICES-002 Compliance Label

Engines affixed with this mark meet all requirements of the Canadian Interference Causing Equipment Regulations.

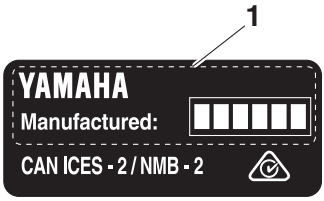


ZMU08191

1. ICES-002 Compliance Label

Manufactured date

The manufactured date is stamped on the label for the engines that conform to the regulations for U.S. Environmental Protection Agency (EPA). The models that manufactured exclusively for the Oceanian countries may not have manufactured date on the label.



ZMU08192

1. Manufactured date

EMU33524

Read manuals and labels

Before operating or working on this outboard motor:

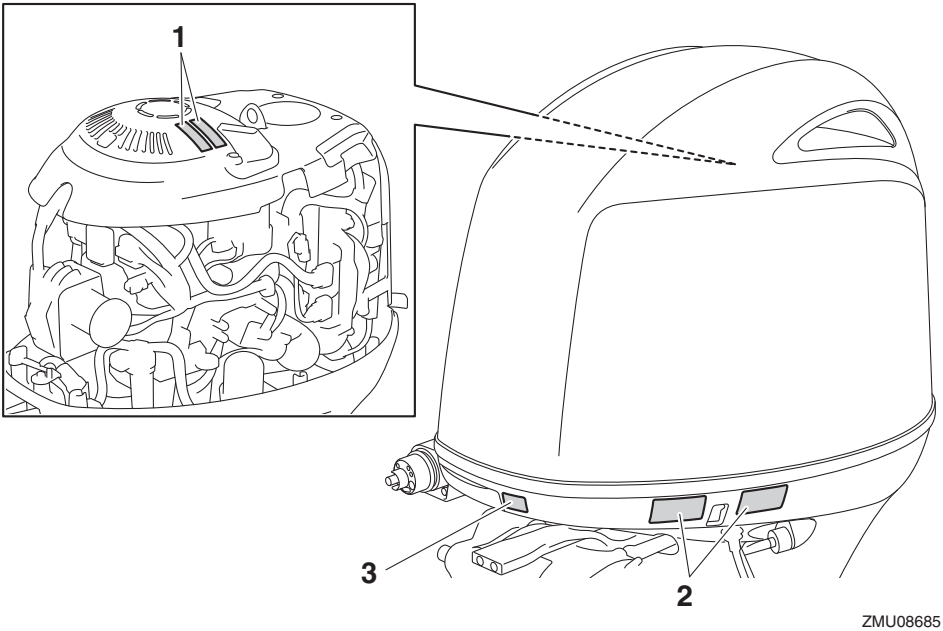
- Read this manual.
- Read any manuals supplied with the boat.
- Read all labels on the outboard motor and the boat.

If you need any additional information, contact your Yamaha dealer.

EMU33836

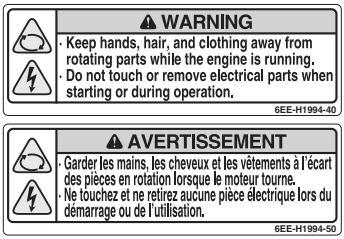
Warning labels

If these labels are damaged or missing, contact your Yamaha dealer for replacements.

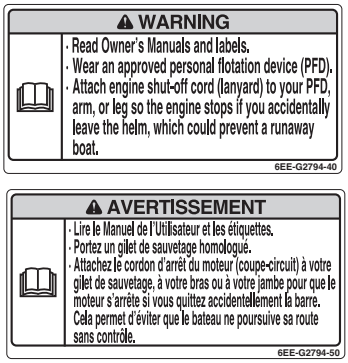


ZMU08685

1



2



ZMU06191

EMU34652

Contents of labels

The above warning labels mean as follows.

1

EWM01682

⚠ WARNING

- **Keep hands, hair, and clothing away from rotating parts while the engine is running.**
- **Do not touch or remove electrical parts when starting or during operation.**

2

EWM01672

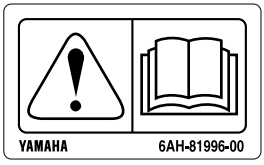
⚠ WARNING

- **Read Owner's Manuals and labels.**
- **Wear an approved personal flotation device (PFD).**
- **Attach engine shut-off cord (lanyard) to your PFD, arm, or leg so the engine stops if you accidentally leave the helm, which could prevent a runaway boat.**

EMU33851

Other labels

3



ZMU05710

EMU35133

Symbols

The following symbols mean as follows.

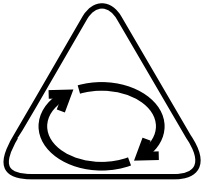
Notice/Warning

ZMU05696

Read Owner's Manual

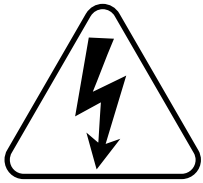
ZMU05664

Hazard caused by continuous rotation



ZMU05665

Electrical hazard



ZMU05666

EMU38092

Specifications

TIP:
"(AL)" stated in the specification data below represents the numerical value for the aluminum propeller installed.

EMU2821V

Dimension and weight:
Overall length:
803 mm (31.6 in)
Overall width:
488 mm (19.2 in)
Overall height L:
1622 mm (63.9 in)
Overall height X:
1749 mm (68.9 in)
Motor transom height L:
516 mm (20.3 in)
Motor transom height X:
643 mm (25.3 in)
Dry weight (AL) L:
162 kg (357 lb)
Dry weight (AL) X:
166 kg (366 lb)

Performance:
Full throttle operating range:
5000–6000 r/min
Rated power:
73.5 kW (100 HP)
Idle speed (in neutral):
700–800 r/min

Power unit:
Type:
4-stroke SOHC L4 16 valves
Total displacement:
1830 cm^3 (111.7 c.i.)
Bore × stroke:
81.0 × 88.8 mm (3.19 × 3.50 in)
Ignition system:
TCI
Spark plug (NGK):
LKR6E-9N
Spark plug gap:
0.8–0.9 mm (0.031–0.035 in)
Steering system:
Remote steering
Starting system:
Electric starter
Starting carburetion system:
Fuel injection
Valve clearance IN (cold engine):
0.15–0.25 mm (0.0059–0.0098 in)
Valve clearance EX (cold engine):
0.25–0.35 mm (0.0098–0.0138 in)
Battery rating (CCA/EN):
430–1080 A
Battery rating (20HR/IEC):
70 Ah
Maximum generator output:
35 A

Lower unit:
Gear shift positions:
Forward-neutral-reverse
Gear ratio:
2.15 (28/13)
Trim and tilt system:
Power trim and tilt
Propeller mark:
K

Fuel and oil:
Recommended fuel:
Regular unleaded gasoline
Min. research octane number (RON):
90
Fuel tank capacity:
25 L (6.61 US gal, 5.50 Imp.gal)
Recommended engine oil:
YAMALUBE 4 or 4-stroke outboard motor oil

Recommended engine oil grade 1:
SAE 10W-30/10W-40/5W-30
API SG/SH/SJ/SL
Engine oil quantity (without oil filter replacement):
3.0 L (3.17 US qt, 2.64 Imp.qt)
Engine oil quantity (with oil filter replacement):
3.2 L (3.38 US qt, 2.82 Imp.qt)
Lubrication system:
Wet sump
Recommended gear oil:
YAMALUBE outboard gear oil or Hypoid gear oil
Recommended gear oil grade:
SAE 90 API GL-4 / SAE 80W API GL-5 / SAE 90 API GL-5
Gear oil quantity:
0.760 L (0.803 US qt, 0.669 Imp.qt)

Tightening torque:

Spark plug:
25 N·m (2.55 kgf·m, 18.4 lb·ft)
Propeller nut:
54 N·m (5.51 kgf·m, 39.8 lb·ft)
Engine oil drain bolt:
27 N·m (2.75 kgf·m, 19.9 lb·ft)
Engine oil filter:
18 N·m (1.84 kgf·m, 13.3 lb·ft)

Noise and vibration level:

Operator sound pressure level (ICOMIA 39/94):
78.7 dB(A)

EMU33556

Installation requirements

EMU33565

Boat horsepower rating

EWM01561

WARNING

Overpowering a boat can cause severe instability.

Before installing the outboard motor(s), confirm that the total horsepower of your outboard motor(s) does not exceed the boats maximum horsepower rating. See the boat's capacity plate or contact the manufacturer.

EMU40491

Mounting outboard motor

EWM02501

WARNING

- **Improper mounting of the outboard motor could result in hazardous conditions such as poor handling, loss of control, or fire hazards.**
- **Because the outboard motor is very heavy, special equipment and training is required to mount it safely.**

Your dealer or other person experienced in proper rigging should mount the outboard motor using correct equipment and complete rigging instructions. For further information, see page 41.

EMU33582

Remote control requirements

EWM01581

WARNING

- **If the engine starts in gear, the boat can move suddenly and unexpectedly, possibly causing a collision or throwing passengers overboard.**
- **If the engine ever starts in gear, the start-in-gear protection device is not working correctly and you should discontinue using the outboard. Contact your Yamaha dealer.**

The remote control unit must be equipped with a start-in-gear protection device(s). This device prevents the engine from starting unless it is in neutral.

EMU25695

Battery requirements

EMU25723

Battery specifications

Battery rating (CCA/EN):
430–1080 A
Battery rating (20HR/IEC):
70 Ah

The engine cannot be started if battery voltage is too low.

EMU36293

Mounting battery

Mount the battery holder securely in a dry, well-ventilated, vibration-free location in the boat. **WARNING! Do not put flammable items, or loose heavy or metal objects in the same compartment as the battery. Fire, explosion or sparks could result.**

[EWM01821]

Battery cable

The battery cable size and length are critical. Consult your Yamaha dealer about the battery cable size and length.

EMU41603

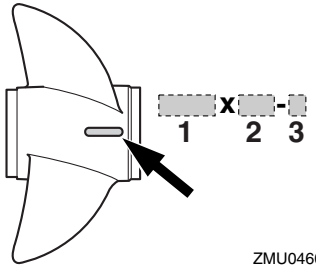
Propeller selection

Next to selecting an outboard motor, selecting the right propeller is one of the most important purchasing decisions a boater can make. The type, size, and design of your propeller have a direct impact on acceleration, top speed, fuel economy, and even engine life. Yamaha designs and manufactures propellers for every Yamaha outboard motor and every application.

Your Yamaha dealer can help you select the right propeller for your boating needs. Select a propeller that will allow the engine to reach the middle or upper half of the operating range at full throttle with the maximum boatload. Generally, select a larger pitch propeller for a smaller operating load and a smaller pitch propeller for a heavier load. If you carry loads that vary widely, select the propeller that lets the engine run in the proper range for your maximum load but remember that you may need to reduce your throttle setting to stay within the recommended engine speed range when carrying lighter loads.

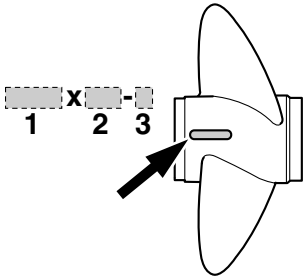
Yamaha recommends to use a propeller suitable for the “Shift Dampener System (SDS)”. For further information, consult your Yamaha dealer.

To check the propeller, see page 79.



ZMU04605

1. Propeller diameter in inches
2. Propeller pitch in inches
3. Type of propeller (propeller mark)



ZMU04606

1. Propeller diameter in inches
2. Propeller pitch in inches
3. Type of propeller (propeller mark)

EMU25771
Start-in-gear protection

Yamaha outboard motors or Yamaha-approved remote control units are equipped with start-in-gear protection device(s). This feature permits the engine to be started only when it is in neutral. Always select neutral before starting the engine.

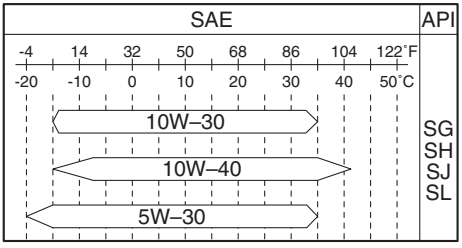
EMU41953
Engine oil requirements

Select an oil grade according to the average temperatures in the area where the outboard motor will be used.

Recommended engine oil:
YAMALUBE 4 or 4-stroke outboard motor oil
Recommended engine oil grade 1:
SAE 10W-30/10W-40/5W-30
API SG/SH/SJ/SL
Recommended engine oil grade 2:
SAE 15W-40/20W-40/20W-50
API SH/SJ/SL
Engine oil quantity (without oil filter replacement):
3.0 L (3.17 US qt, 2.64 Imp.qt)
Engine oil quantity (with oil filter replacement):
3.2 L (3.38 US qt, 2.82 Imp.qt)

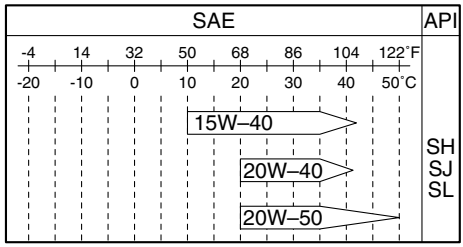
If oil grades listed under Recommended engine oil grade 1 are not available, select an alternative oil grade listed under Recommended engine oil grade 2.

Recommended engine oil grade 1



ZMU08143

Recommended engine oil grade 2



ZMU06855

EMU36361
Fuel requirements

EMU40202
Gasoline

Use a good quality gasoline that meets the minimum octane rating. If knocking or pinging occurs, use a different brand of gasoline or premium unleaded fuel.

Recommended fuel:
Regular unleaded gasoline
Min. research octane number (RON):
90

ECM01982
NOTICE

- **Do not use leaded gasoline. Leaded gasoline can seriously damage the engine.**
- **Avoid getting water and contaminants in the fuel tank. Contaminated fuel can cause poor performance or engine damage. Use only fresh gasoline that has been stored in clean containers.**

Gasohol

There are two types of gasohol: gasohol containing ethanol (E10) and that containing methanol. Ethanol can be used if the ethanol content does not exceed 10% and the fuel meets the minimum octane ratings. E85 is a fuel containing 85% ethanol and must not be used in your outboard motor. All ethanol

blends containing more than 10% ethanol can cause fuel system damage or cause engine starting and running problems. Yamaha does not recommend gasohol containing methanol because it can cause fuel system damage or engine performance problems.
It is recommended that you install a water-separating marine fuel filter assembly (10 micron minimum) between your boat's fuel tank and outboard motor when using ethanol. Ethanol is known to allow moisture to be absorbed into boat fuel tanks and systems. Moisture in the fuel can cause corrosion of metallic fuel system components, starting and running complaints and require additional fuel system maintenance.

EMU36881

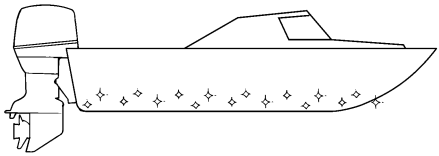
Muddy or acidic water

Yamaha strongly recommends that you have your dealer install the optional chromium-plated water pump kit if you use the outboard motor in muddy or acidic water conditions. However, depending on the model it might not be required.

EMU36331

Anti-fouling paint

A clean hull improves boat performance. The boat bottom should be kept as clean of marine growth as possible. If necessary, the boat bottom can be coated with an anti-fouling paint approved for your area to inhibit marine growth.
Do not use anti-fouling paint which includes copper or graphite. These paints can cause more rapid engine corrosion.



ZMU05176

EMU40302

Outboard motor disposal requirements

Never illegally discard (dump) the outboard motor. Yamaha recommends consulting the dealer about discarding the outboard motor.

EMU36353

Emergency equipment

Keep the following items onboard in case there is trouble with the outboard motor.

- A tool kit with assorted screwdrivers, pliers, wrenches (including metric sizes), and electrical tape.
- Waterproof flashlight with extra batteries.
- An extra engine shut-off cord (lanyard) with clip.
- Spare parts, such as an extra set of spark plugs.

Consult your Yamaha dealer for details.

EMU39001

Emission control information

The following labels are affixed to outboard motors that conform to US regulations.

EMU25232

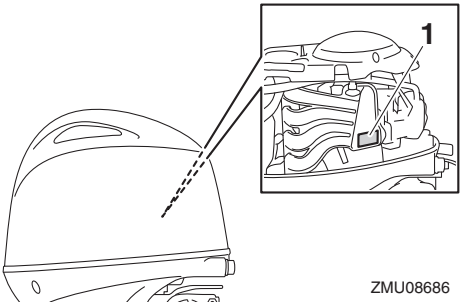
This engine conforms to U.S. Environmental Protection Agency (EPA) regulations for marine SI engines. See the label affixed to your engine for details.

EMU31563

Approval label of emission control certificate

This label is attached at the location shown.

New Technology; (4-stroke) MFI



ZMU08686

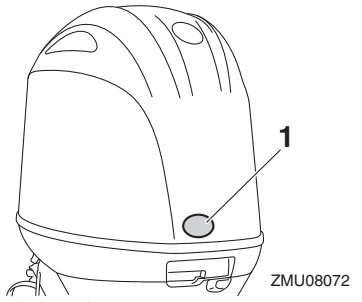
1. Approval label location

ZMU06894

EMU25275

Star labels

Your outboard motor is labeled with a California Air Resources Board (CARB) star label. See below for a description of your particular label.



ZMU08072

1. Star labels location

EMU40331

One Star—Low Emission

The one-star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2001 exhaust emission standards. Engines meeting these standards have 75% lower emissions than conventional carbureted two-stroke engines. These engines are equivalent to the U.S. EPA's 2006 standards for marine engines.

ZMU01702

EMU40341

Two Stars—Very Low Emission

The two-star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2004 exhaust emission standards. Engines meeting these standards have 20% lower emissions than One Star-Low-Emission engines.

ZMU01703

EMU40351

Three Stars—Ultra Low Emission

The three-star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2008 exhaust emission standards or the Sterndrive and Inboard marine engine 2003-2008 exhaust emission standards. Engines meeting these standards have 65% lower emissions than One Star-Low-Emission engines.

ZMU01704

EMU33862

Four Stars—Super Ultra Low Emission

The four-star label identifies engines that meet the Air Resources Board's Sterndrive and Inboard marine engine 2009 exhaust emission standards. Personal Watercraft and Outboard marine engines may also comply with these standards. Engines meeting these standards have 90% lower emissions than One Star-Low-Emission engines.

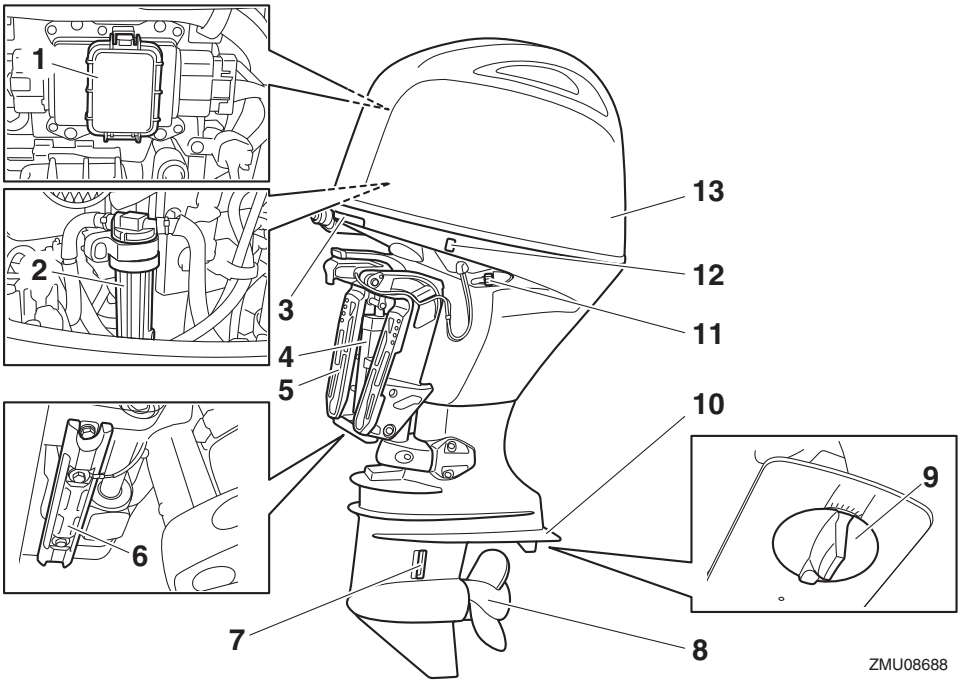
ZMU05663

EMU46721

Components diagram

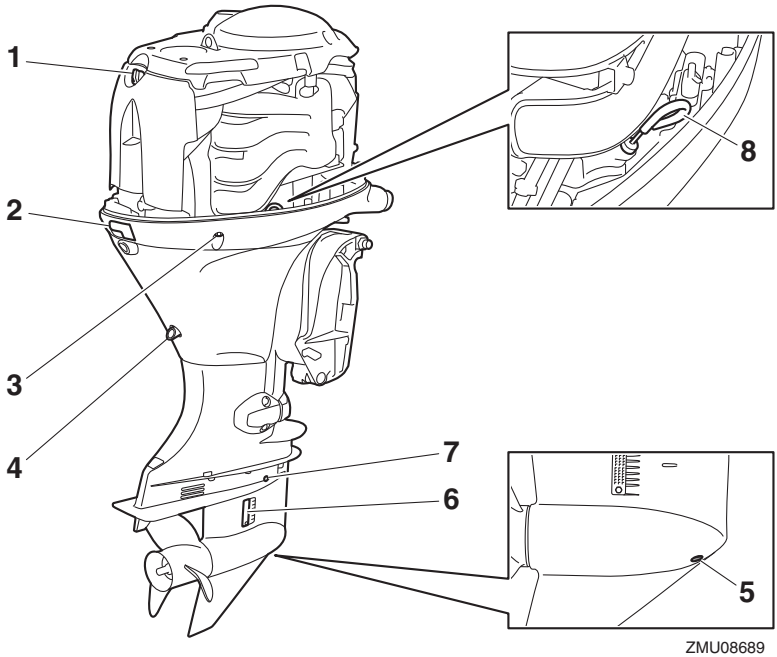
TIP:

* May not be exactly as shown; also may not be included as standard equipment on all models (order from dealer).



1. Fuse box
2. Fuel filter
3. Cowling lock lever
4. Power trim and tilt unit
5. Clamp bracket
6. Anode
7. Cooling water inlet
8. Propeller*
9. Trim tab (anode)
10. Anti-cavitation plate
11. Flushing device
12. Power trim and tilt switch
13. Top cowling

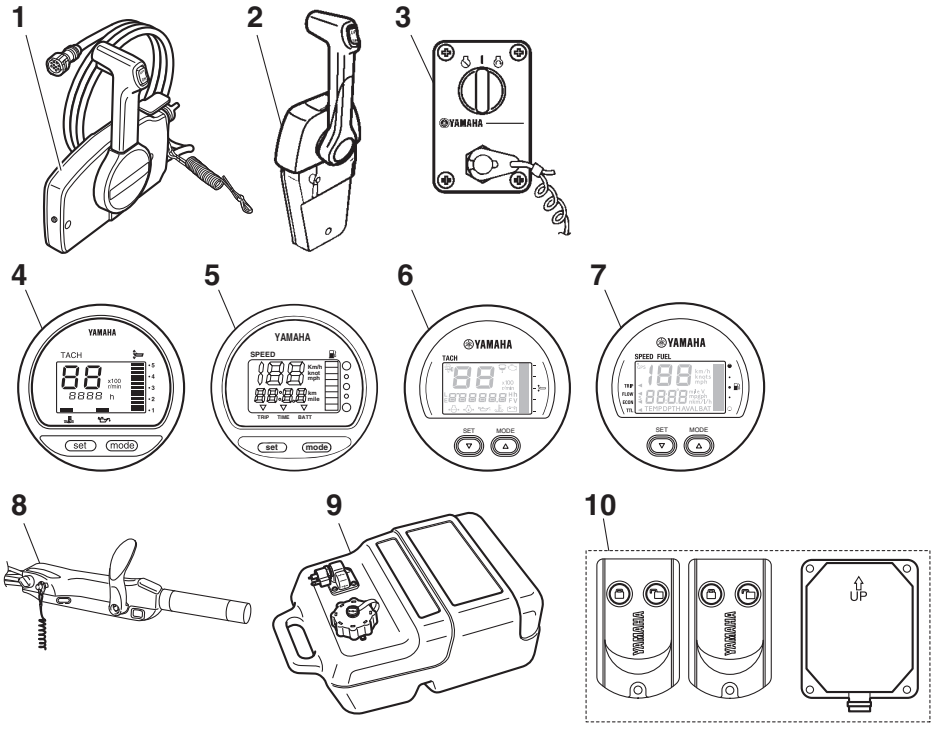
Components



ZMU08689

1. Oil filler cap
2. Cowling lock lever
3. Cooling water pilot hole
4. Drain screw
5. Gear oil drain screw
6. Cooling water inlet
7. Oil level plug
8. Oil dipstick

EMU46731
Optional items
The following items are available from your Yamaha dealer. For details, consult your Yamaha dealer.



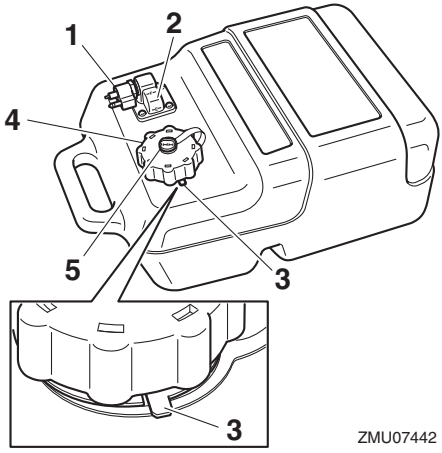
ZMU08805

1. Remote control box (side mount type)
2. Remote control box (binnacle mount type)
3. Switch panel (for use with binnacle type)
4. Digital tachometer
5. Digital speedometer
6. 6Y8 Multifunction tachometer
7. 6Y8 Multifunction speed & fuel meter
8. Tiller handle
9. Fuel tank
10. Yamaha Security System (Y-COP)

EMU43103
Fuel tank (portable fuel tank)
This model can be equipped with an optional portable fuel tank. The parts of the fuel tank are as follows.

EWM00021
⚠ WARNING

The fuel tank supplied with this engine is its dedicated fuel reservoir and must not be used as a fuel storage container. Commercial users should conform to relevant licensing or approval authority regulations.



ZMU07442

1. Fuel joint
2. Fuel gauge
3. Pressure relief tab
4. Fuel tank cap
5. Air vent screw

Fuel joint
This joint is used to connect the fuel line.

Fuel gauge
This gauge shows the approximate amount of fuel remaining in the fuel tank.

Pressure relief tab
This tab is attached to the filler hole of the fuel tank.

Fuel tank cap
This cap seals the fuel tank. To loosen the cap, press and hold the pressure relief tab and turn the cap counterclockwise.

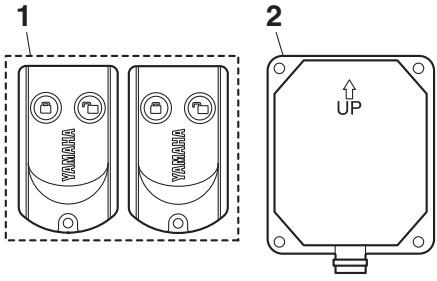
Air vent screw
This screw is on the fuel tank cap. When turning the air vent screw counterclockwise, it is loosened and the pressure in the fuel tank is released to a certain pressure. Air is allowed to enter the fuel tank while operating the engine.

EMU46750
Yamaha Security System (Y-COP)
ECM02461

NOTICE

The Yamaha Security System is sold in conformity with the relevant laws and regulations regarding radio wave transmission. Therefore, if this product is used outside the country where it was sold, it may violate the laws or regulations regarding radio wave transmission in the country it is used in. For details, consult your Yamaha dealer.

The Yamaha Security System, which protects against theft, consists of the receiver and remote control transmitters. The Yamaha Security System is available from your Yamaha dealer. For details, consult your Yamaha dealer.

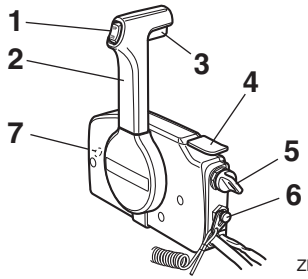


ZMU08527

1. Remote control transmitter
2. Receiver

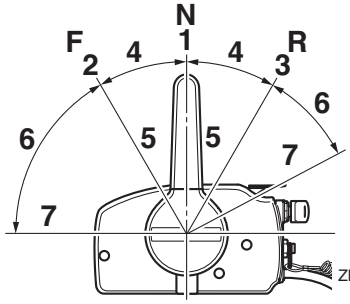
The engine cannot be started if the security system is in the lock mode. The engine can be started only in the unlock mode. For more information, see the installation and owner's manual included with the security system.

EMU26182
Remote control box
The remote control lever actuates both the shifter and the throttle. The electrical switches are mounted on the remote control box.



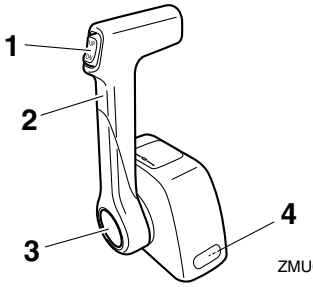
ZMU01723

1. Power trim and tilt switch
2. Remote control lever
3. Neutral interlock trigger
4. Neutral throttle lever
5. Main switch
6. Engine shut-off switch
7. Throttle friction adjuster



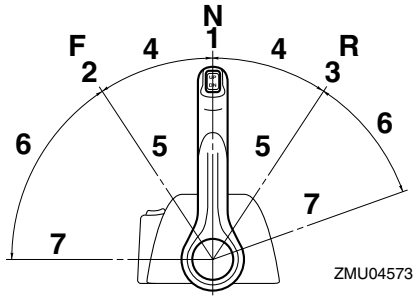
ZMU01725

1. Neutral "**N**"
2. Forward "**F**"
3. Reverse "**R**"
4. Shift
5. Fully closed
6. Throttle
7. Fully open



ZMU04572

1. Power trim and tilt switch
2. Remote control lever
3. Free accelerator
4. Throttle friction adjuster



ZMU04573

1. Neutral "**N**"
2. Forward "**F**"
3. Reverse "**R**"
4. Shift
5. Fully closed
6. Throttle
7. Fully open

EMU26191

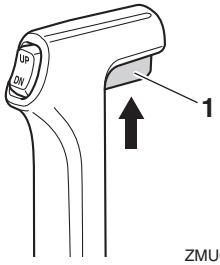
Remote control lever

Moving the lever forward from the neutral position engages forward gear. Pulling the lever back from neutral engages reverse. The engine will continue to run at idle until the lever is moved about 35° (a detent can be felt). Moving the lever farther opens the throttle, and the engine will begin to accelerate.

EMU26202

Neutral interlock trigger

To shift out of neutral, first pull the neutral interlock trigger up.



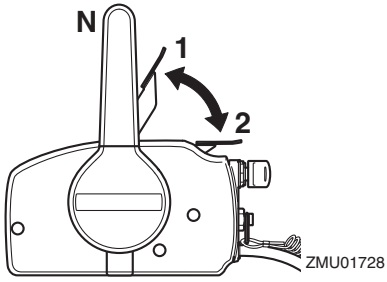
ZMU01727

1. Neutral interlock trigger

EMU26213

Neutral throttle lever

To open the throttle without shifting into either forward or reverse, put the remote control lever in the neutral position and lift the neutral throttle lever.



ZMU01728

1. Fully open
2. Fully closed

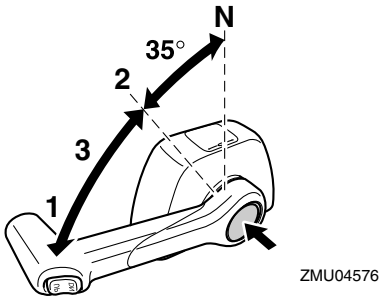
TIP:

The neutral throttle lever will operate only when the remote control lever is in neutral. The remote control lever will operate only when the neutral throttle lever is in the closed position.

EMU26234

Free accelerator

To open the throttle without shifting into either forward or reverse, push the free accelerator button and move the remote control lever.



ZMU04576

1. Fully open
2. Fully closed
3. Free accelerator

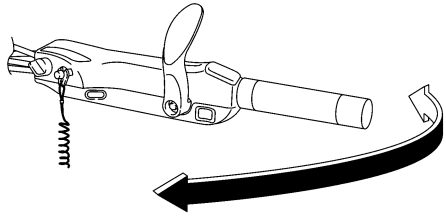
TIP:

- The free accelerator button can only be pushed when the remote control lever is in the neutral position.
- After the button is pushed, the throttle begins to open after the remote control lever is moved at least 35°.
- After using the free accelerator, return the remote control lever to the neutral position. The free accelerator button will return automatically to its set position. The remote control will then engage forward and reverse normally.

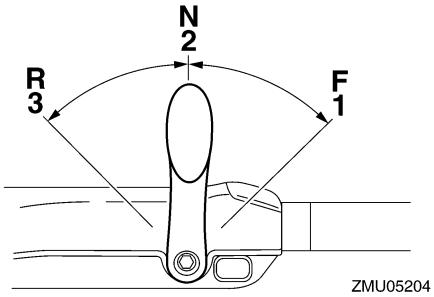
EMU25914

Tiller handle

To change direction, move the tiller handle to the left or right as necessary.


ZMU05203

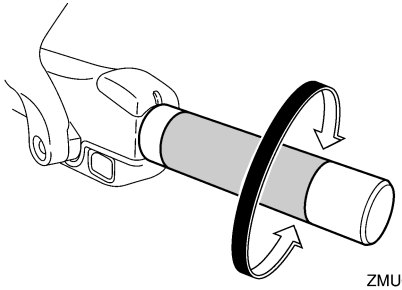
EMU25925
Gear shift lever
Move the gear shift lever forward to engage the forward gear or rearward to engage the reverse gear.



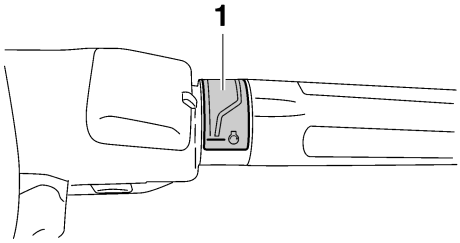
ZMU05204

1. Forward "**F**"
2. Neutral "**N**"
3. Reverse "**R**"

EMU25943
Throttle grip
The throttle grip is on the tiller handle. Turn the grip counterclockwise to increase speed and clockwise to decrease speed.


ZMU05205

EMU25963
Throttle indicator
The fuel consumption curve on the throttle indicator shows the relative amount of fuel consumed for each throttle position. Choose the setting that offers the best performance and fuel economy for the desired operation.

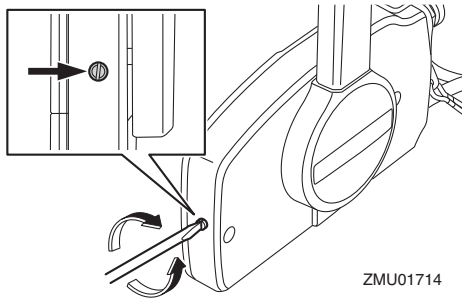


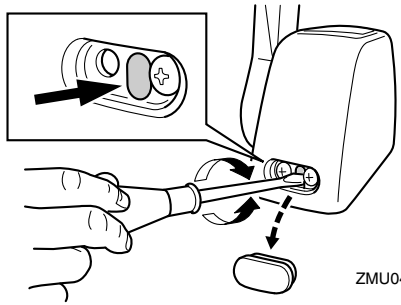
ZMU05206

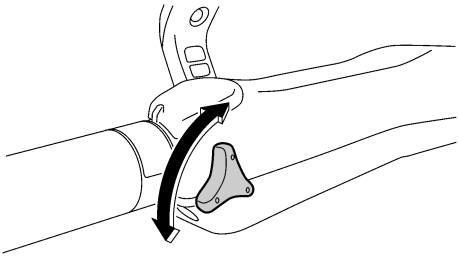
1. Throttle indicator

EMU25978
Throttle friction adjuster
A friction device provides adjustable resistance to movement of the throttle grip or the remote control lever, and can be set according to operator preference.

To increase resistance, turn the adjuster clockwise. To decrease resistance, turn the adjuster counterclockwise. **WARNING! Do not overtighten the friction adjuster. If there is too much resistance, it could be difficult to move the remote control lever or throttle grip, which could result in an accident.** [EWM00033]


ZMU01714


ZMU04563

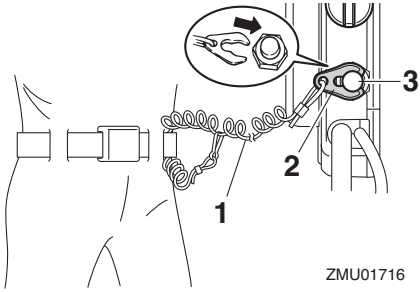

ZMU05207

When constant speed is desired, tighten the adjuster to maintain the desired throttle setting.

EMU25996

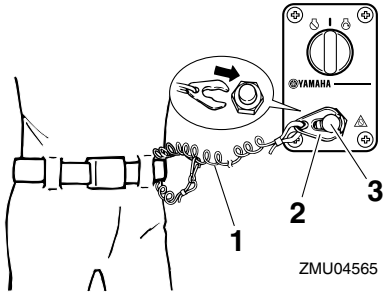
Engine shut-off cord (lanyard) and clip

The clip must be attached to the engine shut-off switch for the engine to run. The cord should be attached to a secure place on the operator's clothing, or arm or leg. Should the operator fall overboard or leave the helm, the cord will pull out the clip, stopping ignition to the engine. This will prevent the boat from running away under power. **WARNING! Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg while operating. Do not attach the cord to clothing that could tear loose. Do not route the cord where it could become entangled, preventing it from functioning. Avoid accidentally pulling the cord during normal operation. Loss of engine power means the loss of most steering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.** [EWM00123]



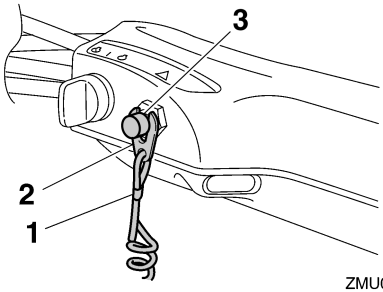
ZMU01716

1. Engine shut-off cord (lanyard)
2. Clip
3. Engine shut-off switch



ZMU04565

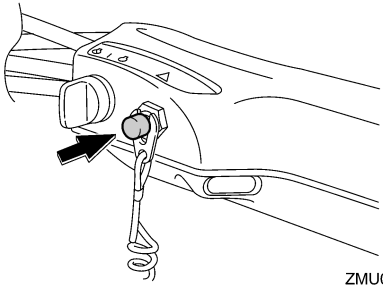
1. Engine shut-off cord (lanyard)
2. Clip
3. Engine shut-off switch



ZMU05208

1. Engine shut-off cord (lanyard)
2. Clip
3. Engine shut-off switch

EMU26004
Engine stop button
The engine stop button stops the engine when the button is pushed.


ZMU05209

EMU26092
Main switch
The main switch controls the ignition system; its operation is described below.

● "OFF" **(off)**

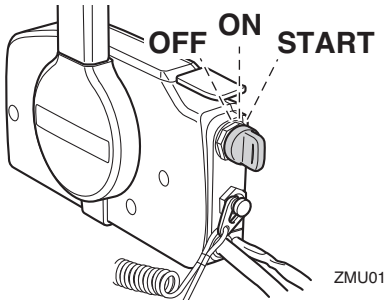
With the main switch in the "OFF" (off) position, the electrical circuits are off, and the key can be removed.

● "ON" **(on)**

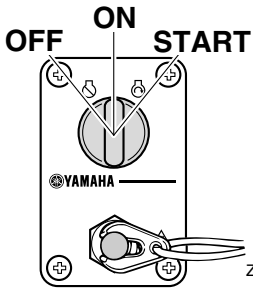
With the main switch in the "ON" (on) position, the electrical circuits are on, and the key cannot be removed.

● "START" **(start)**

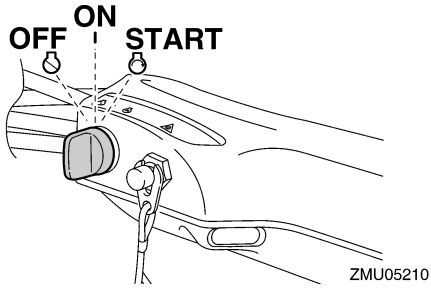
With the main switch in the "START" (start) position, the starter motor turns to start the engine. When the key is released, it returns automatically to the "ON" (on) position.



ZMU01718



ZMU04567



ZMU05210

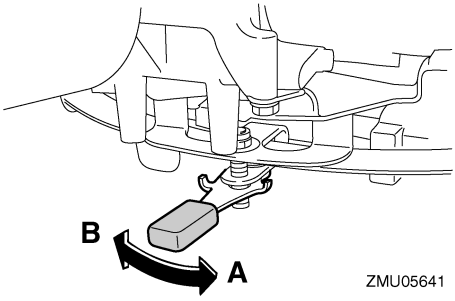
EMU26113
Steering friction adjuster
A friction device provides adjustable resistance to the steering mechanism, and can be set according to operator preference. An adjuster lever is located on the bottom of the tiller handle bracket.

To increase resistance, turn the lever to the port side “A”.
To decrease resistance, turn the lever to the starboard side “B”.

EWM00041

⚠ WARNING

Do not overtighten the friction adjuster. If there is too much resistance, it could be difficult to steer, which could result in an accident.



ZMU05641

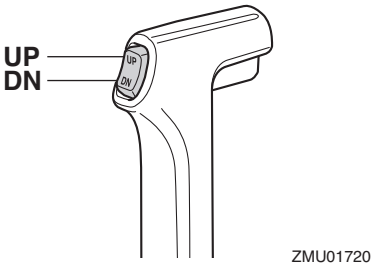
TIP:

- Check the tiller handle for smooth movement when the lever is turned to the starboard side “B”.
- Do not apply lubricants such as grease to the friction areas of the steering friction adjuster.

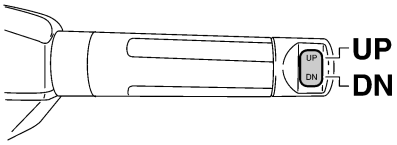
EMU26144

Power trim and tilt switch on remote control or tiller handle

The power trim and tilt system adjusts the outboard motor angle in relation to the transom. Pressing the switch “**UP**” (up) trims the outboard motor up, and then tilts it up. Pressing the switch “**DN**” (down) tilts the outboard motor down and trims it down. When the switch is released, the outboard motor will stop in its current position.
For instructions on using the power trim and tilt switch, see pages 58 and 60.



ZMU01720



ZMU05211

EMU26156

Power trim and tilt switch on bottom cowling

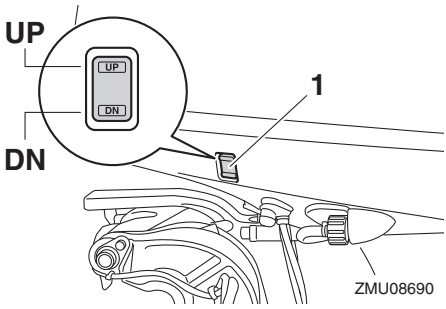
The power trim and tilt switch is located on the side of the bottom cowling. Pushing the switch “**UP**” (up) trims the outboard motor up, and then tilts it up. Pushing the switch “**DN**” (down) tilts the outboard motor down and trims it down. When the switch is released, the outboard motor will stop in its current position.
For instructions on using the power trim and tilt switch, see page 60.

EWM01032

⚠ WARNING

Use the power trim and tilt switch located on the bottom cowling only when the boat is at a complete stop with the engine off. Attempting to use this switch while the boat is moving could increase the risk of

falling overboard and could distract the operator, increasing the risk of collision with another boat or an obstacle.

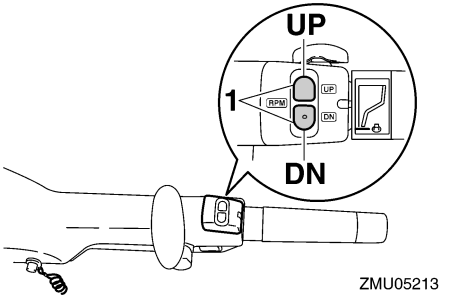


1. Power trim and tilt switch

EMU30903

Variable trolling RPM switches

The trolling speed can be adjusted when the outboard motor is trolling. Press the "**UP**" switch to increase the trolling speed and press the "**DN**" switch to decrease the trolling speed.



1. Variable trolling RPM switch

TIP:

- The trolling speed changes approximately 50 r/min each time a switch is pressed.
- If the trolling speed has been adjusted, the engine returns to the normal trolling speed when the engine is stopped and restarted or when the engine speed exceeds approximately 3000 r/min.
- For instructions on using the variable trolling RPM switches, see page 57.

EMU26246

Trim tab with anode

EWM00841

WARNING

An improperly adjusted trim tab could cause difficult steering. Always test run after the trim tab has been installed or replaced to be sure steering is correct. Be sure you have tightened the bolt after adjusting the trim tab.

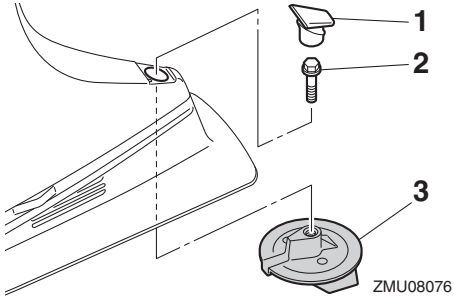
The trim tab should be adjusted so that the steering control can be turned to either the right or left by applying the same amount of force.

If the boat tends to veer to the left (port side), turn the trim tab rear end to the port side "A" in the figure. If the boat tends to veer to the right (starboard side), turn the trim tab end to the starboard side "B" in the figure.

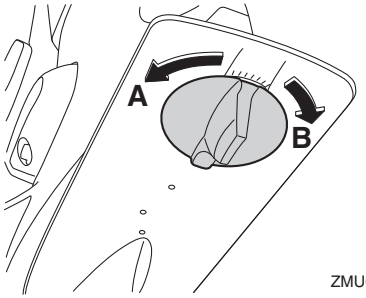
ECM00841

NOTICE

The trim tab also serves as an anode to protect the engine from electrochemical corrosion. Never paint the trim tab as it will become ineffective as an anode.



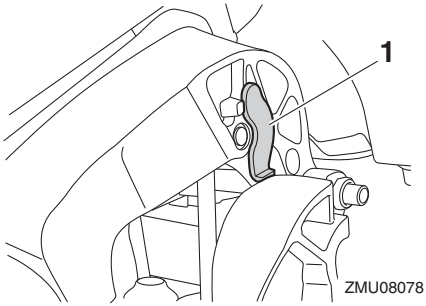
1. Cap
2. Bolt
3. Trim tab



ZMU08077

Bolt tightening torque:
42 N·m (4.28 kgf·m, 31.0 lb·ft)

EMU26342
Tilt support lever for power trim and tilt model
To keep the outboard motor in the tilted up position, lock the tilt support lever to the clamp bracket.



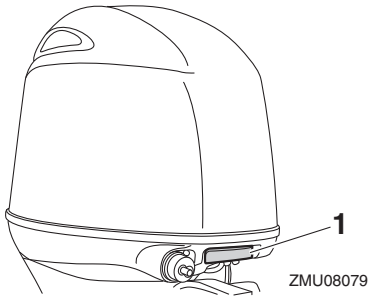
ZMU08078

1. Tilt support lever

ECM00661
NOTICE

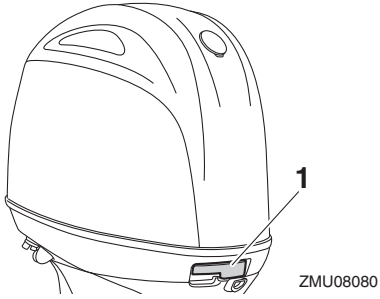
Do not use the tilt support lever or knob when trailering the boat. The outboard motor could shake loose from the tilt support and fall. If the motor cannot be trailered in the normal running position, use an additional support device to secure it in the tilt position.

EMU40762
Cowling lock lever
The cowling lock levers are used to secure the top cowling.



ZMU08079

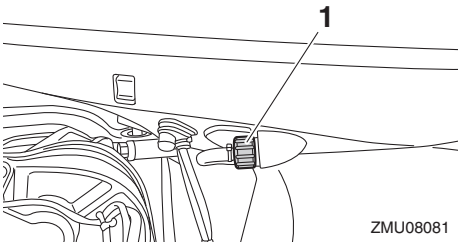
1. Cowling lock lever



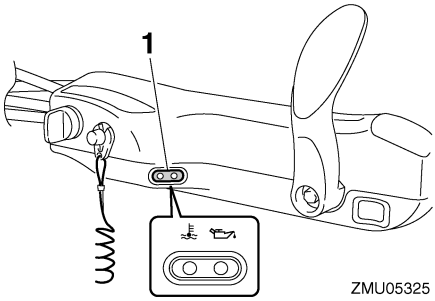
ZMU08080

1. Cowling lock lever

EMU40803
Flushing device
The flushing device is used to clean the cooling water passages of the outboard motor using a garden hose and tap water. For instructions on using the flushing device, see page 68.



1. Flushing device

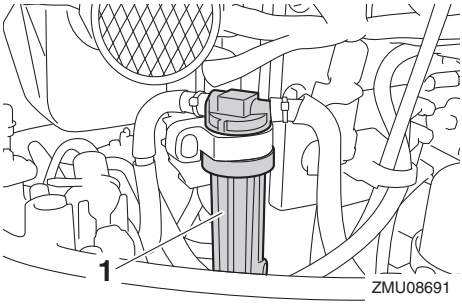


1. Alert indicator

EMU41312

Fuel filter

The fuel filter functions to remove foreign material and separate water from the fuel. If water separated from the fuel exceeds a specific volume, the alert system will activate. For further information, see page 39.



1. Fuel filter

EMU26305

Alert indicator

If the engine develops a condition which is cause for alert, the indicator lights up. For details on how to read the alert indicator, see page 38.

EMU36016

Indicators

EMU36026

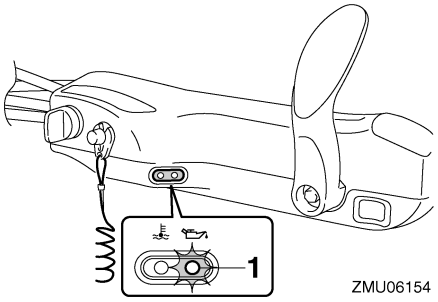
Low oil pressure-alert indicator

If oil pressure drops too low, this indicator will light up. For further information, see page 38.

ECM00024

NOTICE

- **Do not continue to run the engine if the low oil pressure-alert indicator is on and the engine oil level is lower. Serious engine damage will occur.**
- **The low oil pressure-alert indicator does not indicate the engine oil level. Use the oil dipstick to check the oil level. For further information, see page 45.**



1. Low oil pressure-alert indicator

EMU36034

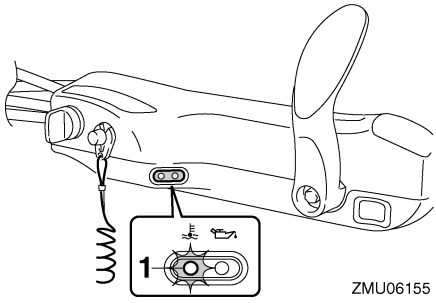
Overheat-alert indicator

If the engine temperature rises too high, this indicator will light up. For further information on reading the indicator, see page 38.

ECM00053

NOTICE

Do not continue to run the engine if the overheat-alert indicator is on. Serious engine damage will occur.



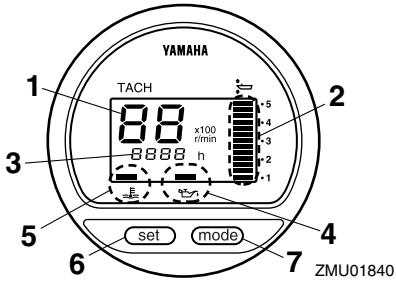
1. Overheat-alert indicator

EMU41391

Digital tachometer

The tachometer shows the engine speed and has the following functions.

All segments of the display will light momentarily after the main switch is turned on and will return to normal thereafter.



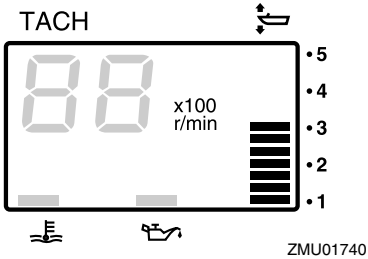
1. Tachometer
2. Trim meter
3. Hour meter
4. Low oil pressure-alert indicator
5. Overheat-alert indicator
6. Set button
7. Mode button

EMU36051

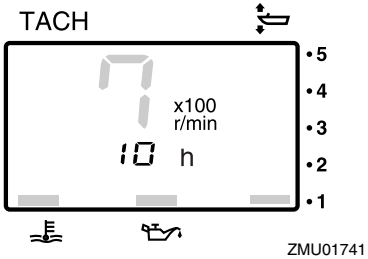
Tachometer

The tachometer displays engine speed in hundreds of revolutions per minute (r/min). For example, if the tachometer display reads “22” then the engine speed is 2200 r/min.

EMU26622
Trim meter
This meter shows the trim angle of your outboard motor.
- Memorize the trim angles that work best for your boat under different conditions. Adjust the trim angle to the desired using the power trim and tilt switch.
- If the trim angle of your motor exceeds the trim operating range, the top segment on the trim meter display will blink.



EMU26652
Hour meter
This meter shows the number of hours the engine has been run. It can be set to show the total number of hours or the number of hours for the current trip. The display can also be turned on and off.



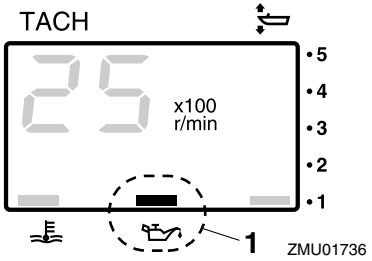
To change the display format, press the "**mode**" (mode) button. The display can show total hours or trip hours, or turn off.

To reset the trip hours, simultaneously press the "**set**" (set) and "**mode**" (mode) buttons for more than 1 second while the trip hours are displayed. This resets the trip counter to 0 (zero).

The total number of hours the engine has been run cannot be reset.

EMU26526
Low oil pressure-alert indicator
If oil pressure drops too low, the alert indicator will start to blink. For further information, see page 38.

ECM00024
NOTICE
- **Do not continue to run the engine if the low oil pressure-alert indicator is on and the engine oil level is lower. Serious engine damage will occur.**
- **The low oil pressure-alert indicator does not indicate the engine oil level. Use the oil dipstick to check the oil level. For further information, see page 45.**



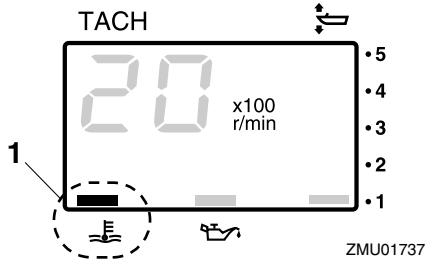
1. Low oil pressure-alert indicator

EMU26584
Overheat-alert indicator
If the engine temperature rises too high, the alert indicator will start to blink. For further information on reading the indicator, see page 38.

ECM00053

NOTICE

Do not continue to run the engine if the overheat-alert indicator is on. Serious engine damage will occur.

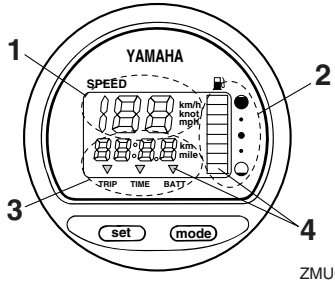


1. Overheat-alert indicator

EMU26603

Digital speedometer

This gauge shows the boat speed and other information.



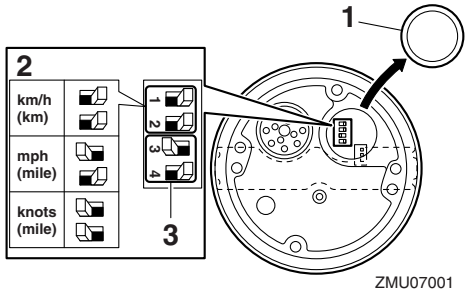
1. Speedometer
2. Fuel gauge
3. Trip meter/clock/voltmeter
4. Alert indicator(s)

All segments of the display will light momentarily after the main switch is turned on and will return to normal thereafter.

EMU36062

Speedometer

The speedometer displays km/h, mph, or knots, according to operator preference. Select the desired units of measurement by setting the selector switch on the back of the gauge. See the illustration for settings.

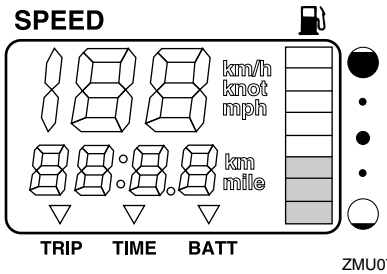


1. Cap
2. Selector switch (for speed unit)
3. Selector switch (for fuel sensor)

EMU26714

Fuel gauge

Eight segments indicate the fuel level. When all segments are showing, the fuel tank is full.



The fuel level reading can be inaccurate due to the position of the sensor in the fuel tank and the attitude of the boat in the water. Operation with bow-up trim or continuous turning can give false readings.

Do not adjust the selector switch for fuel sensor. Incorrectly setting the selector switch on the gauge will give false readings. Consult

your Yamaha dealer on how to correctly set the selector switch. ***NOTICE:*** **Running out of fuel can damage the engine.** [ECM01771]

EMU36072

Trip meter / Clock / Voltmeter

The display shows either the trip meter, the clock, or the voltmeter.

To change the display, press the "**mode**" (mode) button repeatedly until the indicator on the face of the gauge points to "**TRIP**" (trip meter), "**TIME**" (clock), or "**BATT**" (voltmeter).

EMU26692

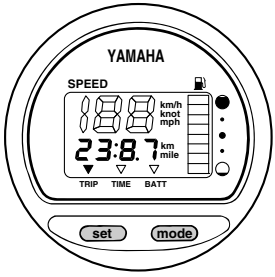
Trip meter

This gauge displays the distance the boat has traveled since the gauge was last reset.

The trip distance is shown in kilometers or miles depending upon the unit of measurement selected for the speedometer.

To reset the trip meter to zero, press the "**set**" (set) and "**mode**" (mode) buttons at the same time.

The trip distance is kept in memory by battery power. The stored data will be lost if the battery is disconnected.



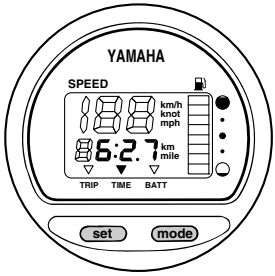
ZMU07003

EMU26702

Clock

To set the clock:

1. Be sure the gauge is in the "**TIME**" (time) mode.
2. Press the "**set**" (set) button; the hour display will begin blinking.
3. Press the "**mode**" (mode) button until the desired hour is displayed.
4. Press the "**set**" (set) button again, the minute display will begin blinking.
5. Press the "**mode**" (mode) button until the desired minute is displayed.
6. Press the "**set**" (set) button again to start the clock.



ZMU07004

The clock operates on battery power. Disconnecting the battery will stop the clock. Reset the clock after connecting the battery.

EMU36081

Voltmeter

The voltmeter displays the charge of the battery in volts(V).

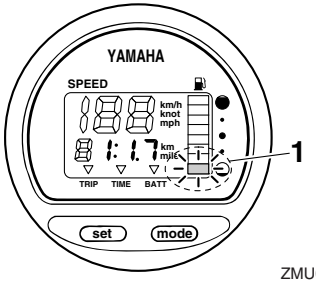
EMU26723

Fuel level-alert indicator

If the fuel level decreases to one segment, the fuel level alert segment will blink.

Do not continue to operate the engine at full throttle if an alert device has activated. Get back to the port using trolling engine speed.

NOTICE: **Running out of fuel can damage the engine.** [ECM01771]



ZMU07005

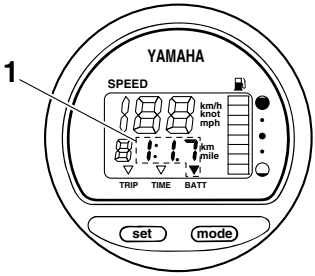
1. Fuel level-alert segment

EMU26733

Low battery voltage-alert indicator

If battery voltage drops, the display will automatically turn on and blink.

Get back to the port soon if an alert device has activated. For charging the battery, consult your Yamaha dealer.



ZMU07006

1. Low battery indicator

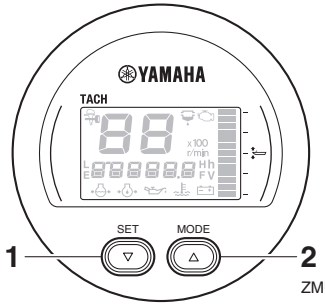
EMU46654

6Y8 Multifunction meters

There are two types of 6Y8 Multifunction meters.

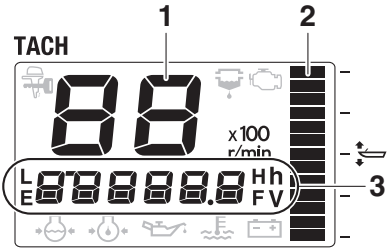
- 6Y8 Multifunction tachometer
- 6Y8 Multifunction speed & fuel meter

6Y8 Multifunction tachometer



ZMU08407

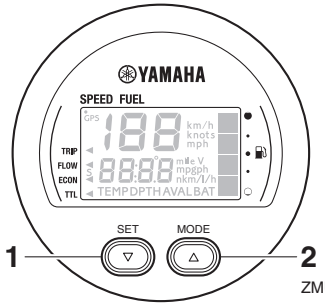
1. Set button
2. Mode button



ZMU08408

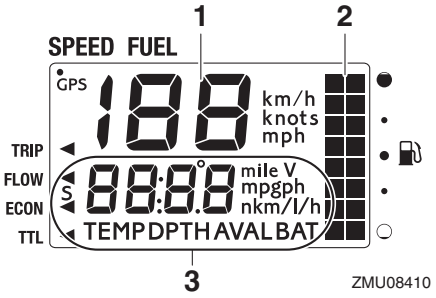
1. Tachometer
2. Trim meter
3. Multifunction display

6Y8 Multifunction speed & fuel meter



ZMU08409

1. Set button
2. Mode button

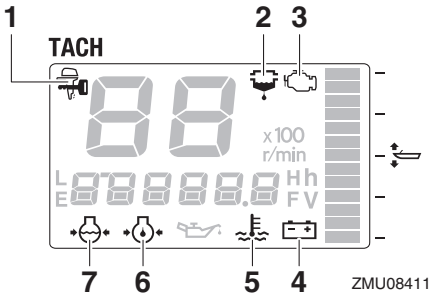


1. Speedometer
2. Fuel meter
3. Multifunction display

TIP:
The information displayed on the multifunction display can be changed. For information on other settings or changing the displayed information, see the operation manual included with the 6Y8 Multifunction meter.

This manual mainly covers the alert display of the 6Y8 Multifunction tachometer. See the following sections for information about the alert indicators.

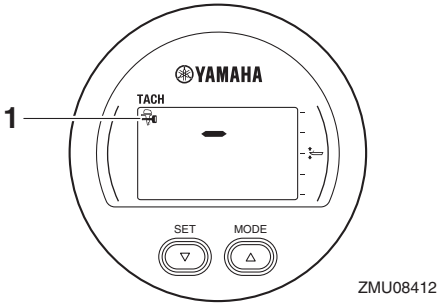
Indicators



1. Yamaha Security System indicator (optional)
2. Water separator-alert indicator
3. Engine trouble-alert indicator
4. Battery voltage indicator
5. Overheat-alert indicator
6. Low oil pressure-alert indicator
7. Cooling water pressure indicator (optional)

Yamaha Security System indicator (optional)
This indicator appears, when the Yamaha Security System is in lock mode.

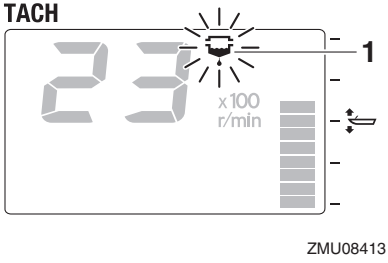
Lock mode



1. Yamaha Security System indicator (optional)

Make sure that the Yamaha Security System indicator is off before starting the engine.

Water separator-alert indicator
If water has accumulated in the water separator (fuel filter) while cruising, the water separator-alert indicator will start to blink.



1. Water separator-alert indicator

Stop the engine immediately and see page 88 of this manual to drain the water from the fuel filter. Get back to the port soon and consult a Yamaha dealer immediately.

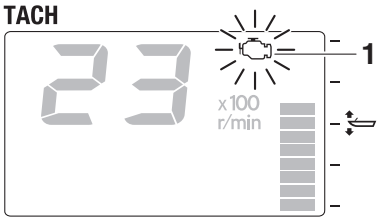
ECM00911

NOTICE

Gasoline mixed with water could cause damage to the engine.

Engine trouble-alert indicator

If the engine malfunctions while cruising, the engine trouble-alert indicator will start to blink. Get back to the port soon and consult a Yamaha dealer immediately.



ZMU08414

1. Engine trouble-alert indicator

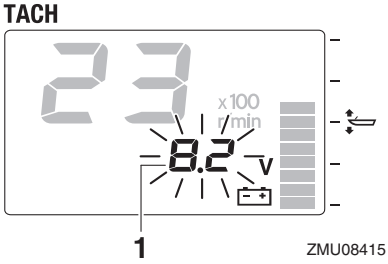
ECM00921

NOTICE

In such an event, the engine will not operate properly. Consult a Yamaha dealer immediately.

Low battery voltage alert

If the battery voltage drops, the battery voltage value will start to blink.



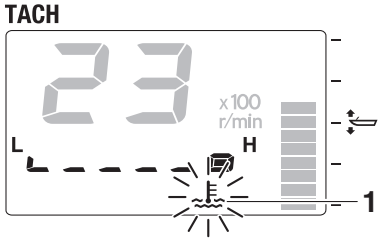
ZMU08415

1. Battery voltage value

Get back to the port soon if the low battery voltage alert device has activated. For charging the battery, consult your Yamaha dealer.

Overheat-alert indicator

If the engine temperature rises too high while cruising, the overheat-alert indicator will start to blink, and the engine speed will automatically decrease to about 2000–3500 r/min.



ZMU08416

1. Overheat-alert indicator

Stop the engine immediately if the buzzer sounds and the overheat device has activated. Check the cooling water inlet for clogging.

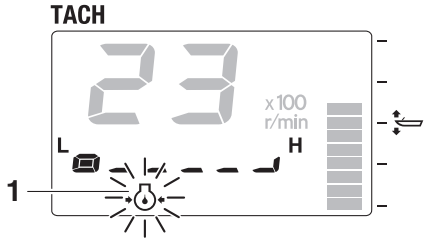
ECM01594

NOTICE

- **Do not continue to run the engine if the overheat-alert indicator blinks. Serious engine damage will occur.**
- **Do not continue to operate the engine if an alert device has activated. Consult your Yamaha dealer if the problem cannot be located and corrected.**

Low oil pressure-alert indicator

If the engine oil pressure drops too low, the low oil pressure-alert indicator will start to blink, and the engine speed will automatically decrease to about 2000–3500 r/min.



ZMU08417

1. Low oil pressure-alert indicator

Stop the engine immediately if the buzzer sounds and the low oil pressure-alert indicator blinks. Check the engine oil level and replenish oil if necessary. If the alert device has activated while the appropriate engine oil level is maintained, consult your Yamaha dealer.

ECM01602

NOTICE

Do not continue to run the engine if the low oil pressure alert device has activated. Serious engine damage will occur.

EMU26805

Alert system

ECM00093

NOTICE

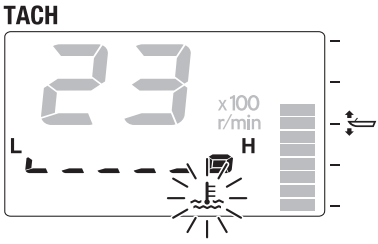
Do not continue to operate the engine if an alert device has activated. Consult your Yamaha dealer if the problem cannot be located and corrected.

EMU43753

Overheat alert

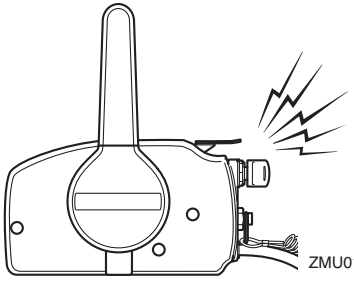
This engine has an overheat-alert device. If the engine temperature rises too high, the alert device will activate.

- The engine speed will automatically decrease to 2000–3500 r/min.
- The overheat-alert indicator will light or blink (if equipped).

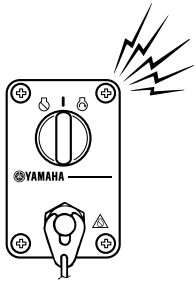


ZMU05422

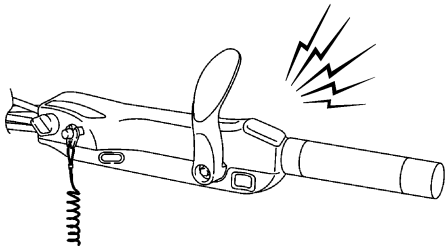
- The buzzer will sound (if equipped on the tiller handle, remote control box, or main switch panel).



ZMU01758



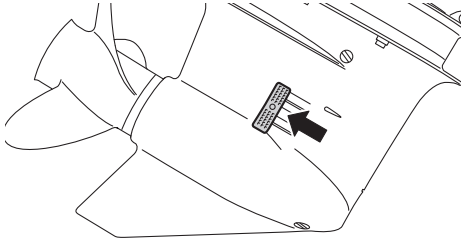
ZMU04583



ZMU05326

If the alert system has activated, stop the engine and check the cooling water inlets:

- Check trim angle to be sure that the cooling water inlet is submerged.
- Check the cooling water inlet for clogging.



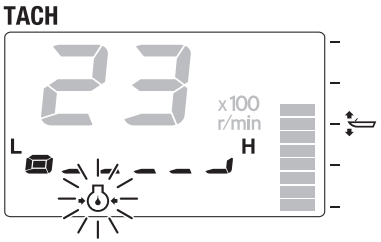
ZMU08288

EMU2685A

Low oil pressure alert

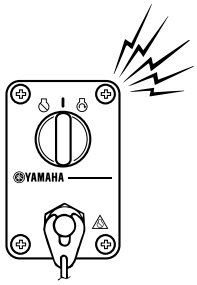
If the oil pressure drops too low, the alert device will activate.

- The engine speed will automatically decrease to about 2000–3500 r/min. The low oil pressure-alert indicator will light or blink.

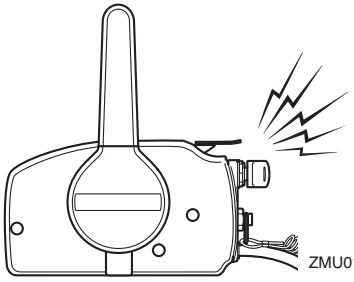


ZMU05431

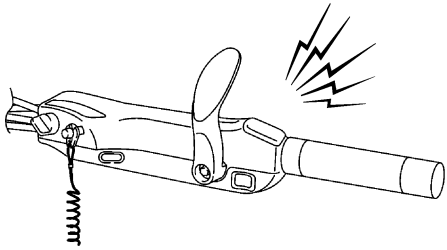
- The buzzer will sound.



ZMU04583



ZMU01758



ZMU05326

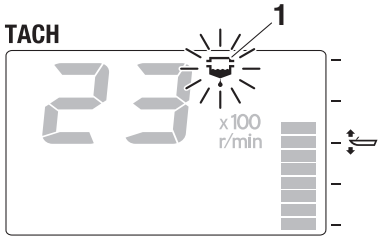
If the alert system has activated, stop the engine as soon as it is safe to do so. Check the oil level and add oil as needed. If the oil level is correct and the alert device does not switch off, consult your Yamaha dealer.

EMU43953

Water separator alert

The outboard motor is equipped with a water separator alert system. If water separated from the fuel exceeds a specific volume, the alert system will activate.

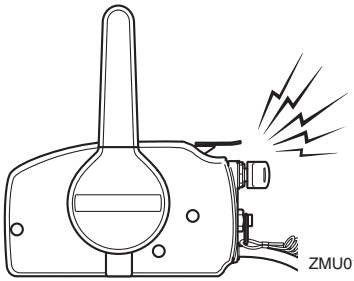
- The water separator-alert indicator will come on or blink.

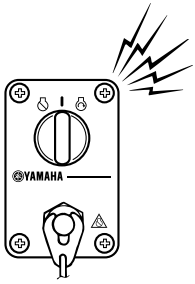


ZMU08546

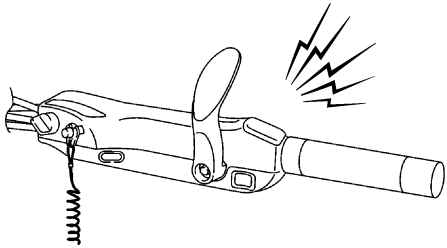
1. Water separator-alert indicator

- The buzzer will sound intermittently when the remote control lever is in the neutral position.


ZMU01758



ZMU04583


ZMU05326

If the alert system has activated, stop the engine and check the fuel filter. If any water is found in the fuel, consult a Yamaha dealer.

ECM02341

NOTICE

Although the buzzer will stop when the engine is started and the remote control lever is moved to the forward or reverse position, do not use the outboard motor. Otherwise, serious engine damage could occur.

EMU26903

Installation

The information presented in this section is intended as reference only. It is not possible to provide complete instructions for every possible boat and motor combination. Proper mounting depends in part on experience and the specific boat and motor combination.

EWM01591

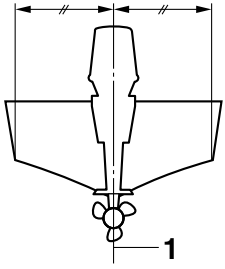
⚠ WARNING

- **Overpowering a boat could cause severe instability. Do not install an outboard motor with more horsepower than the maximum rating on the capacity plate of the boat. If the boat does not have a capacity plate, consult the boat manufacturer.**
- **Improper mounting of the outboard motor could result in hazardous conditions such as poor handling, loss of control, or fire hazards. For permanently mounted models, your dealer or other person experienced in proper rigging should mount the motor.**

EMU33471

Mounting the outboard motor

The outboard motor should be mounted so that the boat is well balanced. Otherwise, the boat could be hard to steer. For single-engine boats, mount the outboard motor on the centerline (keel line) of the boat.



ZMU01760

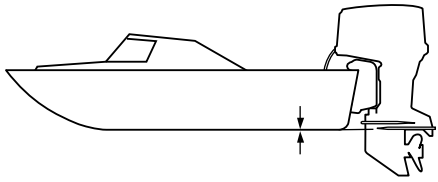
1. Center line (keel line)

EMU26936

Mounting height (boat bottom)

The mounting height of your outboard motor affects its efficiency and reliability. If it is mounted too high, propeller ventilation may occur, which will reduce propulsion due to excessive propeller slip, and the water intakes for the cooling system may not get an adequate water supply, which can cause engine overheating. If the engine is mounted too low, water resistance (drag) will increase, thereby reducing engine efficiency and performance.

Most commonly, outboard motor should be mounted so that the anti-cavitation plate is in alignment with the bottom of the boat. The optimum mounting height of the outboard motor is affected by the boat/motor combination and the desired use. Test runs at different heights can help determine the optimum mounting height. Consult your Yamaha dealer or boat manufacturer for further information on determining the proper mounting height.



ZMU01762

ECM01635

NOTICE

- **Make sure that the idle hole is high enough to prevent water from entering the engine even if the boat is stationary with the maximum load.**

- **Incorrect engine height or obstructions to the smooth flow of water (such as the design or condition of the boat, or accessories, such as transom ladders or depth finder transducers) can create airborne water spray while the boat is cruising. If the outboard motor is operated continuously in the presence of airborne water spray, enough water could enter the engine through the air intake opening in the top cowling to cause severe engine damage. Remove the cause of the airborne water spray.**

EMU36382

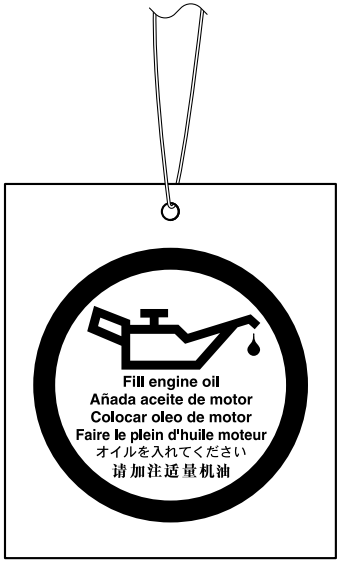
First-time operation

EMU36393

Fill engine oil

The engine is shipped from the factory without engine oil. If your dealer did not fill the oil, you must fill it before starting the engine. ***NOTICE:*** **Check that the engine is filled with oil before first-time operation to avoid severe engine damage.** [ECM01782]

The engine is shipped with the following tag, which should be removed after engine oil is filled for the first time. For more information on checking the engine oil level, see page 45.



ZMU01710

EMU30175

Breaking in engine

Your new engine requires a period of break-in to allow mating surfaces of moving parts to wear in evenly. Correct break-in will help ensure proper performance and longer engine life. ***NOTICE:*** **Failure to follow the break-in procedure could result in reduced engine life or even severe engine damage.** [ECM00802]

EMU27086

Procedure for 4-stroke models

Your new engine requires a period of 10 hours break-in to allow mating surfaces of moving parts to wear in evenly.

TIP:

Run the engine in the water, under load (in gear with a propeller installed) as follows. For 10 hours for breaking in engine avoid extended idling, rough water and crowded areas.

1. For the first hour of operation:
   Run the engine at varying speeds up to 2000 r/min or approximately half throttle.
2. For the second hour of operation:
   Increase engine speed as much as necessary to put the boat on plane (but avoid full-throttle operation), then back off on the throttle while keeping the boat at a planing speed.
3. Remaining 8 hours:
   Run the engine at any speed. However, avoid operating at full throttle for more than 5 minutes at a time.
4. After the first 10 hours:
   Operate the engine normally.

EMU36402

Getting to know your boat

All boats have unique handling characteristics. Operate cautiously while you learn how your boat handles under different conditions and various trim angles (see page 58).

EMU36414

Checks before starting engine

EWM01922

⚠ WARNING

If any item in "Checks before starting engine" is not working properly, have it inspected and repaired before operating the outboard motor. Otherwise, an accident could occur.

ECM00121

NOTICE

Do not start the engine out of water. Overheating and serious engine damage can occur.

EMU36422

Fuel level

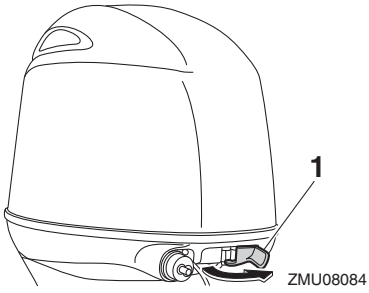
Be sure you have plenty of fuel for your trip. A good rule is to use 1/3 of your fuel to get to the destination, 1/3 to return, and to keep 1/3 as an emergency reserve. With the boat level on a trailer or in the water, turn the key to "ON" (on) and check the fuel level. For fuel filling instructions, see page 48.

EMU40774

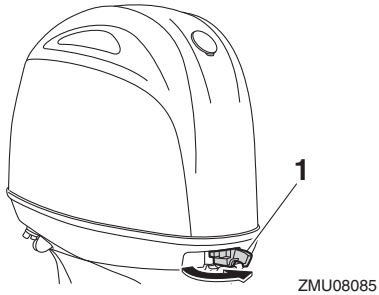
Removing top cowling

For the following checks, remove the top cowling from the bottom cowling.

To remove the top cowling, pull the cowling lock levers and lift up the top cowling.



1. Cowling lock lever



1. Cowling lock lever

EMU36443

Fuel system

EWM00061

⚠ WARNING

Gasoline and its vapors are highly flammable and explosive. Keep away from sparks, cigarettes, flames, or other sources of ignition.

EWM00911

⚠ WARNING

Leaking fuel can result in fire or explosion.

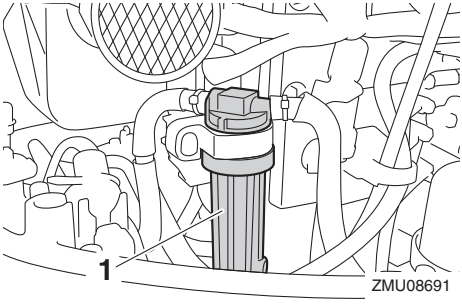
- **Check for fuel leakage regularly.**
- **If any fuel leakage is found, the fuel system must be repaired by a qualified mechanic. Improper repairs can make the outboard unsafe to operate.**

EMU36453

Check for fuel leaks

- Check for fuel leaks or gasoline fumes in the boat.
- Check for fuel leakage from the fuel system.
- Check the fuel tank and fuel lines for cracks, swellings, or other damage.

EMU37323
Checking the fuel filter
Check that the fuel filter is clean and free of water. If any water is found in the fuel, or if a significant amount of debris is found, the fuel tank should be checked and cleaned by a Yamaha dealer.

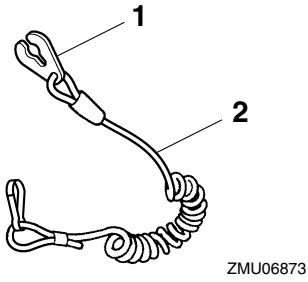


1. Fuel filter

EMU36903
Controls
Tiller handle models:
- Move the tiller handle fully to the left and right to make sure operation is smooth.
- Turn the throttle grip from the fully closed to the fully open position. Make sure that it turns smoothly and that it completely returns to the fully closed position.
- Look for loose or damaged connections of the throttle and shift cables.

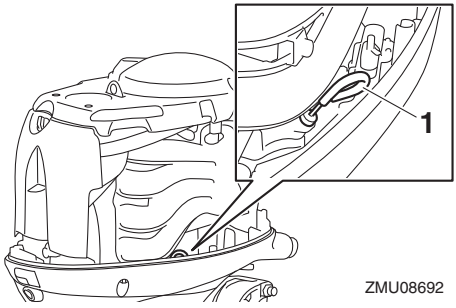
Remote control models:
- Turn the steering wheel full-right and full-left. Make sure operation is smooth and unrestricted throughout the whole range with no binding or excessive free play.
- Operate the throttle levers several times to make sure there is no hesitation in their travel. Operation should be smooth over the complete range of motion, and each lever should return completely to the idle position.
- Look for loose or damaged connections of the throttle and shift cables.

EMU36484
Engine shut-off cord (lanyard)
Inspect the engine shut-off cord and clip for damage, such as cuts, breaks, and wear.



1. Clip
2. Engine shut-off cord (lanyard)

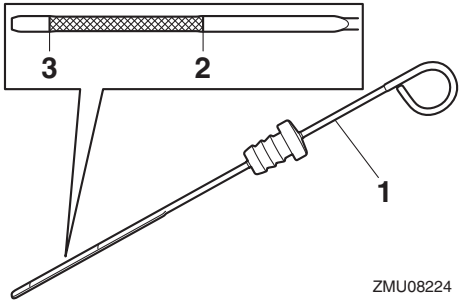
EMU40994
Engine oil
1. Place the outboard motor in a vertical position (not tilted). ***NOTICE:*** **If the outboard motor is not level, the oil level indicated on the oil dipstick may not be accurate.** [ECM01862]
2. Remove the oil dipstick and wipe it clean.



1. Oil dipstick

3. Insert the oil dipstick completely and remove it again.

4. Check that the oil level on the oil dipstick is between the upper and lower marks. Consult your Yamaha dealer if the oil level is not at the proper level or if it appears milky or dirty.



ZMU08224

1. Oil dipstick
2. Upper mark
3. Lower mark

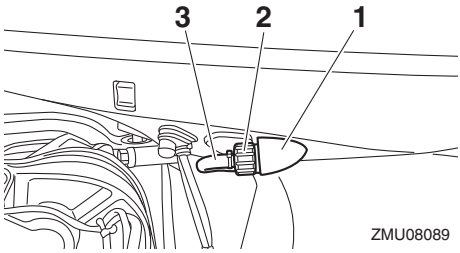
EMU40412
Outboard motor

- Check that the outboard motor is mounted properly and check the outboard motor mounting bolts for looseness.
- Check the propeller for damage.
- Check for engine oil leaks.

EMU36494
Flushing device

Check that the flushing device's garden hose connector is securely screwed on to the fitting on the bottom cowling. ***NOTICE:*** **If the garden hose connector is not properly connected, cooling water can leak out and the engine can overheat during operation.**

[ECM01802]

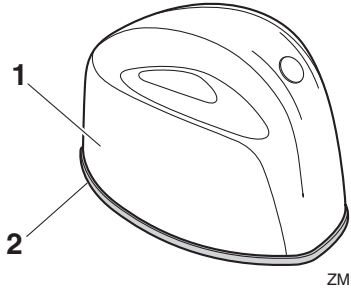


ZMU08089

1. Fitting
2. Garden hose connector
3. Flushing device

EMU36965
Install cowling

1. Be sure that all cowling lock levers are released.
2. Be sure that the rubber seal is seated all the way around the top cowling.

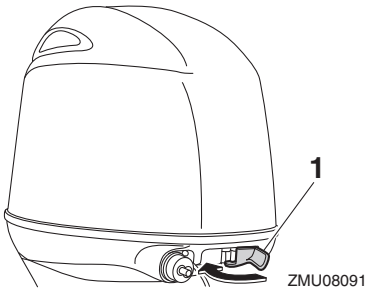


ZMU08090

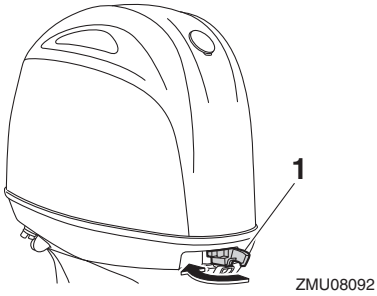
1. Top cowling
2. Rubber seal

3. Place the top cowling on the bottom cowling.
4. Check to be sure the rubber seal is seated correctly between the top cowling and the bottom cowling.
5. Move the cowling lock levers to lock the top cowling as shown. ***NOTICE:*** **If the top cowling is not installed correctly,**

water spray under the top cowling can damage the engine, or the top cowling can blow off at high speeds. [ECM01992]

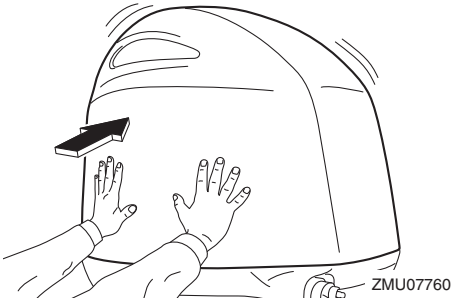


1. Cowling lock lever



1. Cowling lock lever

After installing, check the fitting of the top cowling by pushing it with both hands. If the top cowling is loose, have it repaired by your Yamaha dealer.



EMU34582

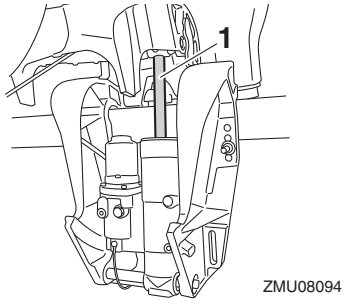
Power trim and tilt system

EWM01931

⚠ WARNING

- **Never get under the lower unit while it is tilted, even when the tilt support lever is locked. Severe injury could occur if the outboard motor accidentally falls.**
- **Body parts can be crushed between the motor and the clamp bracket when the motor is trimmed or tilted.**
- **Be sure no one is near the outboard motor before performing this check.**

1. Check the power trim and tilt unit for any sign of oil leaks.
2. Operate each of the power trim and tilt switches to check that all switches work.
3. Tilt the outboard motor up and check that the trim and tilt rod is pushed out completely.



1. Trim and tilt rod

4. Check that the trim and tilt rod is free of corrosion or other flaws.
5. Tilt the outboard motor down. Check that the trim and tilt rod operates smoothly.

EMU36585

Battery

Check the battery's charge. If your boat is equipped with a Yamaha digital speedometer, the voltmeter and low battery alert functions will help you monitor the battery's

charge. A battery in good condition will provide a minimum of 12 volts. Check that the battery connections are clean, secure and covered by insulating covers. The electrical connections of the battery and cables must be clean and properly connected or the battery will not start the engine.
If the battery needs charging, consult your Yamaha dealer or the battery manufacturer's instructions.
EMU43164

Filling fuel

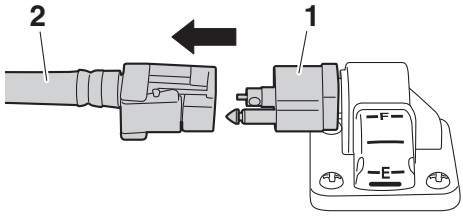
EWM01831

⚠ WARNING

- **Gasoline and its vapors are highly flammable and explosive. Always refuel according to this procedure to reduce the risk of fire and explosion.**
- **Gasoline is poisonous and can cause injury or death. Handle gasoline with care. Never siphon gasoline by mouth. If you should swallow some gasoline or inhale a lot of gasoline vapor, or get some gasoline in your eyes, see your doctor immediately. If gasoline spills on your skin, wash with soap and water. If gasoline spills on your clothing, change your clothes.**

Before refueling, check the following points:
- Ensure the engine is stopped.
- Securely moor the boat in a well-ventilated area and stop the engine. If the boat is trailered, ensure it is stable.
- Do not smoke and keep away from sparks, flames, static electric discharges, or other sources of ignition.
- If you use a portable container to store and dispense fuel, use only a locally approved GASOLINE container.
- To prevent electrostatic sparks, discharge any built-up static electricity from your body before refueling.

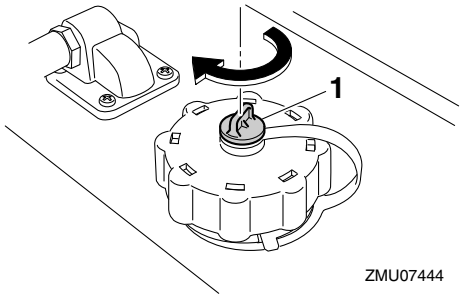
1. Disconnect the fuel hose from the fuel joint on the fuel tank.



ZMU07443

1. Fuel joint
2. Fuel hose

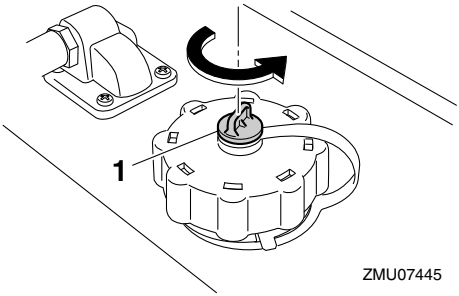
2. Turn the air vent screw clockwise to close it.



ZMU07444

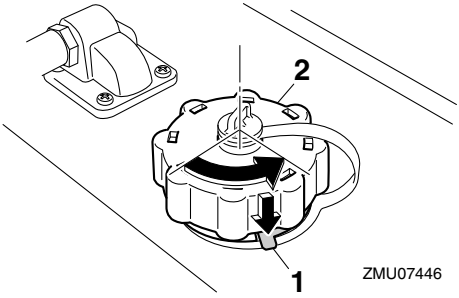
1. Air vent screw

3. Remove the fuel tank from the boat.
4. To loosen the air vent screw, turn it counterclockwise until it stops.



1. Air vent screw

5. While pressing and holding the pressure relief tab under the fuel tank cap, slowly turn the fuel tank cap counterclockwise 1/4 turn.

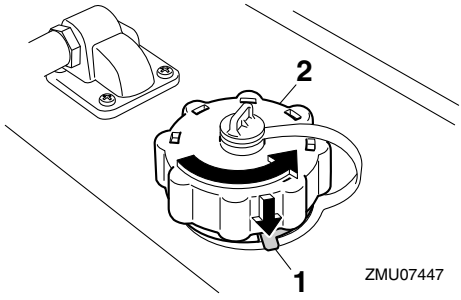


1. Pressure relief tab
2. Fuel tank cap

TIP:

Release the fuel vapor contained in the fuel tank.

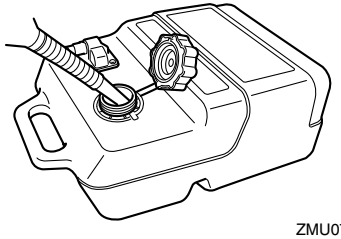
6. While pressing and holding the pressure relief tab under the fuel tank cap again, turn the fuel tank cap counterclockwise to remove it.



1. Pressure relief tab
2. Fuel tank cap

7. Fill the fuel tank with fuel. **WARNING! Do not overfill. Otherwise fuel can expand and overflow if the temperature increases.** [EWM02611]

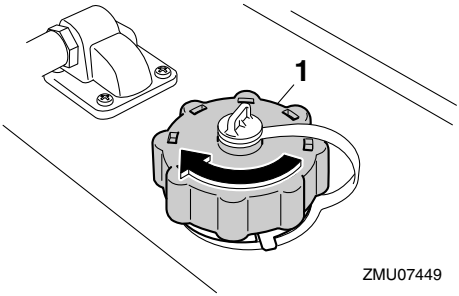
Fuel tank capacity:
25 L (6.61 US gal, 5.50 Imp.gal)



TIP:

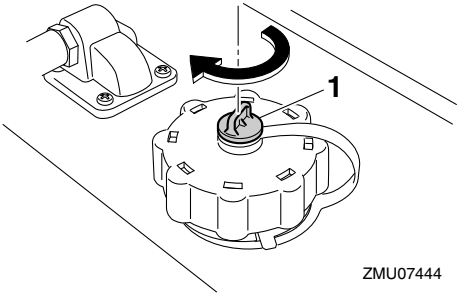
- Wipe up any spilled gasoline immediately with dry rags.
- Dispose of rags properly according to local laws or regulations.

8. Turn the fuel tank cap clockwise to tighten until a click is heard.



1. Fuel tank cap

9. Turn the air vent screw clockwise to close it.



1. Air vent screw

EMU27453

Operating engine

EWM00421

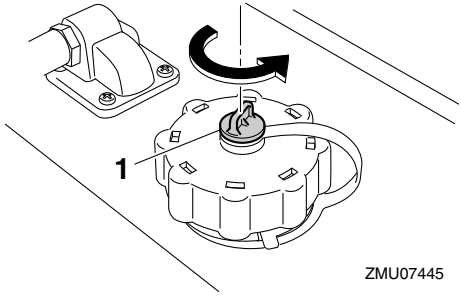
⚠ WARNING

- **Before starting the engine, make sure that the boat is tightly moored and that you can steer clear of any obstructions. Be sure there are no swimmers in the water near you.**
- **When the air vent screw is loosened, gasoline vapor will be released. Gasoline is highly flammable, and its vapors are flammable and explosive. Refrain from smoking, and keep away from open flames and sparks while loosening the air vent screw.**
- **This product emits exhaust gases which contain carbon monoxide, a colorless, odorless gas which could cause brain damage or death when inhaled. Symptoms include nausea, dizziness, and drowsiness. Keep cockpit and cabin areas well ventilated. Avoid blocking exhaust outlets.**

EMU43842

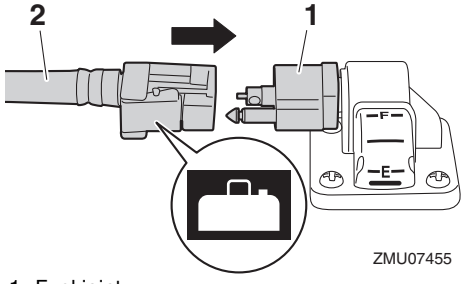
Sending fuel (portable tank)

1. To loosen the air vent screw, turn it counterclockwise until it stops.



1. Air vent screw

2. Firmly connect the other end of the fuel hose to the joint on the fuel tank.



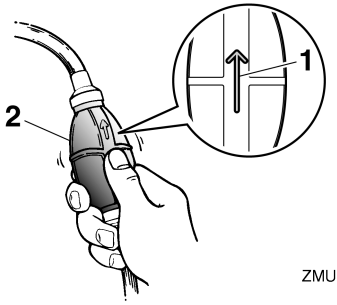
1. Fuel joint
2. Fuel hose

3. Wipe up any spilled gasoline immediately with dry rags.

TIP:

Dispose of rags properly according to local laws or regulations.

4. Squeeze the primer pump, with the arrow pointing up, until you feel it become firm. During engine operation, place the tank horizontally, otherwise fuel cannot be drawn from the fuel tank.



ZMU07457

1. Arrow
2. Primer pump

TIP:

- When using the fuel tank on the boat, a fuel valve may also be equipped on the boat. Open the fuel valve.
- Check the boat's manual for the position of the fuel valve.

EMU27495

Starting engine

EWM01601

⚠ WARNING

Before starting the engine, make sure that the boat is tightly moored and that you can steer clear of any obstructions. Be sure there are no swimmers in the water near you.

EMU27597

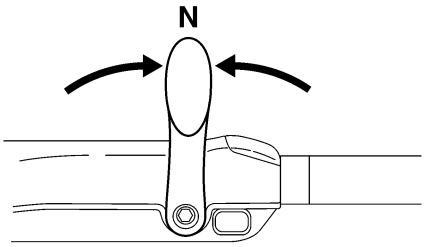
Electric start / prime start models

EWM01842

⚠ WARNING

- **Failure to attach the engine shut-off cord could result in a runaway boat if operator is ejected. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg while operating. Do not attach the cord to clothing that could tear loose. Do not route the cord where it could become entangled, preventing it from functioning.**
- **Avoid accidentally pulling the cord during normal operation. Loss of engine power means the loss of most steering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.**

1. Place the gear shift lever in neutral.

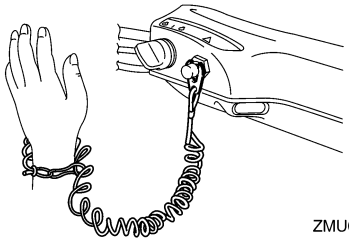


ZMU05215

TIP:

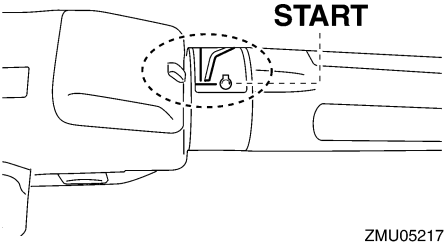
The start-in-gear protection device prevents the engine from starting except when in neutral.

2. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg. Then install the clip on the other end of the cord into the engine shut-off switch.



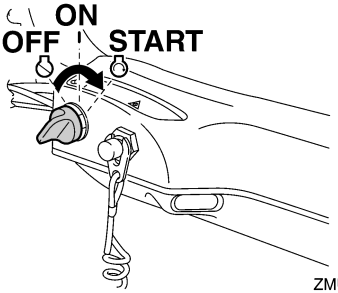
ZMU05216

3. Place the throttle grip in the "START" (start) position. After the engine starts, return the throttle to the fully closed position.



ZMU05217

4. Turn the main switch to "START" (start), and hold it for a maximum of 5 seconds.



ZMU05218

5. Immediately after the engine starts, release the main switch and allow it to return to "ON" (on). ***NOTICE:*** **Never turn the main switch to "START" (start) while the engine is running. Do not keep the starter motor turning for more than 5 seconds. If the starter motor is turned continuously for more than 5 seconds, the battery will be quickly discharged, thus making it impossible to start the engine. The starter can also be damaged. If the engine will not start after 5 seconds of cranking, return the main switch to "ON" (on), wait 10 seconds, then crank the engine again.** [ECM00193]

TIP:

- When the engine is cold, it needs to be warmed up. For further information, see page 54.
- If the engine is warm and fails to start, open the throttle slightly and try to start the engine again. If the engine still fails to start, see page 85.

EMU27666

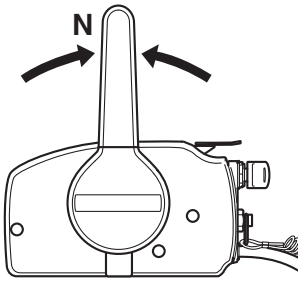
Electric start and remote control models

EWM01842

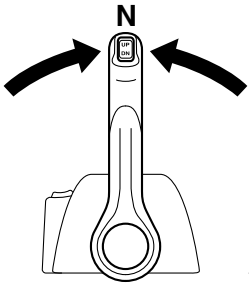
⚠ WARNING

- **Failure to attach the engine shut-off cord could result in a runaway boat if operator is ejected. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg while operating. Do not attach the cord to clothing that could tear loose. Do not route the cord where it could become entangled, preventing it from functioning.**
- **Avoid accidentally pulling the cord during normal operation. Loss of engine power means the loss of most steering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.**

1. Place the remote control lever in neutral.



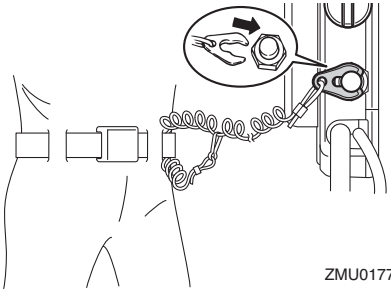
ZMU01771

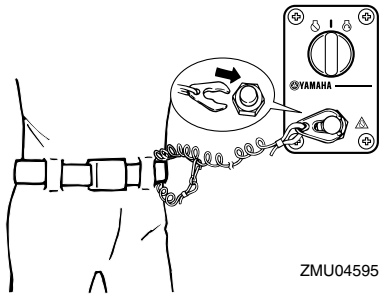


ZMU04588

TIP:
The start-in-gear protection device prevents the engine from starting except when in neutral.

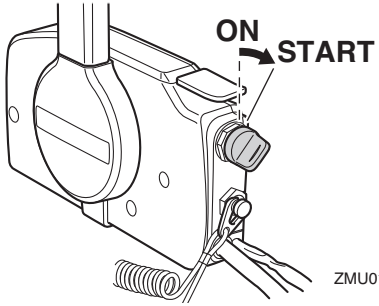
2. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg. Then install the clip on the other end of the cord into the engine shut-off switch.


ZMU01772

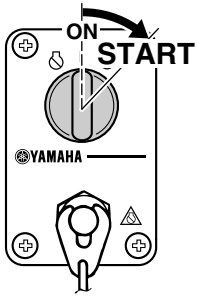


ZMU04595

3. Turn the main switch to "ON" (on).
4. Turn the main switch to "START" (start), and hold it for a maximum of 5 seconds.



ZMU01774



ZMU04596

5. Immediately after the engine starts, release the main switch and allow it to return to "ON" (on). ***NOTICE:*** **Never turn the main switch to "START" (start) while the engine is running. Do not keep the starter motor turning for more than 5 seconds. If the starter motor is turned continuously for more than 5 seconds,**

the battery will be quickly discharged, thus making it impossible to start the engine. The starter can also be damaged. If the engine will not start after 5 seconds of cranking, return the main switch to "ON" (on), wait 10 seconds, then crank the engine again. [ECM00193]

TIP:

- When the engine is cold, it needs to be warmed up. For further information, see page 54.
- If the engine is warm and fails to start, open the throttle slightly and try to start the engine again. If the engine still fails to start, see page 85.

EMU36511

Checks after starting engine

EMU36524

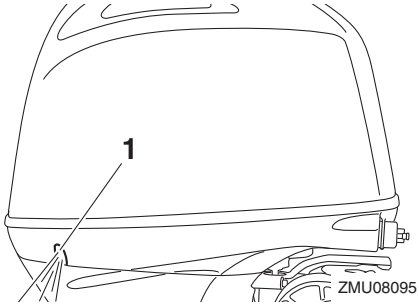
Cooling water

Check for a steady flow of water from the cooling water pilot hole. A continuous flow of water from the pilot hole indicates that the water pump is pumping water through the cooling water passages. If the cooling water passages are frozen, it may take a while for water to start flowing out of the pilot hole.

ECM01811

NOTICE

If water is not flowing out of the pilot hole at all times while the engine is running, overheating and serious damage could occur. Stop the engine and check whether the cooling water inlet on the lower case or the cooling water pilot hole is blocked. Consult your Yamaha dealer if the problem cannot be located and corrected.



1. Cooling water pilot hole

EMU27671

Warming up engine

EMU41234

Procedure for warming up engine

1. After starting the engine, warm up the engine until the engine speed stabilizes at idle speed to provide maximum operating performance and acceleration. ***NOTICE:*** **Failure to do so will shorten engine life.** [ECM04550]

Idle speed (in neutral):
700–800 r/min

2. Check that the low oil pressure-alert indicator remains off. ***NOTICE:*** **If the low oil pressure-alert indicator blinks after the engine starts, stop the engine. Otherwise, serious engine damage could occur. Consult your Yamaha dealer.** [ECM02381]

EMU36532

Checks after engine warm up

EMU36542

Shifting

While the boat is tightly moored, and without applying throttle, confirm that the engine shifts smoothly into forward and reverse, and back to neutral.

EMU36981
Stop switches
- Turn the main switch to "OFF", or press the engine stop button and make sure the engine stops.
- Confirm that removing the clip from the engine shut-off switch stops the engine.
- Confirm that the engine cannot be started with the clip removed from the engine shut-off switch.

EMU34492
Shifting

EWM00181
⚠ WARNING

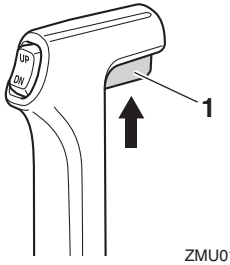
Before shifting, make sure there are no swimmers or obstacles in the water near you.

ECM01611
NOTICE

Warm up the engine before shifting into gear. Until the engine is warm, the idle speed may be higher than normal. High idle speed can prevent you from shifting back to neutral. If this occurs, stop the engine, shift to neutral, then restart the engine and allow it to warm up.

To shift out of neutral

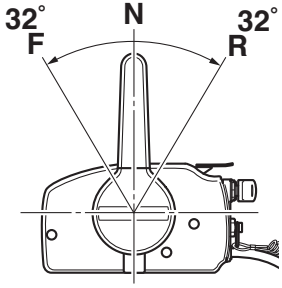
1. Pull the neutral interlock trigger up (if equipped).



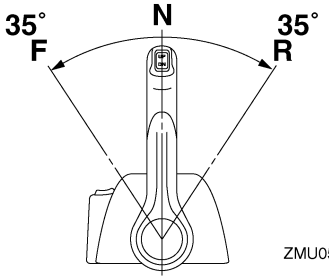
ZMU01727

1. Neutral interlock trigger

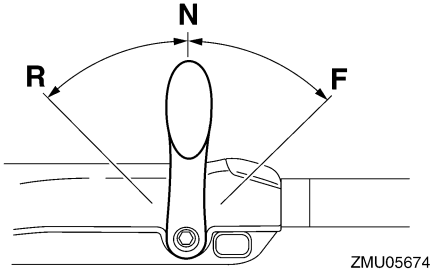
2. Move the remote control lever / gear shift lever firmly and crisply forward (for forward gear) or backward (for reverse gear) [about 35° (a detent can felt) for remote control models].



ZMU05460



ZMU05461

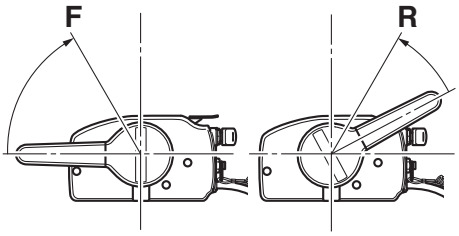


ZMU05674

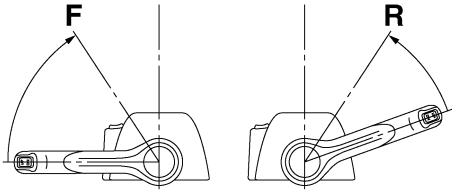
TIP:
Tiller handle models: The gear shift lever operates only when the throttle grip is in the fully closed position.

To shift from in gear (forward/reverse) to neutral

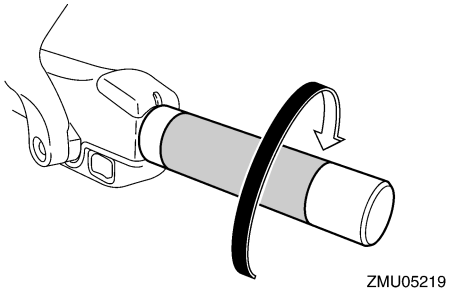
1. Close the throttle so that the engine slows to idle speed.



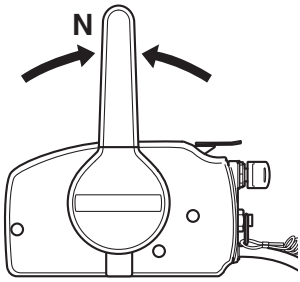
ZMU05462



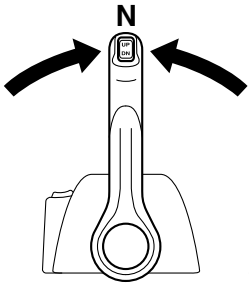
ZMU05463


ZMU05219

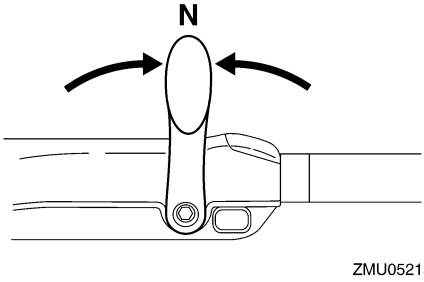
2. After the engine is at idle speed in gear move the remote control lever / gear shift lever firmly and crisply into the neutral position.



ZMU01771



ZMU04588



ZMU05215

EMU31743

Stopping boat

EWM01511

⚠ WARNING

- **Do not use the reverse function to slow down or stop the boat as it could cause you to lose control, be ejected, or impact the steering wheel or other parts of the boat. This could increase the risk of serious injury. It could also damage the shift mechanism.**

- **Do not shift into reverse while traveling at planing speeds. Loss of control, boat swamping, or damage to the boat could occur.**

The boat is not equipped with a separate braking system. Water resistance stops it after the throttle lever is moved back to idle. The stopping distance varies depending on gross weight, water surface conditions, and wind direction.

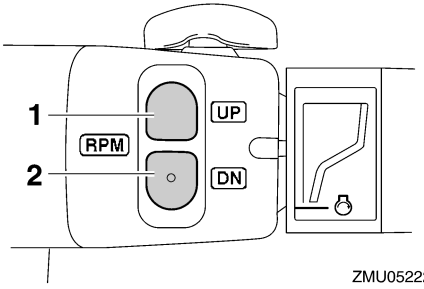
EMU30881

Trolling

EMU30891

Adjusting trolling speed

The trolling speed on outboard motors equipped with the variable trolling RPM switches can be adjusted approximately 50 r/min with each press of a switch.



ZMU05222

1. "**UP**" switch
2. "**DN**" switch

To increase the trolling speed, press the "**UP**" switch.

To decrease the trolling speed, press the "**DN**" switch.

TIP:

- The trolling speed changes approximately 50 r/min each time a switch is pressed.
- If the trolling speed has been adjusted, the engine returns to the normal trolling speed when the engine is stopped and restarted or when the engine speed exceeds approximately 3000 r/min.

EMU27822

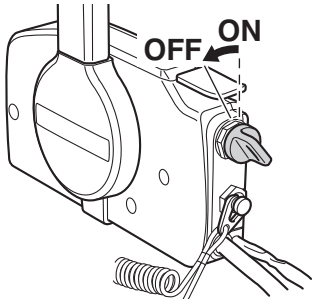
Stopping engine

Before stopping the engine, first let it cool off for a few minutes at idle or low speed. Stopping the engine immediately after operating at high speed is not recommended.

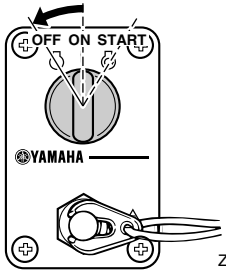
EMU43852

Procedure

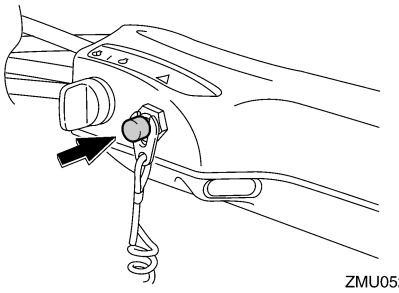
1. Push and hold the engine stop button or turn the main switch to "**OFF**" (off).

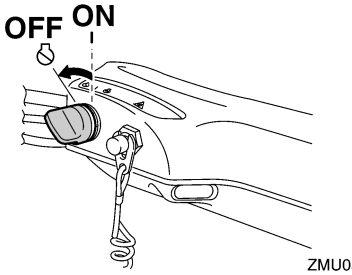


ZMU01779



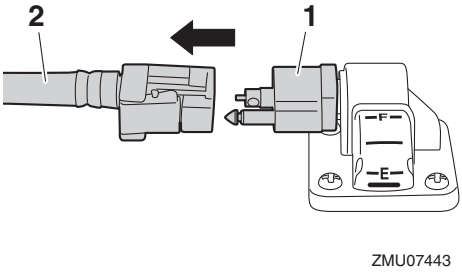
ZMU04599


ZMU05209



ZMU05223

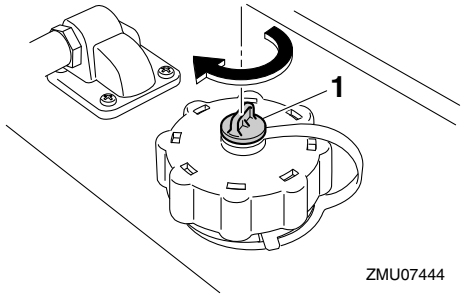
2. After stopping the engine, disconnect the fuel hose from the fuel joint on the fuel tank.



ZMU07443

1. Fuel joint
2. Fuel hose

3. Tighten the air vent screw by turning it clockwise.



ZMU07444

1. Air vent screw

4. Remove the key if the boat will be left unattended.

TIP:

The engine can also be stopped by pulling the cord and removing the clip from the engine shut-off switch, then turning the main switch to "OFF" (off).

EMU27865

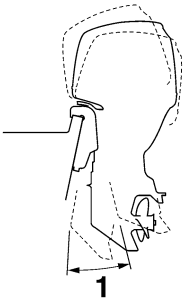
Trimming outboard motor

EWM00741

⚠ WARNING

Excessive trim for the operating conditions (either trim up or trim down) can cause boat instability and can make steering the boat more difficult. This increases the possibility of an accident. If the boat begins to feel unstable or is hard to steer, slow down and/or readjust the trim angle.

The trim angle of the outboard motor helps determine the position of the bow of the boat in the water. Correct trim angle will help improve performance and fuel economy while reducing strain on the engine. Correct trim angle depends upon the combination of boat, engine, and propeller. Correct trim is also affected by variables such as the load in the boat, sea conditions, and running speed.



ZMU05170

1. Trim operating angle

EMU27889

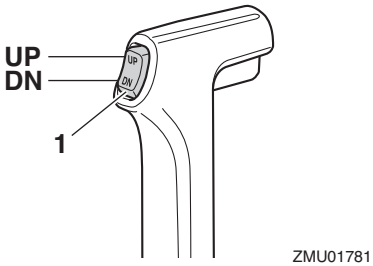
Adjusting trim angle (Power trim and tilt)

EWM00754

⚠ WARNING

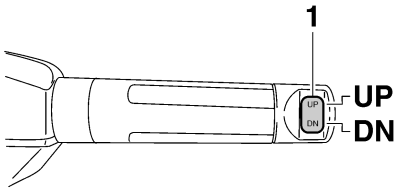
- **Be sure all people are clear of the outboard motor when adjusting the trim angle. Body parts can be crushed between the motor and the clamp bracket when the motor is trimmed or tilted.**
- **Use caution when trying a trim position for the first time. Increase speed gradually and watch for any signs of instability or control problems. Improper trim angle can cause loss of control.**
- **If equipped with a power trim and tilt switch located on the bottom cowling, use the switch only when the boat is at a complete stop with the engine off. Do not adjust the trim angle with this switch while the boat is moving.**

Adjust the outboard motor trim angle using the power trim and tilt switch.



ZMU01781

1. Power trim and tilt switch



ZMU05224

1. Power trim and tilt switch

To raise the bow (trim-out), press the switch "**UP**" (up).

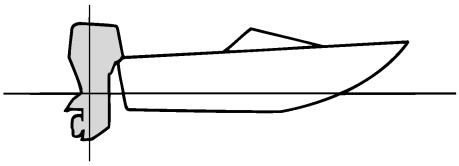
To lower the bow (trim-in), press the switch "**DN**" (down).

Make test runs with the trim set to different angles to find the position that works best for your boat and operating conditions.

EMU27913

Adjusting boat trim

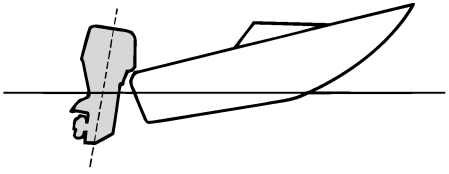
When the boat is on plane, a bow-up attitude results in less drag, greater stability and efficiency. This is generally when the keel line of the boat is up about 3 to 5 degrees. With the bow up, the boat may have a greater tendency to steer to one side or the other. Compensate for this as you steer. When the bow of the boat is down, it is easier to accelerate from a standing start onto plane.



ZMU01784

Bow Up

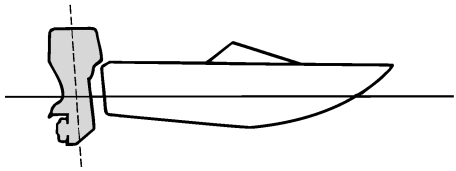
Too much trim-out puts the bow of the boat too high in the water. Performance and economy are decreased because the hull of the boat is pushing the water and there is more air drag. Excessive trim-out can also cause the propeller to ventilate, which reduces performance further, and the boat may "porpoise" (hop in the water), which could throw the operator and passengers overboard.



ZMU01785

Bow Down

Too much trim-in causes the boat to "plow" through the water, decreasing fuel economy and making it hard to increase speed. Operating with excessive trim-in at higher speeds also makes the boat unstable. Resistance at the bow is greatly increased, heightening the danger of "bow steering" and making operation difficult and dangerous.



ZMU01786

TIP:

Depending on the type of boat, the outboard motor trim angle may have little effect on the trim of the boat when operating.

EMU27936

Tilting up and down

If the engine will be stopped for some time or if the boat is moored in shallows, the outboard motor should be tilted up to protect the propeller and lower casing from damage by collision with obstructions, and also to reduce salt corrosion.

EWM00223

⚠ WARNING

Make sure that no one is near the outboard motor when tilting the outboard motor up or down. Otherwise, body parts could be crushed between the outboard motor and the clamp bracket.

EWM00251

⚠ WARNING

Leaking fuel is a fire hazard. If there is a fuel joint on the outboard motor, disconnect the fuel line or close the fuel cock if the engine will be tilted for more than a few minutes. Otherwise fuel may leak.

ECM00242

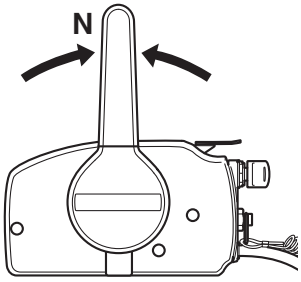
NOTICE

- **Before tilting the outboard motor, stop the engine by following the procedure on page 57. Never tilt the outboard motor while the engine is running. Severe damage from overheating can result.**
- **Do not tilt up the engine by pushing the tiller handle (if equipped) because this could break the handle.**

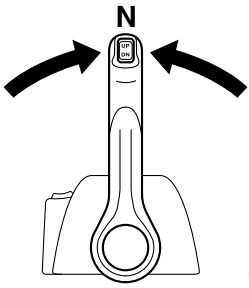
EMU44631

Procedure for tilting up (power trim and tilt models)

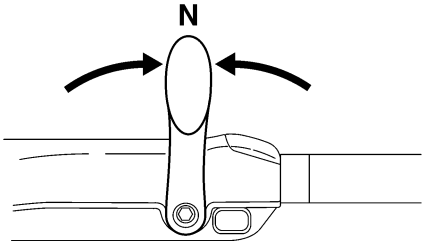
1. Place the remote control lever / gear shift lever in neutral.



ZMU01771

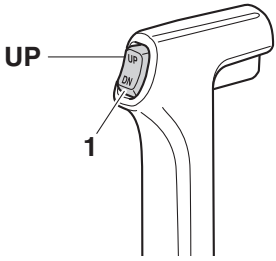


ZMU04588



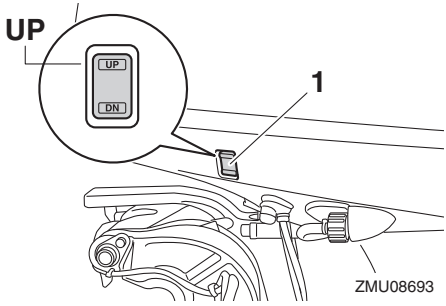
ZMU05215

2. Press the power trim and tilt switch "**UP**" (up) until the outboard motor has tilted up completely.



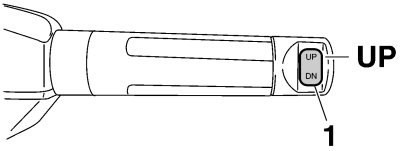
ZMU07848

1. Power trim and tilt switch



ZMU08693

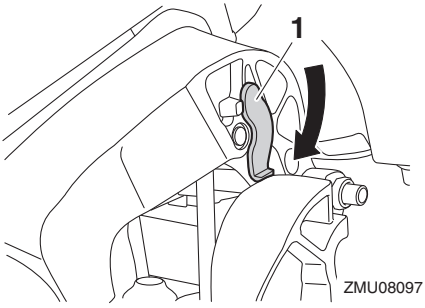
1. Power trim and tilt switch



ZMU08127

1. Power trim and tilt switch

3. Pull the tilt support lever toward you to support the engine. **WARNING! After tilting the outboard motor, be sure to support it with the tilt support knob or tilt support lever. Otherwise the outboard motor could fall back down suddenly if oil in the power trim and tilt unit or in the power tilt unit loses pressure.** [EWM00263] ***NOTICE:*** **Do not use the tilt support lever or knob when trailering the boat. The outboard motor could shake loose from the tilt support and fall. If the motor cannot be trailered in the normal running position, use an additional support device to secure it in the tilt position. For more detailed information, see page 65.** [ECM01642]



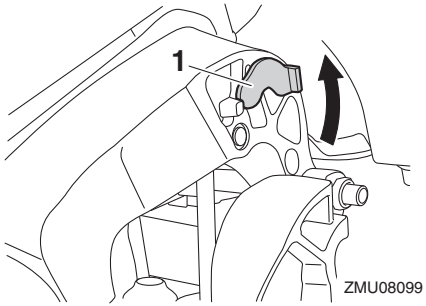
ZMU08097

1. Tilt support lever

EMU42702

Procedure for tilting down

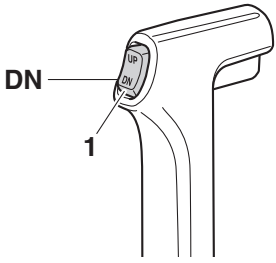
1. Push the power trim and tilt switch "**UP**" (up) until the outboard motor is supported by the tilt rod and the tilt support lever becomes free.
2. Release the tilt support lever.



ZMU08099

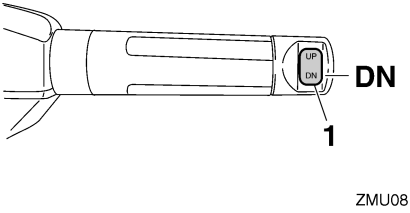
1. Tilt support lever

3. Push the power trim and tilt switch "**DN**" (down) to lower the outboard motor to the desired position.



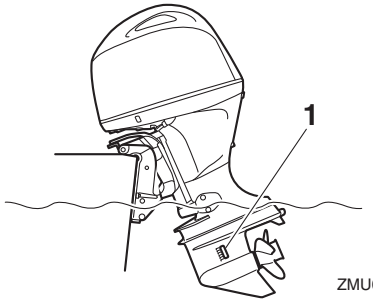
ZMU07851

1. Power trim and tilt switch



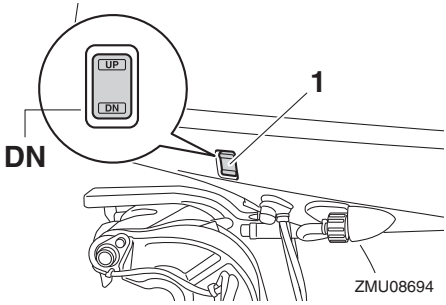
ZMU08128

1. Power trim and tilt switch



ZMU08144

1. Cooling water inlet



ZMU08694

1. Power trim and tilt switch

EMU28063

Shallow water

EMU40702

Cruising in shallow water

The outboard motor can be tilted up partially to allow operation in shallow water.

ECM02361

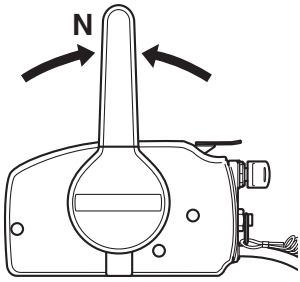
NOTICE

Do not tilt the outboard motor up so that the cooling water inlet on the lower unit is above the surface of the water when setting up for and cruising in shallow water. Otherwise severe damage from overheating can result.

EMU32914

Procedure for power trim and tilt models

1. Place the remote control lever / gear shift lever in neutral.



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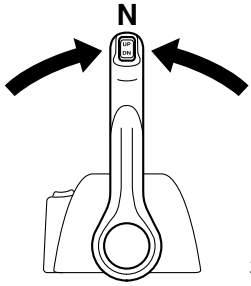

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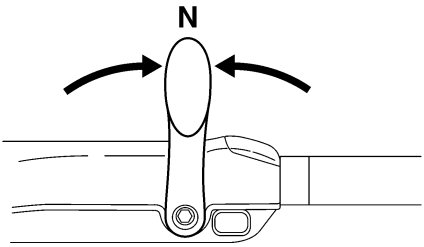


ZMU05215

2. Slightly tilt the outboard motor up to the desired position using the power trim and tilt switch. **WARNING! Using the power trim and tilt switch on the bottom cowling while the boat is moving or engine is on could increase the risk of falling overboard and could distract the operator, increasing the risk of collision with another boat or an obstacle.** [EWM01851]
3. To return the outboard motor to the normal running position, press the power trim and tilt switch and slowly tilt the outboard motor down.

EMU28196

Cruising in other conditions

Cruising in salt water

After operating in salt water, flush the cooling water passages with fresh water to prevent them from becoming clogged. Also rinse the outside of the outboard motor with fresh water.

Cruising in muddy, turbid, or acidic water

Yamaha strongly recommends that you use the optional chromium-plated water pump kit (see page 14) if you use the outboard motor in acidic water or water with a lot of sediment in it, such as muddy or turbid (cloudy) water. After operating in such water, flush the cooling passages with fresh water to prevent corrosion. Also rinse the outside of the outboard motor with fresh water.

EMU2822B
Transporting and storing outboard motor

EWM02621
⚠ WARNING

- **USE CARE when transporting fuel tank, whether in a boat or car.**
- **DO NOT fill fuel container to maximum capacity. Gasoline will expand considerably as it warms up and can build up pressure in the fuel container. This can cause fuel leakage and a potential fire hazard.**
- **Leaking fuel is a fire hazard. When transporting and storing the outboard motor, disconnect the fuel line from the outboard motor to prevent fuel from leaking.**
- **Never get under the outboard motor while it is tilted. Severe injury could occur if the outboard motor accidentally falls.**
- **Do not use the tilt support lever or knob when trailering the boat. The outboard motor could shake loose from the tilt support and fall. If the outboard motor cannot be trailered in the normal running position, use an additional support device to secure it in the tilt position.**

ECM02441
NOTICE

When storing the outboard motor for prolonged time, fuel must be drained from the fuel tank. The deteriorated fuel could clog the fuel line causing engine start difficulty or malfunction.

When storing or transporting the outboard motor, make sure to follow the procedure listed below.

- Disconnect the fuel line from the outboard motor.
- Tighten the fuel tank cap and its air vent screw.
- When the outboard motor is tilted prolonged time for mooring or trailering the boat, disconnect the fuel line from the outboard motor. Tighten the fuel tank cap and its air vent screw.

The outboard motor should be transported and stored in the normal running position. If there is insufficient road clearance in this position, then trailer the outboard motor in the tilt position using a motor support device such as a transom saver bar. Consult your Yamaha dealer for further details.

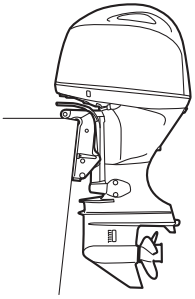
EMU44930
Storing outboard motor

When storing your Yamaha outboard motor for prolonged periods of time (2 months or longer), several important procedures must be performed to prevent excessive damage. It is advisable to have your outboard motor serviced by an authorized Yamaha dealer prior to storage. However, you, the owner, with a minimum of tools, can perform the following procedures.

ECM04450
NOTICE

- **To prevent problems which can be caused by oil entering the cylinder from the sump, keep the outboard motor in the attitude shown when transporting and storing it. If storing or transporting the outboard motor on its side (not upright, port side only), put it on a cushion after draining the engine oil.**
- **Do not place the outboard motor on its side before the cooling water has drained from it completely, otherwise water may enter the cylinder through the exhaust port and cause engine trouble.**

- **Store the outboard motor in a dry, well-ventilated place, not in direct sunlight.**
- **Drain the remaining gasoline from the vapor separator. Gasoline left in the vapor separator for a prolonged period of time will break down and could cause damage to the fuel line.**



ZMU08126

EMU28306

Procedure

EMU44323

Flushing with the flushing attachment

EWM00323

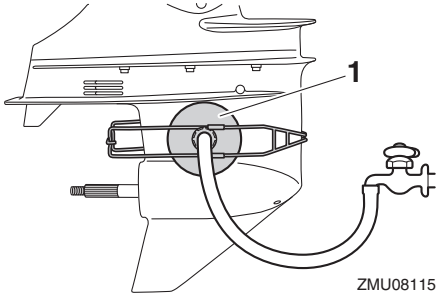
⚠ WARNING

You could be seriously injured if the engine accidentally starts when you are near the propeller.

- **Before inspecting, removing, or installing the propeller, remove the ignition coils from the spark plugs. Also, place the shift control in neutral, turn the main switch to "OFF" (off) and remove the key, and remove the clip from the engine shut-off switch. Turn off the battery cut-off switch if your boat has one.**
- **Do not use your hand to hold the propeller when loosening or tightening the propeller nut. Put a wood block between the anti-cavitation plate and the propeller to prevent the propeller from turning.**

Cooling system flushing is essential to prevent the cooling system from clogging up with salt, sand, or dirt. In addition, fogging/lubricating of the engine is mandatory to prevent excessive engine damage due to rust. Perform the flushing and fogging at the same time.

1. If there is a fuel joint or a fuel valve on the boat, disconnect the fuel line from the joint or close the fuel valve.
2. Wash the exterior of the outboard motor using fresh water. ***NOTICE:*** **Do not spray water into the air intake.** [ECM01841] For further information, see page 68.
3. Remove the top cowling and propeller.
4. Install the flushing attachment over the cooling water inlet, and then turn on the water supply. ***NOTICE:*** **Do not run the engine without supplying it with cooling water. Either the engine water pump will be damaged or the engine will be damaged from overheating. Before starting the engine, be sure to supply water to the cooling water passages. Avoid running the outboard motor at high speed while on the flushing attachment, otherwise overheating could occur.** [ECM02001]



ZMU08115

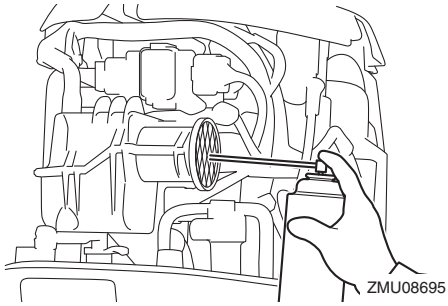
1. Flushing attachment

TIP:
A flushing attachment is available from your Yamaha dealer.

5. Run the engine at a fast idle for a few minutes in neutral while supplying fresh water. **WARNING! Do not touch or remove electrical parts when starting or during operation. Keep hands, hair, and clothes away from the flywheel and other rotating parts while the engine is running.** [EWM00092] ***NOTICE:*** **Never turn the main switch to "START" (start) while the engine is running. Do not keep the starter motor turning for more than 5 seconds. If the starter motor is turned continuously for more than 5 seconds, the battery will be quickly discharged, thus making it impossible to start the engine. The starter can also be damaged. If the engine will not start after 5 seconds of cranking, return the main switch to "ON" (on), wait 10 seconds, then crank the engine again.** [ECM00193]

TIP:
- When using the flushing attachment, maintain adequate water pressure so that there is a steady flow of water from the cooling water pilot hole.
- If the overheat alert device is activated, turn the engine off, and consult your Yamaha dealer.

6. Just prior to turning off the engine, quickly spray fogging oil into the intake silencer. When properly done, the engine will smoke excessively and almost stall.



TIP:
If fogging oil is not available, consult your Yamaha dealer.

7. Turn off the water supply, and then remove the flushing attachment and wipe off any excess water.
8. Install the top cowling and propeller.
9. Drain the cooling water completely out of the outboard motor. Clean the exterior of the outboard motor thoroughly.

EMU41321
Draining the gasoline from the vapor separator
Gasoline in the vapor separator must be drained before storing the outboard motor. Have a Yamaha dealer drain the gasoline from the vapor separator.

EMU41072
Lubrication
1. Change the gear oil. For instructions, see page 81. Check the gear oil for the presence of water that indicates a leaky seal. Seal replacement should be performed by an authorized Yamaha dealer prior to use.
2. Lubricate all grease fittings. For further details, see page 74.

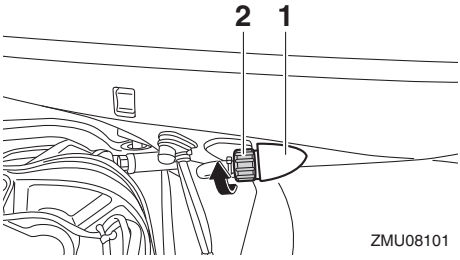
TIP:
For long-term storage, fogging the engine with fogging oil is recommended. Contact your Yamaha dealer for information about fogging oil and procedures for your outboard motor.

EMU40964
Flushing cooling water passage
Perform this procedure right after operation for the most thorough flushing.

ECM01531
NOTICE

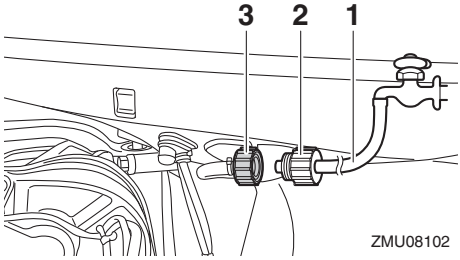
Do not perform this procedure while the engine is running. The water pump may be damaged and severe damage from overheating can result.

1. Disconnect the garden hose connector from the fitting on the bottom cowling.



1. Fitting
2. Garden hose connector

2. Connect the garden hose to the garden hose connector.



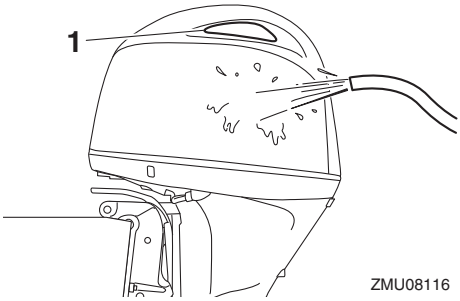
1. Garden hose
2. Garden hose adapter (commercially available)
3. Garden hose connector

3. With the engine off, turn on the water supply and let the water flush through the cooling water passages for about 15 minutes.
4. Turn off the water supply, and then disconnect the garden hose from the garden hose connector.
5. Connect the garden hose connector to the fitting on the bottom cowling and tighten it securely. ***NOTICE:*** **If the garden hose connector is not properly connected, cooling water can leak out and the engine can overheat during operation.** [ECM01802]

TIP:
When flushing the cooling water passages with the boat in the water, tilting the outboard motor up until it is completely out of the water will achieve better results.

EMU44342
Cleaning the outboard motor
When cleaning the outboard motor, the top cowling must be installed.

1. Wash the exterior of the outboard motor using fresh water. ***NOTICE:*** **Do not spray water into the air intake.** [ECM01841]



1. Air intake

2. Drain the cooling water completely out of the outboard motor. Clean the body thoroughly.

EMU28463
Checking painted surface of outboard motor

Check the outboard motor for scratches, nicks, or flaking paint. Areas with damaged paint are more likely to corrode. If necessary, clean and paint the areas. Touch-up paint is available from your Yamaha dealer.

EMU2847E
Periodic maintenance

EWM01872
⚠ WARNING

These procedures require mechanical skills, tools, and supplies. If you do not have the proper skills, tools, or supplies to perform a maintenance procedure, have a Yamaha dealer or other qualified mechanic do the work.

The procedures involve disassembling the motor and exposing dangerous parts. To reduce the risk of injury from moving, hot, or electrical parts:

- **Turn off the engine and keep the key(s) and engine shut-off cord (lanyard) with you when you perform maintenance unless otherwise specified.**
- **The power trim and tilt switches operate even when the ignition key is off. Keep people away from the switches whenever working around the motor. When the motor is tilted, keep away from the area under it or between it and the clamp bracket. Be sure no one is in this area before operating the power trim and tilt mechanism.**
- **Allow the engine to cool before handling hot parts or fluids.**
- **Always completely reassemble the motor before operation.**

EMU28512
Replacement parts

If replacement parts are necessary, use only genuine Yamaha parts or parts of equivalent design and quality. Any part of inferior quality may malfunction, and the resulting loss of control could endanger the operator and passengers. Yamaha genuine parts and accessories are available from your Yamaha dealer.

EMU34152
Severe operating conditions

Severe operating conditions involve one or more of the following types of operation on a regular basis:

- Operating continuously at or near maximum engine speed (rpm) for many hours
- Operating continuously at a low engine speed (rpm) for many hours
- Operating without sufficient time for engine to warm up and cool down
- Frequent quick acceleration and deceleration
- Frequent shifting
- Frequently starting and stopping the engine(s)
- Operation that fluctuates often between light and heavy cargo loads

Outboard motors operating under any of these above conditions require more frequent maintenance. Yamaha recommends that you do this service twice as often as specified in the maintenance chart. For example, if a particular service should be done at 50 hours, do it instead at 25 hours. This will help prevent more rapid deterioration of engine components.

EMU46071
Maintenance chart 1

TIP:

- Refer to the sections in this chapter for explanations of each owner-specific action.
- The maintenance cycle on these charts assume usage of 100 hours per year and regular flushing of the cooling water passages. Maintenance frequency should be adjusted when operating the engine under adverse conditions such as extended trolling.
- Disassembly or repairs may be necessary depending on the outcome of maintenance checks.
- Expendable or consumable parts and lubricants will lose their effectiveness over time and through normal usage regardless of the warranty period.
- When operating in salt water, muddy, other turbid (cloudy), acidic water, the engine should be flushed with clean water after each use.

The "●" symbol indicates the check-ups which you may carry out yourself.
The "○" symbol indicates work to be carried out by your Yamaha dealer.

Item	Actions	Initial	Every			Page
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)	
Anode(s) (external)	Inspection or replacement as necessary		●/○			82
Anode(s) (internal) *1	Inspection or replacement as necessary		○			—
Anode(s) (internal) *2	Replacement				○	—
Battery (electrolyte level, terminal)	Inspection	●/○	●/○			82
Battery (electrolyte level, terminal)	Fill, charging or replacing as necessary		○			—
Cooling water leakage	Inspection or replacement as necessary	○	○			—
Cowling lock lever	Inspection		●/○			44, 46
Engine starting condition/noise	Inspection	●/○	●/○			50

Item	Actions	Initial	Every			Page
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)	
Engine idle speed/noise	Inspection	●/○	●/○			76
Engine oil	Replacement	●/○	●/○			76
Engine oil filter (cartridge)	Replacement		●/○			—
Fuel filter (can be disassembled)	Inspection or replacement as necessary	●/○	●/○			45
Fuel line (High pressure)	Inspection	●	●			—
Fuel line (High pressure)	Inspection or replacement as necessary	○	○			—
Fuel line (Low pressure)	Inspection	●	●			—
Fuel line (Low pressure)	Inspection or replacement as necessary	○	○			—
Fuel pump	Inspection or replacement as necessary			○		—
Fuel/engine oil leakage	Inspection	○	○			—
Gear oil	Replacement	●/○	●/○			81
Greasing points	Greasing	●/○	●/○			74
Clamp bracket bolt (through tube)	Inspection and greasing		○			—
Impeller/water pump housing	Inspection or replacement as necessary		○			—
Impeller/water pump housing	Replacement			○		—
Power trim and tilt unit	Inspection	●/○	●/○			47
Propeller/propeller nut/cotter pin	Inspection or replacement as necessary	●/○	●/○			79
PCV (Pressure Control Valve)	Inspection or replacement as necessary		○			—
Shift link/shift cable	Inspection, adjustment or replacement as necessary	○	○			—

Item	Actions	Initial	Every			Page
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)	
Spark plug(s)	Inspection or replacement as necessary		●/○			75
Spark plug caps/spark plug wires	Inspection or replacement as necessary	○	○			—
Shift Dampener System (SDS) propeller damper	Inspection or replacement		○			—
Water from the cooling water pilot hole	Inspection	●/○	●/○			54
Throttle link/throttle cable	Inspection, adjustment or replacement as necessary	○	○			—
Thermostat	Inspection or replacement as necessary		○			—
Timing belt	Inspection or replacement as necessary		○			—
Valve clearance	Inspection and adjustment				○	—
Cooling water inlet	Inspection	●/○	●/○			17
Main switch/stop switch	Inspection or replacement as necessary	○	○			—
Wire harness connections/wire coupler connections	Inspection or replacement as necessary	○	○			—
(Yamaha) Meter/gauge	Inspection	○	○			—
Fuel tank (Yamaha portable tank)	Inspection and cleaning as necessary		○			—

EMU47020

*1 cylinder head, cylinder block

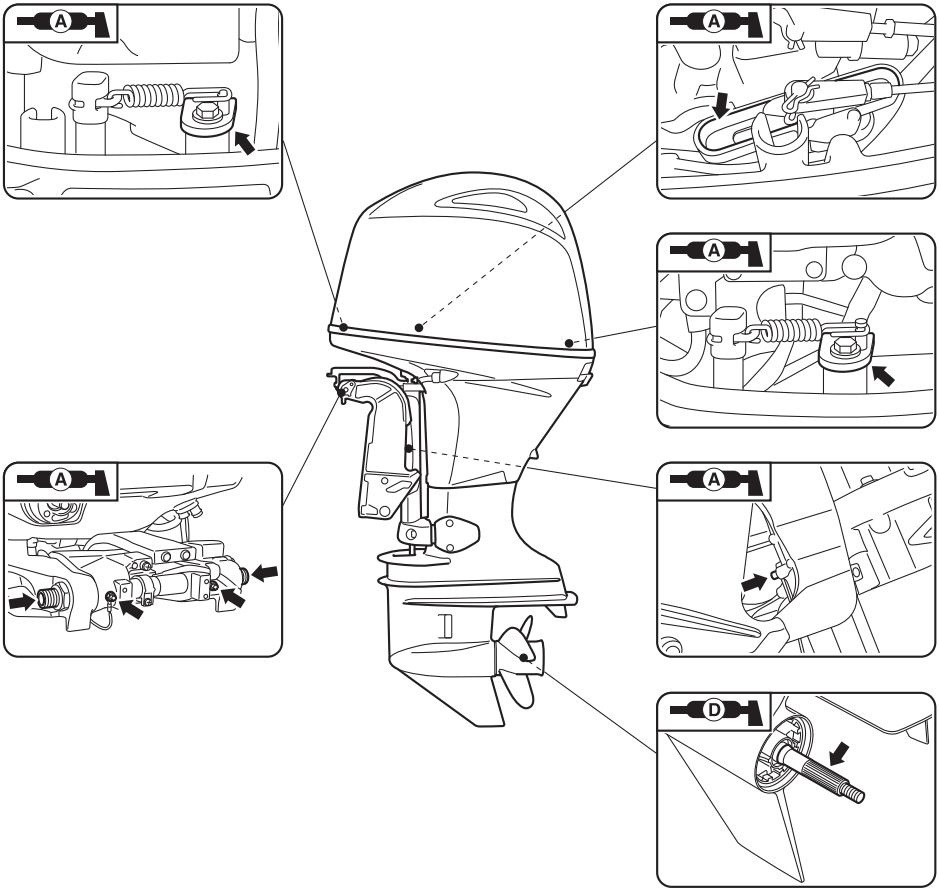
*2 cylinder head, cylinder block, fuel cooler, exhaust guide

EMU46080
Maintenance chart 2

Item	Actions	Every	Page
		1000 hours	
Exhaust guide/exhaust manifold	Inspection or replacement as necessary	◯	—
Timing belt	Replacement	◯	—

EMU46620
Greasing

Yamaha grease A "A" (water resistant grease)
Yamaha grease D "D" (corrosion resistant grease)



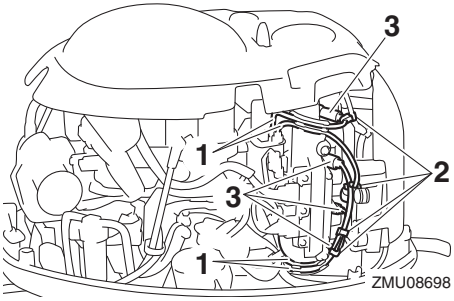
ZMU08696

EMU47031
Inspecting spark plug

The spark plug is an important engine component. The condition of the spark plug can indicate something about the condition of the engine. For example, if the center electrode porcelain is very white, this could indicate an intake air leak or carburetion problem in that cylinder. Do not attempt to diagnose any problems yourself. Instead, take the outboard motor to a Yamaha dealer. You should periodically remove and check the spark plug because heat and deposits will cause the spark plug to slowly break down and erode.

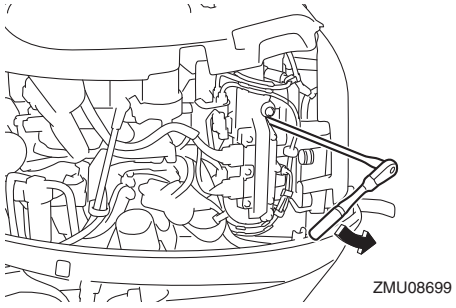
To remove the spark plug

1. Remove the spark plug wire from the holder.



1. Spark plug wire
2. Holder
3. Spark plug cap

2. Remove the spark plug cap from the spark plug.
3. Remove the spark plug. **WARNING! When removing or installing a spark plug, be careful not to damage the insulator. A damaged insulator could allow external sparks, which could lead to explosion or fire.** [EWM00562]

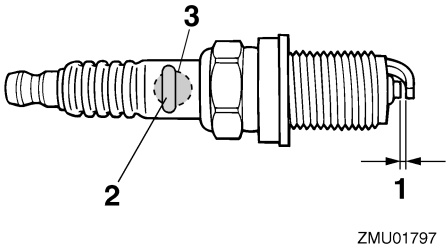


To check the spark plug

1. Check the condition of the spark plug. If electrode erosion becomes excessive or carbon and other deposits are excessive, replace the spark plug with the specified plug.

Standard spark plug:
LKR6E-9N

2. Measure the spark plug gap using a thickness gauge. If the spark plug gap is out of specification, replace the spark plug with the specified plug.



1. Spark plug gap
2. Spark plug part number
3. Spark plug I.D. mark (NGK)

Spark plug gap:
0.8–0.9 mm (0.031–0.035 in)

To install the spark plug

1. Wipe off any dirt from the threads, insulator, and gasket surface of the spark plug.
2. Install the spark plug, and then tighten it to the specified torque.

Spark plug tightening torque:
25 N·m (2.55 kgf·m, 18.4 lb·ft)

TIP:

If a torque-wrench is not available when you are reinstalling a spark plug, a good estimate of the correct torque is 1/12 turn past finger-tight. When you are installing a new spark plug, a good estimate of the correct torque is 1/2 turn past finger-tight.

3. Install the spark plug cap.
4. Fit the spark plug wire to the holder.

EMU29045

Inspecting idle speed

EWM00452

⚠ WARNING

- **Do not touch or remove electrical parts when starting or during operation.**
- **Keep hands, hair, and clothes away from the flywheel and other rotating parts while the engine is running.**

ECM00491

NOTICE

This procedure must be performed while the outboard motor is in the water. A flushing attachment or test tank can be used.

If the boat is not equipped with a tachometer for the outboard motor, use a diagnostic tachometer for this procedure. Results may vary depending on whether testing is conducted with the flushing attachment, in a test tank, or with the outboard motor in the water.

1. Start the engine and allow it to warm up fully in neutral until it is running smoothly.
2. Once the engine has warmed up, verify whether the idle speed is set to specification. For idle speed specifications, see page 10. If you have difficulty verifying the idle speed, or the idle speed requires adjustment, consult a Yamaha dealer or other qualified mechanic.

EMU38807

Changing engine oil

EWM00761

⚠ WARNING

- **Avoid draining the engine oil immediately after stopping the engine. The oil is hot and should be handled with care to avoid burns.**
- **Be sure the outboard motor is securely fastened to the transom or a stable stand.**

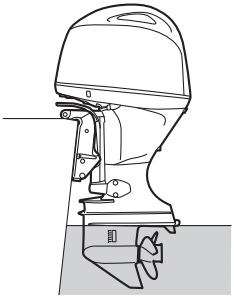
ECM01711

NOTICE

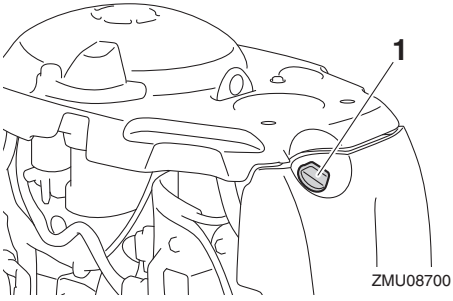
Change the engine oil after the first 20 hours of operation or 3 months, and every 100 hours or at 1-year intervals thereafter. Otherwise the engine will wear quickly.

To prevent spilling oil where it could cause damage to nature, it is strongly recommended that you use an oil changer to change the engine oil. If an oil changer is not available, drain the engine oil by removing the drain screw. If you are not familiar with the procedure for changing the engine oil, consult your Yamaha dealer.

1. Put the outboard motor in an upright position (not tilted). ***NOTICE:*** **If the outboard motor is not level, the oil level indicated on the oil dipstick may not be accurate.** [ECM01862]

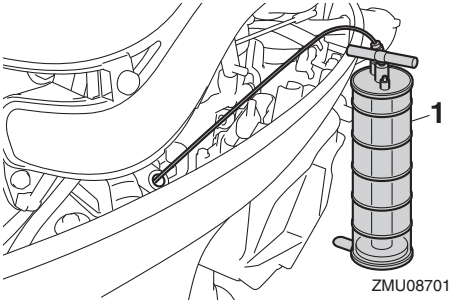

ZMU08105

2. Start the engine. Warm it up and keep the idle speed for 5-10 minutes.
3. Stop the engine and leave it for 5-10 minutes.
4. Remove the top cowling.
5. Remove the oil filler cap. Pull out the dipstick and use the oil changer to extract the oil completely.



ZMU08700

1. Oil filler cap

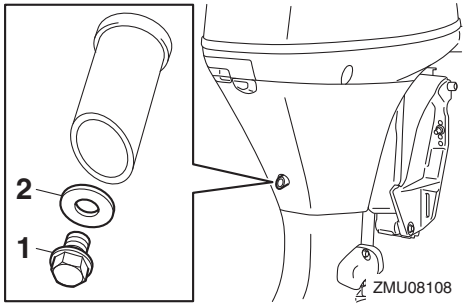


ZMU08701

1. Oil changer

TIP:
When using an oil changer, skip steps 6 and 7.

6. Prepare a suitable container that holds a larger amount than the engine oil capacity. Remove the drain screw and gasket while holding the container under the drain hole. Let the oil drain completely. Wipe up any spilled oil immediately.



ZMU08108

1. Drain screw
2. Gasket

TIP:
If the oil does not drain easily, change the tilt angle or turn the outboard motor to port and starboard to drain the oil.

7. Put a new gasket on the oil drain screw. Apply a light coat of oil to the gasket and install the drain screw.

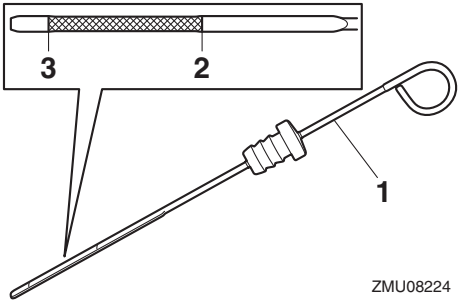
Drain screw tightening torque:
27 N·m (2.75 kgf·m, 19.9 lb·ft)

TIP:
If a torque wrench is not available when you are installing the drain screw, finger tighten the screw just until the gasket comes into contact with the surface of the drain hole. Then tighten 1/4 to 1/2 turn more. Tighten the drain screw to the correct torque with a torque wrench as soon as possible.

8. Add the correct amount of oil through the filler hole. Put back the filler cap and the dipstick. ***NOTICE:*** **Overfilling the oil could cause leakage or damage. If the oil level is above the upper level mark, drain until the level meets the specified capacity.** [ECM01851]

Recommended engine oil:
YAMALUBE 4 or 4-stroke outboard motor oil
Engine oil quantity (without oil filter replacement):
3.0 L (3.17 US qt, 2.64 Imp.qt)
Engine oil quantity (with oil filter replacement):
3.2 L (3.38 US qt, 2.82 Imp.qt)

9. Leave the outboard motor for 5-10 minutes.
10. Remove the oil dipstick and wipe it clean.
11. Insert the dipstick and remove it again. Be sure to completely insert the dipstick into the dipstick guide, otherwise the oil level measurement will be incorrect.
12. Recheck the oil level using the dipstick to be sure the level falls between the upper and lower marks. Consult your Yamaha dealer if the oil level is out of specified level.



ZMU08224

1. Oil dipstick
2. Upper mark
3. Lower mark

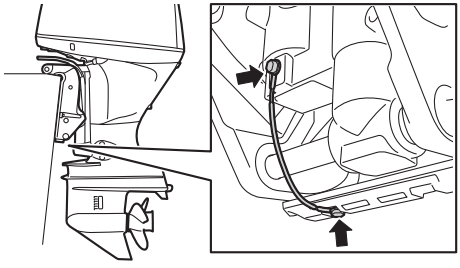
13. Start the engine and make sure that the low oil pressure-alert indicator remains off. Also, make sure that there are no oil leaks. ***NOTICE:*** **If the low oil pressure-alert indicator comes on or if there are oil leaks, stop the engine and find the cause. Continued operation with a problem could cause severe engine damage. Consult your Yamaha dealer if the problem cannot be located and corrected.** [ECM01623]
14. Install the top cowling.
15. Dispose of used oil according to local regulations.

TIP:

- For more information on the disposal of used oil, consult your Yamaha dealer.
- Change the oil more often when operating the engine under adverse conditions such as extended trolling.

EMU29116
Inspecting wiring and connectors

- Inspect that each connector is engaged securely.
- Inspect that each ground lead is properly secured.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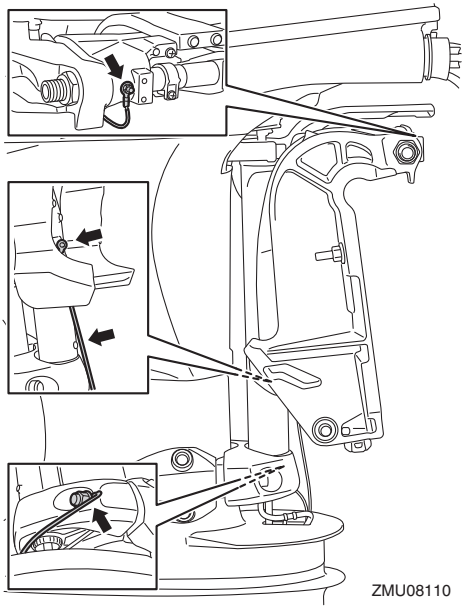


ZMU08110

EMU32113

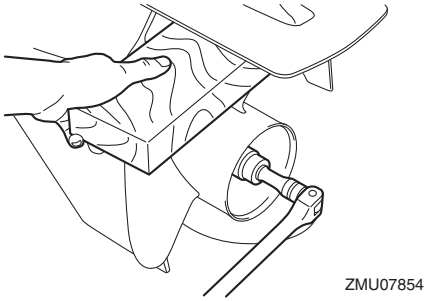
Checking propeller

EWM01882

⚠ WARNING

You could be seriously injured if the engine accidentally starts when you are near the propeller. Before inspecting, removing, or installing the propeller, place the shift control in neutral, turn the main switch to "OFF" (off) and remove the key, and remove the clip from the engine shut-off switch. Turn off the battery cut-off switch if your boat has one.

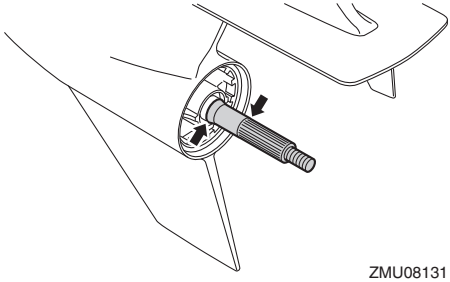
Do not use your hand to hold the propeller when loosening or tightening the propeller nut. Put a wood block between the anti-cavitation plate and the propeller to prevent the propeller from turning.



ZMU07854

Checkpoints

- Check each of the propeller blades for erosion from cavitation or ventilation, or other damage.
- Check the propeller shaft for damage.
- Check the splines for wear or damage.
- Check for fish line tangled around the propeller shaft.



ZMU08131

- Check the propeller shaft oil seal for damage.

EMU30663

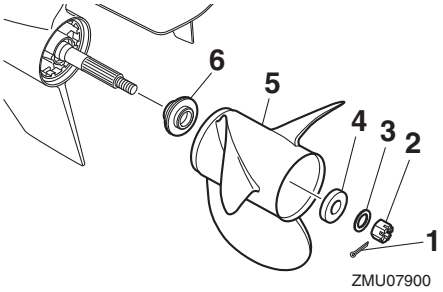
Removing propeller

EMU29198

Spline models

1. Straighten the cotter pin and pull it out using a pair of pliers.
2. Remove the propeller nut, washer, and spacer (if equipped). **WARNING! Do not use your hand to hold the propeller when loosening the propeller nut.**

[EWM01891]



ZMU07900

1. Cotter pin
2. Propeller nut
3. Washer
4. Spacer
5. Propeller
6. Thrust washer

3. Remove the propeller, washer (if equipped), and thrust washer.

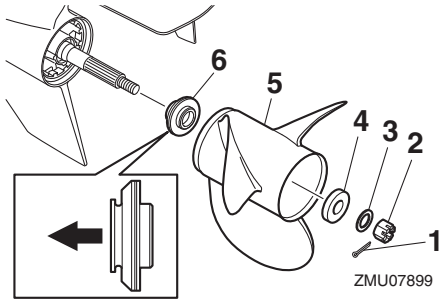
EMU30673
Installing propeller

EMU29236
Spline models

ECM00502
NOTICE

Make sure to use a new cotter pin and bend the ends over securely. Otherwise, the propeller could come off during operation and be lost.

1. Apply Yamaha marine grease or a corrosion resistant grease to the propeller shaft.
2. Install the spacer (if equipped), thrust washer, washer (if equipped), and propeller on the propeller shaft. ***NOTICE:*** **Make sure to install the thrust washer before installing the propeller. Otherwise, the lower case and propeller boss could be damaged.** [ECM01882]
3. Install the spacer (if equipped) and the washer. Tighten the propeller nut to the specified torque.

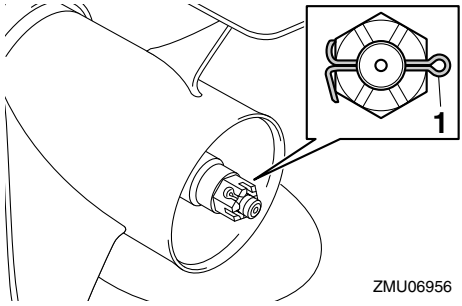


ZMU07899

1. Cotter pin
2. Propeller nut
3. Washer
4. Spacer
5. Propeller
6. Thrust washer

Propeller nut tightening torque:
54 N·m (5.51 kgf·m, 39.8 lb·ft)

4. Align the propeller nut with the propeller shaft hole. Insert a new cotter pin in the hole and bend the cotter pin ends. ***NOTICE:*** **Do not reuse the cotter pin. Otherwise, the propeller can come off during operation.** [ECM01892]



ZMU06956

1. Cotter pin

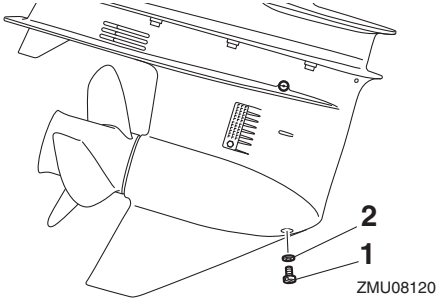
TIP:
If the propeller nut does not align with the propeller shaft hole after tightening to the specified torque, tighten the nut further to align it with the hole.

EMU47100
Changing gear oil
EWM00801

⚠ WARNING

- **Be sure the outboard motor is securely fastened to the transom or a stable stand. You could be severely injured if the outboard motor falls on you.**
- **Never get under the lower unit while it is tilted, even when the tilt support lever or knob is locked. Severe injury could occur if the outboard motor accidentally falls.**

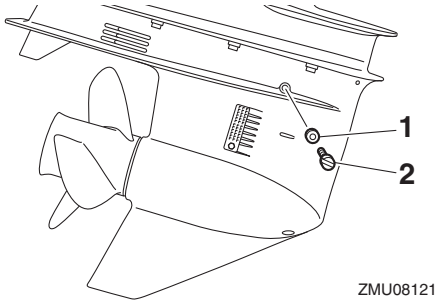
1. Tilt the outboard motor so that the gear oil drain screw is at the lowest point possible.
2. Place a suitable container under the gear case.
3. Remove the gear oil drain screw and gasket. The screw is magnetic so a small quantity of metal particles on the end of the screw is normal. Simply remove them. ***NOTICE:*** **If there is an excessive quantity of metal particles on the magnetic gear oil drain screw, this can indicate lower unit problem. Consult your Yamaha dealer.** [ECM01901]



1. Gear oil drain screw
2. Gasket

TIP:
Always use new gaskets. Do not reuse the removed gaskets.

4. Remove the oil level plug and gasket to allow the oil to drain completely. ***NOTICE:*** **Check the used gear oil after it has been drained. If the gear oil is milky or contains water or a large amount of metal particles, the gear case may be damaged. Have a Yamaha dealer check and repair the outboard motor.** [ECM00714]

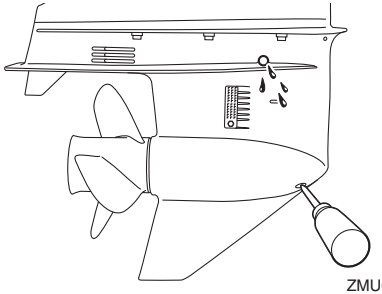


1. Gasket
2. Oil level plug

TIP:
For disposal of used oil, consult your Yamaha dealer.

5. Put the outboard motor in a vertical position. Using a flexible or pressurized filling device, inject the gear oil into the gear oil drain screw hole.

Recommended gear oil:
YAMALUBE outboard gear oil or Hypoid gear oil
Recommended gear oil grade:
SAE 90 API GL-4 / SAE 80W API GL-5 / SAE 90 API GL-5
Gear oil quantity:
0.760 L (0.803 US qt, 0.669 Imp.qt)


ZMU08122

6. Put a new gasket on the oil level plug. When the oil begins to flow out of the oil level plug hole, insert and tighten the oil level plug to the specified torque.

TIP:
Apply a light coat of gear oil to the oil level plug thread and gasket before installation.

Tightening torque:
7 N·m (0.71 kgf·m, 5.2 lb·ft)

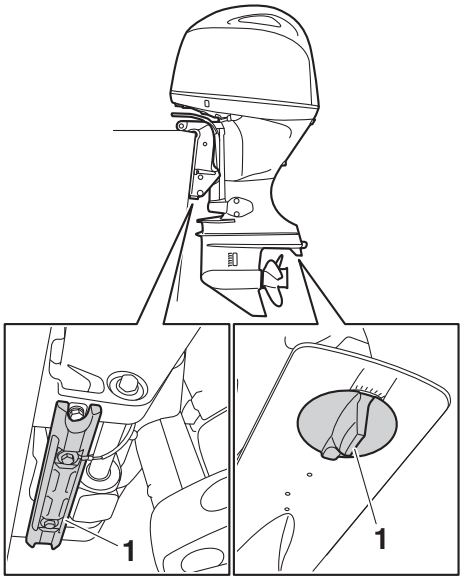
7. Put a new gasket on the gear oil drain screw. Insert and tighten the gear oil drain screw to the specified torque.

TIP:
Apply a light coat of gear oil to the gear oil drain screw thread and gasket before installation.

Tightening torque:
7 N·m (0.71 kgf·m, 5.2 lb·ft)

EMU29318
Inspecting and replacing anode(s)
Yamaha outboard motors are protected from corrosion by sacrificial anodes. Inspect the external anodes periodically. Remove scales from the surfaces of the anodes. Consult a Yamaha dealer for replacement of external anodes.

ECM00721
NOTICE
Do not paint anodes, as this would render them ineffective.



ZMU08111

1. Anode

TIP:
Inspect ground leads attached to external anodes on equipped models. Consult a Yamaha dealer for inspection and replacement of internal anodes attached to the power unit.

EMU29324
Checking battery (for electric start models)
EWM01903
⚠ WARNING
Battery electrolyte is poisonous and caustic, and batteries generate explosive hydrogen gas. When working near the battery:

- **Wear protective eye gear and rubber gloves.**
- **Do not smoke or bring any other source of ignition near the battery.**

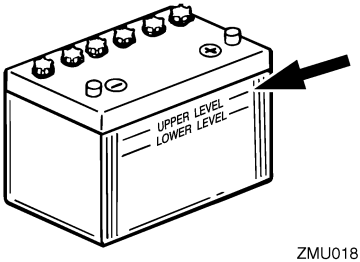
The procedure for checking the battery varies for different batteries. This procedure contains typical checks that apply to many batteries, but you should always refer to the battery manufacturer's instructions.

ECM01921

NOTICE

A poorly maintained battery will quickly deteriorate.

1. Check the electrolyte level.



ZMU01810

2. Check the battery's charge. If your boat is equipped with the digital speedometer, the voltmeter and low battery alert functions will help you monitor the battery's charge. If the battery needs charging, consult your Yamaha dealer.
3. Check the battery connections. They should be clean, secure, and covered by an insulating cover. **WARNING! Bad connections can produce shorting or arcing and cause an explosion.** [EWM01913]

EMU29335

Connecting the battery

EWM00573

⚠ WARNING

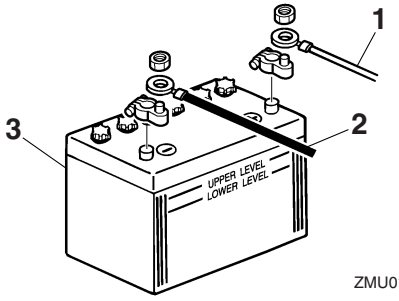
Mount the battery holder securely in a dry, well-ventilated, vibration-free location in the boat. Install a fully charged battery in the holder.

ECM01125

NOTICE

Do not reverse the battery cables. Otherwise, the electrical parts could be damaged.

1. Make sure the main switch (on applicable models) is "**OFF**" (off) before working on the battery.
2. Connect the red battery cable to the POSITIVE (+) terminal first. Then connect the black battery cable to the NEGATIVE (-) terminal.



ZMU01811

1. Red cable
2. Black cable
3. Battery

3. The electrical contacts of the battery and cables must be clean and properly connected, or the battery will not start the engine.

EMU29372

Disconnecting the battery

1. Turn off the battery cut-off switch (if equipped) and main switch. ***NOTICE:*** **If they are left on, the electrical system can be damaged.** [ECM01931]
2. Disconnect the negative cable(s) from the negative (-) terminal. ***NOTICE:*** **Always disconnect all negative (-) cables first to avoid a short circuit and damage to the electrical system.** [ECM01941]
3. Disconnect the positive cable(s) and remove the battery from the boat.
4. Clean, maintain, and store the battery according to the manufacturer's instructions.

EMU47140

Troubleshooting

This section describes the likely causes and remedies for problems, such as those in the fuel, compression, and ignition systems, poor starting, and loss of power. Please note that all of the items in this section may not apply to your model.
If your outboard motor requires repair, bring it to a Yamaha dealer.
If the engine trouble-alert indicator is blinking, consult your Yamaha dealer.

Starter will not operate.
Q. Is remote control lever in gear?
A. Shift to neutral.

Q. Is battery capacity low or weak?
A. Check battery condition. Use battery of recommended capacity.

Q. Are battery connections corroded or loose?
A. Tighten battery cables and clean battery terminals.

Q. Is fuse for starter relay or electric circuit blown?
A. Check for cause of electric overload and repair. Replace fuse with one of correct amperage.

Q. Are starter components malfunctioning?
A. Have serviced by a Yamaha dealer.

Engine will not start (starter operates).
Q. Is clip on engine shut-off cord (lanyard) installed?
A. Install clip to engine shut-off switch.

Q. Is fuel tank empty?
A. Fill tank with clean, fresh fuel.

Q. Is fuel contaminated or stale?
A. Fill tank with clean, fresh fuel.

Q. Is fuel filter clogged?
A. Clean or replace fuel filter.

Q. Is starting procedure incorrect?
A. See page 51.

Q. Is fuel pump malfunctioning?
A. Have serviced by a Yamaha dealer.

Q. Are spark plugs fouled or of incorrect type?
A. Inspect spark plugs. Clean or replace with recommended type.

Q. Are spark plug caps fitted incorrectly?
A. Check and re-fit caps.

Q. Are ignition parts malfunctioning?
A. Have serviced by a Yamaha dealer.

Q. Is ignition wiring damaged or poorly connected?
A. Inspect wires for breaks and wear. Have connections tightened and broken or worn wires replaced by a Yamaha dealer.

Q. Are engine inner parts damaged?
A. Have serviced by a Yamaha dealer.

Engine idles irregularly or stalls.
Q. Are spark plugs fouled or of incorrect type?
A. Inspect spark plugs. Clean or replace with recommended type.

Q. Is fuel system clogged?

A. Inspect for pinched or kinked fuel line or other obstructions in fuel system.

Q. Is fuel contaminated or stale?
A. Fill tank with clean, fresh fuel.

Q. Is fuel filter clogged?
A. Clean or replace fuel filter.

Q. Are ignition parts malfunctioning?
A. Have serviced by a Yamaha dealer.

Q. Has alert system activated?
A. Find and correct cause of alert.

Q. Is spark plug gap incorrect?
A. Replace spark plug.

Q. Is ignition wiring damaged or poorly connected?
A. Inspect wires for breaks and wear. Have connections tightened and broken or worn wires replaced by a Yamaha dealer.

Q. Is specified engine oil not being used?
A. Inspect engine oil and replace with specified type.

Q. Is thermostat clogged or malfunctioning?
A. Have serviced by a Yamaha dealer.

Q. Is fuel pump malfunctioning?
A. Have serviced by a Yamaha dealer.

Q. Is fuel tank air vent restricted or clogged?
A. Remove obstruction.

Q. Is outboard motor angle too high?
A. Return to normal operating position.

Q. Is fuel joint connection incorrect?
A. Connect correctly.

Q. Is throttle cable adjustment incorrect?
A. Have serviced by a Yamaha dealer.

Q. Is battery cable disconnected?
A. Connect securely.

Alert buzzer sounds or indicator lights.

Q. Is cooling system clogged?
A. Inspect cooling water inlet for obstructions.

Q. Is low oil pressure-alert indicator on or blinking?
A. Have serviced by a Yamaha dealer.

Q. Is heat range of spark plugs incorrect?
A. Inspect spark plugs and replace with recommended type.

Q. Is specified engine oil not being used?
A. Inspect engine oil and replace with specified type.

Q. Is engine oil contaminated or deteriorated?
A. Replace engine oil with specified type.

Q. Is oil filter clogged?
A. Have serviced by a Yamaha dealer.

Q. Is oil pump malfunctioning?
A. Have serviced by a Yamaha dealer.

Q. Is load on boat improperly distributed?
A. Distribute load to place boat on an even plane.

Q. Is thermostat or water pump malfunctioning?

A. Have serviced by a Yamaha dealer.

Q. Is there excess water in fuel filter?
A. Drain fuel filter.

Engine power loss.
Q. Is propeller damaged?
A. Have propeller repaired or replaced.

Q. Is propeller pitch or diameter incorrect?
A. Install correct propeller to operate outboard motor at its recommended speed (r/min) range.

Q. Is outboard motor mounted at incorrect height on transom?
A. Have outboard motor adjusted to proper transom height.

Q. Has alert system activated?
A. Find and correct cause of alert.

Q. Is boat bottom fouled with marine growth?
A. Clean boat bottom.

Q. Are spark plugs fouled or of incorrect type?
A. Inspect spark plugs. Clean or replace with recommended type.

Q. Are weeds or other foreign material tangled on gear housing?
A. Remove foreign material and clean lower unit.

Q. Is fuel system clogged?
A. Inspect for pinched or kinked fuel line or other obstructions in fuel system.

Q. Is fuel filter clogged?
A. Clean or replace fuel filter.

Q. Is fuel contaminated or stale?
A. Fill tank with clean, fresh fuel.

Q. Is spark plug gap incorrect?
A. Replace spark plug.

Q. Is ignition wiring damaged or poorly connected?
A. Inspect wires for breaks and wear. Have connections tightened and broken or worn wires replaced by a Yamaha dealer.

Q. Are electrical parts malfunctioning?
A. Have serviced by a Yamaha dealer.

Q. Is specified fuel not being used?
A. Replace fuel with specified type.

Q. Is specified engine oil not being used?
A. Replace engine oil with specified type.

Q. Is thermostat clogged or malfunctioning?
A. Have serviced by a Yamaha dealer.

Q. Is fuel tank air vent restricted or clogged?
A. Remove obstruction.

Q. Is fuel pump malfunctioning?
A. Have serviced by a Yamaha dealer.

Q. Is fuel joint connection incorrect?
A. Connect correctly.

Q. Is heat range of spark plugs incorrect?
A. Inspect spark plugs and replace with recommended type.

Q. Is engine not responding properly to remote control lever position?

A. Have serviced by a Yamaha dealer.

Engine vibrates excessively.
Q. Is propeller damaged?
A. Have propeller repaired or replaced.

Q. Is propeller shaft damaged?
A. Have serviced by a Yamaha dealer.

Q. Are weeds or other foreign material tangled on propeller?
A. Remove and clean propeller.

Q. Are outboard motor mounting bolts loose?
A. Tighten bolts or have serviced by a Yamaha dealer.

Q. Is steering pivot loose or damaged?
A. Have serviced by a Yamaha dealer.

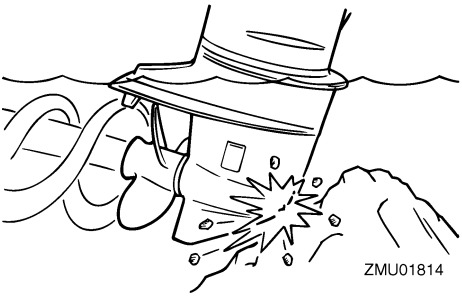
EMU29434
Temporary action in emergency

EMU29442
Impact damage

EWM00871
⚠ WARNING

The outboard motor can be seriously damaged by a collision while operating or trailering. Damage could make the outboard motor unsafe to operate.

If the outboard motor hits an object in the water, follow the procedure below.


ZMU01814

1. Stop the engine immediately.
2. Check the control system and all components for damage. Also, check the boat for damage.
3. Whether damage is found or not, return to the nearest harbor slowly and carefully.
4. Have a Yamaha dealer check the outboard motor before operating it again.

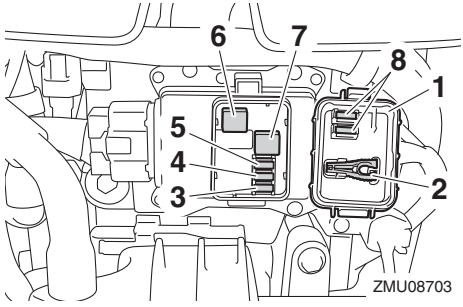
EMU46602
Replacing fuse

EWM00632
⚠ WARNING

Substituting an incorrect fuse or a piece of wire could allow excessive current flow. This could cause electric system damage and a fire hazard.

If a fuse has blown, replace the fuse according to the following procedure.

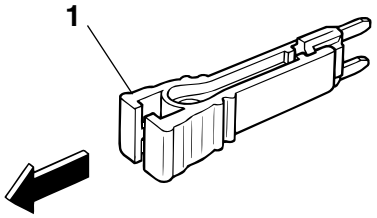
1. Turn the main switch to the "**OFF**" (off) position.
2. Remove the fuse box cover.
3. Remove the fuse with a fuse puller, and then replace it with a spare one of the proper amperage.



ZMU08703

1. Fuse box cover
2. Fuse puller
3. Engine control unit / ignition coil / electric fuel pump / fuel injector / vapor shut-off valve fuse (20 A)
4. Main switch / PTT switch fuse (20 A)
5. Starter relay fuse (30 A)

6. Spare engine main fuse (50 A)
7. Engine main fuse (50 A)
8. Spare fuse (20 A, 30 A)



ZMU04337

1. Fuse puller

Consult your Yamaha dealer if the new fuse immediately blows again.

EMU40984

Power trim and tilt unit will not operate

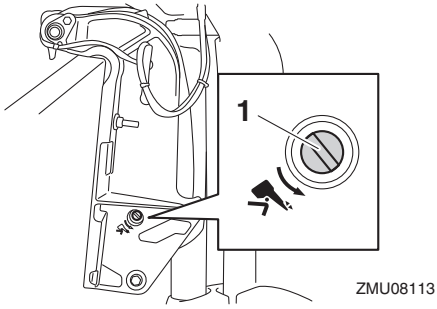
EWM02331

⚠ WARNING

Never get under the engine while it is tilted. Severe injury could occur if the outboard motor accidentally falls.

If the outboard motor cannot be tilted up or down using the power trim and tilt unit because of a discharged battery or a failure with the power trim and tilt unit, the outboard motor can be tilted manually.

1. Stop the engine.
2. Loosen the manual valve screw by turning it counterclockwise until it stops.



ZMU08113

1. Manual valve screw

3. Tilt the outboard motor up manually to the desired position, and then tighten the manual valve screw by turning it clockwise.

EMU47040

Water separator-alert is activated after leaving port

EWM01501

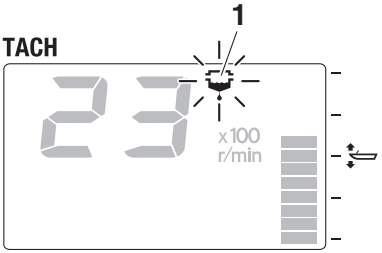
⚠ WARNING

Gasoline is highly flammable, and its vapors are flammable and explosive.

- **Do not perform this procedure on a hot or running engine. Allow the engine to cool.**
- **There will be fuel in the fuel filter. Keep away from sparks, cigarettes, flames or other sources of ignition.**
- **This procedure will allow some fuel to spill. Catch fuel in a rag. Wipe up any spilled fuel immediately.**
- **The fuel filter must be reassembled carefully with the O-ring, filter cup, and hoses in place. Improper assembly or replacement could result in a fuel leak, which could result in a fire or explosion hazard.**

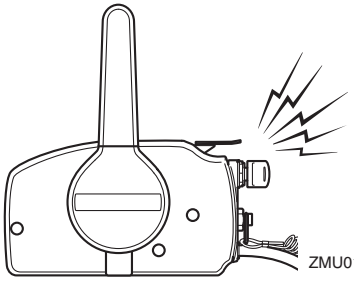
If the water separator-alert indicator blinks or the buzzer sounds intermittently, perform the following procedure.

TIP:
The buzzer sounds only when the remote control lever is placed in neutral.

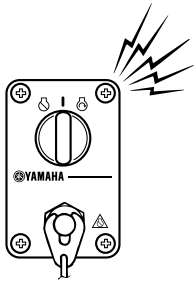


ZMU05441

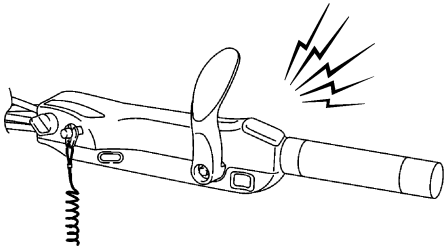
1. Water separator-alert indicator



ZMU01758

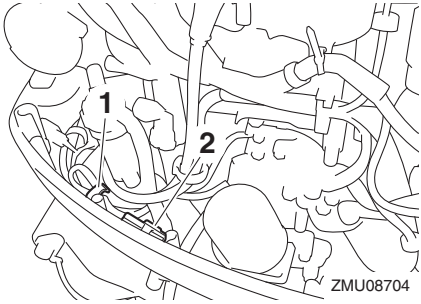


ZMU07012



ZMU05326

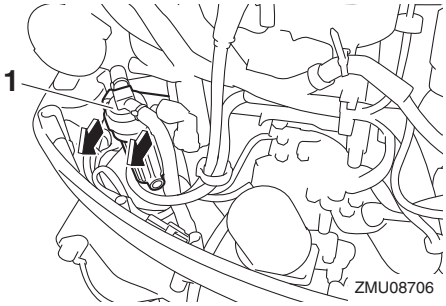
1. Stop the engine.
2. Remove the top cowling.
3. Remove the water detection switch lead from the holder.



ZMU08704

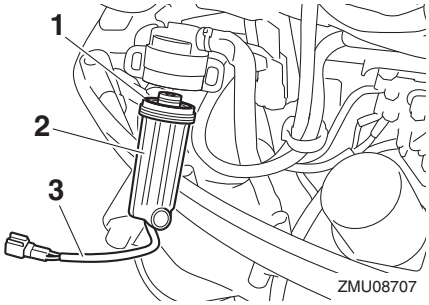
1. Holder
2. Water detection switch coupler

4. Disconnect the water detection switch coupler. ***NOTICE:*** **Be careful not to get any water on the water detection switch coupler, otherwise a malfunction could occur.** [ECM01951]
5. Remove the fuel filter from its holder.



1. Fuel filter

6. Unscrew the filter cup, and then remove the O-ring from the filter cup. ***NOTICE:*** **Be careful not to twist the water detection switch lead when unscrewing the filter cup.** [ECM01961]



1. O-ring
2. Filter cup
3. Water detection switch lead

7. Drain the water in the filter cup by soaking it up with a rag.
8. Put the O-ring on the filter cup in its original position, and then install the filter cup onto the filter housing. ***NOTICE:*** **Be careful not to twist the water detection switch lead when screwing the filter cup onto the filter housing.** [ECM01971]
9. Fit the fuel filter into its holder.
10. Connect the water detection switch coupler securely until a click is heard.
11. Fasten the water detection switch lead with the holder.
12. Install the top cowling.
13. Turn the main switch to the "**ON**" (on) position and check that the water separator-alert indicator remains off and the buzzer does not sound. If the water separator-alert indicator blinks or the buzzer sounds, have your Yamaha dealer check the outboard motor. ***NOTICE:*** **Although the buzzer will stop when the engine is started and the remote control lever is moved to the forward or reverse position, do not use the outboard motor. Otherwise, serious engine damage could occur.** [ECM02391]

EMU33502
Treatment of submerged motor

If the outboard motor is submerged, immediately take it to a Yamaha dealer. Otherwise some corrosion may begin almost immediately. ***NOTICE:*** **Do not attempt to run the outboard motor until it has been completely inspected.** [ECM00402]

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