YAMAHA

F9.9
T9.9

OWNER'S MANUAL

⚠ Read this manual carefully before operating this outboard motor.

U.S.A.Edition
LIT-18626-09-19
6AU-28199-16

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

YAMAHA LIT-CALIF-65-01

ZMU01690

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.

EMU31285

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.

EWM00781

⚠ WARNING

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

ECM00701

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.

TIP:

The F9.9MHA, F9.9EA, T9.9PHA, T9.9PA, T9.9EHA 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.

EMU25112

F9.9, T9.9
OWNER'S MANUAL

1st edition, February 2011

Printed in Japan
P/N LIT-18626-09-19

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EMU33622

Outboard motor safety

Observe these precautions at all times.

EMU36501

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.

EMU33630

Rotating parts

Hands, feet, hair, jewelry, clothing, 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 cowling with the engine running.

Only operate the engine with the 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.

EMU33640

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.

EMU33650

Electric shock

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

EMU34790

Power 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 tilt mechanism.

The power 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 or knob is locked. Severe injury could occur if the outboard motor accidentally falls.

EMU33671

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.

EMU33810

Gasoline

Gasoline and its vapors are highly flammable and explosive. Always, refuel according to the procedure on page 46 to reduce the risk of fire and explosion.

EMU33820
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.

EMU33900
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.

EMU33780
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.

EMU33740
Boating safety
This section includes a few of the many important safety precautions that you should follow when boating.

EMU33710
Alcohol and drugs
Never operate after drinking alcohol or taking drugs. Intoxication is one of the most common factors contributing to boating fatalities.

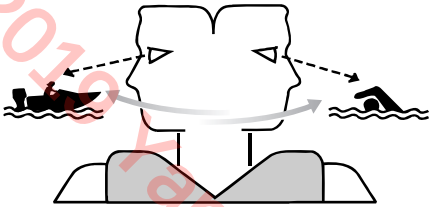
EMU33720
Personal flotation devices
Have an approved personal flotation device (PFD) on board for every occupant. Yamaha recommends that you must wear a PFD whenever boating. At a minimum, children and non-swimmers should always wear PFDs, and everyone should wear PFDs when there are potentially hazardous boating conditions.

EMU33731
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.

EMU33751
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.

EMU33760
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 manufacturers instructions. Overloading or incorrect weight distribution can compromise the boats handling and lead to an accident, capsizing or swamping.

EMU33772
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.

EMU33790
Weather
Stay informed about the weather. Check weather forecasts before boating. Avoid boating in hazardous weather.

EMU33800
Accident reporting
Boat operators are required by law to file a Boating Accident Report with their state boating law enforcement agency if their boat is involved in any of the following accidents:

1. There is loss of life or probable loss of life.
2. There is personal injury that requires medical attention beyond first aid.
3. There is property damage to boats or other property over a certain amount.
4. There is complete loss of a boat.

Contact local law enforcement personnel if a report is necessary.

EMU33870
Boat education and training
Operators should take a boating safety course. This may be required in your state. Many of the organizations listed in the next section can provide information about courses in your area.

You may also want to consider an Internet-based program for basic boater education. The Online Boating Safety Course provided by the BoatU.S. Foundation, is approved by the National Association of State Boating Law Administrators (NASBLA) and recognized by the United States Coast Guard. Most, but not all, states accept this course to meet their minimum requirements. While it cannot replace an in-depth course such as one offered by the U.S. Coast Guard, U.S. Power Squadron, or other organization, this online course does provide a general overview of the basics in boating safety, requirements, navigation, and operation. Upon successful completion of the course, the user can download a certificate of completion immediately or, for a small charge, request one by mail. To take this free course, go to boatus.org.

EMU33880
Passenger training
Make sure at least one other passenger is trained to operate the boat in the event of an emergency.

EMU33890
Boating safety publications
Be informed about boating safety. Additional publications and information can be obtained from many boating organizations.

EMU33590
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. The rules presented in the following section are condensed- and have been provided for your convenience only.
Contact the U.S. Coast Guard, the National Association of State Boating Law Administrators, or your local Power Squadron for a complete set of rules governing the waters in which you will be using your boat.

EMU33682
Boating organizations
The following organizations provide boating safety training and information about boating safety and laws.

United States Coast Guard
Consumer Affairs Staff (G-BC)
Office of Boating, Public, and Consumer Affairs
U.S. Coast Guard Headquarters
Washington, D.C. 20593-0001
http://www.uscgboating.org/

United States Power Squadrons
1-888-FOR-USPS (1-888-367-8777)
http://www.usps.org/

Boat Owners Association of The United States
1-800-336-BOAT (1-800-336-2628)
http://www.boatus.com/

National Association of State Boating Law Administrators (NASBLA)
1500 Leestown Road, Suite 330
Lexington, KY 40511 859-225-9497
http://www.nasbla.org/

National Marine Manufacturers Association (NMMA)
200 East Randolph Drive
Suite 5100
Chicago, IL 60601
http://www.nmma.org/

Marine Retailers Association of America
155 N. Michigan Ave. Chicago,
IL 60304
http://www.mraa.com/

EMU33691
Basic boating rules (Rules of the road)
Just as there are rules that apply when you are driving on streets and highways, there are waterway rules that apply when you are driving your boat. These rules are used internationally. (For U.S.A.: and are also enforced by the United States Coast Guard and local agencies.) You should be aware of these rules, and follow them whenever you encounter another vessel on the water.

EMU33700
Steering and sailing rules and sound signals
Whenever two vessels on the water meet one another, one vessel has the right-of-way; it is called the “stand-on” vessel. The vessel that does not have the right-of-way is called the

"give-way" or "burdened"vessel. These rules determine which vessel has the right-of-way, and what each vessel should do.

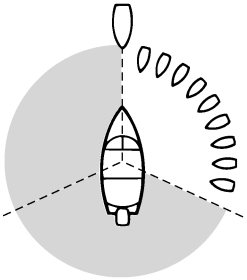
Stand-on vessel
The vessel with the right-of-way has the duty to continue its course and speed, except to avoid an immediate collision. When you maintain your direction and speed, the other vessel will be able to determine how best to avoid you.

Give-way vessel
The vessel that does not have the right-of-way has the duty to take positive and timely action to stay out of the way of the Stand-On vessel. Normally, you should not cross in front of the vessel with the right-of-way. You should slow down or change directions briefly and pass behind the other vessel. You should always move in such a way that the operator of the other vessel can see what you are doing.

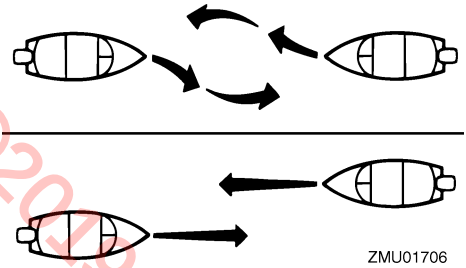
" The general prudential rule "
This rule is called Rule 2 in the International Rules and says,
" In obeying and construing these rules due regard shall be had to all dangers of navigation and collision, and to any special circumstances, which may render a departure from the above rules necessary in order to avoid immediate danger."
In other words, follow the standard rules except when a collision will occur unless both vessels try to avoid each other. If that is the case, both vessels become " Give-Way " vessels.

EMU25521
Rules when encountering vessels
There are three main situations that you may encounter with other vessels which could lead to a collision unless the Steering Rules are followed:

Meeting: (you are approaching another vessel head-on)
Crossing: (you are traveling across the other vessel's path)
Overtaking: (you are passing or being passed by another vessel)
In the following illustration, your boat is in the center. You should give the right-of-way to any vessels shown in white area (you are the Give-Way vessel). Any vessels in the shaded area must yield to you (they are the Give-Way vessels). Both you and the meeting vessel must alter course to avoid each other.

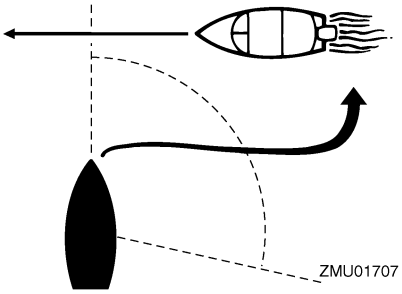

ZMU01705

Meeting
If you are meeting another power vessel head on, and are close enough to run the risk of collision, neither of you has the right-of-way Both of you should alter course to avoid an accident. You should keep the other vessel on your port (left) side. This rule doesn't apply if both of you will clear one another if you continue on your set course and speed.


ZMU01706

Crossing

When two power driven vessels are crossing each other's path close enough to run the risk of collision, the vessel which has the other on the starboard (right) side must keep out of the way of the other. If the other vessel is on your right, you must keep out of its way; you are the Give-Way vessel. If the other vessel is on your port (left) side, remember that you should maintain course and direction, provided the other vessel gives you the right-of-way as it should.


ZMU01707

Overtaking

If you are passing another vessel, you are the "Give-Way" vessel. This means that the other vessel is expected to maintain its course and speed. You must stay out of its way until you are clear of it. Likewise, if another vessel is passing you, you should maintain your speed and direction so that the other vessel can steer itself around you.

EMU25531

Other special situations

There are three other rules you should be aware of when driving your boat around other vessels.

Narrow channels and bends

When navigating in narrow channels, you should keep to the right when it is safe and practical to do so. If the operator of a power-driven vessel is preparing to go around a bend that may obstruct the view of other water vessels, the operator should sound a prolonged blast on the whistle (4 to 6 seconds). If another vessel is around the bend, it too should sound the whistle. Even if no reply is heard, however, the vessel should still proceed around the bend with caution. If you navigate such waters with your boat, you will need to carry a portable air horn, available from local marine supply stores.

Fishing vessel right-of-way

All vessels that are fishing with nets, lines or trawls are considered to be "fishing vessels" under the International Rules. Vessels with trolling lines are not considered fishing vessels. Fishing vessels have the right-of-way regardless of position. Fishing vessels cannot, however, impede the passage of other vessels in narrow channels.

Sailing vessel right-of-way

Sailing vessels should normally be given the right-of-way. The exceptions to this are:

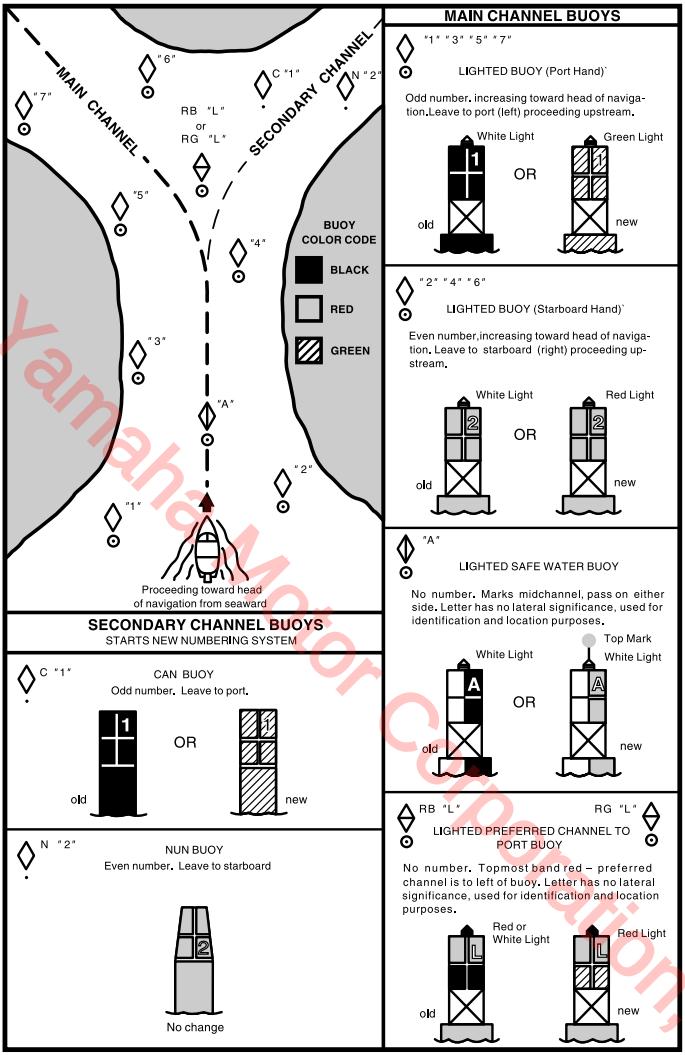
1. When the sailing vessel is overtaking the power-driven vessel, the power-driven vessel has the right-of-way.
2. Sailing vessels should keep clear of any fishing vessel.
3. In a narrow channel, a sailing vessel should not hamper the safe passage of a power-driven vessel that can navigate only in such a channel.

Reading buoys and other markers

The waters of the United States are marked for safe navigation by the lateral system of buoyage. Simply put, buoys and markers have an arrangement of shapes, colors, numbers and lights to show which side of the buoy a boater should pass on when navigating in a particular direction. The markings on these buoys are oriented from the perspective of being entered from seaward (the boater is going towards the port). This means that red buoys are passed on the starboard (right) side when proceeding from open water into port, and black buoys are to port (left) side. When navigating out of port, your position with respect to the buoys should be reversed; red buoys should be to port and black buoys to starboard.

Many bodies of water used by boaters are entirely within the boundaries of a particular state. The Uniform State Waterway Marking System has been devised for these waters. This system uses buoys and signs with distinctive shapes and colors to show regulatory or advisory information. These markers are white with black letters and orange boarders. They signify speed zones, restricted areas, danger areas, and general information.

Remember, markings may vary by geographic location. Always consult local boating authorities before driving your boat in unfamiliar waters.



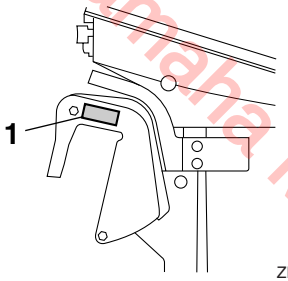
ZMU01708

EMU25171
Identification numbers record

EMU25184
Outboard motor serial number

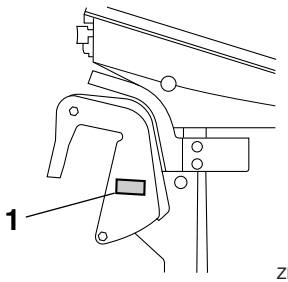
The outboard motor serial number is stamped on the label attached to the port side of the clamp bracket.

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.



ZMU05335

1. Outboard motor serial number location



ZMU05336

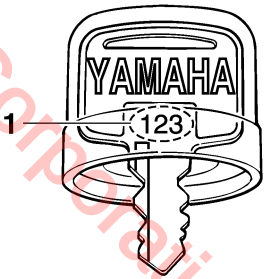
1. Outboard motor serial number location

ZMU01692

EMU25191
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

EMU33523

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.

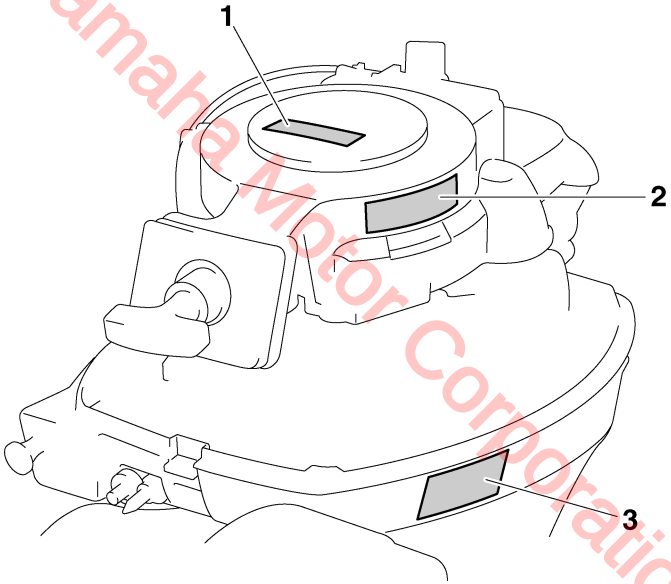
If you need any additional information, contact your Yamaha dealer.

EMU33832

Warning labels

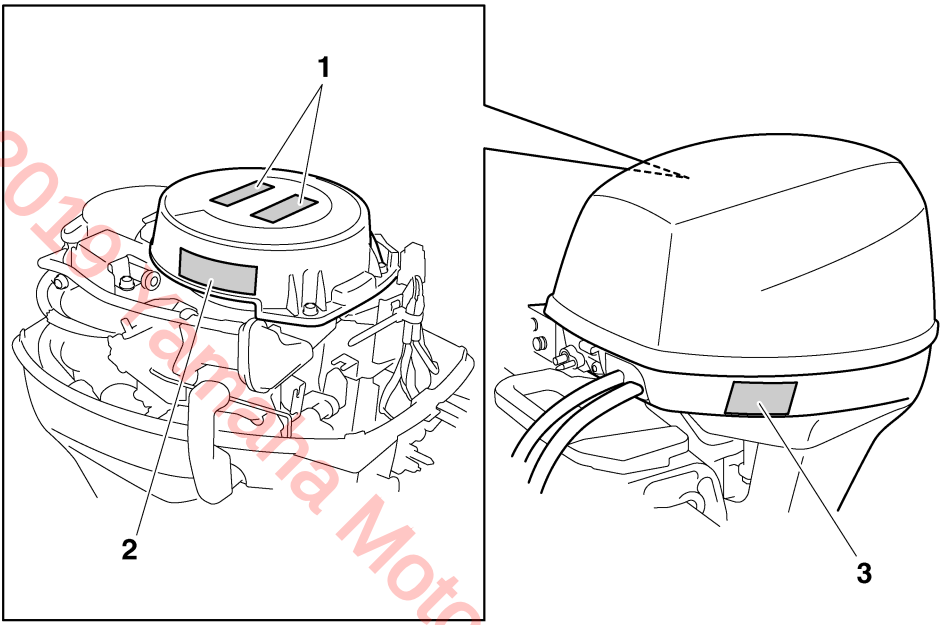
If these labels are damaged or missing, contact your Yamaha dealer for replacements.

F9.9MHA, T9.9PHA, T9.9EHA



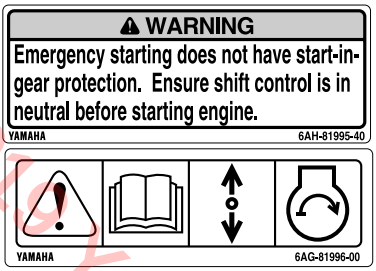
ZMU05785

F9.9EA, T9.9PA



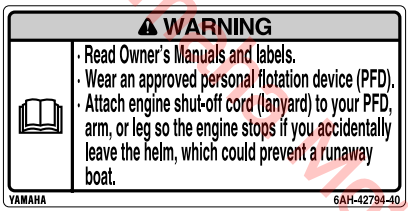
ZMU05787

1



2

3



ZMU05670

EMU33843

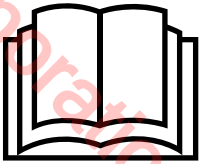
Symbols

The following symbols mean as follows.

Notice/Warning

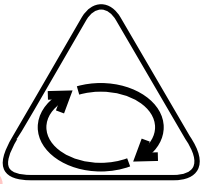
ZMU05696

Read Owner's Manual



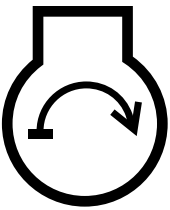
ZMU05664

Hazard caused by continuous rotation



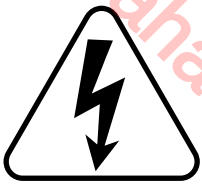
ZMU05665

Engine start/ Engine cranking



ZMU05668

Electrical hazard



ZMU05666

Remote control lever/gear shift lever operating direction, dual direction

ZMU05667

EMU34521

Specifications

TIP:

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

Likewise, "(SUS)" represents the value for stainless steel propeller installed and "(PL)" for plastic propeller installed.

EMU2821K

Dimension:

Overall length:
- F9.9EA 552 mm (21.7 in)
- F9.9MHA 927 mm (36.5 in)
- T9.9EHA 1038 mm (40.9 in)
- T9.9PA 552 mm (21.7 in)
- T9.9PHA 1038 mm (40.9 in)

Overall width:
- F9.9EA 332 mm (13.1 in)
- F9.9MHA 375 mm (14.8 in)
- T9.9EHA 370 mm (14.6 in)
- T9.9PA 331 mm (13.0 in)
- T9.9PHA 371 mm (14.6 in)

Overall height S:
- F9.9MHA 1000 mm (39.4 in)

Overall height L:
- F9.9EA 1127 mm (44.4 in)
- F9.9MHA 1127 mm (44.4 in)
- T9.9EHA 1187 mm (46.7 in)
- T9.9PA 1187 mm (46.7 in)
- T9.9PHA 1187 mm (46.7 in)

Overall height X:
- T9.9EHA 1255 mm (49.4 in)
- T9.9PA 1255 mm (49.4 in)
- T9.9PHA 1255 mm (49.4 in)

Transom height S:
- F9.9MHA 435 mm (17.1 in)

Transom height L:
- F9.9EA 557 mm (21.9 in)
- F9.9MHA 557 mm (21.9 in)
- T9.9EHA 552 mm (21.7 in)
- T9.9PA 557 mm (21.9 in)
- T9.9PHA 552 mm (21.7 in)

Transom height X:
- T9.9EHA 620 mm (24.4 in)
- T9.9PA 625 mm (24.6 in)
- T9.9PHA 620 mm (24.4 in)

Weight (AL) S:
- F9.9MHA 40.0 kg (88 lb)

Weight (AL) L:
- F9.9EA 43.0 kg (95 lb)
- F9.9MHA 41.0 kg (90 lb)
- T9.9EHA 47.2 kg (104 lb)
- T9.9PA 49.0 kg (108 lb)
- T9.9PHA 51.8 kg (114 lb)

Weight (AL) X:
- T9.9EHA 50.0 kg (110 lb)
- T9.9PA 50.2 kg (111 lb)
- T9.9PHA 52.9 kg (117 lb)

Performance:

Full throttle operating range:
- 5000–6000 r/min

Maximum output:
- 7.3 kW@5500 r/min (9.9 HP@5500 r/min)

Idle speed (in neutral):
- 1050 ±50 r/min

Engine:

Type:
- 4-stroke L

Displacement:
- 212.0 cm^3

Bore × stroke:
- 56.0 × 43.0 mm (2.20 × 1.69 in)

Ignition system:
- CDI

Spark plug (NGK):
- BR6HS-10

Spark plug gap:
0.9–1.0 mm (0.035–0.039 in)
Control system:
F9.9EA Remote control
F9.9MHA Tiller handle
T9.9EHA Tiller handle
T9.9PA Remote control
T9.9PHA Tiller handle
Starting system:
F9.9EA Electric starter
F9.9MHA Manual starter
T9.9EHA Manual starter and Electric starter
T9.9PA Electric starter
T9.9PHA Electric starter
Starting carburetion system:
Choke valve
Valve clearance (cold engine) IN:
0.15–0.20 mm (0.0059–0.0079 in)
Valve clearance (cold engine) EX:
0.20–0.25 mm (0.0079–0.0098 in)
Min. cold cranking amps (CCA/SAE):
F9.9EA 245.0 A
T9.9EHA 245.0 A
T9.9PA 245.0 A
T9.9PHA 245.0 A
Min. marine cranking amps (MCA/ABYC):
F9.9EA 323.0 A
T9.9EHA 323.0 A
T9.9PA 323.0 A
T9.9PHA 323.0 A
Min. reserve capacity (RC/SAE):
F9.9EA 52 minutes
T9.9EHA 52 minutes
T9.9PA 52 minutes
T9.9PHA 52 minutes
Alternator output:
F9.9MHA 80 W
Maximum generator output:
F9.9EA 6 A
T9.9EHA 6 A
T9.9PA 6 A

Drive unit:

Gear positions:
Forward-neutral-reverse
Gear ratio:
F9.9EA 2.08(27/13)
F9.9MHA 2.08(27/13)
T9.9EHA 2.92(38/13)
T9.9PA 2.92(38/13)
T9.9PHA 2.92(38/13)
Trim and tilt system:
F9.9EA Manual tilt
F9.9MHA Manual tilt
T9.9EHA Manual tilt
T9.9PA Power tilt
T9.9PHA Power tilt
Propeller mark:
F9.9EA N
F9.9MHA N
T9.9EHA R
T9.9PA R
T9.9PHA R

Fuel and oil:

Recommended fuel:
Regular unleaded gasoline
Min. pump octane:
86
Fuel tank capacity:
12.0 L (3.17 US gal, 2.64 Imp.gal)
Recommended engine oil:
YAMALUBE 4-M FC-W or 4-stroke outboard motor oil
Recommended engine oil grade 1:
SAE 10W-30/10W-40/5W-30
API SE/SF/SG/SH/SJ/SL
Engine oil quantity:
0.8 L (0.85 US qt, 0.70 Imp.qt)

Lubrication:
Wet sump
Recommended gear oil:
Hypoid gear oil SAE#90
Gear oil quantity:
F9.9EA 0.150 L (0.159 US qt, 0.132 Imp.qt)
F9.9MHA 0.150 L (0.159 US qt, 0.132 Imp.qt)
T9.9EHA 0.370 L (0.391 US qt, 0.326 Imp.qt)
T9.9PA 0.370 L (0.391 US qt, 0.326 Imp.qt)
T9.9PHA 0.370 L (0.391 US qt, 0.326 Imp.qt)

Tightening torque for engine:

Spark plug:
25.0 Nm (2.55 kgf-m, 18.4 ft-lb)
Propeller nut:
F9.9EA 17.0 Nm (1.73 kgf-m, 12.5 ft-lb)
F9.9MHA 17.0 Nm (1.73 kgf-m, 12.5 ft-lb)
T9.9EHA 21.0 Nm (2.14 kgf-m, 15.5 ft-lb)
T9.9PA 21.0 Nm (2.14 kgf-m, 15.5 ft-lb)
T9.9PHA 21.0 Nm (2.14 kgf-m, 15.5 ft-lb)
Engine oil drain bolt:
24.0 Nm (2.45 kgf-m, 17.7 ft-lb)

EMU33554

Installation requirements

EMU33564

Boat horsepower rating

EWM01560

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.

EMU33571

Mounting motor

EWM01570

WARNING

- **Improper mounting of the outboard motor could result in hazardous conditions such as poor handling, loss of control, or fire hazards.**
- **Because the 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 motor using correct equipment and complete rigging instructions. For further information, see page 37.

EMU33581

Remote control requirements

EWM01580

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.

EMU25694

Battery requirements

EMU25713

Specifications of Battery

Use a fully charged battery that meets the following specifications. The engine cannot be started if battery voltage is too low.

Minimum cold cranking amps (CCA/SAE):
F9.9EA 245.0 A
T9.9EHA 245.0 A
T9.9PA 245.0 A
T9.9PHA 245.0 A
Minimum marine cranking amps (MCA/ABYC):
F9.9EA 323.0 A
T9.9EHA 323.0 A
T9.9PA 323.0 A
T9.9PHA 323.0 A
Minimum reserve capacity (RC/SAE):
F9.9EA 52 minutes
T9.9EHA 52 minutes
T9.9PA 52 minutes
T9.9PHA 52 minutes

ECM01061

NOTICE

Do not use a battery that does not meet the specified capacity. If a battery that does not meet specifications is used, the electric system could perform poorly or be overloaded, causing electric system damage.

EMU36290

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.**

[EWM01820]

EMU25730

Without a rectifier or Rectifier Regulator

ECM01090

NOTICE

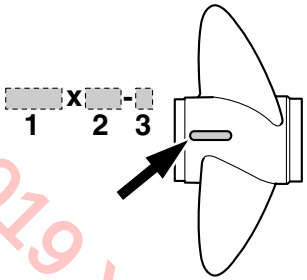
A battery cannot be connected to models that do not have a rectifier or Rectifier Regulator.

If you wish to use a battery with the models without a rectifier or Rectifier Regulator, install an optional Rectifier Regulator.
Using a maintenance-free battery with the above models can shorten the life of the battery significantly.
Install an optional Rectifier Regulator or use accessories rated to withstand 18 volts or higher with the above models. Consult your Yamaha dealer for details on installing an optional Rectifier Regulator.

EMU34195

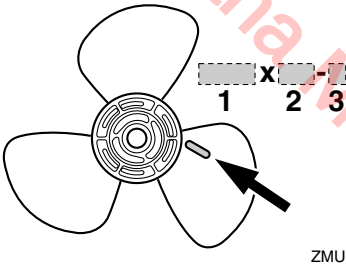
Propeller selection

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 outboard motor came with a Yamaha propeller selected to perform well over a range of applications, but there may be uses where a different propeller would be more appropriate.
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 boat-load. 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.
To check the propeller, see page 82.



ZMU04606

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



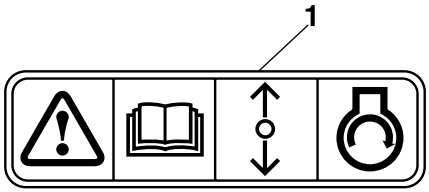
ZMU04604

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

EMU25761

Start-in-gear protection

Yamaha outboard motors affixed with the pictured label 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.



ZMU01713

1. Start-in-gear protection label

EMU39692

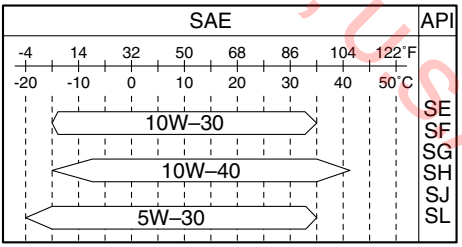
Engine oil requirements

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

Recommended engine oil:
YAMALUBE 4-M FC-W or 4-stroke outboard motor oil
Recommended engine oil grade 1:
SAE 10W-30/10W-40/5W-30
API SE/SF/SG/SH/SJ/SL
Recommended engine oil grade 2:
SAE 15W-40/20W-40/20W-50
API SH/SJ/SL
Engine oil quantity:
0.8 L (0.85 US qt, 0.70 Imp.qt)

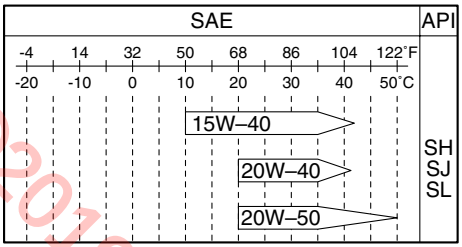
If oil grades listed under Recommended engine oil grade 1 are not available, select an alternative oil grade listed under Recommended engine oil grade 2.

Recommended engine oil grade 1



ZMU06854

Recommended engine oil grade 2



ZMU06855

EMU36360

Fuel requirements

EMU41330

Gasoline

Use a good quality gasoline that meets the minimum octane requirement. If knocking or pinging occurs, use a different brand of gasoline or premium unleaded fuel. Yamaha recommends that you use alcohol-free gasoline (see Gasoline with Ethanol) whenever possible.

The use of a poor quality gasoline may result in starting and running problems. If you encounter drivability problems, which you suspect could be related to the fuel you are using, we recommend that you switch to a recognized high quality brand of gasoline, such as a gasoline that is advertised as Top Tier Detergent Gasoline. Failure to comply with these recommendations may also result in unscheduled maintenance, fuel system damage, and internal engine damage.

Recommended fuel:
Regular unleaded gasoline
Min. pump octane:
86

ECM01981

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.**

Gasoline with Ethanol

Two types of gasoline are commonly available in the U.S.A. for use in automobiles and boats: conventional gasoline without Ethanol and gasoline with Ethanol, which is typically referred to as E10 gasoline. According to federal regulations, E10 gasoline may contain up to 10% Ethanol.

A high quality gasoline without Ethanol is the preferred fuel for your Yamaha outboard motor. However, if gasoline with Ethanol is the only fuel available in your area, your Yamaha outboard motor is calibrated to run properly on fresh E10 gasoline that meets the minimum octane requirement specified for this model.

ECM02400

NOTICE

Never use a gasoline for your outboard motor that contains more than 10% Ethanol, such as E85 which contains 85% Ethanol, or gasoline containing any amount of Methanol. These fuels can cause starting and running problems, as well as serious fuel system and internal engine damage.

Gasoline containing ethanol has several properties that may cause boat fuel system problems.

- Ethanol is a strong solvent (cleaning agent) that can clean gum and varnish deposits from a boat's fuel system, particularly in older boats, as well as tanks and pipes used in gasoline distribution. These released deposits contaminate the fuel and can cause

problems, such as clogged fuel filters, carburetors, or fuel injectors, which could result in engine damage.
- Ethanol may dissolve resins used in the construction of fiberglass fuel tanks. The dissolved resins contaminate the fuel and can cause problems, such as clogged fuel filters, carburetors, or fuel injectors, which could result in engine damage.
- Ethanol is hygroscopic (has a strong attraction to water). Therefore, any water that inadvertently enters the fuel system, including moisture that is absorbed from the air, will mix with the ethanol in the gasoline. If the amount of water is excessive, the ethanol and water mixture will separate from the gasoline in a layer at the bottom of the fuel tank. This ethanol and water mixture is very corrosive to aluminum fuel tanks and fuel system components.
- The usable life span of E10 gasoline may be shorter than the normal length of off-season boat storage, causing starting and running problems related to stale fuel.

For more information on using fuel containing ethanol, visit: http://www.yamaha-motor.com

Gasoline Filtration

Yamaha outboard motors are equipped with internal fuel filters. However, excessive water or debris entering your engine's fuel system could prematurely clog the internal filters, causing starting and running problems, fuel system damage, and internal engine damage. Therefore, it is recommended that an external 10-micron water-separating fuel filter be installed on your boat and serviced frequently. Consult your authorized Yamaha dealer for a 10-micron filter that meets your engine's requirements.

EMU41340

Gasoline Additives

Gasoline blends change to meet automobile emission regulations and economic conditions. Additives, added by gasoline distributors, necessary for proper automobile engine operation and durability, may not be sufficient for typical boat applications. Intake valve and combustion chamber deposits may accumulate in boat engines more rapidly than encountered in automotive use. In addition, gasoline used for boating will typically age longer between refills than gasoline used in automobiles, resulting in stale and unusable gasoline that may cause starting and running problems, fuel system damage, and internal engine damage.

Yamaha recommends the use of two Yamalube gasoline additives to reduce internal deposits and extend the storage life of gasoline. Continuous use of Yamalube Ring Free Fuel Additive Plus reduces harmful internal deposits. Yamalube Fuel Stabilizer & Conditioner Plus added to fresh gasoline will help protect the fuel system from varnishing while helping to keep the gasoline's octane level from decreasing excessively during storage. Other additives may also be available on the market that may have varying degrees of effectiveness. Consult your Yamaha dealer concerning what may work best for the locally available gasoline and environmental conditions.

EMU36880

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.

EMU41350

Anti-fouling paint

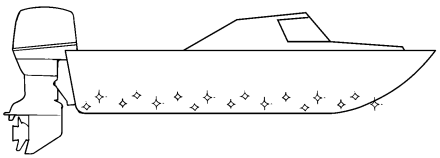
A clean hull is required to maintain your boat's performance. Boats moored in the water should be protected from marine growth (barnacles, mussels, and marine plants). If approved by regulations for your area, the bottom of the hull can be coated with an anti-fouling paint to inhibit marine growth.

Anti-fouling paints specifically formulated for use on aluminum may be applied to the outboard motor. The original Yamaha paint surface may be scuffed lightly before applying anti-fouling paint, but do not remove the original paint. Removal of the original paint will increase the rate of corrosion.

ECM02410

NOTICE

Anti-fouling paint for fiberglass and wood may contain materials, such as copper, graphite, and tin, that can cause corrosion if applied to aluminum boats and outboard motor components. Never apply these types of paint to your outboard motor because rapid corrosion damage could occur.



ZMU05176

Sacrificial anodes are attached to the outboard motor to provide corrosion protection and must never be painted.

ECM02420

NOTICE

Painted sacrificial anodes will not provide corrosion protection.

EMU36341

Motor disposal requirements

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

EMU36352

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.

EMU25222

Emission control information

EMU25230

North American models

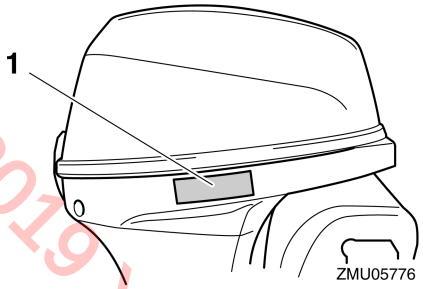
This engine conforms to U.S. Environmental Protection Agency (EPA) regulations for marine SI engines. See the label affixed to your engine for details.

EMU25243

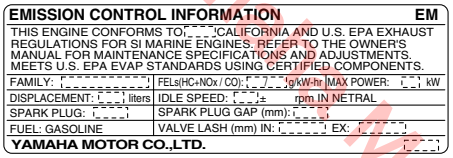
Approval label of emission control certificate

This label is attached to the bottom cowling.

New Technology; (4-stroke/HPDI) EM



1. Approval label location

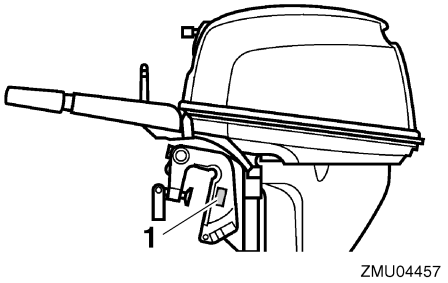


ZMU07059

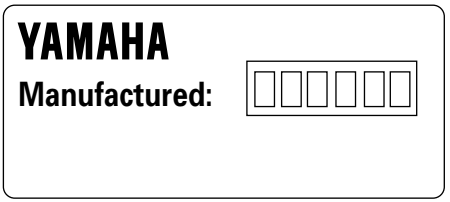
EMU25263

Manufactured date label

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



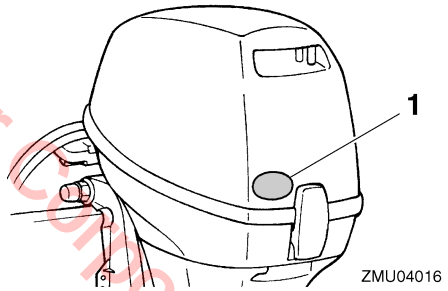
1. Manufactured date label location



EMU25274

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.



1. Star labels location

EMU40330

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

EMU40340

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

EMU40350

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

EMU33861

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

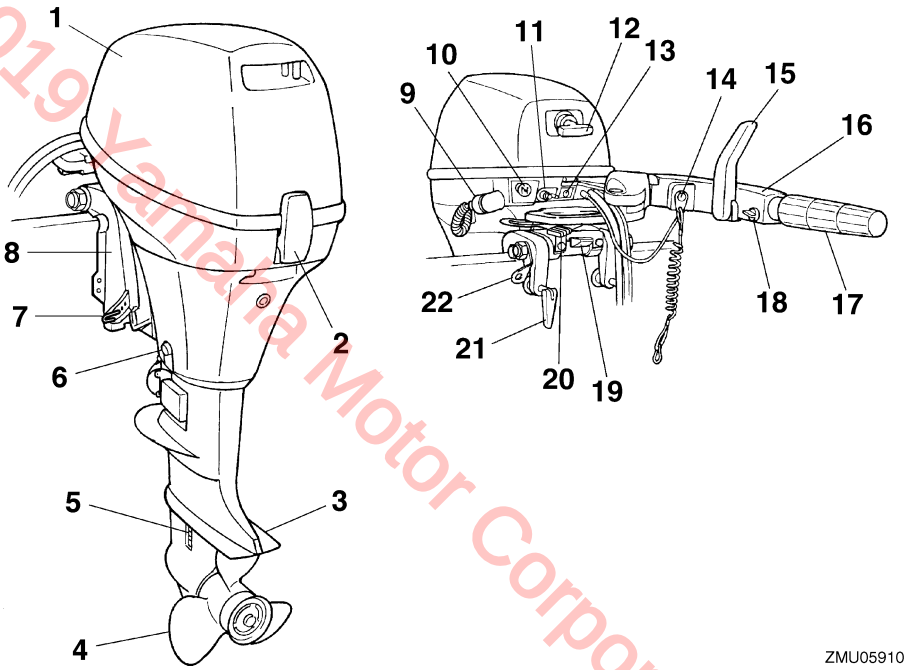
EMU2579Y

Components diagram

TIP:

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

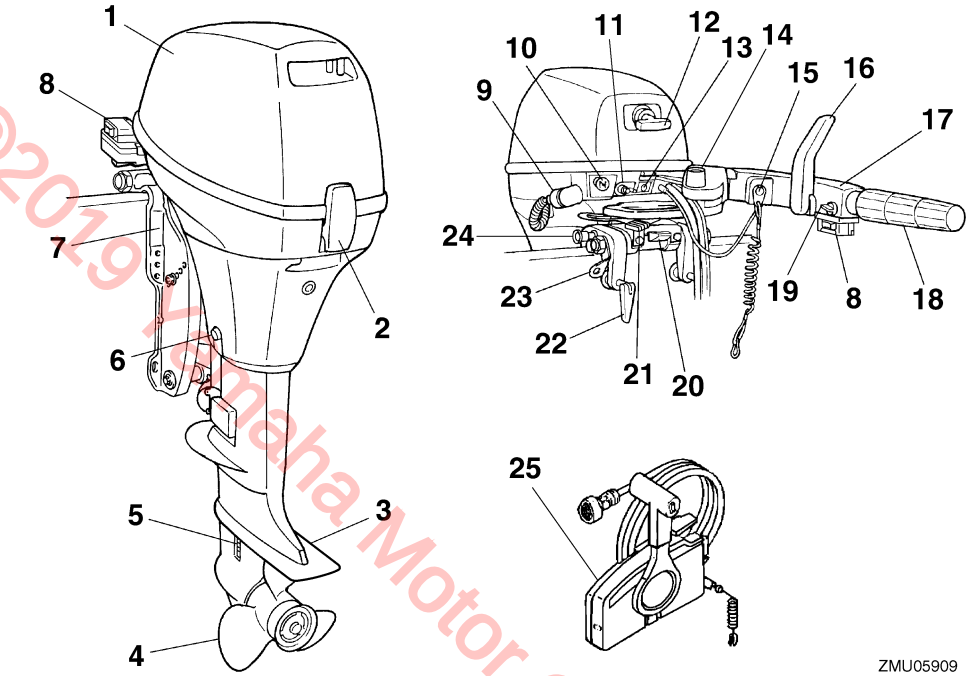
F9.9



ZMU05910

1. Top cowling
2. Cowling lock lever
3. Anti-cavitation plate
4. Propeller
5. Cooling water inlet
6. Drain screw
7. Trim rod
8. Clamp bracket
9. Flushing device
10. Choke knob
11. Fuel joint
12. Manual starter handle*
13. Alert indicator
14. Engine stop button/Engine shut-off switch*
15. Gear shift lever*
16. Tiller handle*
17. Throttle grip*
18. Throttle friction adjuster*
19. Tilt lock lever
20. Steering friction adjuster*
21. Clamp screw
22. Restraint cable attachment

T9.9



ZMU05909

1. Top cowling
2. Cowling lock lever
3. Anti-cavitation plate
4. Propeller
5. Cooling water inlet
6. Drain screw
7. Clamp bracket
8. Power tilt switch*
9. Flushing device
10. Choke knob
11. Fuel joint
12. Manual starter handle*
13. Alert indicator
14. Starter button*
15. Engine stop button/Engine shut-off switch*
16. Gear shift lever*
17. Tiller handle*
18. Throttle grip*
19. Throttle friction adjuster*
20. Tilt lock lever*
21. Steering friction adjuster*
22. Clamp screw
23. Restraint cable attachment
24. Tilt support knob*
25. Remote control box (side mount type)*

EMU25802

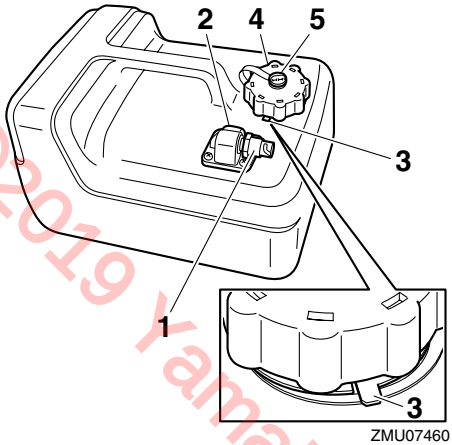
Fuel tank

If your model was equipped with a portable fuel tank, its function is as follows.

EWM00020

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.



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

EMU25830
Fuel joint
This joint is used to connect the fuel line.

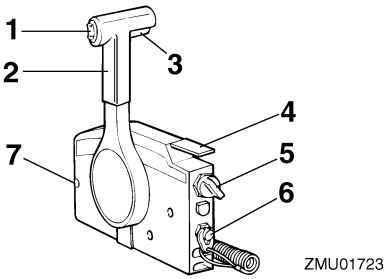
EMU43120
Fuel gauge
This gauge shows the approximate amount of fuel remaining in the fuel tank.

EMU43150
Pressure relief tab
This is attached to the filler hole of the fuel tank.

EMU43130
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.

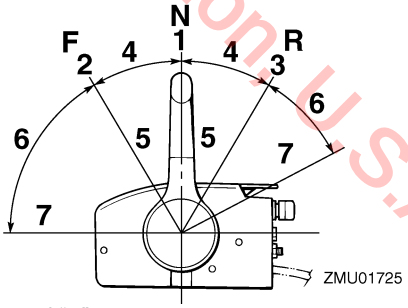
EMU43141
Air vent screw
This screw is on the fuel tank cap. When turning the air vent screw counterclockwise, it is loosened and the pressure in the fuel tank is released to a certain pressure. Air is allowed to enter the fuel tank while operating the engine.

EMU26181
Remote control box
The remote control lever actuates both the shifter and the throttle. The electrical switches are mounted on the remote control box.



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

EMU26190
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.



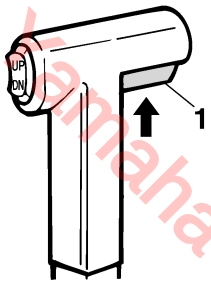
1. Neutral "**N**"
2. Forward "**F**"

3. Reverse “R”
4. Shift
5. Fully closed
6. Throttle
7. Fully open

EMU26201

Neutral interlock trigger

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



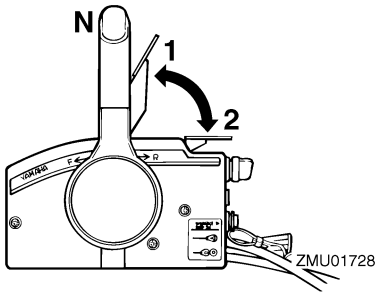
ZMU01727

1. Neutral interlock trigger

EMU26212

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

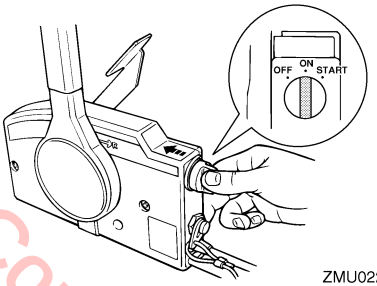
TIP:

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.

EMU26221

Choke switch

To activate the choke system, press in the main switch while the key is turned to the “ON” (on) or “START” (start) position. The choke system will then supply the rich fuel mixture required to start the engine. When the key is released, the choke will switch off automatically.

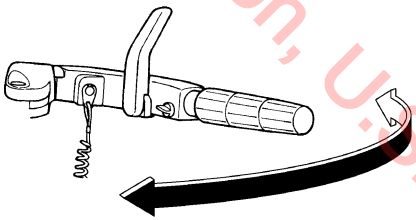


ZMU02206

EMU25913

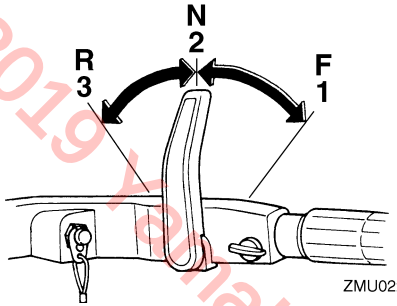
Tiller handle

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



ZMU02207

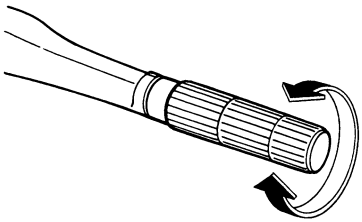
EMU25924
Gear shift lever
Move the gear shift lever forward to engage the forward gear or rearward to engage the reverse gear.



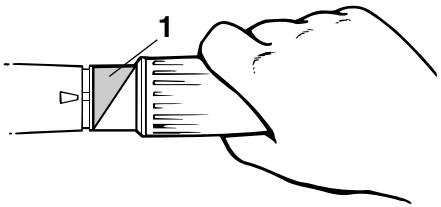
ZMU02220

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

EMU25942
Throttle grip
The throttle grip is on the tiller handle. Turn the grip counterclockwise to increase speed and clockwise to decrease speed.


ZMU02378

EMU25962
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.

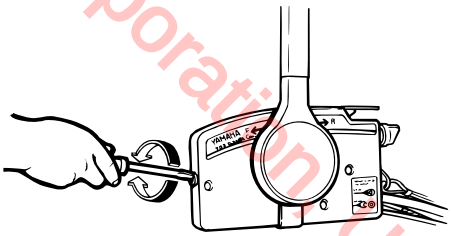


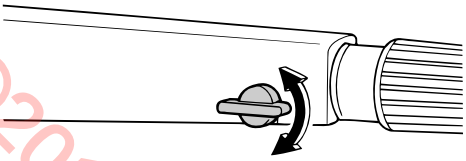
ZMU05338

1. Throttle indicator

EMU25976
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.** [EWM00032]


ZMU05369



ZMU05342

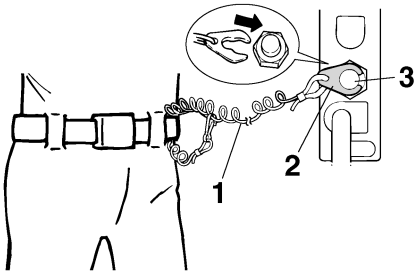
When constant speed is desired, tighten the adjuster to maintain the desired throttle setting.

EMU25995

Engine shut-off cord (lanyard) and clip

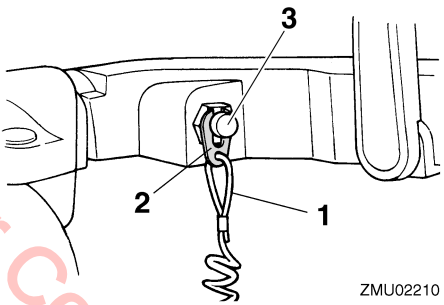
The clip must be attached to the engine shut-off switch for the engine to run. The cord should be attached to a secure place on the operator's clothing, or arm or leg. Should the operator fall overboard or leave the helm, the cord will pull out the clip, stopping ignition to the engine. This will prevent 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.**

[EWM00122]



ZMU01716

1. Cord
2. Clip
3. Engine shut-off switch



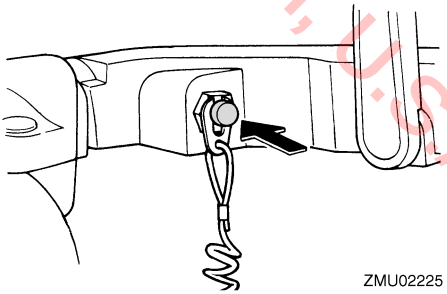
ZMU02210

1. Cord
2. Clip
3. Engine shut-off switch

EMU26003

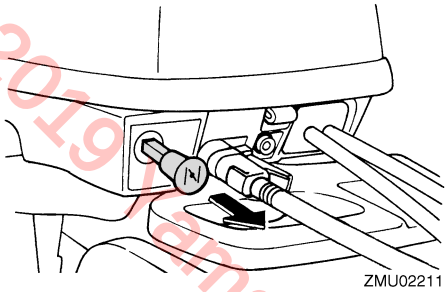
Engine stop button

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

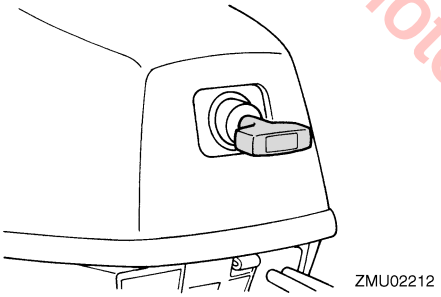


ZMU02225

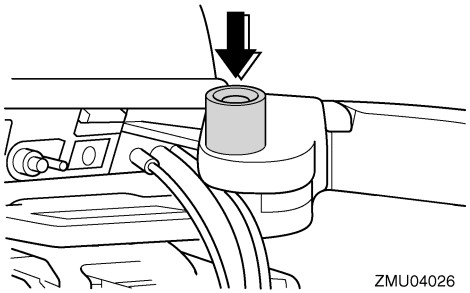
EMU26013
Choke knob for pull type
To supply the engine with the rich fuel mixture required to start, pull out this knob.


ZMU02211

EMU26074
Manual starter handle
The manual starter handle is used to crank and start the engine.


ZMU02212

EMU26080
Starter button
To start the engine with the electric starter, push the starter button.


ZMU04026

EMU26091
Main switch
The main switch controls the ignition system; its operation is described below.

- "OFF" **(off)**

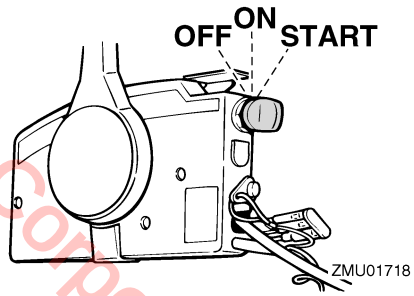
With the main switch in the "OFF" (off) position, the electrical circuits are off, and the key can be removed.

- "ON" **(on)**

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

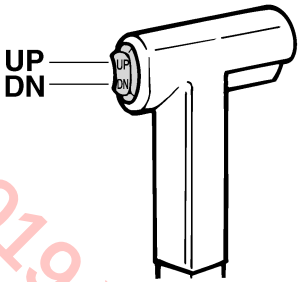
- "START" **(start)**

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.

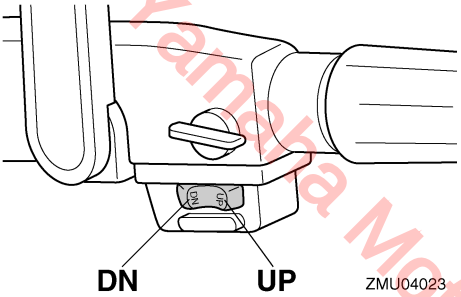


ZMU01718

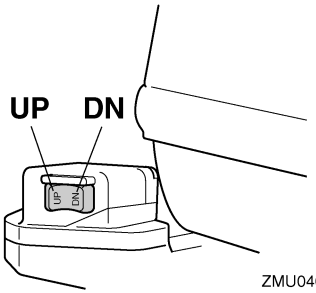
EMU26102
Power tilt switch
The power tilt system adjusts the outboard motor angle in relation to the transom. Pushing the switch "UP" (up) tilts the outboard motor up. Pressing the switch "DN" (down) tilts the outboard motor down. When the switch is released, the outboard motor will stop in its current position.



ZMU01720



ZMU04023



ZMU04024

TIP:

For instructions on using the power tilt switch, see pages 60 and 62.

EMU31432

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.

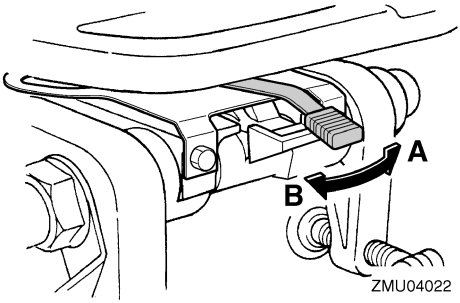
To increase resistance, turn the lever to the port side “A”.

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

EWM00040

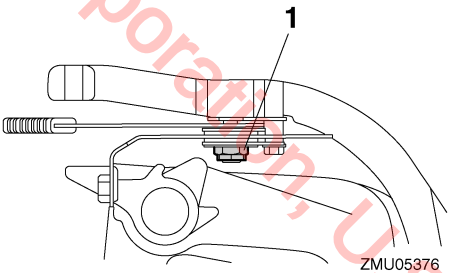
WARNING

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



ZMU04022

If the resistance does not increase even when the lever is turned to the port side “A”, make sure that the nut is tightened to the specified torque.



ZMU05376

1. Nut

Nut tightening torque: 8.0 Nm (0.82 kgf-m, 5.9 ft-lb)

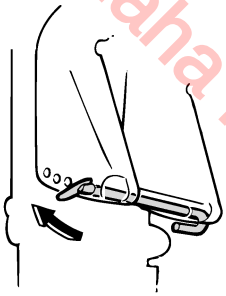
TIP:

- Steering movement is blocked when the adjuster lever is set to the “A” position.
- 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.

EMU26262

Trim rod (tilt pin)

The position of the trim rod determines the minimum trim angle of the outboard motor in relation to the transom.

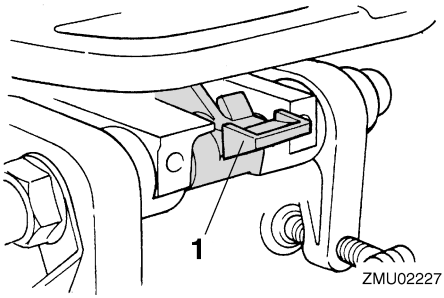


ZMU02214

EMU30530

Tilt lock mechanism

The tilt lock mechanism is used to prevent the outboard motor from lifting out of the water when in reverse gear.



ZMU02227

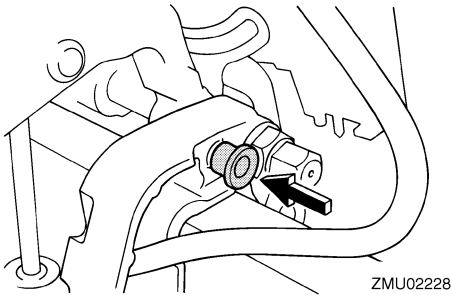
1. Tilt lock lever

To lock it, set the tilt lock lever in the lock position. To release, push the tilt lock lever in the release position.

EMU26321

Tilt support knob

To keep the outboard motor in the tilted up position, push the tilt support knob under the swivel bracket.



ZMU02228

ECM00660

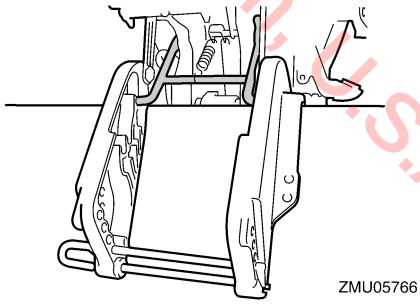
NOTICE

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.

EMU26333

Tilt support bar

The tilt support bar keeps the outboard motor in the tilted up position.



ZMU05766

ECM01660

NOTICE

Do not use the tilt support bar 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.

EMU26361

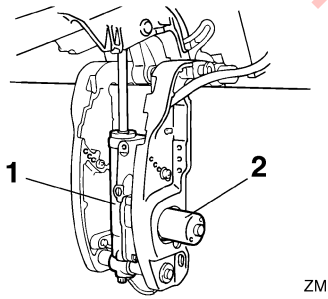
Power tilt unit

This unit tilts the outboard motor up and down and is controlled with the power tilt switch.

ECM00630

NOTICE

Do not step on or exert pressure on the power tilt motor. The power tilt unit could be damaged as a result.



ZMU02231

1. Power tilt unit
2. Power tilt motor

ECM00660

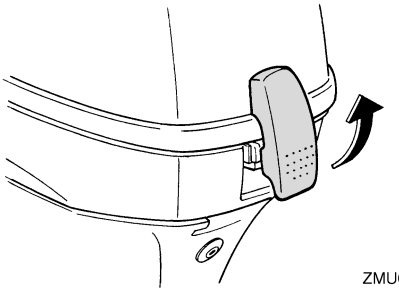
NOTICE

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.

EMU26384

Cowling lock lever (pull up type)

To remove the engine top cowling, pull up the cowling lock lever(s) and lift off the cowling. When installing the cowling, check to be sure it fits properly in the rubber seal. Then lock the cowling by moving the cowling lock lever(s) downward.

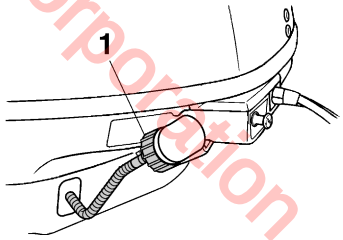


ZMU02232

EMU26463

Flushing device

This device is used to clean the cooling water passages of the motor using a garden hose and tap water.



ZMU02233

1. Flushing device

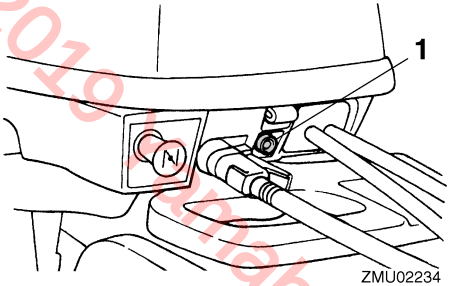
TIP:

For details on usage, see page 72.

EMU26304

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 36.



1. Low oil pressure-alert indicator

EMU36015

Indicators

EMU36024

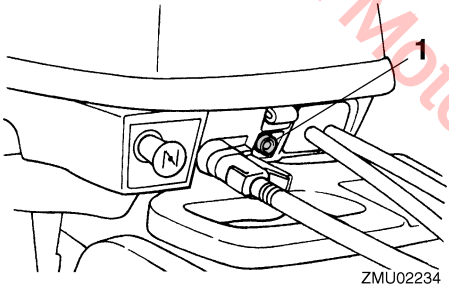
Low oil pressure-alert indicator

If oil pressure drops too low, this indicator will light up. For further information, see page 36.

ECM00022

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 remaining oil quantity. For further information, see page 42.**



1. Low oil pressure-alert indicator

EMU26803

Alert system

ECM00091

NOTICE

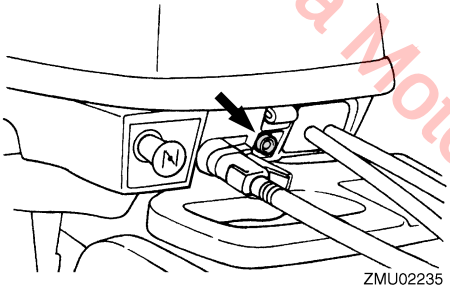
Do not continue to operate the engine if a alert device has activated. Consult your Yamaha dealer if the problem cannot be located and corrected.

EMU3016B

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 r/min. If equipped with a low oil pressure-alert indicator, it will light or blink.



ZMU02235

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

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.

EMU26902

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.

EWM01590

⚠ 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.**

EMU34801

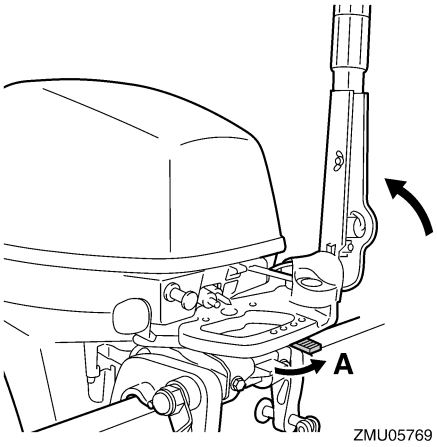
Mounting the outboard motor

ECM01680

NOTICE

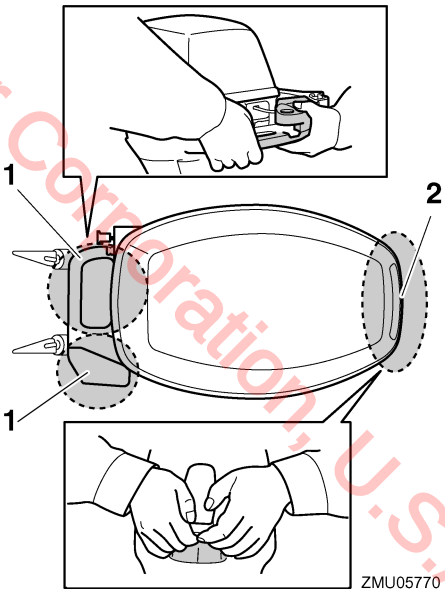
Do not hold the top cowling when mounting or dismounting the outboard motor. The top cowling could come off, causing the outboard motor to fall.

1. Be sure to mount the outboard motor while the boat is on land. If the boat is on the water, move it to an area on land.
2. To prevent steering movement, turn the adjuster lever to “A” (if equipped with the adjuster lever). To hold the steering bracket easily, raise the tiller handle to the vertical position (if equipped with the tiller handle).



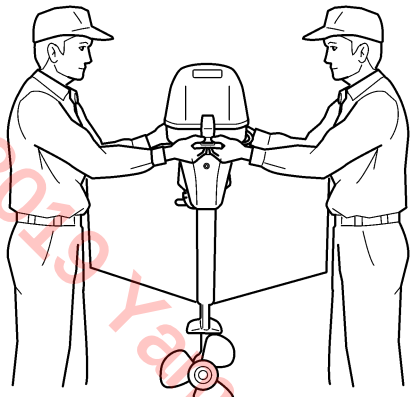
ZMU05769

3. Hold the handgrip and steering bracket as shown in the illustration and lift up the outboard motor using two people.

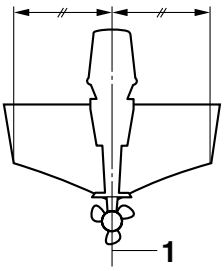


ZMU05770

1. Steering bracket
2. Handgrip


ZMU05771

4. Mount the outboard motor on the center line (keel line) of the boat, and ensure that the boat itself is well balanced. Otherwise the boat will be hard to steer. For boats without a keel or which are asymmetrical, consult your dealer.

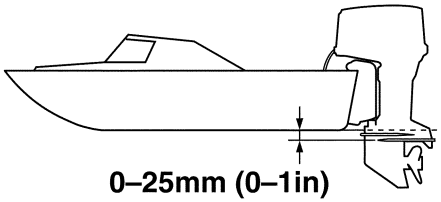


ZMU01760

1. Center line (keel line)

EMU26925
Mounting height

To run your boat at optimum efficiency, the water resistance (drag) of the boat and outboard motor must be made as little as possible. The mounting height of the outboard motor greatly affects the water resistance. If the mounting height is too high, cavitation tends to occur, thus reducing the propulsion; and if the propeller tips cut the air, the engine speed will rise abnormally and cause the engine to overheat. If the mounting height is too low, the water resistance will increase and thereby reduce engine efficiency. Mount the outboard motor so that the anti-cavitation plate is between the bottom of the boat and a level 25 mm (1 in) below it.



ZMU05167

ECM01634
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.**

TIP:

- The optimum mounting height of the outboard motor is affected by the boat and motor combination and the desired use. Test

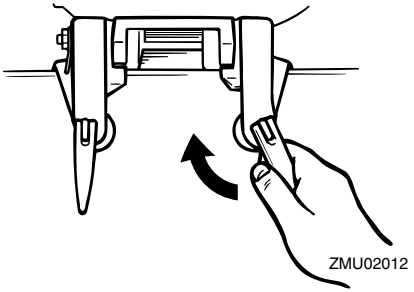
runs at different heights can help determine the optimum mounting height. Consult your Yamaha dealer or boat manufacturer for further information on determining the proper mounting height.

- For instructions on setting the trim angle of the outboard motor, see page 60.

EMU26973

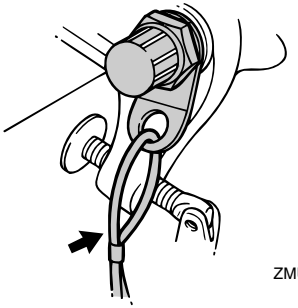
Clamping the outboard motor

1. Place the outboard motor on the transom so that it is positioned as close to the center as possible. Tighten the transom clamp screws evenly and securely. Occasionally check the clamp screws for tightness during operation of the outboard motor because they could become loose due to engine vibration. **WARNING! Loose clamp screws could allow the outboard motor to fall off or move on the transom. This could cause loss of control and serious injury. Make sure the clamp screws are tightened securely. Occasionally check the screws for tightness during operation.** [EWM00642]



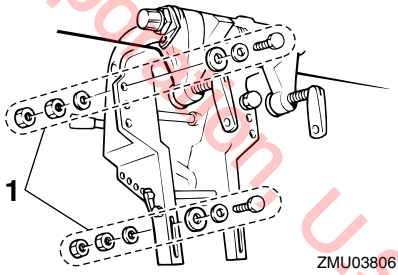
ZMU02012

2. If the restraint cable attachment is equipped on your engine, a restraint cable or chain should be used. Attach one end to the restraint cable attachment and the other to a secure mounting point on the boat. Otherwise the engine could be completely lost if it accidentally falls off the transom.



ZMU02013

3. Secure the clamp bracket to the transom using the bolts provided with the outboard (if packed). For details, consult your Yamaha dealer. **WARNING! Avoid using bolts, nuts or washers other than those contained in the engine packaging. If used, they must be of at least the same quality of material and strength and must be tightened securely. After tightening, test run the engine and check their tightness.** [EWM00651]



ZMU03806

1. Bolts

EMU36381

First-time operation

EMU36391

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.** [ECM01781]

The engine is shipped with the following sticker, which should be removed after engine oil is filled for the first time. For more information on checking the engine oil level, see page 42.

ZMU01710

EMU30174

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.** [ECM00801]

EMU27085

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.

EMU36400

Getting to know your boat

Different boats handle differently. Operate cautiously while you learn how your boat handles under different conditions and with different trim angles (see page 60).

EMU36413

Checks before starting engine

EWM01921

⚠ 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.

ECM00120

NOTICE

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

EMU36560

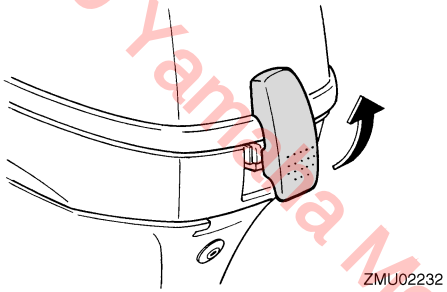
Fuel level

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, check the fuel level. For fuel filling instructions, see page 44.

EMU36572
Remove the top cowling

For the following checks, remove the top cowling from the bottom cowling. To remove the top cowling, release the cowling lock lever and lift off the top cowling.


ZMU02232

EMU36442
Fuel system

EWM00060
⚠ WARNING

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

EWM00910
⚠ 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.**

EMU36451
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 damages.

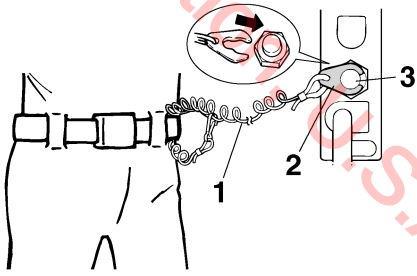
EMU36902
Controls

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.

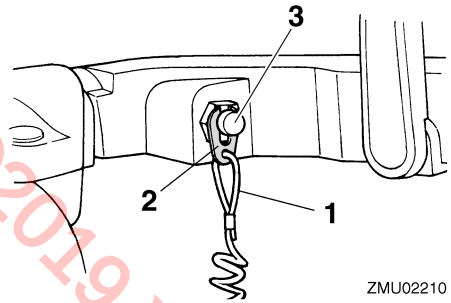
EMU36483
Engine shut-off cord (lanyard)

Inspect the engine shut-off cord and clip for damage, such as cuts, breaks, and wear.



ZMU01716

1. Cord
2. Clip
3. Engine shut-off switch

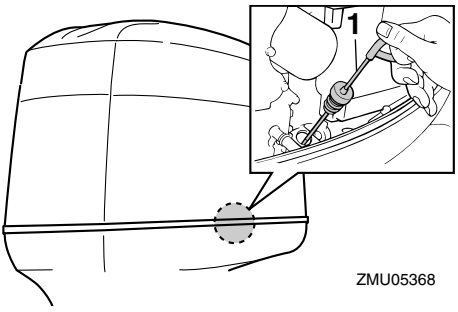


ZMU02210

1. Cord
2. Clip
3. Engine shut-off switch

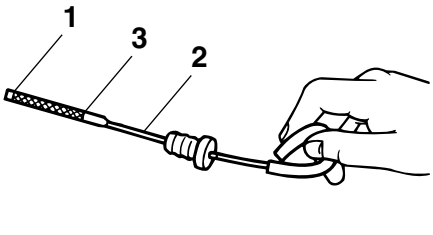
EMU27166
Engine oil

1. Put the outboard motor in an upright position (not tilted). ***NOTICE:*** **If the motor is not level, the oil level indicated on the dipstick may not be accurate.**
   [ECM01790]
2. Remove oil dipstick and wipe it clean.
3. 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.
4. Check the oil level using the dipstick to be sure the level falls between the upper and lower marks. Fill with oil if it is below the lower mark, or drain to the specified level if it is above the upper mark.



ZMU05368

1. Oil dipstick



ZMU02082

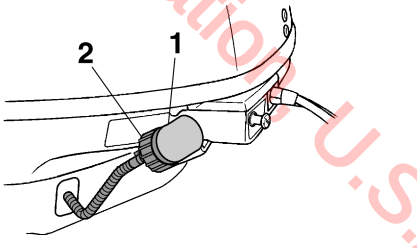
1. Lower level mark
2. Oil dipstick
3. Upper level mark

EMU27153
Engine

- Check the engine and engine mounting.
- Look for loose or damaged fasteners.
- Check the propeller for damage.
- Check for engine oil leaks.

EMU36493
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.**
[ECM01801]

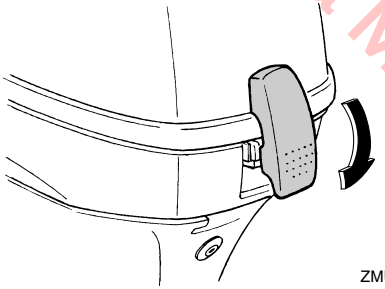


ZMU06070

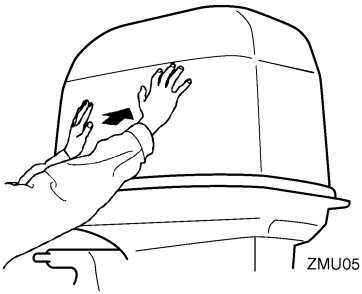
1. Fitting
2. Flushing device

EMU36954
Install top cowling

1. Be sure that the cowling lock lever is released.
2. Be sure that the rubber seal is seated all the way around the top cowling.
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 lever to lock the 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.** [ECM01991]


ZMU06136

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.

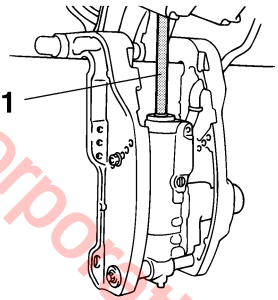

ZMU05175

EMU34782
Checking power tilt system

EWM01970
⚠ WARNING

- **Never get under the lower unit while it is tilted, even when the tilt support knob 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 tilt unit for any sign of oil leaks.
2. Operate each of the power tilt switches to check that all switches work.
3. Tilt the outboard motor up and check that the tilt rod is pushed out completely.



ZMU02272

1. Tilt rod

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

EMU36582
Battery

Check that the battery is in good condition, and fully charged. Check that the battery connections are clean, secure and covered by insulating covers. The electrical contacts of the

battery and cables must be clean and properly connected or the battery will not start the engine.
Refer to the battery manufacturer's instructions for checks for your particular battery.

EMU43162

Filling fuel

EWM01830

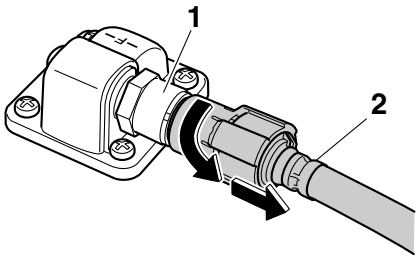
⚠ WARNING

- **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.

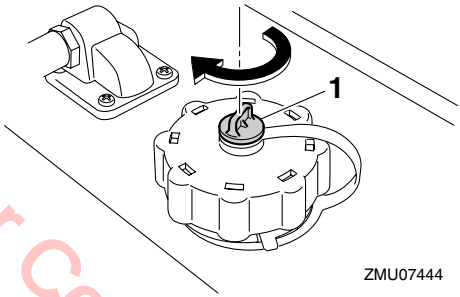
1. Turn the fuel hose counterclockwise from the fuel joint of the fuel tank to disconnect it.



ZMU07443

1. Fuel joint
2. Fuel hose

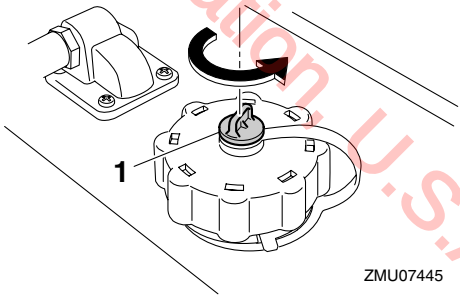
2. Turn the air vent screw clockwise to close it.



ZMU07444

1. Air vent screw

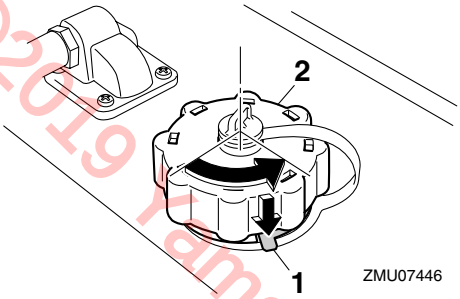
3. Remove the fuel tank from the boat.
4. To loosen the air vent screw, turn it counterclockwise until it stops.



ZMU07445

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.



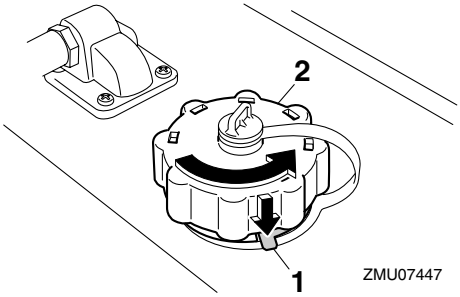
ZMU07446

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.

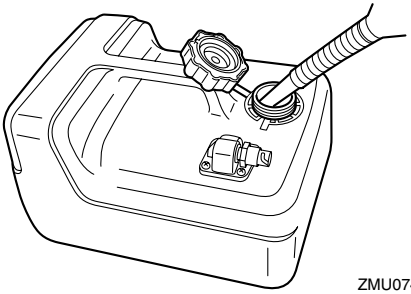


ZMU07447

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.** [EWM02610]

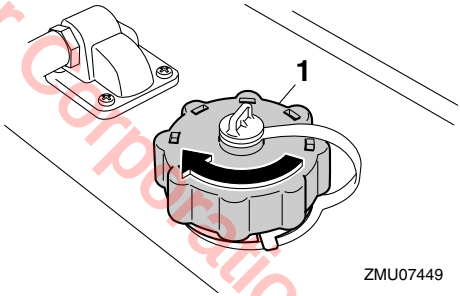
Fuel tank capacity:
12.0 L (3.17 US gal, 2.64 Imp.gal)


ZMU07461

TIP:

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

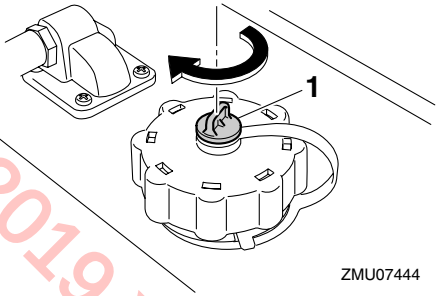
8. Turn the fuel tank cap clockwise to tighten until a click is heard.



ZMU07449

1. Fuel tank cap

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



1. Air vent screw

EMU27452

Operating engine

EWM00420

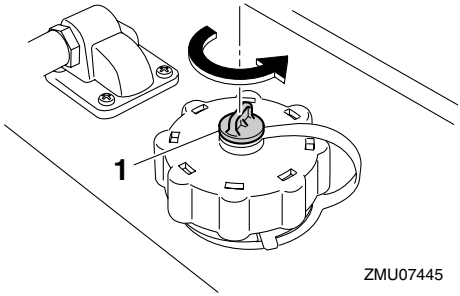
⚠ WARNING

- **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.**

EMU43172

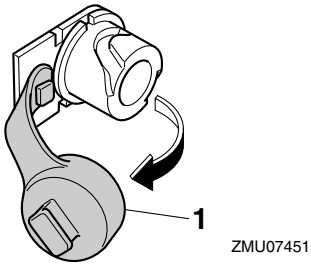
Sending fuel (portable tank)

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



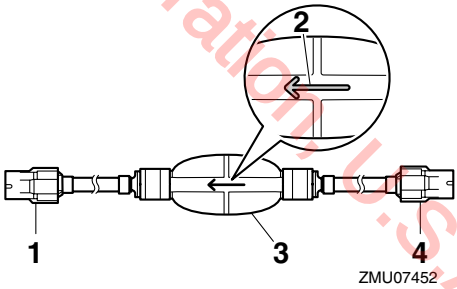
1. Air vent screw

2. Remove the fuel joint cap on the outboard motor.



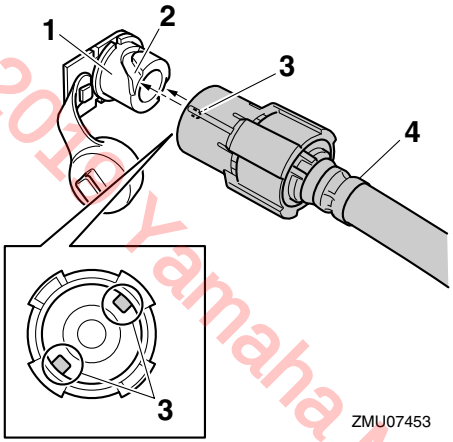
1. Fuel joint cap

3. Check the direction of the fuel hose. Make sure that the arrow of the primer pump points toward the outboard motor.



1. Toward the outboard motor
2. Arrow
3. Primer pump
4. Toward the fuel tank

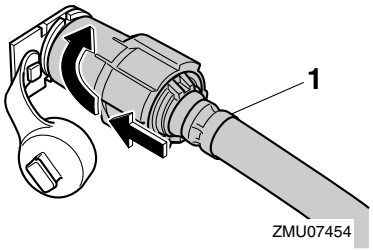
4. Align the groove in the fuel joint on the outboard motor with the protrusions on the fuel hose.



ZMU07453

1. Fuel joint
2. Groove
3. Protrusion
4. Fuel hose

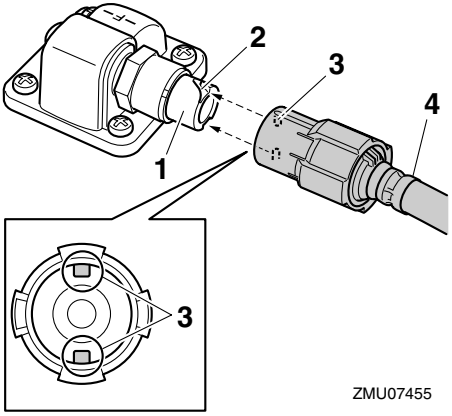
5. Push in the fuel hose and turn it clockwise to connect it securely.



ZMU07454

1. Fuel hose

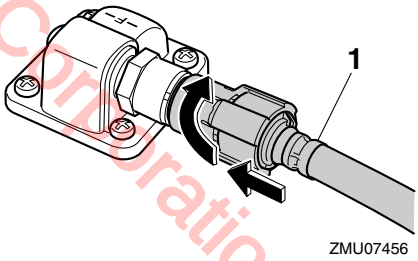
6. Align the groove in the fuel joint on the fuel tank with the protrusions on the fuel hose.



ZMU07455

1. Fuel joint
2. Groove
3. Protrusion
4. Fuel hose

7. Push in the fuel hose and turn it clockwise to connect it securely.



ZMU07456

1. Fuel hose

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

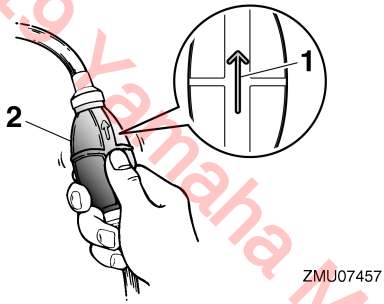
TIP:

Dispose of rags properly according to local laws or regulations.

9. When using the fuel tank on the boat, a fuel valve may also be equipped on the boat. Open the fuel valve.

TIP:
Check the boat's manual for the position of the fuel valve.

10. 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.



1. Arrow
2. Primer pump

EMU27494
Starting engine
EWM01600

⚠ 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.

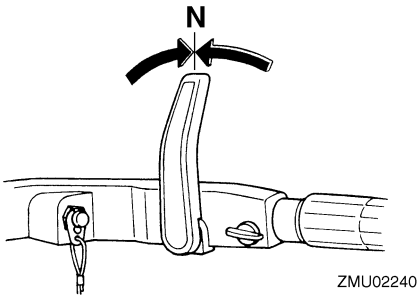
EMU34813
Manual start models (tiller control)
EWM01840

⚠ WARNING

- **Failure to attached 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.**

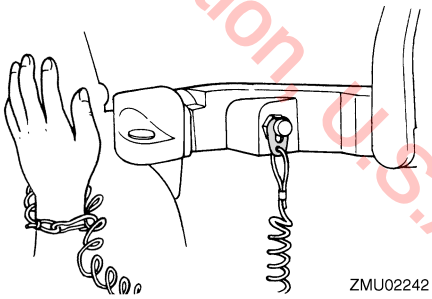
Starting procedure (cold engine)

1. Place the gear shift lever in neutral.

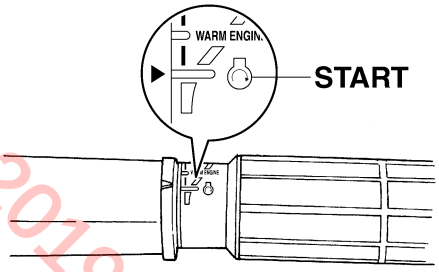


TIP:
The start-in-gear protection device prevents the engine from starting except when in neutral.

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.

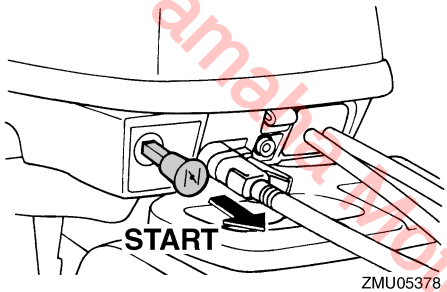


3. Place the throttle grip in the "START" (start) position.



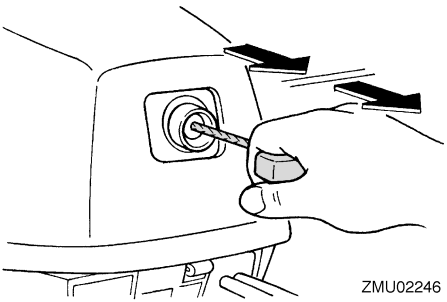
ZMU05928

4. Pull out the choke knob fully.

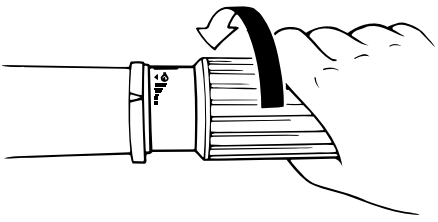


ZMU05378

5. Pull the manual starter handle slowly until you feel resistance. Then give a strong pull straight out to crank and start the engine.


ZMU02246

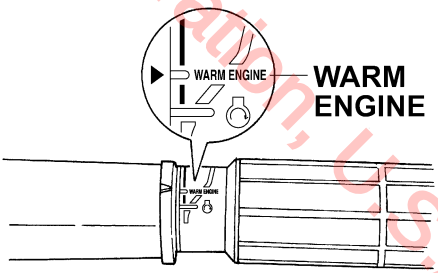
6. After the engine starts, slowly return the manual starter handle to its original position before releasing it.
7. Slowly return the throttle grip to the fully closed position.


ZMU02030

8. Return the choke knob to the home position gradually.

TIP:

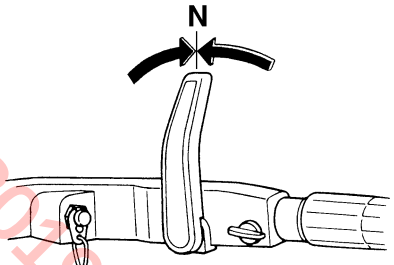
- If the choke knob is left in the "START" (start) position while the engine is running, the engine will run poorly or stall.
- When the engine is cold, for example, when the ambient temperature is low in winter, it needs to be warmed up. For further information, see page 55.
- Do not turn the throttle grip unnecessarily to open and close the throttle before starting the engine, otherwise the engine may be difficult to start. If the engine is difficult to start, place the throttle grip in the "WARM ENGINE" (warm engine) position and try again.



ZMU05780

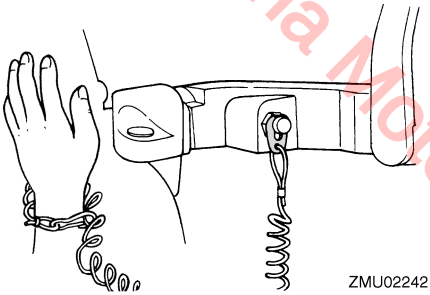
Starting procedure (warm engine)

1. Place the gear shift lever in neutral.

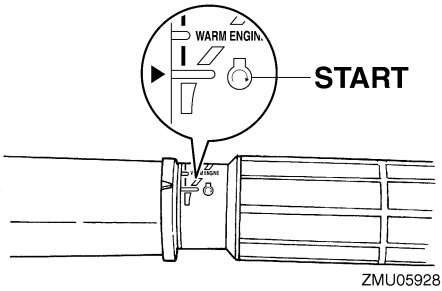


ZMU02240

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.

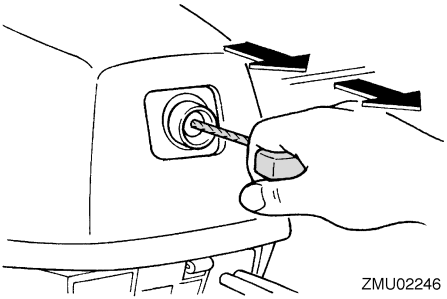

ZMU02242

3. Place the throttle grip in the "**START**" (start) position.



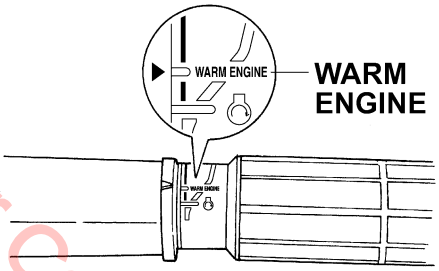
ZMU05928

4. Pull the manual starter handle slowly until you feel resistance. Then give a strong pull straight out to crank and start the engine.


ZMU02246

TIP:

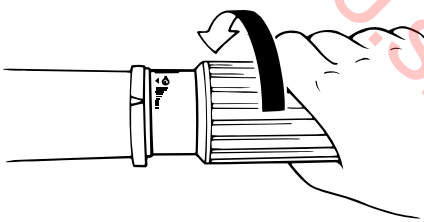
- If the engine does not start, place the throttle grip in the "**WARM ENGINE**" (warm engine) position and try again.



ZMU05780

- It is not necessary to use the choke when starting a warm engine.

5. After the engine starts, slowly return the manual starter handle to its original position before releasing it.
6. Slowly return the throttle grip to the fully closed position.


ZMU02030

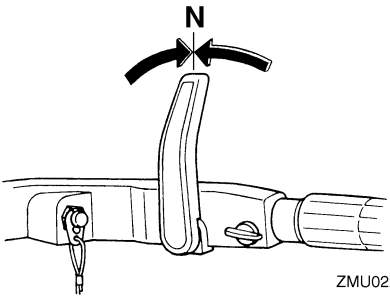
EMU34923
Electric start models (tiller control)
EWM01840

⚠ WARNING

- **Failure to attached 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.**

Starting procedure (cold engine)

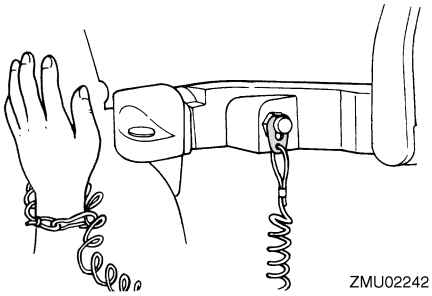
1. Place the gear shift lever in neutral.



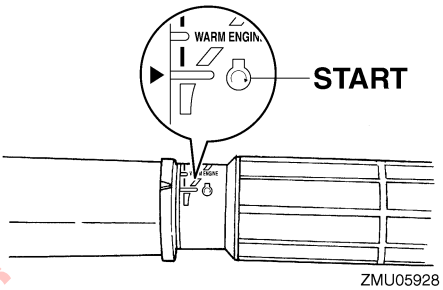
ZMU02240

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.

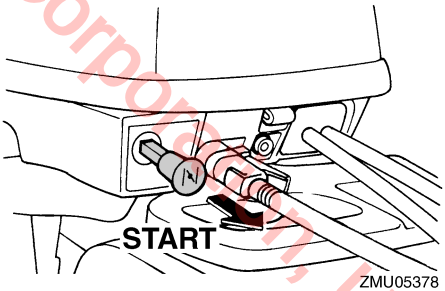

ZMU02242

3. Place the throttle grip in the "START" (start) position.



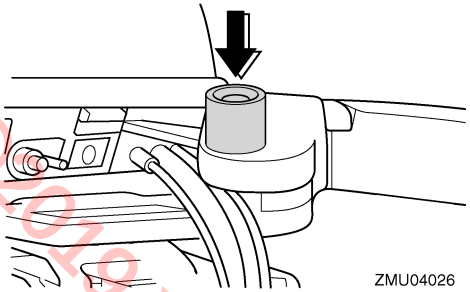
ZMU05928

4. Pull out the choke knob fully.

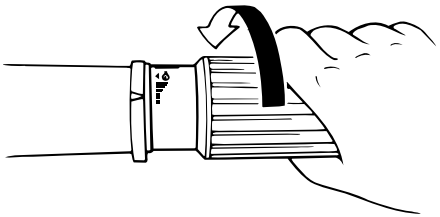


ZMU05378

5. Push the starter button to start the engine.


ZMU04026

6. Immediately after the engine starts, release the starter button to allow it to return to its original position. ***NOTICE:*** **Never push the starter button 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, release the starter button, wait 10 seconds, then crank the engine again.** [ECM00161]
7. Slowly return the throttle grip to the fully closed position.


ZMU02030

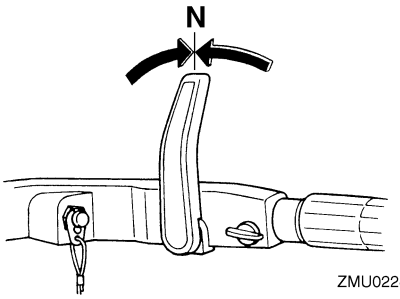
8. Return the choke knob to the home position gradually.

TIP:

- If the choke knob is left in the "START" (start) position while the engine is running, the engine will run poorly or stall.
- When the engine is cold, for example, when the ambient temperature is low in winter, it needs to be warmed up. For further information, see page 55.

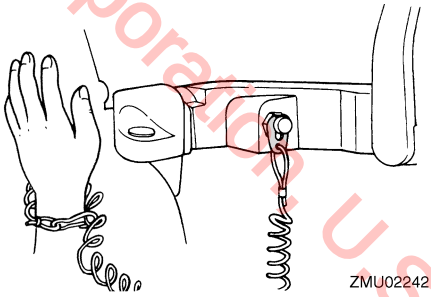
Starting procedure (warm engine)

1. Place the gear shift lever in neutral.

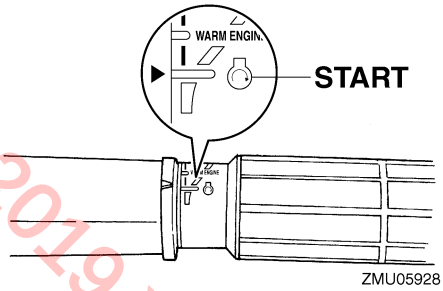


ZMU02240

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.

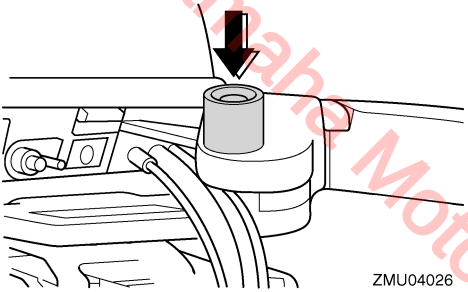

ZMU02242

3. Place the throttle grip in the "START" (start) position.



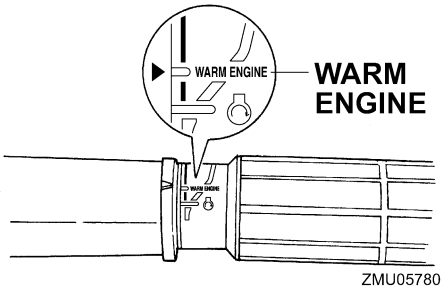
ZMU05928

4. Push the starter button to start the engine.


ZMU04026

TIP:

- If the engine does not start, place the throttle grip in the "WARM ENGINE" (warm engine) position and try again.

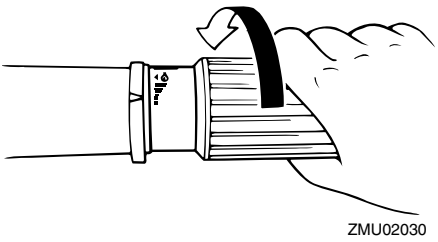


ZMU05780

- It is not necessary to use the choke when starting a warm engine.

5. Immediately after the engine starts, release the starter button to allow it to return to its original position.

6. Slowly return the throttle grip to the fully closed position.


ZMU02030

EMU34932

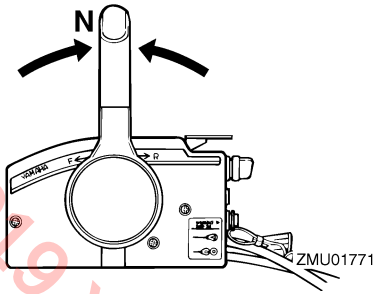
Electric start models (remote control)

EWM01840

WARNING

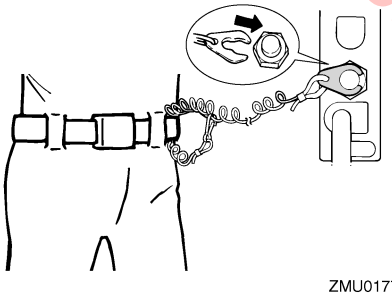
- **Failure to attached engine shut-off cord could result in a runaway boat if operator is ejected. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg while operating. Do not attach the cord to clothing that could tear loose. Do not route the cord where it could become 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.

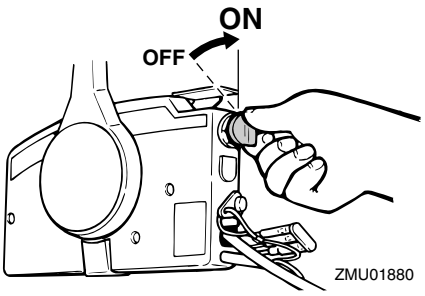


TIP:
The start-in-gear protection device prevents the engine from starting except when in neutral.

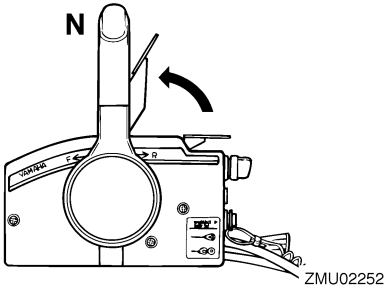
2. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg. Then install the clip on the other end of the cord into the engine shut-off switch.



3. Turn the main switch to "**ON**" (on).

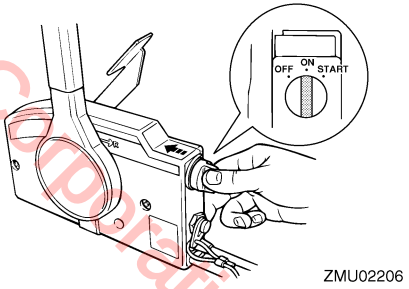


4. Open the throttle slightly without shifting using the neutral throttle lever.



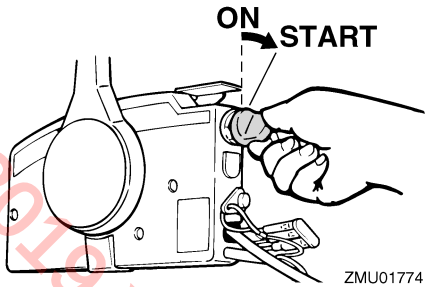
TIP:
The neutral throttle lever can only be used when the remote control lever is in neutral.

5. Press in and hold the main switch to operate the remote choke system. (The remote choke system operates only when the main switch is pressed in fully.)



TIP:
It is not necessary to use the choke when starting a warm engine.

6. Turn the main switch to "**START**" (start) to start the engine.



ZMU01774

7. Immediately after the engine starts, release the main switch and allow it to return to "ON" (on). The remote choke system stops operating when the main switch is released. ***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.** [ECM00192]
8. Return the neutral throttle lever to the original position.

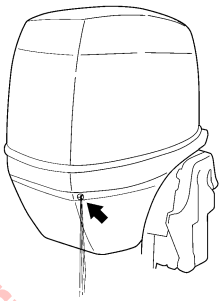
TIP:
When the engine is cold, for example, when the ambient temperature is low in winter, it needs to be warmed up. For further information, see page 55.

EMU36510
Checks after starting engine

EMU36523
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.

ECM01810
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.


ZMU05168

EMU27670
Warming up engine

EMU27716
Manual start and electric start models
1. After starting the engine, allow it to idle for 3 minutes to warm up. Failure to do so will shorten engine life.
2. Be sure the low oil pressure-alert indicator goes off after starting the engine. ***NOTICE:*** **If the low oil pressure-alert indicator blinks after the engine starts, stop the engine. Otherwise, serious engine damage could occur. Check the oil level and add engine oil if necessary. Consult your Yamaha dealer if the cause for the low oil pressure alert cannot be found.** [ECM01831]

EMU36531
Checks after engine warm up

EMU36541
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.

EMU36980
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.

EMU34561
Shifting

EWM00180
⚠ WARNING

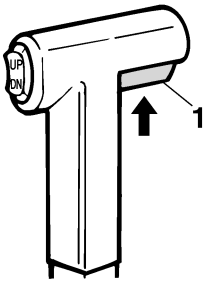
Before shifting, make sure there are no swimmers or obstacles in the water near you.

ECM01610
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

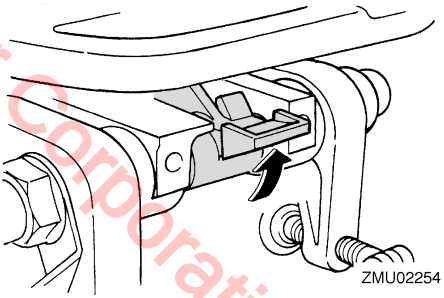
1. Pull the neutral interlock trigger up (if equipped).

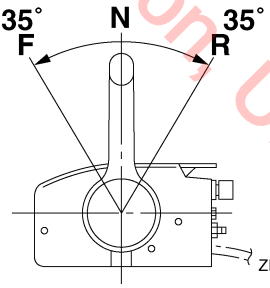


ZMU01727

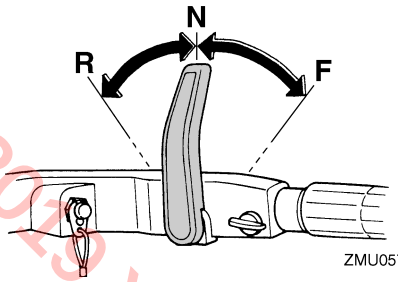
1. Neutral interlock trigger

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]. Be sure to check that the tilt lock lever is in the lock/down position (if equipped) before operating in reverse.


ZMU02254



ZMU05460

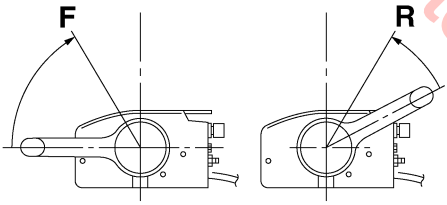


ZMU05762

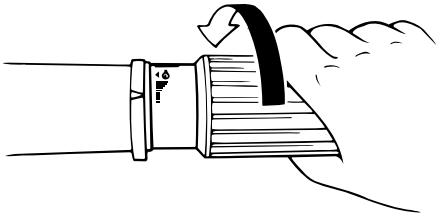
TIP:
Tiller handle models: The gear shift lever operates only when the throttle grip is in the fully closed position.

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

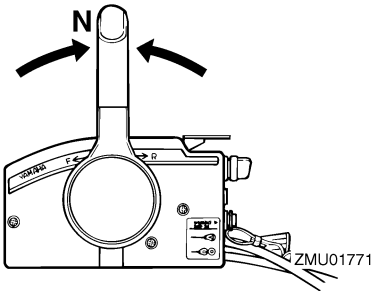
1. Close the throttle so that the engine slows to idle speed.



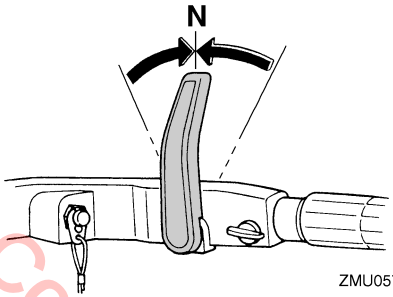
ZMU05462


ZMU02030

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



ZMU05764

EMU31742

Stopping boat

EWM01510

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.

EMU27821

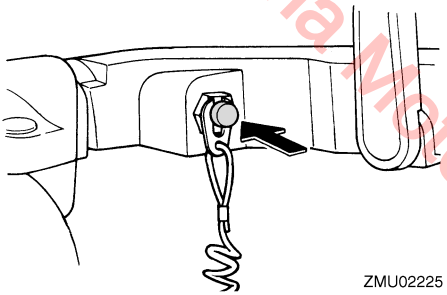
Stopping engine

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.

EMU43430

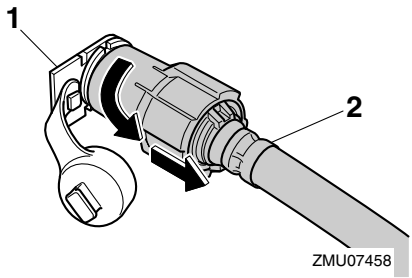
Procedure

1. Push and hold the engine stop button until the engine comes to a complete stop.



ZMU02225

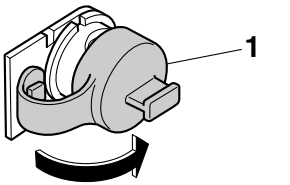
2. After stopping the engine, disconnect the fuel hose from the fuel joint on the outboard motor by turning it counterclockwise.



ZMU07458

1. Fuel joint
2. Fuel hose

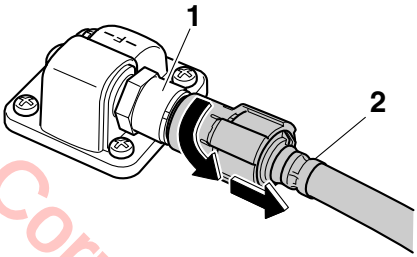
3. Install the fuel joint cap on the outboard motor.



ZMU07459

1. Fuel joint cap

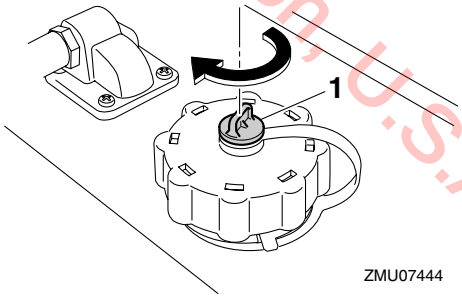
4. Disconnect the fuel hose from the fuel joint on the fuel tank by turning it counterclockwise.



ZMU07443

1. Fuel joint
2. Fuel hose

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



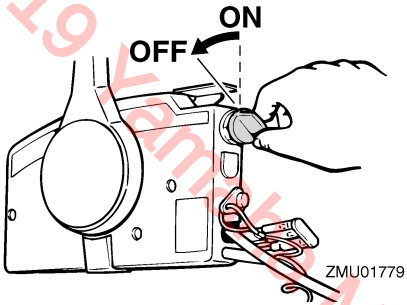
ZMU07444

1. Air vent screw

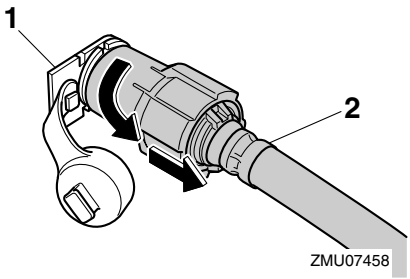
TIP:
If the outboard motor is equipped with an engine shut-off cord, the engine can also be stopped by pulling the cord and removing the clip from the engine shut-off switch.

EMU43440
Procedure

1. Turn the main switch to "OFF" (off).

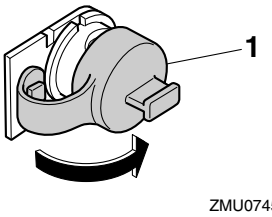


2. After stopping the engine, disconnect the fuel hose from the fuel joint on the outboard motor by turning it counterclockwise.



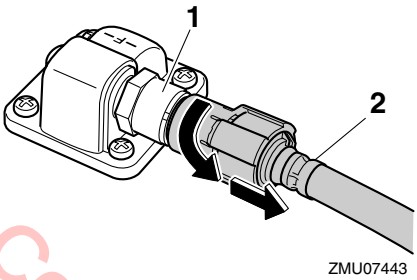
1. Fuel joint
2. Fuel hose

3. Install the fuel joint cap on the outboard motor.



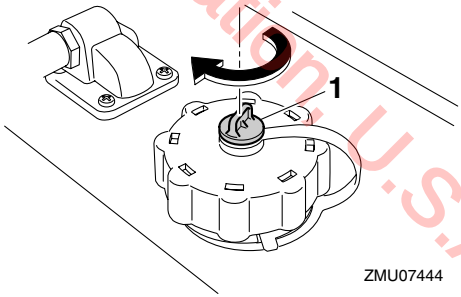
1. Fuel joint cap

4. Disconnect the fuel hose from the fuel joint on the fuel tank by turning it counterclockwise.



1. Fuel joint
2. Fuel hose

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



1. Air vent screw

6. When using the fuel tank on a boat, close the fuel valve.

TIP:
Check the boat's manual for the position of the fuel valve.

7. 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).

EMU27862

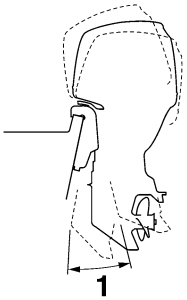
Trimming outboard motor

EWM00740

⚠ 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

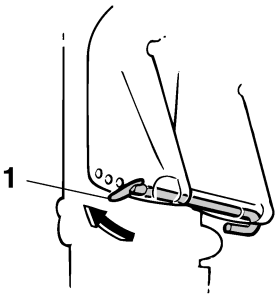
1. Trim operating angle

EMU27872

Adjusting trim angle for manual tilt models

There are 4 or 5 holes provided in the clamp bracket to adjust the outboard motor trim angle.

1. Stop the engine.
2. Tilt the outboard motor up, and then remove the trim rod from the clamp bracket.



ZMU02257

1. Trim rod

3. Reposition the rod in the desired hole.

To raise the bow ("trim-out"), move the rod away from the transom.

To lower the bow ("trim-in"), move the rod toward the transom.

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

EWM00400

⚠ WARNING

- **Stop the engine before adjusting the trim angle.**
- **Use care to avoid being pinched when removing or installing the rod.**
- **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.**

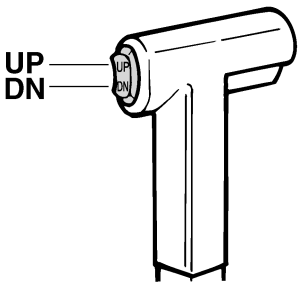
TIP:
The outboard motor trim angle can be changed approximately 4 degrees by shifting the trim rod one hole.

EMU27904
Adjusting trim angle (power tilt models)
EWM00753

⚠ 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.**

Tilt the engine to the desired angle using the power tilt switch.

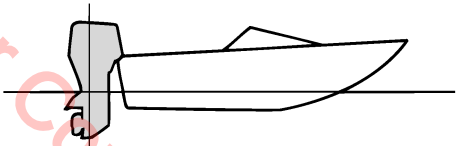


ZMU01720

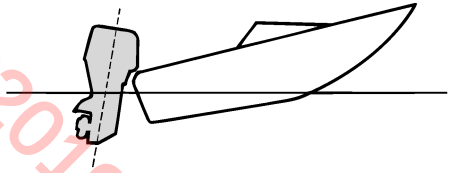
TIP:
Stay within the trim operating angle when trimming the outboard motor using the power tilt system.

To raise the bow (“trim-out”), tilt the engine up. To lower the bow (“trim-in”), tilt the engine down.
Make test runs with the trim set to different angles to find the position that works best for your boat and operating conditions.

EMU27912
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

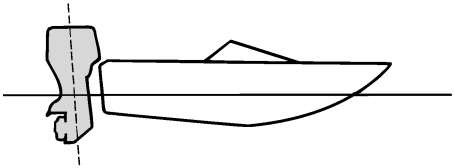
Bow Up
Too much trim-out puts the bow of the boat too high in the water. Performance and economy are decreased because the hull of the boat is pushing the water and there is more air drag. Excessive trim-out can also cause the propeller to ventilate, which reduces performance further, and the boat may “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.

EMU27935

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.

EWM00222

⚠ 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.

EWM00250

⚠ 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.

ECM00241

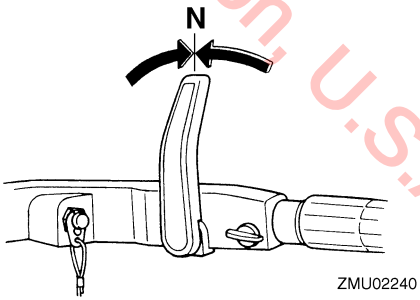
NOTICE

- **Before tilting the outboard motor, stop the engine by following the procedure on page 58. 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.**

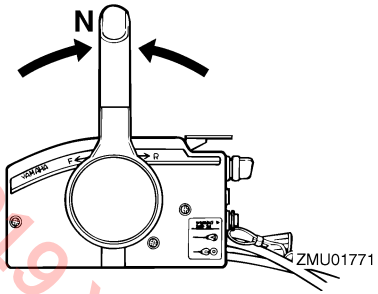
EMU43220

Procedure for tilting up (manual tilt models)

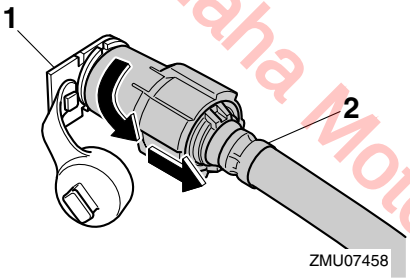
1. Place the remote control lever / gear shift lever in neutral.



ZMU02240

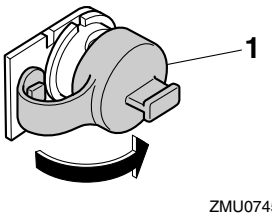


2. Disconnect the fuel hose from the fuel joint on the outboard motor by turning it counterclockwise.



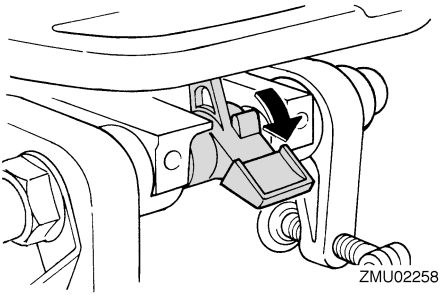
1. Fuel joint
2. Fuel hose

3. Install the fuel joint cap on the outboard motor.

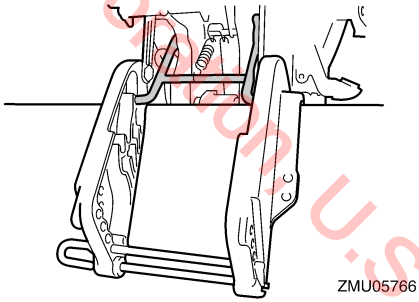


1. Fuel joint cap

4. Place the tilt lock lever (if equipped) in the release/up position.



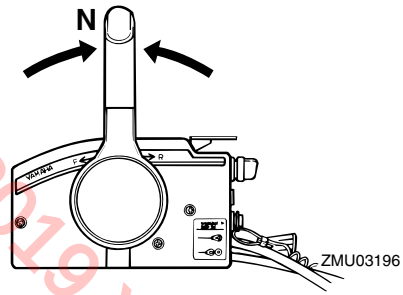
5. Pull up the shallow water lever (if equipped).
6. Hold the rear of the top cowling with one hand and tilt the engine up fully.
7. Push the tilt support knob into the clamp bracket. Or the tilt support bar will turn to the lock position automatically. ***NOTICE:*** **Do not use the tilt support lever 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 69.** [ECM01641]

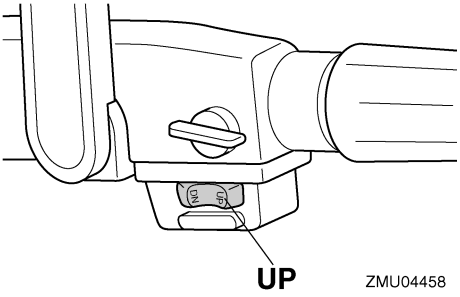


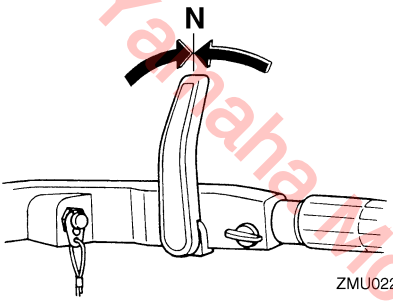
EMU32724

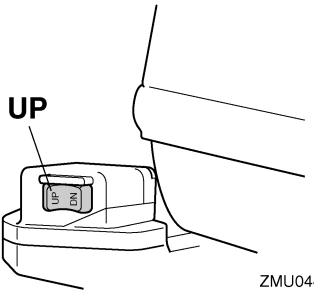
Procedure for tilting up (power tilt models)

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

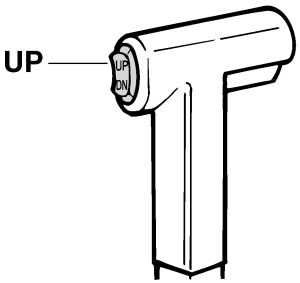




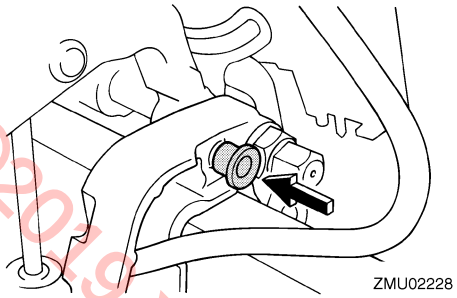




2. Press the power tilt switch "**UP**" (up) until the outboard motor has tilted up completely.



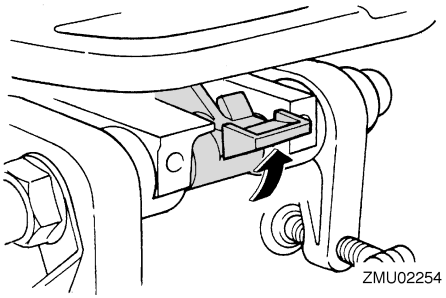
3. Push the tilt support knob into the clamp bracket to support the engine. **WARNING! After tilting the outboard motor, be sure to support it with the tilt support knob or tilt support lever. Otherwise the outboard motor could fall back down suddenly if oil in the power trim and tilt unit or in the power tilt unit loses pressure.** [EWM00262] ***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 69.** [ECM01641]


ZMU02228

4. Models equipped with trim rods: Once the outboard motor is supported with the tilt support lever, press the power tilt switch "**DN**" (down) to retract the trim rods. ***NOTICE:*** **Make sure that the trim rods retracts completely during mooring. This protects the rods from marine growth and corrosion, which could damage the power trim and tilt mechanism.** [ECM00252]

EMU30192
Procedure for tilting down (manual tilt models)

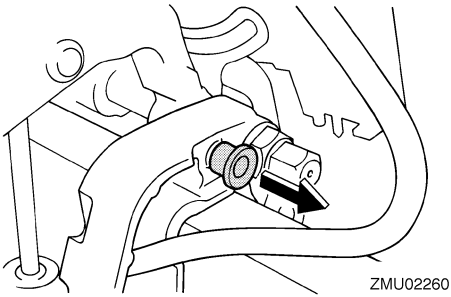
1. Place the tilt lock lever in the lock position.


ZMU02254

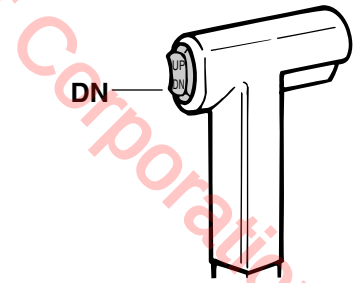
2. Slightly tilt the engine up until the tilt support bar is automatically released.
3. Slowly tilt the engine down.

EMU33121
Procedure for tilting down (power tilt models)

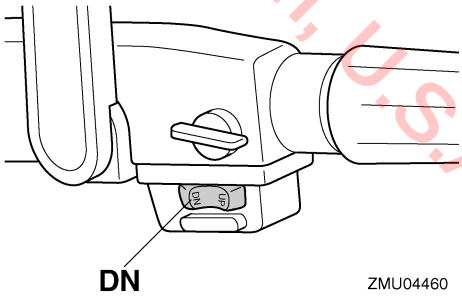
1. Push the power tilt switch "**UP**" (up) until the outboard motor is supported by the tilt rod and the tilt support knob becomes free.
2. Pull out the tilt support knob.


ZMU02260

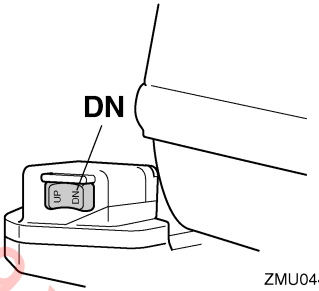
3. Push the power tilt switch "**DN**" (down) to lower the outboard motor to the desired position.



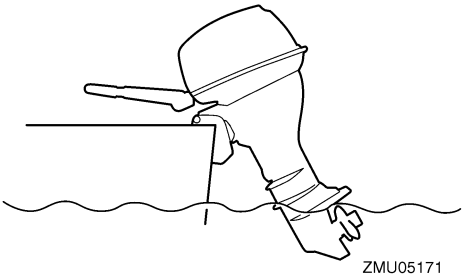
ZMU01936



ZMU04460



ZMU04461


ZMU05171

EMU28062

Shallow water

EMU28073

Cruising in shallow water (manual tilt models)

EWM01781

WARNING

- **Run the boat at the lowest possible speed when using the shallow water cruising system. The tilt lock mechanism does not work while the shallow water cruising system is being used. Hitting an underwater obstacle could cause the outboard motor to lift out of the water, resulting in loss of control.**
- **Use extra care when operating in reverse. Too much reverse thrust can cause the outboard motor to lift out of the water, increasing the chance of accident and personal injury.**

ECM00260

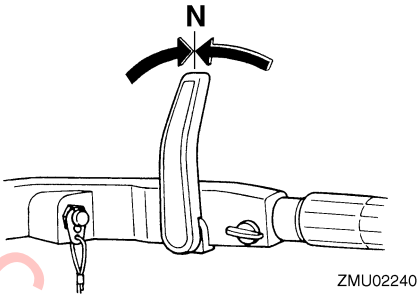
NOTICE

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.

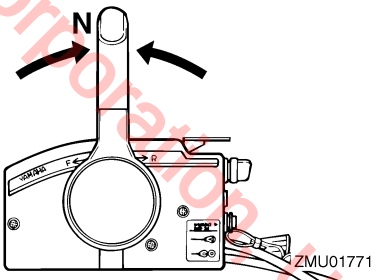
EMU28125

Procedure

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

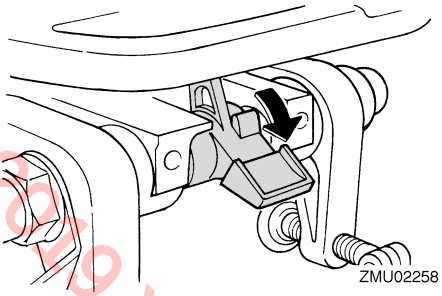


ZMU02240

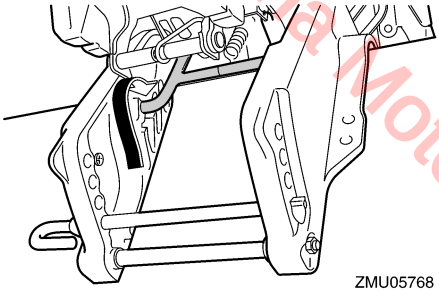


ZMU01771

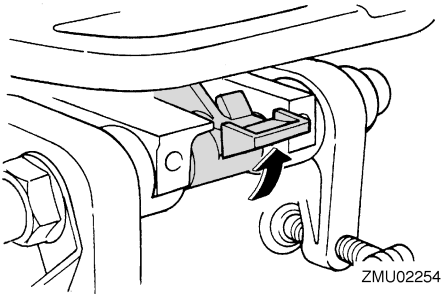
2. Place the tilt lock lever in the release/up position.



3. Slightly tilt the outboard motor up. The tilt support bar will lock automatically, supporting the outboard motor in a partially raised position. This outboard motor has 2 positions for shallow water cruising.



4. To return the outboard motor to the normal running position, place the remote control lever / gear shift lever in neutral.
5. Place the tilt lock lever in the lock/down position, then slightly tilt the outboard motor up until the tilt support bar automatically returns to the free position.



6. Slowly lower the outboard motor to the normal position.

EMU32861

Power tilt models

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

ECM00260

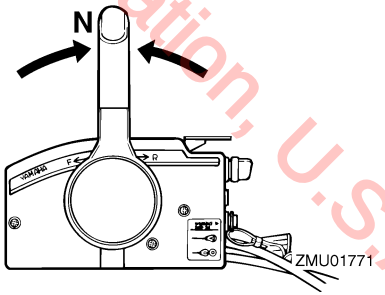
NOTICE

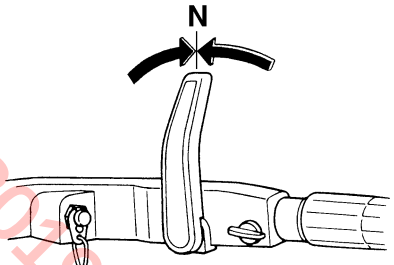
Do not tilt the outboard motor up so that the cooling water inlet on the lower unit is above the surface of the water when setting up for and cruising in shallow water. Otherwise severe damage from overheating can result.

EMU32942

Procedure for power tilt models

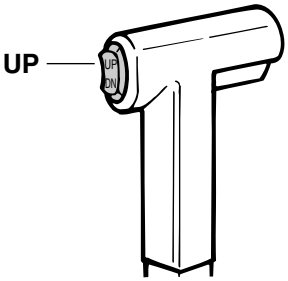
1. Place the remote control lever / gear shift lever in neutral.



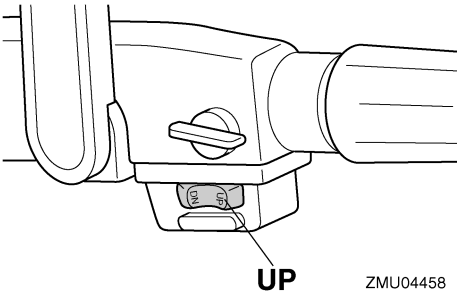


ZMU02240

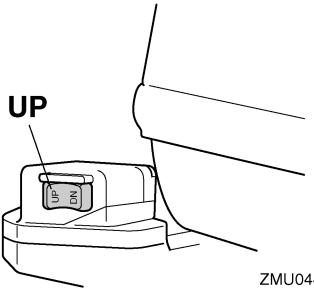
2. Slightly tilt the outboard motor up to the desired position using the power tilt switch. **WARNING! Using the power tilt switch on the bottom cowling while the boat is moving or engine is on could increase the risk of falling overboard and could distract the operator, increasing the risk of collision with another boat or an obstacle.** [EWM01960]



ZMU01935



ZMU04458



ZMU04459

3. To return the outboard motor to the normal running position, press the power tilt switch and slowly tilt the outboard motor down.

EMU28195

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 20) 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.

EMU43250
Transporting and storing outboard motor

EWM02620
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.**

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

- Disconnect the fuel hose from the fuel joint on the outboard motor and install the fuel joint cap.
- Tighten the fuel tank cap and its air vent screw.
- Store the fuel tank in a well-ventilated place.
- Store the fuel tank in a place that is stable and not exposed to shocks.

When the outboard motor is tilted prolonged time for mooring or trailering the boat, make sure to follow the procedure listed below.

- Disconnect the fuel hose from the fuel joint on the outboard motor and install the fuel joint cap.
- Tighten the fuel tank cap and its air vent screw.

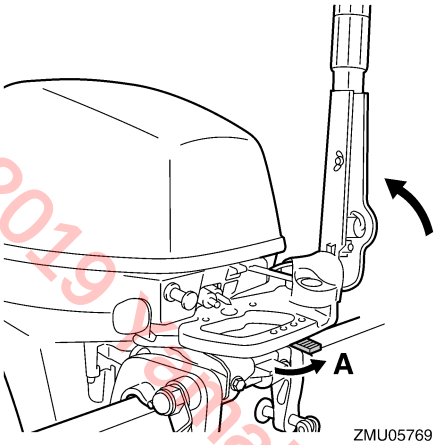
The outboard motor should be transported and stored in the normal running position. If there is insufficient road clearance in this position, then trailer the outboard motor in the tilt position using a motor support device such as a transom saver bar. Consult your Yamaha dealer for further details.

EMU43450
Dismounting the outboard motor

ECM01680
NOTICE

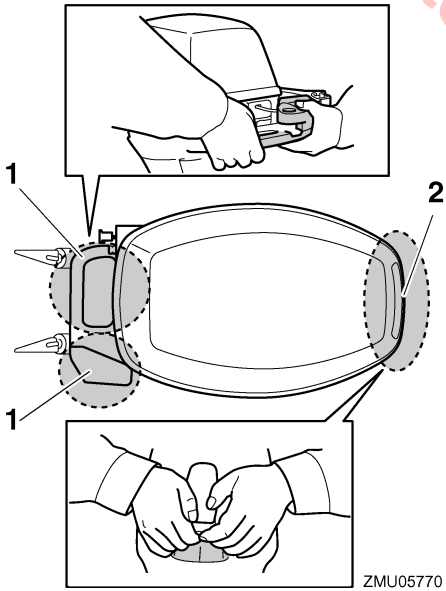
Do not hold the top cowling when mounting or dismounting the outboard motor. The top cowling could come off, causing the outboard motor to fall.

1. Stop the engine and land the boat.
2. Disconnect the fuel hose from the fuel joint on the outboard motor and install the fuel joint cap.
3. For electric start models, disconnect the battery cables from the battery terminals.
4. To prevent steering movement, turn the adjuster lever to “A” (if equipped with the adjuster lever). To hold the steering bracket easily, raise the tiller handle to the vertical position (if equipped with the tiller handle).



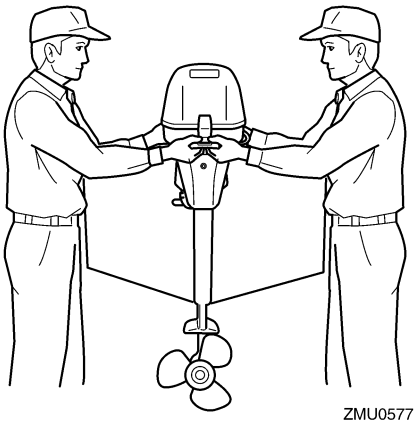
ZMU05769

5. Loosen the clamp screw(s).
6. Hold the handgrip and steering bracket as shown in the illustration and lift up the outboard motor to dismount it from the boat.

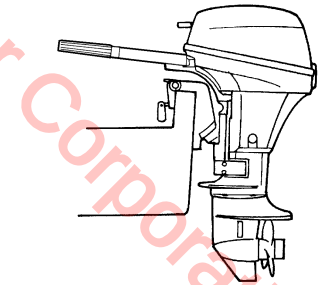


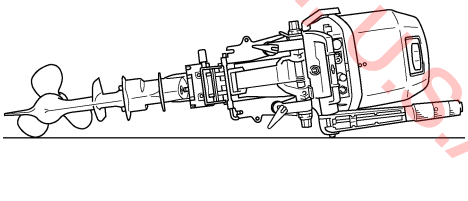
ZMU05770

1. Steering bracket
2. Handgrip


ZMU05771

7. When transporting or storing the outboard motor while removed from a boat, keep the outboard motor in the attitude shown or use an outboard motor stand.


ZMU02263


ZMU02487

TIP:
When transporting the outboard motor in a horizontal position, place a towel or something similar under the outboard motor to protect it from damage.

EMU28241
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.

ECM01080
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), 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.**

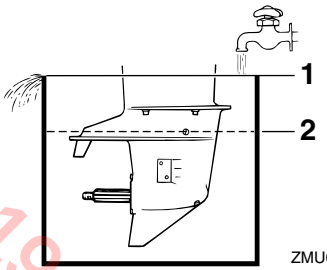
EMU28305
Procedure
EMU43330
Flushing in a test tank
ECM00301
NOTICE

Before starting the engine, make sure to supply water to the cooling water passages. Otherwise, the engine could overheat and be damaged.

1. Dismount the outboard motor from the boat. For further details, see page 69.
2. Wash the outboard motor body using fresh water. ***NOTICE:*** **Do not spray water into the air intake.** [ECM01840] For further information, see page 73.
3. Fill the fuel tank with fresh fuel and add one ounce of “Yamaha Fuel Conditioner and Stabilizer” to each gallon of fuel.

TIP:
The use of “Yamaha Fuel Conditioner and Stabilizer” eliminates the need to drain the fuel system. Consult your Yamaha dealer or other qualified mechanic if the fuel system is to be drained instead.

4. Disconnect the fuel hose from the fuel joint on the outboard motor and install the fuel joint cap.
5. Remove the engine top cowling and silencer cover. Remove the propeller. For further details, see page 83.
6. Position the outboard motor on a water tank. For further details, see page 37.



1. Water surface
2. Lowest water level

7. Fill the tank with fresh water to above the level of the anti-cavitation plate. ***NOTICE:*** **If the fresh water level is below the level of the anti-cavitation plate, or if the water supply is insufficient, engine seizure may occur.** [ECM00291]
8. Cooling system flushing is essential to prevent the cooling system from clogging up with salt, sand, or dirt. In addition, fogging of the engine is mandatory to prevent excessive engine damage due to rust. Perform the flushing and fogging at the same time. **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.** [EWM00091]
9. Run the engine at a fast idle for 10–15 minutes in neutral position.
10. Just prior to turning off the engine, quickly spray "Yamaha Stor-Rite Engine Fogging Oil" alternately into each carburetor or the fogging hole of the silencer cover, if equipped. When properly done, the engine will smoke excessively and almost stall.
11. Remove the outboard motor from the test tank. For further details, see page 69.
12. Drain the cooling water completely out of the motor. Clean the body thoroughly.
13. Install the silencer cover/cap and top cowling.

EMU28402
Lubrication

1. Install the spark plug(s) and torque to proper specification. For information on spark plug installation, see page 79.
2. Change the gear oil. For instructions, see page 84. Inspect the oil for the presence of water that indicates a leaky seal. Seal replacement should be performed by an authorized Yamaha dealer prior to use.
3. Grease all grease fittings. For further details, see page 78.

TIP:

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

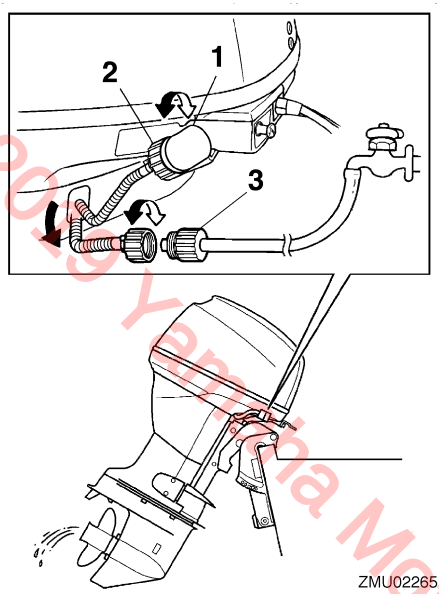
EMU28445
Flushing power unit

Perform this procedure right after operation for the most thorough flushing.

ECM01530
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. After shutting off the engine, unscrew the garden hose connector from the fitting on the bottom cowling.



ZMU02265

1. Fitting
2. Garden hose connector
3. Garden hose adapter

2. Screw the garden hose adapter onto a garden hose, which is connected to a fresh water supply, and then connect it to the garden hose connector.
3. With the engine off, turn on the water tap and let the water flush through the cooling passages for about 15 minutes. Turn off the water and disconnect the garden hose adapter from the garden hose connector.
4. Reinstall the garden hose connector onto the fitting on the bottom cowling. Tighten the connector securely. ***NOTICE:*** **Do not leave the garden hose connector loose on the bottom cowling fitting or let the hose hang free during normal operation. Water will leak out of the connector instead of cooling the engine, which can cause serious overheating. Be sure the connector is tightened securely on the fitting after flushing the engine.** [ECM00541]

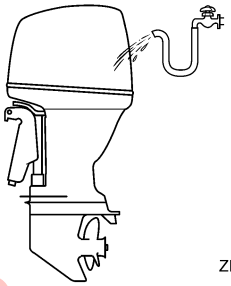
TIP:

- When flushing the engine with the boat in the water, tilting up the outboard motor until it is completely out of the water will achieve better results.
- For cooling system flushing instructions, see page 69.

EMU28452

Cleaning the outboard motor

After use, wash the exterior of the outboard motor with fresh water. Flush the cooling system with fresh water.


ZMU05174

EMU28461

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. A touch-up paint is available from your Yamaha dealer.

EMU37012

Periodic maintenance

EWM01942

⚠ 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 tilt switch 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 tilt mechanism.**
- **Allow the engine to cool before handling hot parts or fluids.**
- **Always completely reassemble the motor before operation.**

Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine engine repair establishment or individual. All warranty repairs, however, including those to the emission control system, must be performed by an authorized Yamaha marine dealership.

A service manual is available for purchase through your Yamaha dealer for owners who have the mechanical skills, tools, and other equipment necessary to perform maintenance not covered by this owner's manual.

EMU28511

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.

EMU35521

Maintenance interval guidelines

The service intervals provided in the Maintenance Chart were developed based upon "typical" use that includes operating at varied speeds, with sufficient time for engine warm up and cool-down, a medium to light load, and an average cruising speed near the 3000 to 4000 rpm range. As with any engine, however, if your normal operating conditions are different, you should consider service more often than shown, especially how often you change your engine oil and gear oil. Examples might include extended wide-open-throttle use or long periods of trolling or idling, carrying heavy loads, or frequent starting and stopping or shifting. More frequent maintenance will often pay off many times over in increased engine life and greater owner satisfaction. Consult your Yamaha dealer for additional maintenance recommendations.

EMU34446
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		
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)
Anode(s) (external)	Inspection or replacement as necessary		●/○		
Anode(s) (cylinder head, thermostat cover)	Inspection or replacement as necessary		○		
Anodes (exhaust cover, cooling water passage cover, Rectifier Regulator cover)	Replacement				○
Battery (electrolyte level, terminal)	Inspection	●/○	●/○		
Battery (electrolyte level, terminal)	Fill, charging or replacing as necessary		○		
Cooling water leakage	Inspection or replacement as necessary	○	○		
Cowling lock lever	Inspection		●/○		
Engine starting condition/noise	Inspection	●/○	●/○		
Engine idle speed/noise	Inspection	●/○	●/○		
Engine oil	Replacement	●/○	●/○		
Engine oil filter (built into oil pan)	Inspection, cleaning or replacement as necessary		○		
Fuel filter (disposal type)	Replacement		○		

Item	Actions	Initial	Every		
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)
Fuel line	Inspection	●	●		
Fuel line	Inspection or replacement as necessary	○	○		
Fuel pump	Inspection or replacement as necessary			○	
Fuel/engine oil leakage	Inspection	○	○		
Gear oil	Replacement	●/○	●/○		
Greasing points	Greasing	●/○	●/○		
Impeller/water pump housing	Inspection or replacement as necessary		○		
Impeller/water pump housing	Replacement			○	
Power trim and tilt unit	Inspection	●/○	●/○		
Propeller/propeller nut/cotter pin	Inspection or replacement as necessary	●/○	●/○		
Shift link/shift cable	Inspection, adjustment or replacement as necessary	○	○		
Spark plug(s)	Inspection or replacement as necessary		●/○		
Spark plug caps/spark plug wires	Inspection or replacement as necessary	○	○		
Water from the cooling water pilot hole	Inspection	●/○	●/○		
Throttle link/throttle cable/throttle pick-up timing	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	●/○	●/○		
Main switch/stop switch/choke switch	Inspection or replacement as necessary	○	○		
Wire harness connections/wire coupler connections	Inspection or replacement as necessary	○	○		

Item	Actions	Initial	Every		
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)
Fuel tank (Yamaha portable tank)	Inspection and cleaning as necessary		○		

EMU34451

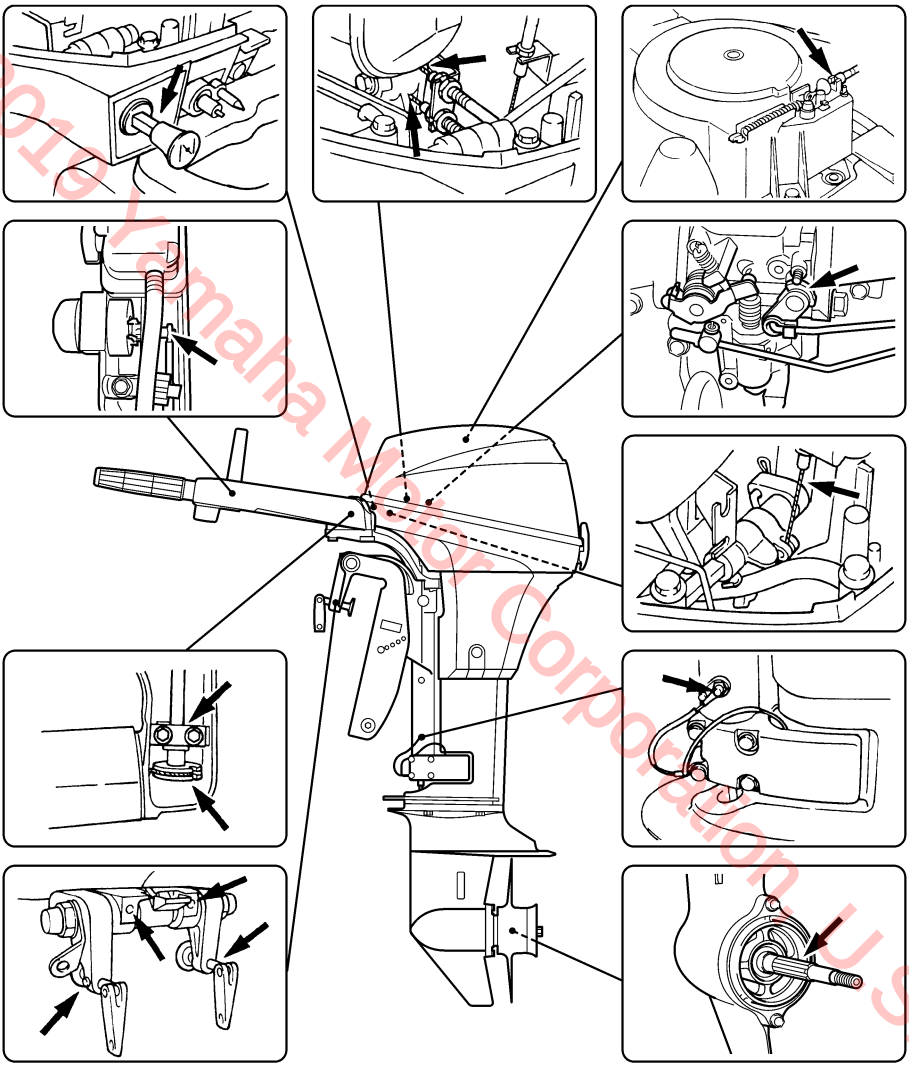
Maintenance chart 2

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

EMU28933
Greasing

Yamaha marine grease (Water resistant grease)

F9.9, T9.9



ZMU05790

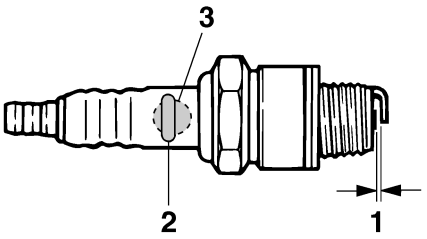
EMU28957
Cleaning and adjusting spark plug

The spark plug is an important engine component and is easy to inspect. 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 inspect the spark plug because heat and deposits will cause the spark plug to slowly break down and erode.

1. Remove the spark plug caps from the spark plugs.
2. Remove the spark plug. If electrode erosion becomes excessive, or if carbon and other deposits are excessive, you should replace the spark plug with another of the correct type. **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.** [EWM00561]

Standard spark plug:
BR6HS-10

3. Be sure to use the specified spark plug, otherwise the engine may not operate properly. Before fitting the spark plug, measure the electrode gap with a wire thickness gauge; replace it if out of specification.



ZMU02179

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

Spark plug gap:
0.9–1.0 mm (0.035–0.039 in)

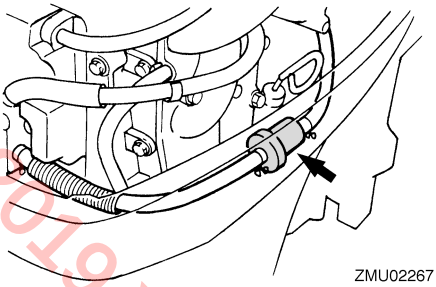
4. When fitting the plug, wipe off any dirt from the threads, and then screw it in to the correct torque.

Spark plug torque:
25.0 Nm (2.55 kgf-m, 18.4 ft-lb)

TIP:
If a torque-wrench is not available when you are fitting a spark plug, a good estimate of the correct torque is 1/4 to 1/2 a turn past finger-tight. Have the spark plug adjusted to the correct torque as soon as possible with a torque-wrench.

EMU28991
Checking fuel filter

Check the fuel filter periodically. The fuel filter is a one piece, disposable type. If foreign matter is found in the filter, replace it. For replacement of the fuel filter, consult your Yamaha dealer.



ZMU02267

EMU29044
Inspecting idle speed

EWM00451

⚠ 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.**

ECM00490

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 14. If you have difficulty verifying the idle speed, or the idle speed requires adjustment, consult a Yamaha dealer or other qualified mechanic.

EMU38804
Changing engine oil

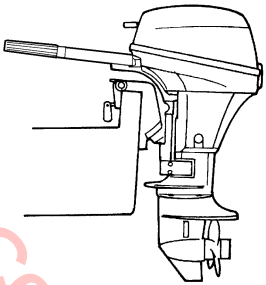
ECM01710

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.

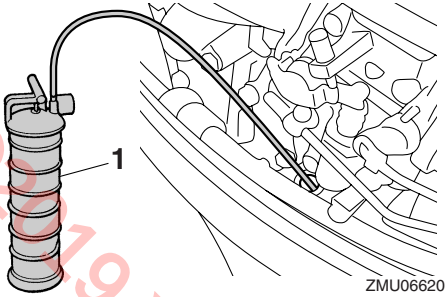
Extract the engine oil with an oil changer.

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.** [ECM01861]



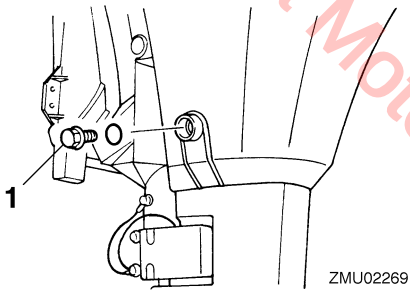
ZMU02263

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.



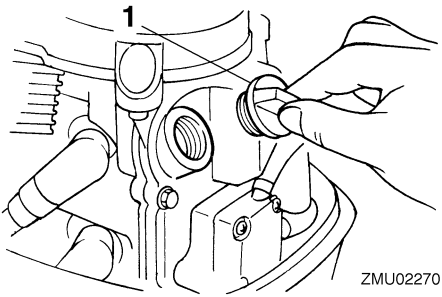
1. Oil changer

TIP:
If the oil changer is not available, remove the drain screw while holding a container under the drain hole. Let the oil drain completely. Wipe up any spilled oil immediately.



1. Drain screw

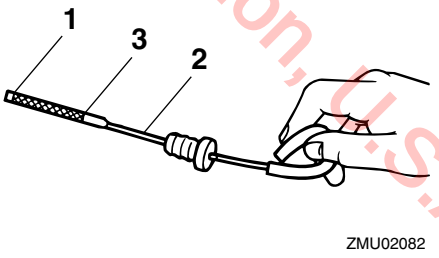
6. Add the correct amount of oil through the filler hole. Put back the filler cap and the dipstick. ***NOTICE:*** **Overfilling the oil could cause leakage or damage. If the oil level is above the upper level mark, drain until the level meets the specified capacity.** [ECM01850]



1. Oil filler cap

Recommended engine oil:
YAMALUBE 4-M FC-W or 4-stroke outboard motor oil
Engine oil quantity:
0.8 L (0.85 US qt, 0.70 Imp.qt)

7. Leave the outboard motor for 5-10 minutes.
8. Remove oil dipstick and wipe it clean.
9. 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.
10. 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.



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

11. 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.** [ECM01622]
12. Dispose of used oil according to local regulations.

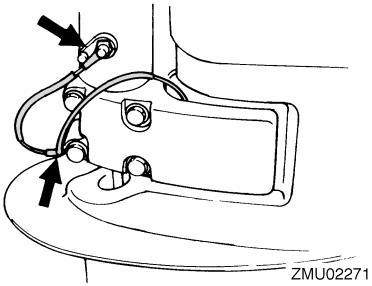
TIP:

- 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.

EMU29114

Inspecting wiring and connectors

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



ZMU02271

EMU32112

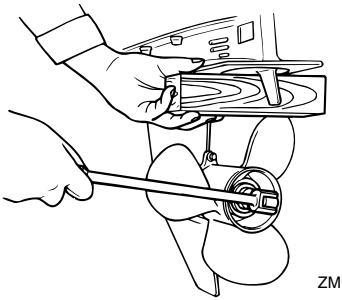
Checking propeller

EWM01881

⚠ 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.

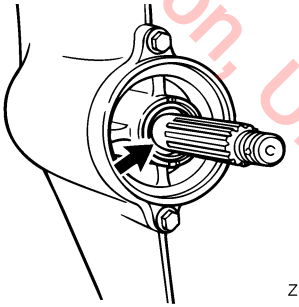
Do not use your hand to hold the propeller when loosening or tightening the propeller nut. Put a wood block between the anti-cavitation plate and the propeller to prevent the propeller from turning.



ZMU01897

Checkpoints

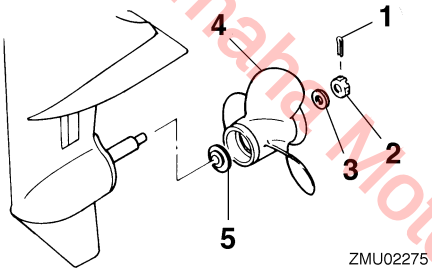
- Check each of the propeller blades for erosion from cavitation or ventilation, or other damage.
- Check the propeller shaft for damage.
- Check the splines for wear or damage.
- Check for fish line tangled around the propeller shaft.



ZMU02274

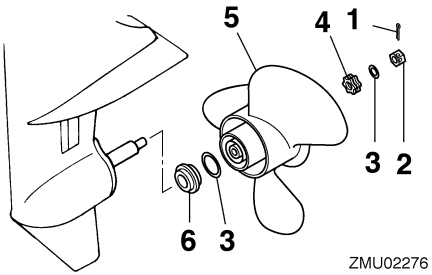
- Check the propeller shaft oil seal for damage.

EMU30662
Removing propeller
EMU29197
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.** [EWM01890]



ZMU02275

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



ZMU02276

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.

EMU30672
Installing propeller
EMU29234
Spline models
ECM00501

NOTICE

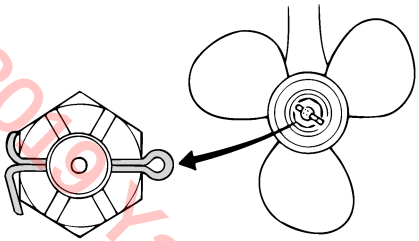
Make sure to use a new cotter pin and bend the ends over securely. Otherwise, the propeller could come off during operation and be lost.

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.** [ECM01881]
3. Install the spacer (if equipped) and the washer. Tighten the propeller nut to the specified torque.

Propeller nut tightening torque:
F9.9EA 17.0 Nm (1.73 kgf-m, 12.5 ft-lb)
F9.9MHA 17.0 Nm (1.73 kgf-m, 12.5 ft-lb)
T9.9EHA 21.0 Nm (2.14 kgf-m, 15.5 ft-lb)
T9.9PA 21.0 Nm (2.14 kgf-m, 15.5 ft-lb)
T9.9PHA 21.0 Nm (2.14 kgf-m, 15.5 ft-lb)

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.** [ECM01891]



ZMU01805

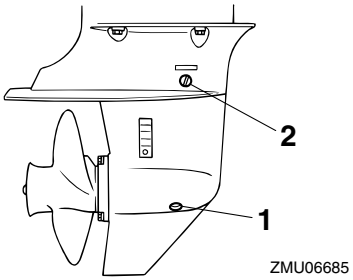
TIP:
If the propeller nut does not align with the propeller shaft hole after tightening to the specified torque, tighten the nut further to align it with the hole.

EMU29289
Changing gear oil

EWM00800
⚠ 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. ***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.** [ECM01900]



ZMU06685

1. Gear oil drain screw
2. Oil level plug

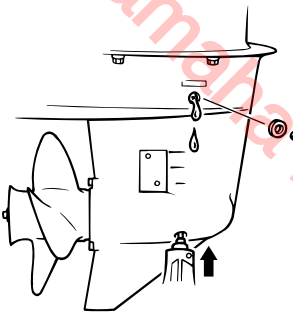
TIP:
- If a magnetic gear oil drain screw is equipped, remove all metal particles from the screw before installing it.
- Always use new gaskets. Do not reuse the removed gaskets.

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.** [ECM00713]

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:
Hypoid gear oil SAE#90
Gear oil quantity:
F9.9EA 0.150 L (0.159 US qt, 0.132 Imp.qt)
F9.9MHA 0.150 L (0.159 US qt, 0.132 Imp.qt)
T9.9EHA 0.370 L (0.391 US qt, 0.326 Imp.qt)
T9.9PA 0.370 L (0.391 US qt, 0.326 Imp.qt)
T9.9PHA 0.370 L (0.391 US qt, 0.326 Imp.qt)



ZMU06686

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.

Tightening torque:
9.0 Nm (0.92 kgf-m, 6.6 ft-lb)

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

Tightening torque:
9.0 Nm (0.92 kgf-m, 6.6 ft-lb)

EMU29313

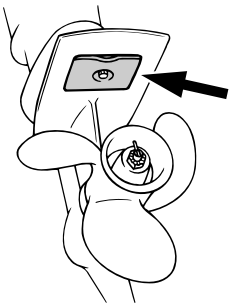
Inspecting and replacing anode(s)

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.

ECM00720

NOTICE

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



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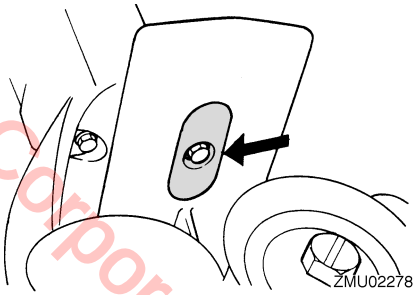

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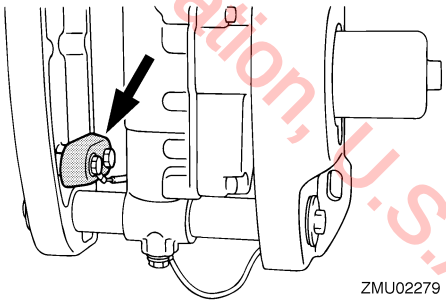


ZMU02279

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.

EMU29323
Checking battery (for electric start models)

EWM01902
⚠ WARNING

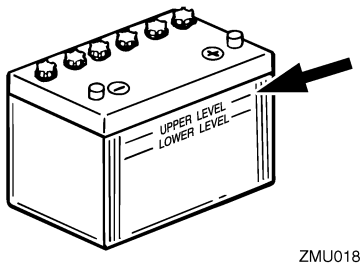
Battery electrolyte is poisonous and caustic, and batteries generate explosive hydrogen gas. When working near the battery:
- **Wear protective eye gear and rubber gloves.**
- **Do not smoke or bring any other source of ignition near the battery.**

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.

ECM01920
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.** [EWM01912]

EMU29334
Connecting the battery

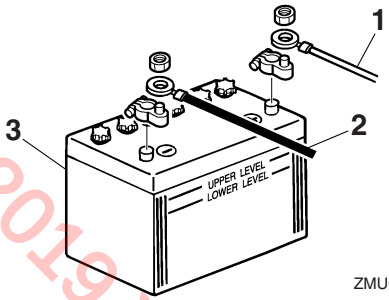
EWM00572
⚠ WARNING

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

ECM01124
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.

EMU29371

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.** [ECM01930]
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.** [ECM01940]
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.

EMU29427

Troubleshooting

A problem in the fuel, compression, or ignition systems can cause poor starting, loss of power, or other problems. This section describes basic checks and possible remedies, and covers all Yamaha outboard motors. Therefore some items may not apply to your model.
If your outboard motor requires repair, bring it to your Yamaha dealer.
If the engine trouble-alert indicator is flashing, consult your Yamaha dealer.

Starter will not operate.
Q. Is battery capacity weak or low?
A. Check battery condition. Use battery of recommended capacity.

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

Q. Is fuse for electric start 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 faulty?
A. Have serviced by a Yamaha dealer.

Q. Is shift lever in gear?
A. Shift to neutral.

Engine will not start (starter operates).
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 filter.

Q. Is starting procedure incorrect?
A. See page 48.

Q. Has fuel pump malfunctioned?
A. Have serviced by a Yamaha dealer.

Q. Are spark plug(s) fouled or of incorrect type?
A. Inspect spark plug(s). Clean or replace with recommended type.

Q. Are spark plug cap(s) fitted incorrectly?
A. Check and re-fit cap(s).

Q. Is ignition wiring damaged or poorly connected?
A. Check wires for wear or breaks. Tighten all loose connections. Replace worn or broken wires.

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

Q. Is engine shut-off cord (lanyard) not attached?
A. Attach cord.

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

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

Q. Is fuel system obstructed?

A. Check 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 filter.

Q. Have ignition parts failed?
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. Inspect and adjust as specified.

Q. Is ignition wiring damaged or poorly connected?
A. Check wires for wear or breaks. Tighten all loose connections. Replace worn or broken wires.

Q. Is specified engine oil not being used?
A. Check and replace oil as specified.

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

Q. Are carburetor adjustments incorrect?
A. Have serviced by a Yamaha dealer.

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

Q. Is air vent screw on fuel tank closed?
A. Open air vent screw.

Q. Is choke knob pulled out?
A. Return to home position.

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

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

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

Q. Is throttle valve 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. Check water intake for restriction.

Q. Is engine oil level low?
A. Fill oil tank with specified engine oil.

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

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

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

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

Q. Has oil feed/injection pump malfunctioned?
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 water pump or thermostat faulty?
A. Have serviced by a Yamaha dealer.

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

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 at its recommended speed (r/min) range.

Q. Is trim angle incorrect?
A. Adjust trim angle to achieve most efficient operation.

Q. Is motor mounted at incorrect height on transom?
A. Have 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 plug(s) fouled or of incorrect type?
A. Inspect spark plug(s). Clean or replace with recommended type.

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

Q. Is fuel system obstructed?
A. Check for pinched or kinked fuel line or other obstructions in fuel system.

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

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

Q. Is spark plug gap incorrect?
A. Inspect and adjust as specified.

Q. Is ignition wiring damaged or poorly connected?
A. Check wires for wear or breaks. Tighten all loose connections. Replace worn or broken wires.

Q. Have electrical parts failed?
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. Check and replace oil with specified type.

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

Q. Is air vent screw closed?
A. Open the air vent screw.

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

Q. Is fuel joint connection incorrect?

A. Connect correctly.

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

Q. Is high pressure fuel pump drive belt broken?
A. Have serviced by a Yamaha dealer.

Q. Is engine not responding properly to shift 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 matter tangled on propeller?
A. Remove and clean propeller.

Q. Is motor mounting bolt loose?
A. Tighten bolt.

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

EMU29433
Temporary action in emergency

EMU29441
Impact damage

EWM00870
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.

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.

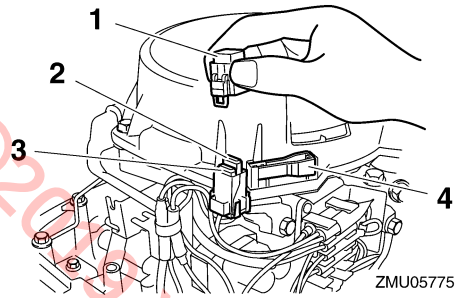
EMU30682
Replacing fuse

If a fuse has blown, open the fuse holder and remove the fuse with a fuse puller. Replace it with a spare one of the proper amperage.

EWM00631
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.

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

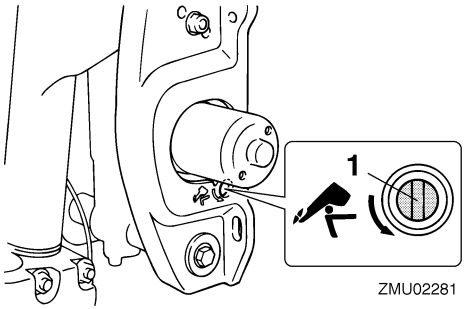


1. Fuse box
2. Fuse (10 A)
3. Spare fuse (10 A)
4. Fuse puller

EMU32130
Power tilt will not operate

If the engine cannot be tilted up or down with the power tilt because of a discharged battery or a failure with the power tilt unit, the engine can be tilted manually.

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



1. Manual valve screw

2. Put the engine in the desired position, then tighten the manual valve screw by turning it clockwise.

EMU29533
Starter will not operate

If the starter mechanism does not operate (the engine cannot be cranked with the starter), the engine can be started with an emergency starter rope.

EWM01022

WARNING

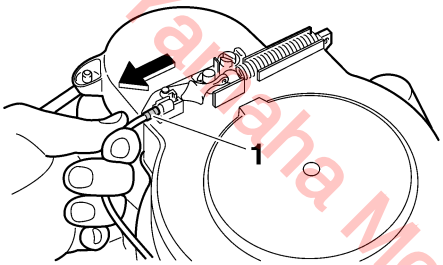
- **Use this procedure only in an emergency to return to the nearest port for repairs.**
- **When the emergency starter rope is used to start the engine, the start-in-gear protection device does not operate. Make sure the remote control lever is in neutral. Otherwise the boat could unexpectedly start to move, which could result in an accident.**
- **Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg while operating the boat.**
- **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.**
- **Make sure no one is standing behind you when pulling the starter rope. It could whip behind you and injure someone.**
- **An unguarded, rotating flywheel is very dangerous. Keep loose clothing and other objects away when starting the engine. Use the emergency starter rope only as instructed. Do not touch the flywheel or other moving parts when the engine is running. Do not install the starter mechanism or top cowling after the engine is running.**

- **Do not touch the ignition coil, spark plug wire, spark plug cap, or other electrical components when starting or operating the motor. You could get an electrical shock.**

EMU29562

Emergency starting engine

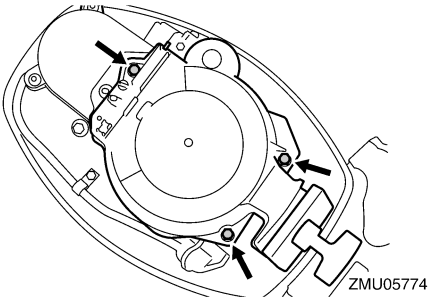
1. Remove the top cowling.
2. Remove the start-in-gear protection cable from the starter, if equipped.



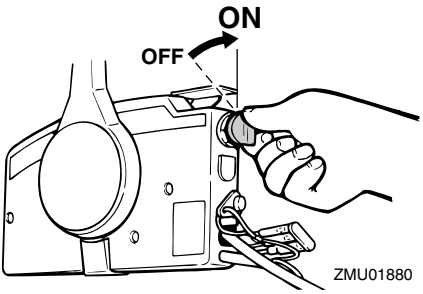
ZMU05773

1. Start-in-gear protection cable

3. Remove the starter/flywheel cover after removing the bolt(s).

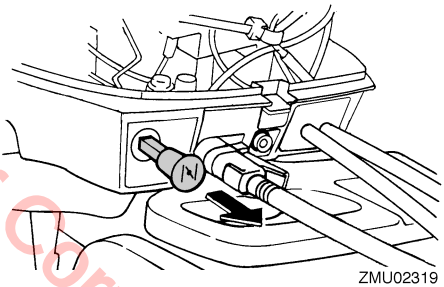

ZMU05774

4. Prepare the engine for starting. For further information, see page 48. Be sure the engine is in neutral and that the clip is attached to the engine shut-off switch. The main switch must be "**ON**" (on), if equipped.

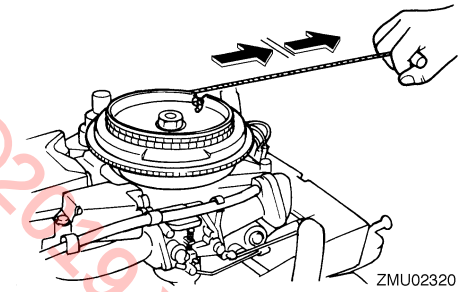


ZMU01880

5. If equipped the choke knob, pull out it when the engine is cold. After the engine starts, gradually return the choke knob to its home position as the engine warms up.


ZMU02319

6. Insert the knotted end of the emergency starter rope into the notch in the flywheel rotor and wind the rope several turns around the flywheel clockwise.
7. Give a strong pull straight out to crank and start the engine. Repeat if necessary.



EMU29671

Engine fails to operate

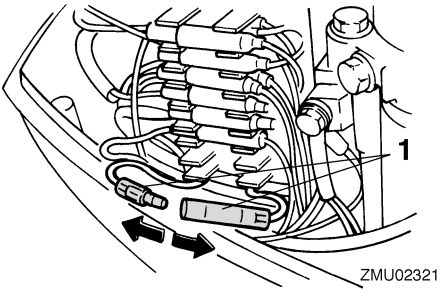
EMU35321

Emergency engine operation

If the battery voltage is low or in the unlikely event of an ignition system malfunction, the engine speed may become erratic or the engine may stop. In such a situation, follow the procedure below.

Disconnect the yellow cord (emergency circuit) of the CDI unit.

Run the engine at low speed and return to port. ***NOTICE:*** **Follow this procedure only in an emergency and just long enough to return to port for repairs.** [ECM00381]



1. Yellow cord

EMU33501

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.** [ECM00401]

EMU29830

YAMAHA MOTOR CORPORATION, U.S.A.
FOUR-STROKE OUTBOARD MOTOR
THREE-YEAR LIMITED WARRANTY

Yamaha Motor Corporation, U.S.A. hereby warrants that new Yamaha 1999-or-later model four-stroke outboard motors originally distributed by Yamaha Motor Corporation, U.S.A. will be free from defects in material and workmanship for the period of time stated herein, subject to certain stated limitations.

PERIOD OF WARRANTY. Any new Yamaha 1999-or-later model four-stroke outboard motor purchased and registered with Yamaha Motor Corporation, U.S.A. for pleasure use in the United States, will be warranted against defects in material or workmanship for a period of three (3) years from the date of purchase, subject to exclusions noted herein. Any Yamaha outboard motor purchased and utilized for commercial applications will be warranted for a period of one (1) year from the date of purchase, subject to exclusions noted herein. Yamaha peripheral equipment (control cables, propellers, gauges, remote control boxes, key switches, engine harnesses, throttle and shift cables, and wiring external from the motor unit) installed with the motor will be warranted for one (1) year from the date of purchase of either pleasure or commercial use. Replacement parts used in warranty repairs will be warranted for the balance of the applicable warranty period.

The second and third year of warranty (if applicable) shall be limited to covering the cost of parts and labor for major components only. The major components covered are:

Power Unit Section
- Power Head
- Intake Manifold
- Carburetor Assembly and its Related Components
- Fuel Injection System and its Related Components
- Fuel and Oil Pump Assemblies
- Ignition System (Standard and Microcomputer)

Lower Unit Section
- Exhaust System
- Upper Casing
- Lower Unit Assembly

Bracket Section
- Bracket System
- Power Trim and Tilt Assembly

WARRANTY REGISTRATION. To be eligible for warranty coverage, the outboard motor must be registered with Yamaha Motor Corporation, U.S.A. Warranty registration can be accomplished by any authorized Yamaha Outboard Motor Dealer. Upon receipt of the registration, an Owner's Warranty Card will be sent by Yamaha to the registered purchaser.

OBTAINING REPAIRS UNDER WARRANTY. To receive repairs under this warranty, a valid Owner's Warranty Card must be presented to an authorized Yamaha Outboard Motor Dealer.

During the period of warranty, any authorized Yamaha outboard dealer will, free of charge, repair or replace, at Yamaha's option, any parts adjudged defective by Yamaha due to faulty workmanship or material from the factory. All replaced parts will become the property of Yamaha Motor Corporation, U.S.A.

CUSTOMER'S RESPONSIBILITY. Under the terms of this warranty, the customer will be responsible for ensuring that the outboard motor is properly operated, maintained, and stored as specified in the applicable Owner's Manual.

The owner of the outboard motor shall give notice to an authorized Yamaha Outboard Motor Dealer of any and all apparent defects within ten (10) days of discovery and make the motor available at that time for inspection and repairs at the dealer's place of business.

GENERAL EXCLUSIONS FROM WARRANTY. This warranty will not cover the repair of damage if the damage is a result of abuse or neglect of the product. Examples of abuse and neglect include, but are not limited to:
1. Racing or competition use, modification of original parts, abnormal strain.
2. Lack of proper maintenance and off season storage as described in the Owner's Manual; installation of parts or accessories that are not equivalent in design and quality to genuine Yamaha parts.
3. Operation of the motor at an rpm other than specified, use of lubricants or oils that are not suitable for outboard motor use.
4. Damage as a result of accidents, collisions, contact with foreign materials, or submersion.
5. Growth of marine organism on motor surfaces.
6. Normal deterioration.

ZMU07048

Consumer information

SPECIFIC PARTS EXCLUDED FROM WARRANTY. Parts replaced due to normal wear or routine maintenance such as oil, spark plugs, shear pins, propellers, hubs, fuel and oil filters, brushes for the starter motor and power tilt motor, water pump impellers, and anodes, are not covered by warranty.

Charges for removal of the motor from a boat and transporting the motor to and from an authorized Yamaha Outboard Motor Dealer are excluded from warranty coverage.

Specific parts excluded from the second and third year of warranty (if applicable) are:

- Top and Bottom Cowling
- Electric Components (other than ignition system)
- Rubber Components (such as hoses, tubes, rubber seals, fittings, and clamps)

EMISSION CONTROL WARRANTY. Yamaha warrants to the ultimate purchaser and any subsequent owner, that the emission control components on this engine are designed, built and equipped so as to conform at the time of sale with applicable regulations under section 213 of the Clean Air Act and that this engine, if manufactured from January 2004 through December 2009, is free from defects in materials and workmanship which cause said engine to fail to conform with applicable regulations for two (2) years from the date of purchase or 200 hours of operation, whichever comes first, except for certain major emission components, if equipped, which are covered for three (3) years from the date of purchase or 200 hours, whichever comes first. For engines manufactured January 2010 or after, the coverage for exhaust emissions is five (5) years from the date of purchase or 175 hours of operation, whichever comes first, and hoses under the cowl are covered for evaporative emissions for two (2) years from the date of purchase. Some states have different emission control warranty provisions. As these vary from state to state, consult your Yamaha dealer or contact Yamaha Customer Relations at 1-866-894-1626 for more information.

TRANSFER OF WARRANTY. Transfer of the warranty from the original purchaser to any subsequent purchaser is possible by having the motor inspected by an authorized Yamaha Outboard Motor Dealer and requesting the dealer to submit a change of registration to Yamaha Motor Corporation, U.S.A. within ten (10) days of the transfer.

YAMAHA MOTOR CORPORATION, U.S.A. MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE OBLIGATIONS AND TIME LIMITS STATED IN THIS WARRANTY ARE HEREBY DISCLAIMED BY YAMAHA MOTOR CORPORATION, U.S.A. AND EXCLUDED FROM THIS WARRANTY.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. ALSO EXCLUDED FROM THIS WARRANTY ARE ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING LOSS OF USE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

YAMAHA MOTOR CORPORATION, U.S.A.
1270 Chastain Road
Kennesaw, GA 30144

ZMU07047

EMU29841

IMPORTANT WARRANTY INFORMATION IF YOU USE YOUR YAMAHA OUTSIDE THE USA OR CANADA

Welcome to the Yamaha Family!

Congratulations on the purchase of your new Yamaha Products. Yamaha is committed to exceptional customer satisfaction, and we want your ownership experience to be a satisfying one. Please read the following warranty information to help ensure satisfaction with your Yamaha.

This model was manufactured as a USA specification model, and the warranty statement shown in this manual is for the United States market.
Please note the following information:

1. As explained in the Limited Warranty Statement, the Yamaha warranty covers your Yamaha when it is registered and used in the United States or Canada.

2. If you need repairs while temporarily using your Yamaha in another country, contact the local authorized Yamaha distributor for that country. Yamaha will work with that distributor to make the needed repairs as quickly as possible. If you have to pay for a repair that you believe your warranty would have covered at home, present all repair orders, receipts, or other related documents to your local dealer when you return home. He will be able to contact Yamaha on your behalf to see if any refund can be provided.

TIP:
Your Yamaha model may not be sold in some countries. Therefore, a Yamaha dealer outside the United States or Canada may not have all of the replacement parts or technical information available to provide proper service. This may unavoidably delay repairs. Thank you for your understanding should this happen.

3. If your Yamaha is registered or used primarily outside the United States or Canada, the warranty printed in this manual does not apply to you. Contact the dealer who sold the Yamaha marine power unit to you for customer support information.

ZMU05199

EMU43020

For your best ownership experience, think **Genuine Yamaha!**

Genuine Yamaha Parts — Genuine Yamaha replacement parts are the exact same parts as the ones originally equipped on your vehicle, providing you with the performance and durability you have come to expect. Why settle for aftermarket parts that may not provide full confidence and satisfaction?

Genuine Yamaha Accessories — Yamaha only offers accessories that meet our high standards for quality and performance. Buy with confidence, knowing your Genuine Yamaha Accessories will fit right and perform right — right out of the box.

Yamalube — Take care of your Yamaha with legendary Yamalube oils, lubricants, and care products. They're formulated and approved by the toughest judges we know: the Yamaha engineering teams that know your Yamaha from the inside out.

Genuine Yamaha Service Manuals — Get the same factory manual for your vehicle that the technicians at your authorized Yamaha dealer use. Service manuals are available through your Yamaha dealer or you can order them directly through yamahapubs.com.

Genuine Yamaha products are available only from your Yamaha dealer.

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