



**F300A
F350A
FL300A
FL350A**

OWNER'S MANUAL

▲ Read this manual carefully before operating this outboard motor.

6AW-28199-74-E0

EMU25052

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.

Important manual information

EMU25105

To the owner

Thank you for choosing 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.

EWMM00781



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.

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

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

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

TIP:

The F300AET, F350AET, FL300AET, FL350AET 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.

EMU25121

F300A, F350A, FL300A, FL350A OWNER'S MANUAL

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EMU33622

Outboard motor safety

Observe these precautions at all times.

EMU336500

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.

- Shut off 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.

EMU33660

Power trim and tilt

Body parts can be crushed between the mo-

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

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

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

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 50 to reduce the risk of fire and explosion.

Safety information

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.

EMU33730

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 shut off the motor.

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

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

EMU33750

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

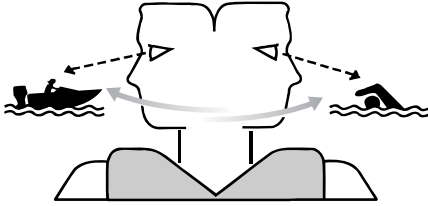
Do not overload the boat. Consult the boat capacity plate or boat manufacturer for maximum weight and number of passengers. Be sure that weight is properly distributed according to the boat manufacturers instructions. Overloading or incorrect weight distribution can compromise the boats handling.

ding and lead to an accident, capsizing or swamping.

EMU33771

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.

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.

EMU33600

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.

General information

EMU25171

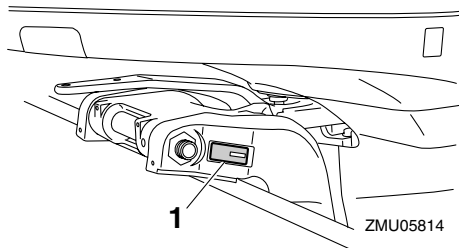
Identification numbers record

EMU25183

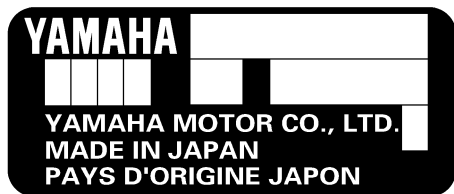
Outboard motor serial number

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.



1. Outboard motor serial number location



EMU34942

Digital electronic control serial number

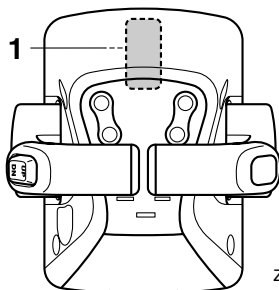
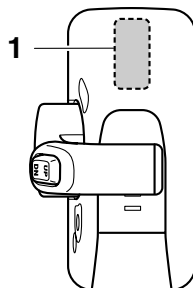
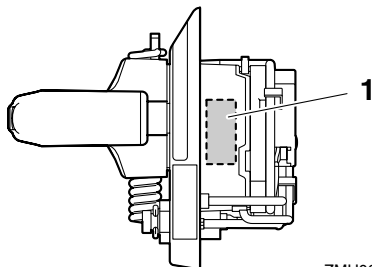
The digital electronic control serial number is stamped on the label attached to the digital electronic control box.

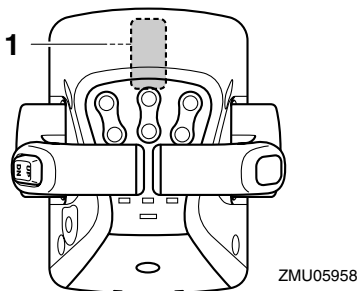
Record your digital electronic control serial

number in the spaces provided to assist you in newly connecting the digital electronic control to the outboard motor.

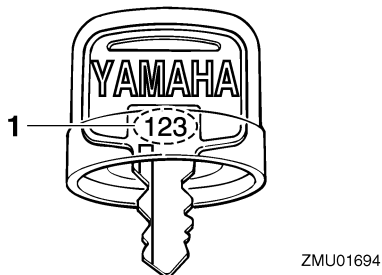
TIP:

Consult your Yamaha dealer if you have any questions concerning the digital electronic control serial number.





1. Digital electronic control serial number location



1. Key number

EMU37290

EC Declaration of Conformity (DoC)

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

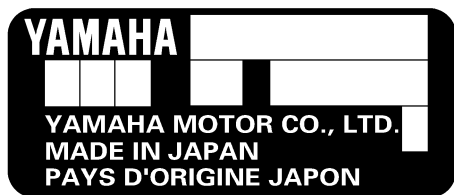
Each conformed outboard motor accompanied with EC DoC. EC DoC contains the following information;

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

EMU25203

CE Marking

Outboard motors affixed with this “CE” marking conform with the directives of; 98/37/EC, 94/25/EC - 2003/44/EC and 2004/108/EC.



EMU25190

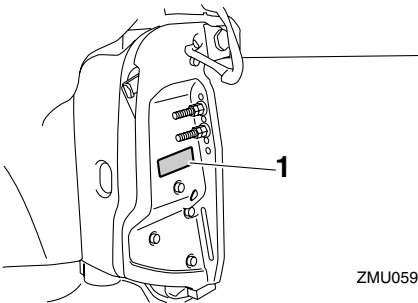
Key number

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.

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ZMU01693

General information



ZMU05943

1. CE marking location



ZMU06040

EMU33520

Read manuals and labels

Before operating or working on this motor:

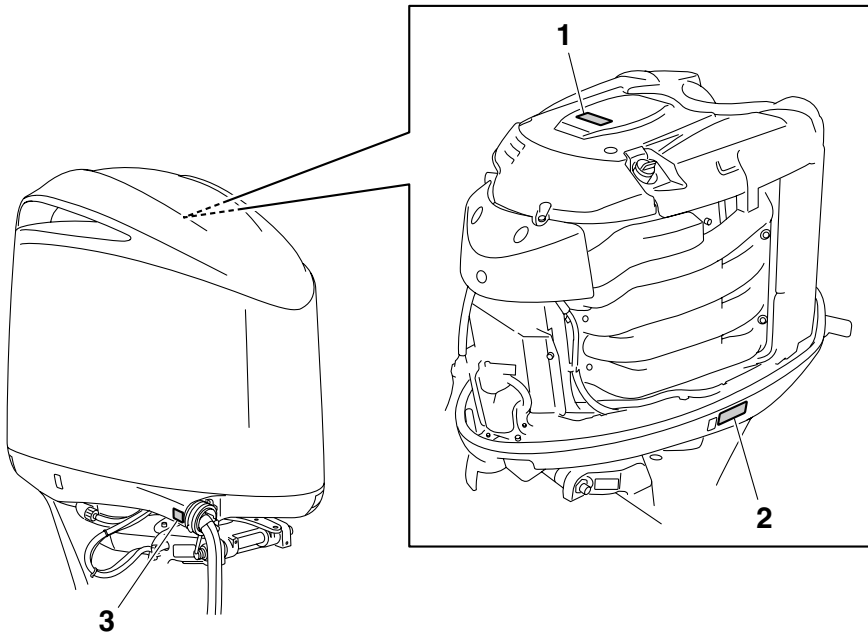
- Read this manual.
- Read any manuals supplied with the boat.
- Read all labels on the outboard motor and the boat.

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

EMU33831

Warning labels

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



ZMU05942

General information

1



⚠ WARNING

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

YAMAHA 6AH-81994-40



⚠ AVERTISSEMENT

- Garder les mains, les cheveux et les vêtements à l'écart des pièces en rotation lorsque le moteur tourne.
- Ne touchez et ne retirez aucune pièce électrique lors du démarrage ou de l'utilisation.

YAMAHA 6AH-81994-50

2



⚠ WARNING

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

YAMAHA 6AH-42794-40



⚠ AVERTISSEMENT

- Lire le Manuel de l'utilisateur et les étiquettes.
- Portez un gilet de sauvetage homologué.
- Attachez le cordon d'arrêt du moteur (coupe-circuit) à votre gilet de sauvetage, à votre bras ou à votre jambe pour que le moteur s'arrête si vous quittez accidentellement la barre. Cela permet d'éviter que le bateau ne poursuive sa route sans contrôle.

YAMAHA 6AH-42794-50

EMU34651

Contents of labels

The above warning labels mean as follows.

1

EWM01681



WARNING

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

2

EWM01671



WARNING

- Read Owner's Manuals and labels.
- Wear an approved personal flotation device (PFD).
- Attach engine shut-off cord (lanyard) to your PFD, arm, or leg so the engine

stops if you accidentally leave the helm, which could prevent a runaway boat.

EMU33850

Other labels

3





YAMAHA 6AH-81996-00

ZMU06191

ZMU05710

EMU35132

Symbols

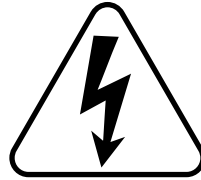
The following symbols mean as follows.

Notice/Warning



ZMU05696

Electrical hazard



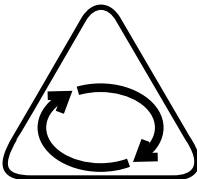
ZMU05666

Read Owner's Manual



ZMU05664

Hazard caused by continuous rotation



ZMU05665

Specifications and requirements

EMU35950

Specifications

TIP:

“*” means, select the engine oil referring to the chart of engine oil paragraph. For further information, see page 14.

EMU2821C

Dimension:

Overall length:

1029 mm (40.5 in)

Overall width:

633 mm (24.9 in)

Overall height X:

2006 mm (79.0 in)

Overall height U:

2133 mm (84.0 in)

Transom height X:

637 mm (25.1 in)

Transom height U:

764 mm (30.1 in)

Weight (without propeller) X:

365.0 kg (805 lb)

Weight (without propeller) U:

373.0 kg (822 lb)

Performance:

Full throttle operating range:

5000–6000 r/min

Maximum output:

F300AET 220.7 kW@5500 r/min

(300 HP@5500 r/min)

F350AET 257.4 kW@5500 r/min

(350 HP@5500 r/min)

FL300AET 220.7 kW@5500 r/min

(300 HP@5500 r/min)

FL350AET 257.4 kW@5500 r/min

(350 HP@5500 r/min)

Idling speed (in neutral):

650 ±50 r/min

Engine:

Type:

4-stroke V

Displacement:

5330.0 cm³

Bore × stroke:

94.0 × 96.0 mm (3.70 × 3.78 in)

Ignition system:

TCI

Spark plug with resistor (NGK):

LFR6A-11

Spark plug gap:

1.0–1.1 mm (0.039–0.043 in)

Control system:

Remote control

Starting system:

Electric

Starting carburetion system:

Electronic fuel injection

Valve clearance (cold engine) IN:

0.17–0.23 mm (0.0067–0.0091 in)

Valve clearance (cold engine) EX:

0.31–0.37 mm (0.0122–0.0146 in)

Min. cold cranking amps (CCA/EN):

670.0 A

Min. rated capacity (20HR/IEC):

110.0 Ah

Maximum generator output:

50.0 A

Drive unit:

Gear positions:

Forward-neutral-reverse

Gear ratio:

1.73 (26/15)

Trim and tilt system:

Power trim and tilt

Propeller mark:

F300AET X

F350AET X

FL300AET XL

FL350AET XL

Fuel and oil:

Recommended fuel:

Specifications and requirements

F300AET Regular unleaded gasoline
F350AET Premium unleaded gasoline
FL300AET Regular unleaded gasoline
FL350AET Premium unleaded gasoline

Min. research octane:

F300AET 91
F350AET 94
FL300AET 91
FL350AET 94

Recommended engine oil:

4-stroke outboard motor oil

Recommended engine oil group 1*:

SAE 10W-30/10W-40/20W-40/5W-30
API SE/SF/SG/SH/SJ/SL

Recommended engine oil group 2*:

SAE 15W-40/20W-50
API SH/SJ/SL

Lubrication:

Wet sump

Engine oil quantity without replacement of oil filter (Oil pan capacity):

7.8 L (8.24 US qt, 6.86 Imp.qt)

Engine oil quantity with replacement of oil filter (Oil pan capacity):

8.0 L (8.46 US qt, 7.04 Imp.qt)

Amount of adding engine oil (at Periodic maintenance) Excluding oil filter:

6.3 L (6.66 US qt, 5.54 Imp.qt)

Amount of adding engine oil (at Periodic maintenance) Including oil filter:

6.5 L (6.87 US qt, 5.72 Imp.qt)

Recommended gear oil:

Hypoid gear oil SAE 90 or 80W-90,
API GL-5

Gear oil quantity:

F300AET 1.520 L (1.607 US qt,
1.338 Imp.qt)

F350AET 1.520 L (1.607 US qt,
1.338 Imp.qt)
FL300AET 1.310 L (1.385 US qt,
1.153 Imp.qt)
FL350AET 1.310 L (1.385 US qt,
1.153 Imp.qt)

Tightening torque for engine:

Spark plug:

28.0 Nm (2.86 kgf-m, 20.7 ft-lb)

Propeller nut:

55.0 Nm (5.61 kgf-m, 40.6 ft-lb)

Engine oil drain bolt:

28.0 Nm (2.86 kgf-m, 20.7 ft-lb)

Engine oil filter:

18.0 Nm (1.84 kgf-m, 13.3 ft-lb)

Noise and vibration level:

Operator sound pressure level (ICOMIA
39/94 and 40/94):
79.1 dB(A)

EMU33553

Installation requirements

EMU33563

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 motor(s) does not exceed the boat's 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, spe-**

Specifications and requirements

cial 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 42.

EMU34952

Digital electronic control requirements

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

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.

This digital electronic control unit is only available for the outboard motor which you have purchased.

Prior to use of the digital electronic control unit, set it in order to operate your outboard motor only. Otherwise, it will not be possible to operate the outboard motor.

Perform setting of the outboard motor and the digital electronic control unit in the following cases.

- If a used outboard motor is installed
- If the digital electronic control unit is replaced
- If the ECM (Electronic control module) of the used outboard motor is replaced

- If the ECM (Electronic control module) of the digital electronic control unit is replaced

Consult your Yamaha dealer for setting.

EMU25694

Battery requirements

EMU25721

Battery specifications

Minimum cold cranking amps (CCA/EN): 670.0 A Minimum rated capacity (20HR/IEC): 110.0 Ah

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

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]

EMU36300

Multiple batteries

To connect multiple batteries, such as for multiple engine configurations or for an accessory battery, consult your Yamaha dealer about battery selection and correct wiring.

EMU34191

Propeller selection

Next to selecting an outboard, choosing 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.

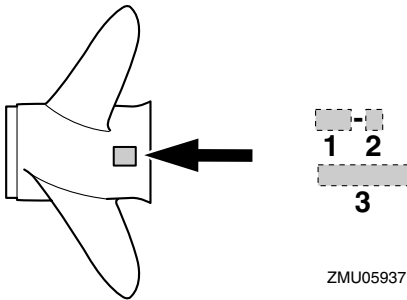
Your outboard motor came with a Yamaha

Specifications and requirements

propeller chosen 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 boatload. Generally, choose 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, choose 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.

For instructions on propeller removal and installation, see page 87.



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

EMU36310

Counter rotation models

Standard outboard motors rotate clockwise. Counter rotation models rotate counterclockwise. Counter rotation models are typically used in multiple motor setups and are marked with an “L” on the gear case above

the anti-ventilation plate.

On counter rotation models, be sure to use a propeller intended for counterclockwise rotation. These propellers are identified with the letter “L” after the size indication on the propeller. **WARNING! Never use a standard propeller with a counter rotation motor, or a counter rotation propeller with a standard motor. Otherwise the boat could go in the direction opposite of that expected (for example, reverse instead of forward), which could lead to an accident.**

[EWM01810]

For instructions on propeller removal and installation, see page 87 and 88.

EMU35140

Start-in-gear protection

Yamaha outboard motors or Yamaha-approved digital electronic 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.

Specifications and requirements

EMU35533

Engine oil requirements

- Recommended engine oil:

4-stroke motor oil with a combination of the following SAE and API oil classifications

Engine oil type SAE:

10W-30, 10W-40, 20W-40, 5W-30

Engine oil grade API:

SE, SF, SG, SH, SJ, SL

Engine oil quantity without replacement of oil filter (Oil pan capacity):

7.8 L (8.24 US qt, 6.86 Imp.qt)

Engine oil quantity with replacement of oil filter (Oil pan capacity):

8.0 L (8.46 US qt, 7.04 Imp.qt)

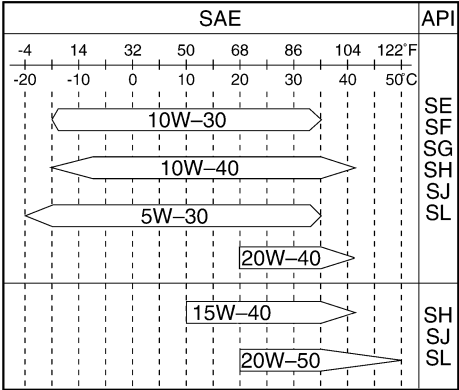
Amount of adding engine oil (at Periodic maintenance) Excluding oil filter:

6.3 L (6.66 US qt, 5.54 Imp.qt)

Amount of adding engine oil (at Periodic maintenance) Including oil filter:

6.5 L (6.87 US qt, 5.72 Imp.qt)

If the recommended engine oil grades are not available, select an alternative from the following chart according to the average temperatures in your area.



ZMU05947

EMU36360

Fuel requirements

EMU37710

Gasoline

F300A, FL300A

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

- Recommended gasoline:

Regular unleaded gasoline with a minimum octane rating of 91 (Research Octane Number).

F350A, FL350A

Use a good quality gasoline that meets the minimum octane rating.

- Recommended gasoline:

Premium unleaded gasoline with a minimum octane rating of 94 (Research Octane Number).

ECM01980

NOTICE

- Do not use leaded gasoline. Leaded gasoline can seriously damage the en-

Specifications and requirements

gine.

- **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.**

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.

EMU36330

Anti-fouling paint

A clean hull improves boat performance. The boat bottom should be kept as clean of marine growth as possible. If necessary, the boat bottom can be coated with an anti-fouling paint approved for your area to inhibit marine growth.

Do not use anti-fouling paint which includes copper or graphite. These paints can cause more rapid engine corrosion.

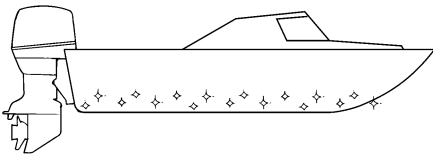
EMU36351

Emergency equipment

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



ZMU05176

EMU36341

Motor disposal requirements

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

Components

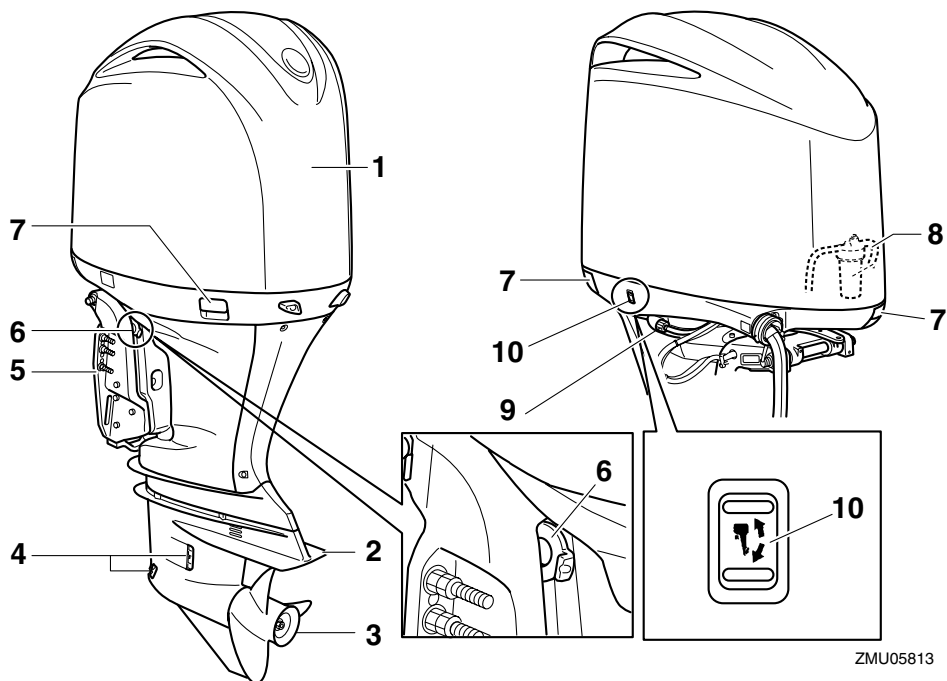
EMU2579J

Components diagram

TIP:

* May not be exactly as shown; also may not be included as standard equipment on all models.

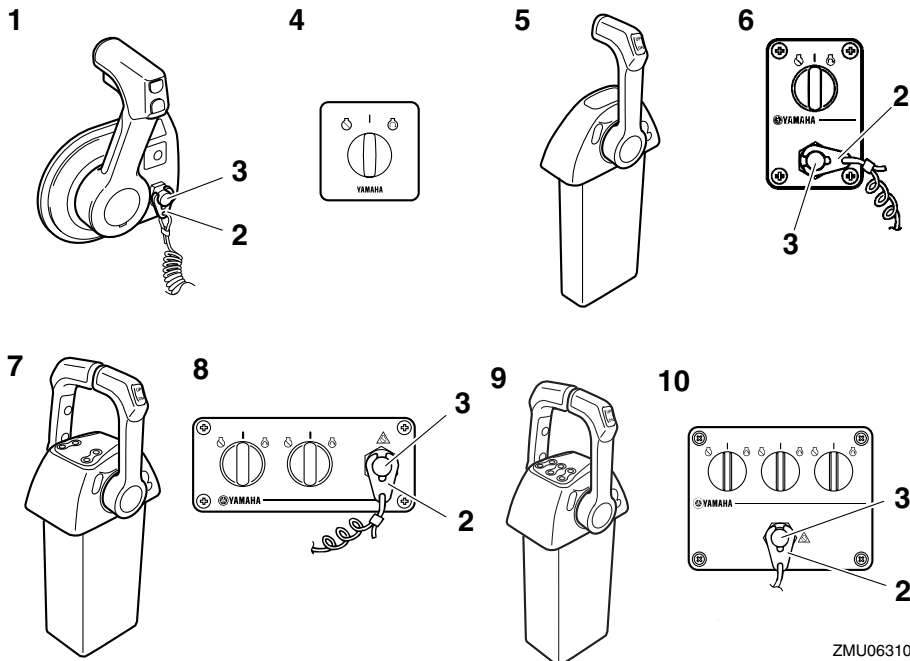
F300A, F350A, FL300A, FL350A



ZMU05813

1. Top cowling
2. Anti-cavitation plate
3. Propeller*
4. Cooling water inlet
5. Clamp bracket
6. Tilt support lever
7. Top cowling lock lever(s)
8. Water separator
9. Flushing device
10. Power trim and tilt switch

Single station models

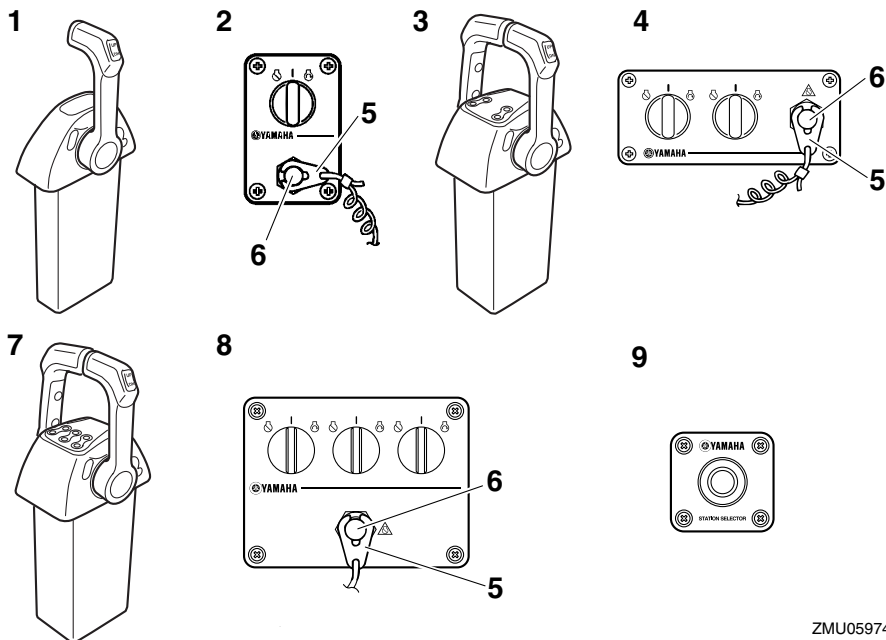


ZMU06310

1. Digital electronic control (side-mount type)*
2. Clip
3. Engine shut-off switch
4. Switch panel (for use with side-mount type)*
5. Digital electronic control (single type)*
6. Switch panel (for use with single type)*
7. Digital electronic control (twin type)*
8. Switch panel (for use with twin type)*
9. Digital electronic control (triple type)*
10. Switch panel (for use with triple type)*

Components

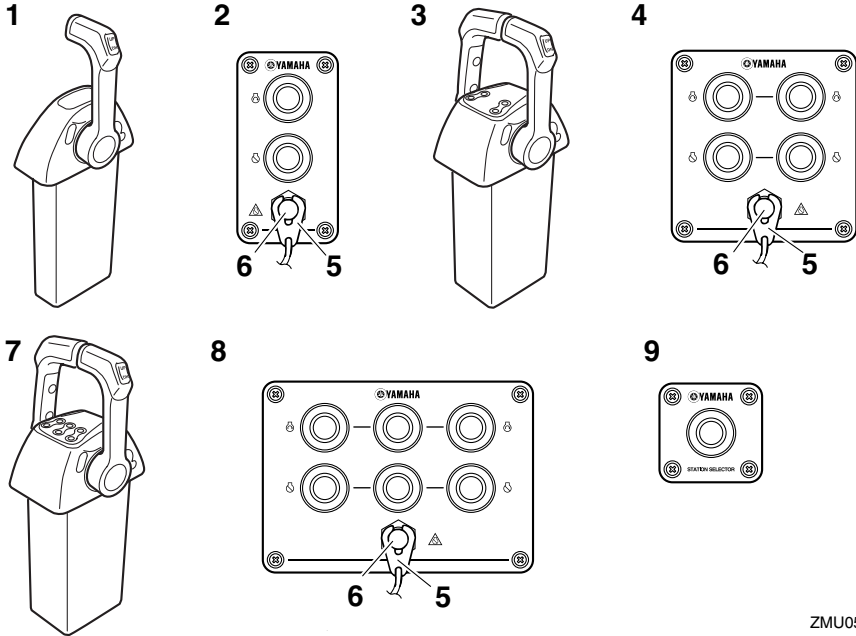
Dual station models / main station



ZMU05974

1. Digital electronic control (single type)*
2. Switch panel (for use with single type)*
3. Digital electronic control (twin type)*
4. Switch panel (for use with twin type)*
5. Clip
6. Engine shut-off switch
7. Digital electronic control (triple type)*
8. Switch panel (for use with triple type)*
9. Station selector switch panel*

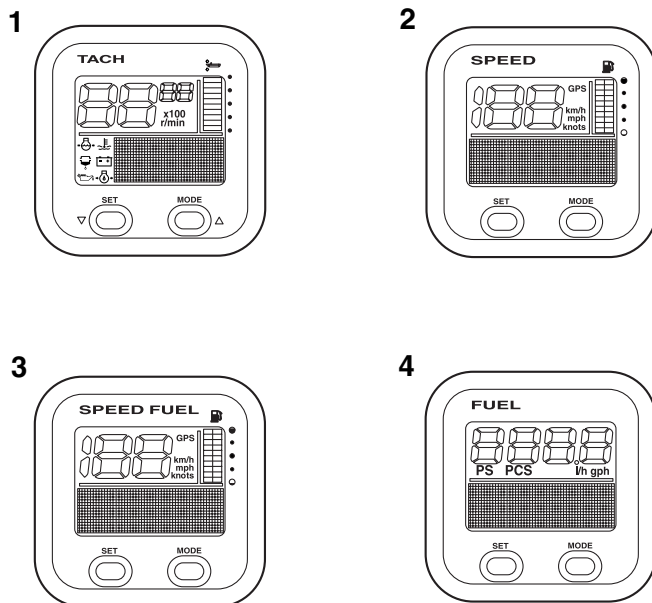
Dual station models / sub station



ZMU05975

1. Digital electronic control (single type)*
2. Switch panel (for use with single type)*
3. Digital electronic control (twin type)*
4. Switch panel (for use with twin type)*
5. Clip
6. Engine shut-off switch
7. Digital electronic control (triple type)*
8. Switch panel (for use with triple type)*
9. Station selector switch panel*

Components



ZMU05485

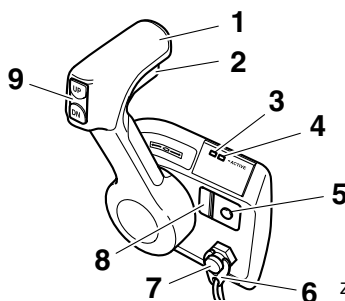
1. Tachometer unit (Square type)*
2. Speedometer unit (Square type)*
3. Speed & fuel meter unit (Square type)*
4. Fuel management meter (Square type)*

EMU35941

Digital electronic control

The digital electronic control actuates the shifter, the throttle and remote electrical operations. Make sure that the active indicator lights and that the digital electronic control unit is correctly connected to the outboard motor.

The digital electric controls of the main station and sub station have the same functions.



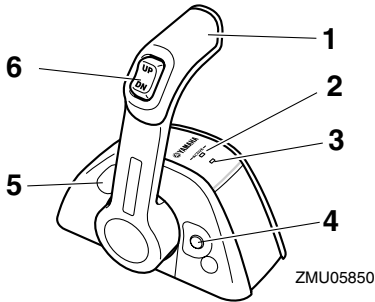
ZMU06225

1. Control lever
2. Neutral interlock trigger
3. Digital electronic control-alert indicator
4. Digital electronic control-active indicator
5. Free throttle switch
6. Clip
7. Engine shut-off switch
8. Throttle friction adjuster
9. Power trim and tilt switch

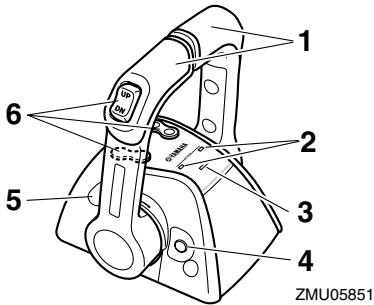
EMU34972

Digital electronic control-active indicator

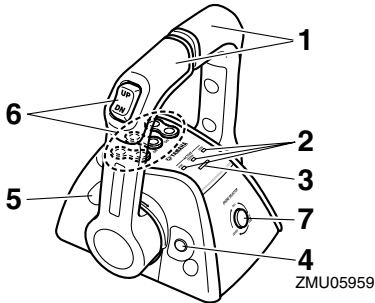
The digital electronic control-active indicator indicates that the digital electronic control system is in the operating state.



ZMU05850

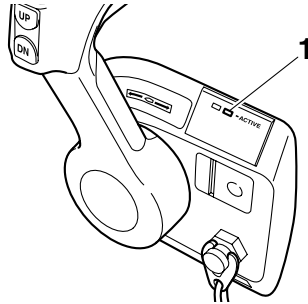


ZMU05851

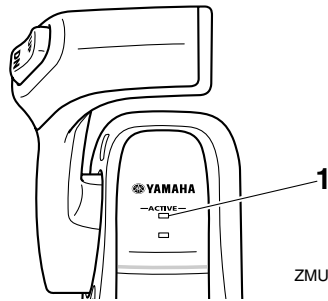


ZMU05959

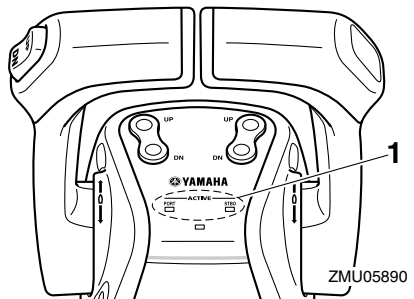
1. Control lever
2. Digital electronic control-active indicator
3. Digital electronic control-alert indicator
4. Free throttle switch
5. Throttle friction adjuster
6. Power trim and tilt switch
7. Engine selector switch



ZMU06276

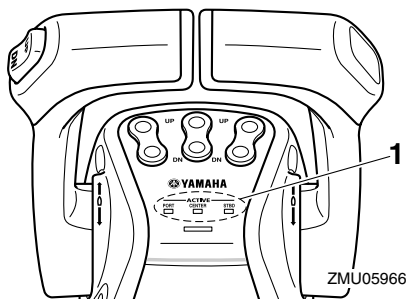


ZMU05888



ZMU05890

Components



1. Digital electronic control-active indicator

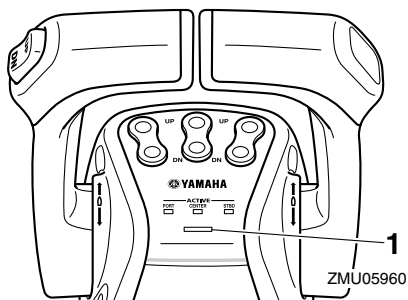
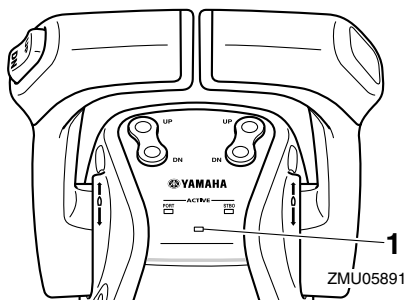
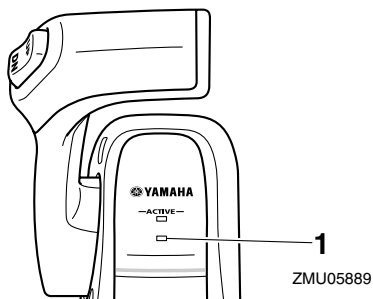
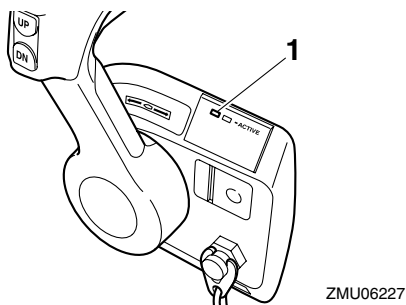
The digital electronic control-active indicator on the selected station lights.

- **Lights:** Operation of both shift and throttle possible.
- **Blinks (when the gear shift is in neutral only):** Shift not operable. Only throttle operation available.
- **Off:** Shift and throttle not operable.

EMU34983

Digital electronic control-alert indicator

The digital electronic control-alert indicator lights when trouble occurs in the connection between the digital electronic control and outboard motor. Consult your Yamaha dealer for details.



1. Digital electronic control-alert indicator

EMU35821

Control lever

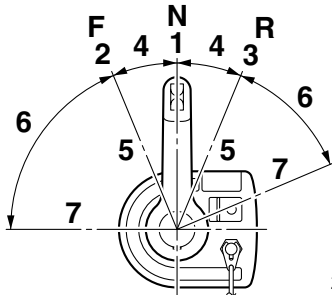
Moving the lever forward from the neutral position engages forward gear. Pulling the lever back from neutral engages reverse. The engine will continue to run at idle until the lever is moved 22.5° (a detent can be felt). Moving the lever farther opens the throttle, and the engine will begin to accelerate.

Digital electronic control for twin type has the function of automatically synchronizing the engine speeds of both engines.

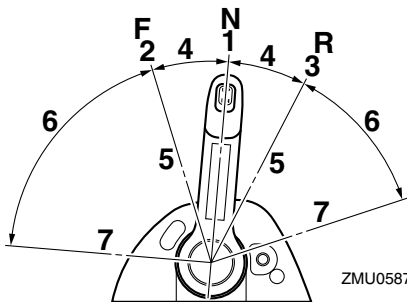
Also digital electronic control for triple type has the function of automatically synchronizing the engine speeds of the center engine and starboard side engine to adapt to the portside engine speed.

The functions of the control lever for triple-type digital electronic control are as follows.

- Operate the port side engine using the port side control lever.
- The center engine runs at the average speed of port side and starboard side engines' speeds.
- Operate the starboard side engine using the starboard side control lever.



ZMU06228



ZMU05878

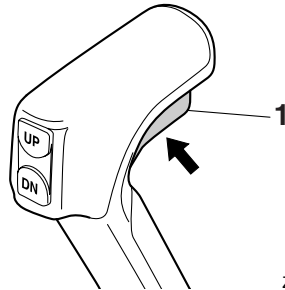
1. Neutral "N"
2. Forward "F"
3. Reverse "R"

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.



ZMU06285

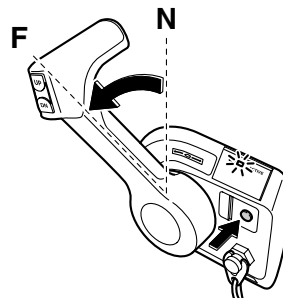
1. Neutral interlock trigger

EMU35831

Free throttle switch

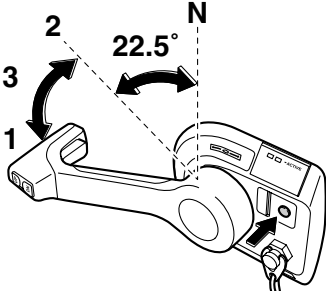
In neutral, keep this switch pressed, move the control lever forward, and release the switch after the digital electronic control-active indicator starts blinking. While the indicator blinks, you can open or close the throttle. This can also be done when the control lever is set in reverse.

Single type



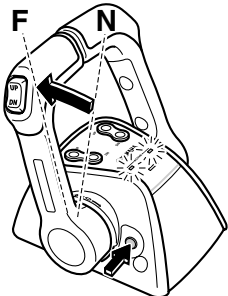
ZMU06231

Components



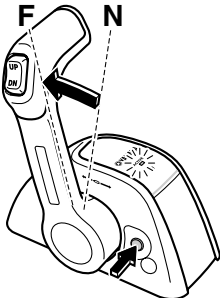
ZMU06232

Twin type

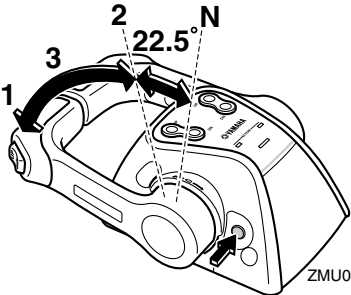


ZMU05882

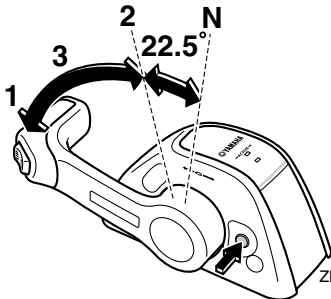
Single type



ZMU05880

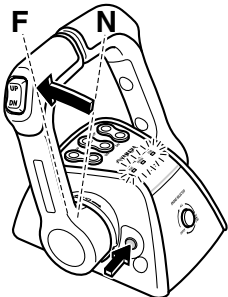


ZMU05883

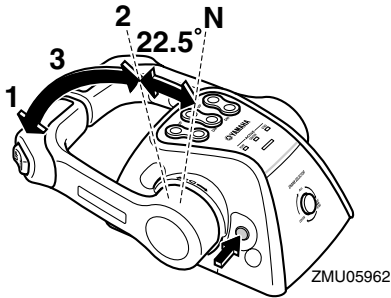


ZMU05881

Triple type



ZMU05961



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

The free throttle switch can only be used when the control lever is in the neutral position.

During operation the digital electronic control-active indicator changes from continuously lit to blinking. When the indicator starts blinking, the throttle begins to open after the control lever is moved at least 22.5°.

After using the free throttle switch, return the control lever to the neutral position. The free throttle switch will return automatically to its set position. The digital electronic control-active indicator will change from blinking to continuously lit and the digital electronic control will then engage forward and reverse normally.

EMU35871

Throttle friction adjuster

A friction device provides adjustable resistance to movement of the control lever, and can be set according to operator preference. To increase resistance, turn the adjuster clockwise. To decrease resistance, turn the adjuster counterclockwise.

EWM01770

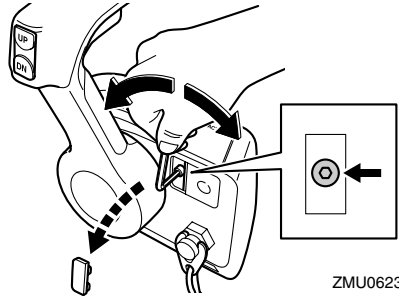


- If the friction is too small, the control le-

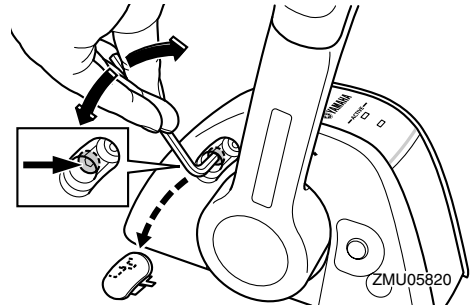
ver could move freely and cause an accident.

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

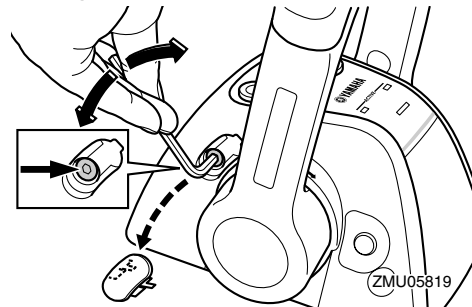
Single type



Single type

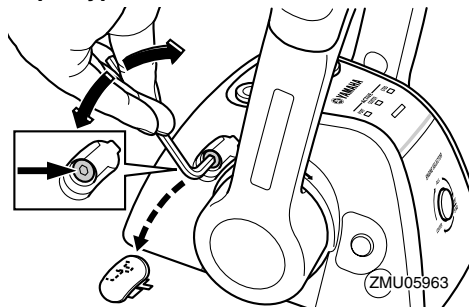


Twin type



Components

Triple type



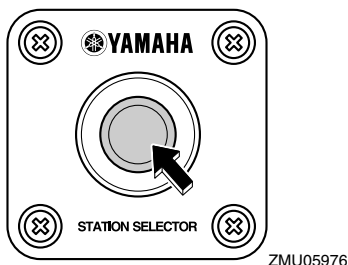
When constant speed is desired, tighten the adjuster to maintain the desired throttle setting.

EMU35710

Station selector switch

The station selector switch can select either the main station or sub station for the digital electronic control which operates the boat. The digital electric controls of the main station and sub station have the same functions. You can change the station when the main switch is turned to “ON” (on) and all control levers are in Neutral.

The switch panel can be operated at both the main station and sub station when the main switch is set to “ON” (on).

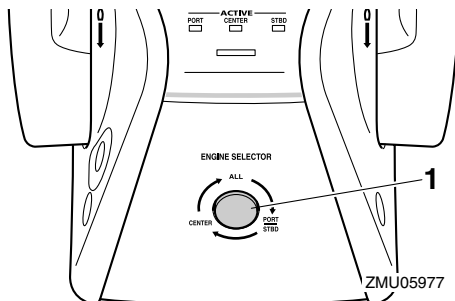


EMU35720

Engine selector switch

When all engines have started, you can select the desired engine for operation by pushing the engine selector switch. The en-

gine selector switch works only when all the control levers are in neutral.



1. Engine selector switch

EMU35772

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.

EWMO1790

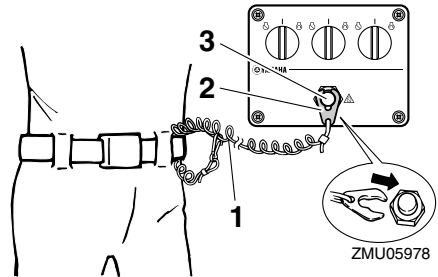
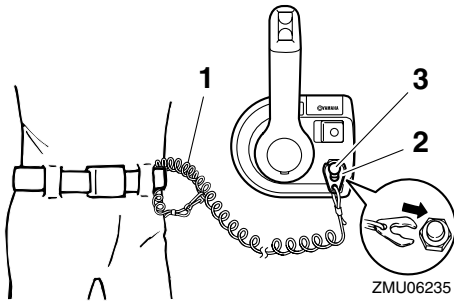
WARNING

- 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.

TIP:

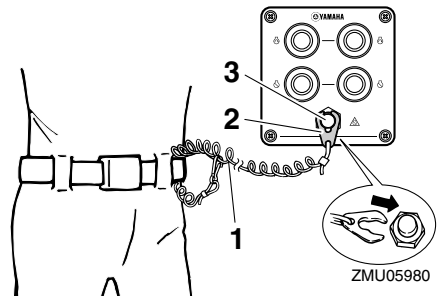
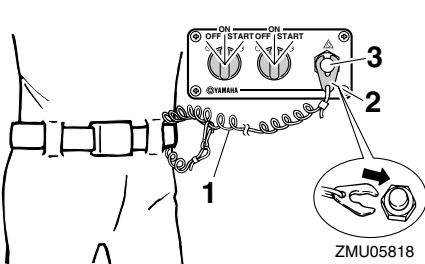
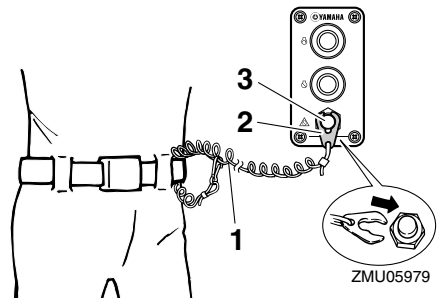
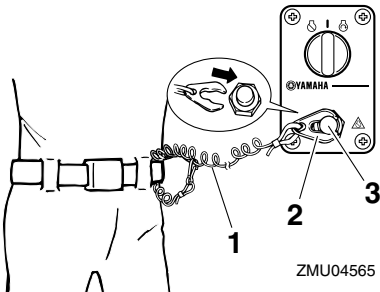
The engine cannot be started with the clip removed.

Main station

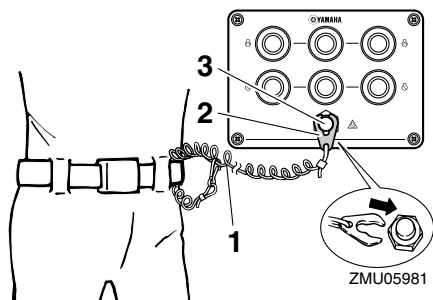


1. Cord
2. Clip
3. Engine shut-off switch

Sub station



Components



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

EMU35781

Main switch

The main switch controls the ignition system; its operation is described below. Only equipped with the main station.

● “OFF” (off)

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

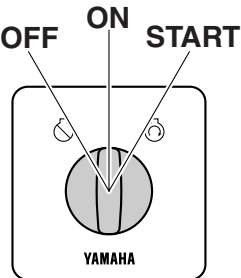
● “ON” (on)

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

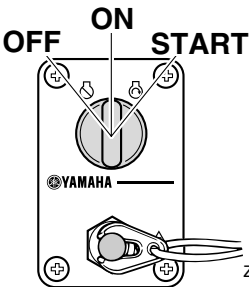
● “START” (start)

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.

Single type

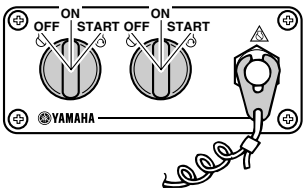


ZMU06245



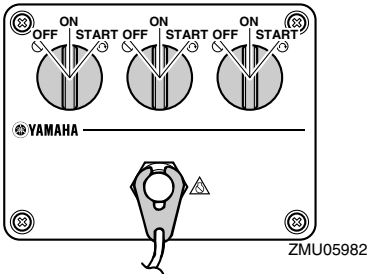
ZMU04567

Twin type



ZMU05821

Triple type

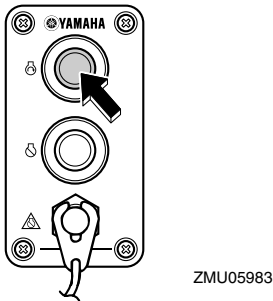


EMU35730

Starter button

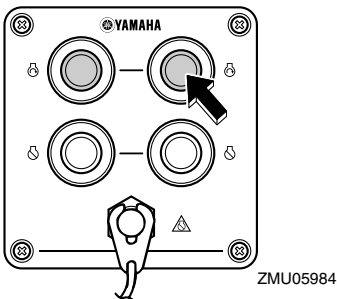
To start the engine with the electric starter, push the black button. Only equipped on the sub station.

Single type



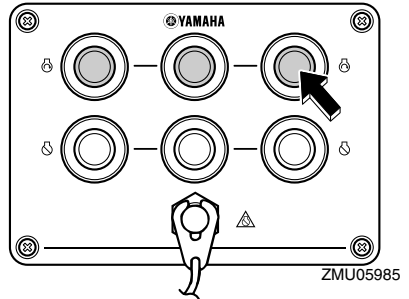
ZMU05983

Twin type



ZMU05984

Triple type

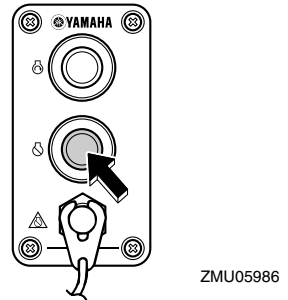


EMU35740

Engine stop button

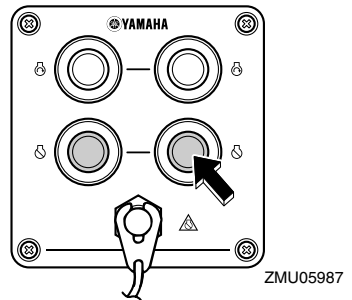
To stop the engine, push the red button. Only equipped on the sub station.

Single type



ZMU05986

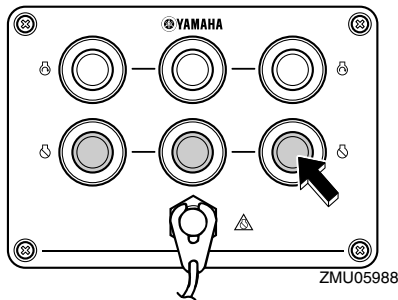
Twin type



ZMU05987

Components

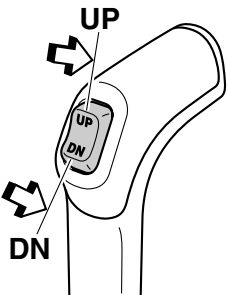
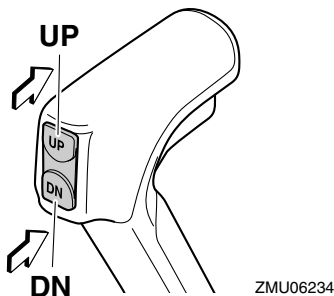
Triple type



EMU35152

Power trim and tilt switch on digital electronic control

The power trim and tilt system adjusts the outboard motor angle in relation to the transom. Pressing the switch “UP” (up) trims the outboard motor up, and then tilts it up. Pressing the switch “DN” (down) tilts the outboard motor down and trims it down. When the switch is released, the outboard motor will stop in its current position. For instructions on using the power trim and tilt switch, see pages 67 and 69.



ZMU05822

EMU26153

Power trim and tilt switch on bottom engine cowling

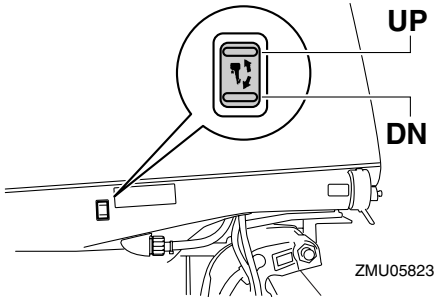
The power trim and tilt switch is located on the side of the bottom engine cowling. Pressing the switch “UP” (up) trims the outboard motor up, and then tilts it up. Pressing the switch “DN” (down) tilts the outboard motor down and trims it down. When the switch is released, the outboard motor will stop in its current position.

For instructions on using the power trim and tilt switch, see page 69.

EWMO1030

WARNING

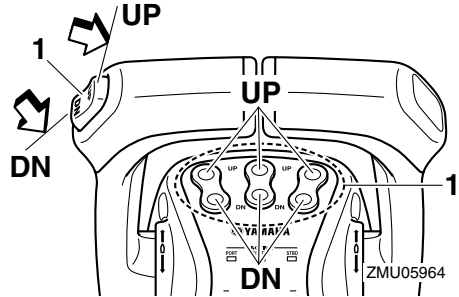
Use the power trim and tilt switch located on the bottom engine cowling only when the boat is at a complete stop with the engine off. Attempting to use this switch while the boat is moving could increase the risk of falling overboard and could distract the operator, increasing the risk of collision with another boat or an obstacle.



EMU35851

Power trim and tilt switches

The power trim and tilt system adjusts the outboard motor angle in relation to the transom. Pushing the switch “UP” (up) trims the outboard motor up, and then tilts it up. Pressing the switch “DN” (down) tilts the outboard motor down and trims it down. When the switch is released, the outboard motor will stop in its current position.



1. Power trim and tilt switch

On the twin engine control, the switch on the control grip controls both outboard motors at the same time.

On the triple engine control, the switch on the control grip controls all outboard motors at the same time.

For instructions on using the power trim and tilt switches, see pages 67 and 69.

EMU35040

Tilt limiter

This outboard motor is equipped with a tilt limiter that controls the tilt range.

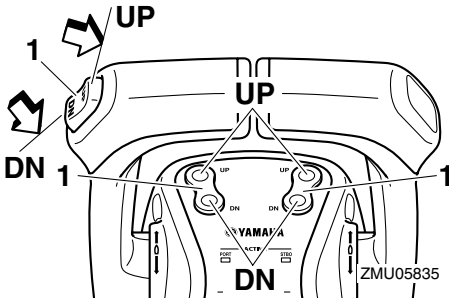
TIP:

Consult your Yamaha dealer about changing the setting.

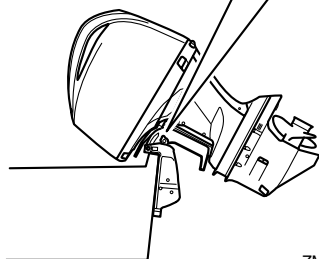
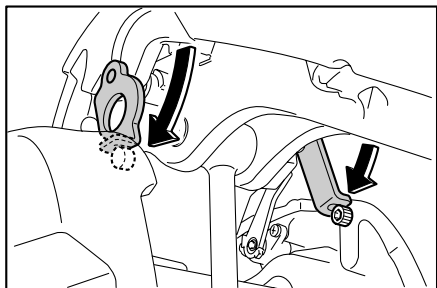
EMU35030

Tilt support lever for power trim and tilt model

To keep the outboard motor in the tilted up position, lock the tilt support lever to the clamp bracket. Make sure that the lever is securely retained by the bolts.



Components



ZMU05824

ECM00660

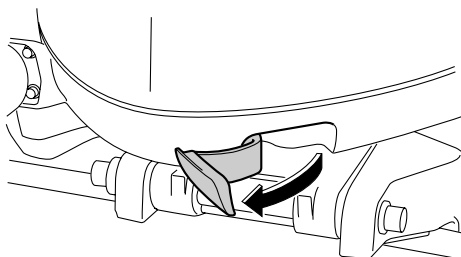
NOTICE

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.

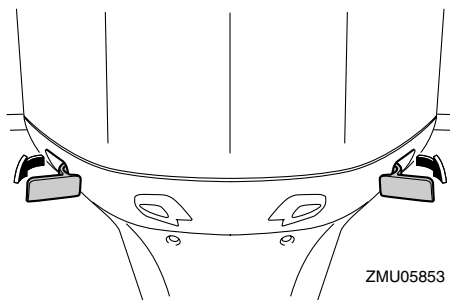
EMU35051

Top cowling lock lever (turn type)

To remove the top cowling, turn the front and side lock levers to release them and lift off the cowling. Reverse this procedure when reinstalling the top cowling.

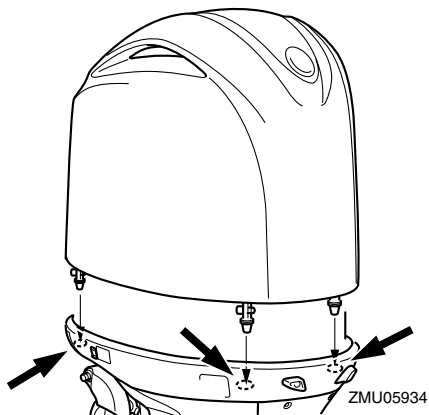


ZMU05852



ZMU05853

When installing the cowling, align the 3 positions of the grommets to fit the cowling in the rubber seal.



ZMU05934

When installing the cowling, check to be sure it fits properly in the rubber seal. Be sure to check that the gap between the

top cowling and the bottom cowling is even all around the cowling. If the top cowling is loose or the gap is not even, reinstall the cowling.

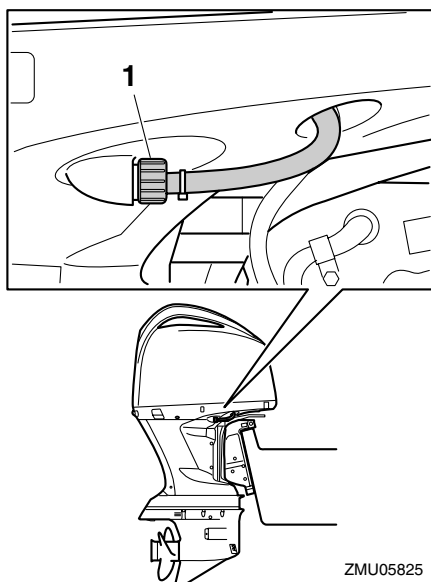
EMU26460

Flushing device

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

TIP:

For details on usage, see page 76.

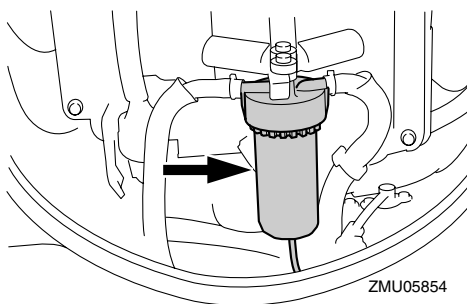


1. Flushing device

EMU35561

Fuel filter/Water separator

This engine has a combination fuel filter/water separator and associated alert system. If water separated from the fuel exceeds a specific volume, the alert device of 6Y8 Multifunction Tachometer will activate.



Activation of alert device

- The water separator-alert indicator of 6Y8 Multifunction Tachometer will blink.
- The buzzer will sound intermittently only when the gear shift is in neutral.
- If the alert system has activated, stop the engine and consult a Yamaha dealer immediately.

Instruments and indicators

EMU31653

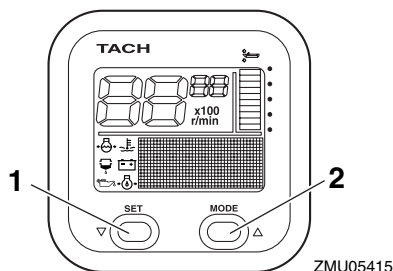
6Y8 Multifunction meters

Multifunction meters have 6 kinds of meter units; tachometer unit (square or round types), speedometer unit (square type), speed & fuel meter unit (square or round types), and fuel management meter (square type). The indicator system is slightly different between the round and square types. Check the model and type of your unit carefully. This manual describes mainly the alert indicators. For more details on setting meters or changing indicator systems, see the attached operation manual.

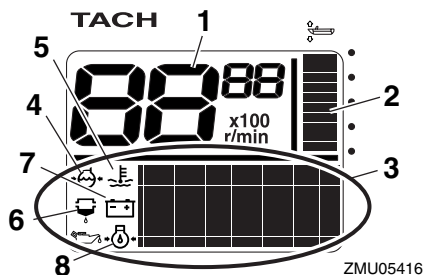
EMU36182

6Y8 Multifunction tachometers

The tachometer shows the engine revolutions per minute. It has functions of trim meter, adjusting trolling speed, cooling water/engine temperature display, battery voltage display, total hour/trip hour display, oil pressure display, water detection alert, engine trouble alert, and periodic maintenance notification. If optional sensors are connected to the unit, cooling water pressure display will be available. For the optional sensor, consult your Yamaha dealer. The tachometer unit is available in round or square types. Check your tachometer unit type.



1. Set button
2. Mode button



1. Tachometer
2. Trim meter
3. Multifunction display
4. Cooling water pressure
5. Cooling water/engine temperature
6. Water detection-alert indicator
7. Battery voltage
8. Oil pressure (4-stroke models)

EMU36120

Start-up checks

Place the control lever in neutral and turn the main switch to "ON" (on). After all the displays come on and the total hour display comes on, the gauge will change to normal operation. If the buzzer sounds and the water separator-alert indicator blinks, consult your Yamaha dealer immediately.

TIP:

To stop the buzzer, press the "set" (set) or "mode" (mode) button.

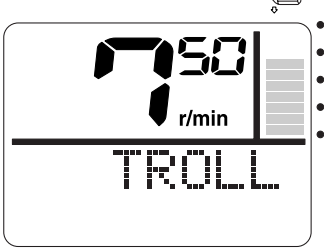
EMU37690

Adjusting trolling speed

You can adjust the trolling speed randomly by increasing or decreasing it approximately 50 r/min. When in the trolling speed setting mode, the display switches to the normal display when the engine speed is increased (within 3000 r/min) using the throttle. When the throttle is closed, the display returns to the trolling speed setting mode. For details, see the attached operation manual.

Instruments and indicators

TACH



ZMU05931

TIP:

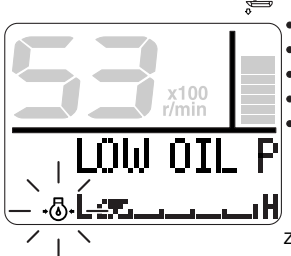
- Trolling is affected by currents and other operating conditions and may differ from the actual engine speed.
- The default engine idle speed is reset automatically when the display is switched to the normal display. The default engine idle speed is also reset automatically when the engine is turned off or when the engine speed exceeds 3000 r/min.
- When warming up a cold engine, the trolling speed cannot be decreased below the specified engine idle speed.

EMU36130

Low oil pressure-alert

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

TACH



ZMU05430

Stop the engine immediately if the buzzer sounds and the low oil pressure-alert indica-

tor blinks. Check the engine oil quantity and replenish oil if necessary. If the alert device has activated while the appropriate engine oil quantity is maintained, consult your Yamaha dealer.

ECM01601

NOTICE

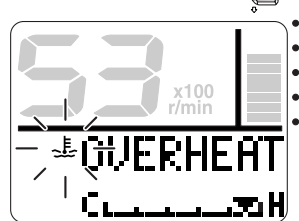
Do not continue to run the engine if the low oil pressure alert device has activated. Serious engine damage will occur.

EMU36221

Overheat alert

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

TACH



ZMU05421

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

ECM01592

NOTICE

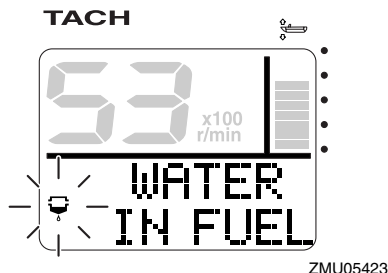
- **Do not continue to run the engine if the overheat-alert indicator blinks. Serious engine damage will occur.**
- **Do not continue to operate the engine if a alert device has activated. Consult your Yamaha dealer if the problem cannot be located and corrected.**

Instruments and indicators

EMU36150

Water separator alert

This indicator will blink if water has accumulated in the water separator (fuel filter) while cruising. In such an event, stop the engine immediately and see page 97 of this manual to drain the water from the fuel filter. Get back to the port soon and consult a Yamaha dealer immediately.



ECM00910

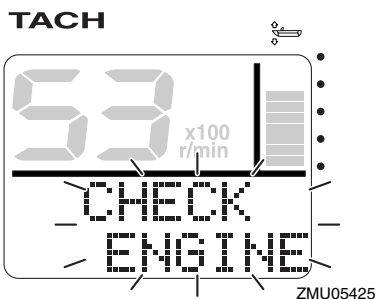
NOTICE

Gasoline mixed with water could cause damage to the engine.

EMU36160

Engine trouble alert

This indicator will blink if the engine malfunctions while cruising. Get back to the port soon and consult a Yamaha dealer immediately.



ECM00920

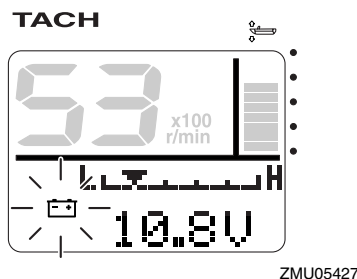
NOTICE

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

EMU36170

Low battery voltage-alert

If the battery voltage drops, the low battery voltage-alert indicator and the battery voltage value will start to blink. Get back to the port soon if the low battery voltage-alert device has activated. For charging the battery, consult your Yamaha dealer.



EMU36231

6Y8 Multifunction speed & fuel meters

The speed & fuel meter unit shows the boat speed and has the functions of fuel meter, total fuel consumption display, fuel economy display, fuel flow display, and system voltage

Instruments and indicators

display. The chosen display is selected by using the “**set**” (set) and “**mode**” (mode) buttons as described in this section. If optional sensors are connected to the unit, trip display, water surface temperature display, depth display, and clock will also be available. For the optional sensors, consult your Yamaha dealer.

The speed & fuel meter unit is available in round or square types. Check your speed & fuel meter unit type for operation information. After the main switch is first turned on, all the displays come on as a test. After a few seconds, the gauge will change to normal operation.

For more information, see the operation manual originally supplied with the meter.

2. Fuel meter
3. Multifunction display

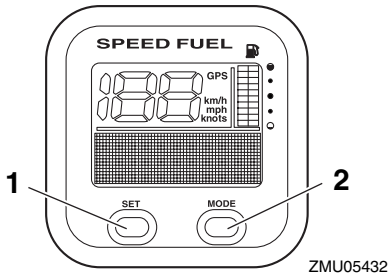
EMU36240

6Y8 Multifunction speedometers

The speedometer unit shows the boat speed and has functions of fuel meter and system voltage display. The chosen display is selected by using the “**set**” (set) and “**mode**” (mode) buttons as described in this section. In addition, the speedometer can show the desired unit of measurement such as km/ h, mph, or knots. If optional sensors are connected to the unit, trip display, water surface temperature display, depth display, and clock will also be available. For the optional sensors, consult your Yamaha dealer.

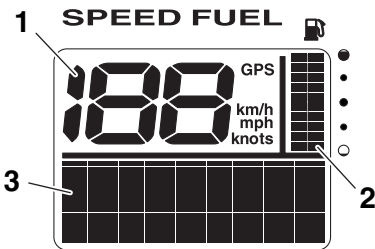
After the main switch is first turned on, all the displays come on as a test. After a few seconds, the gauge will change to normal operation.

For more information, see the operation manual originally supplied with the meter.



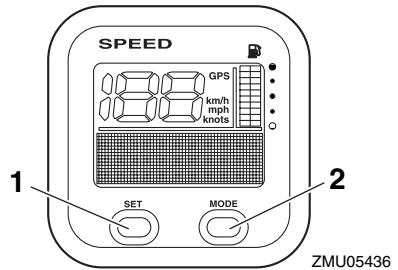
ZMU05432

1. Set button
2. Mode button



ZMU05433

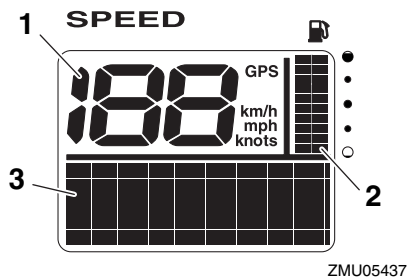
1. Speedometer



ZMU05436

1. Set button
2. Mode button

Instruments and indicators



- 1. Speedometer
- 2. Fuel meter
- 3. Multifunction display

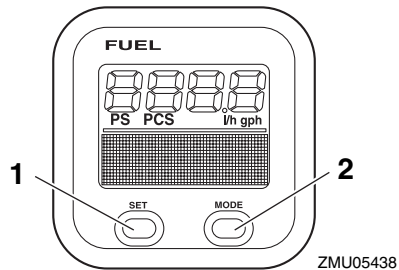
EMU36250

6Y8 Multifunction fuel management meters

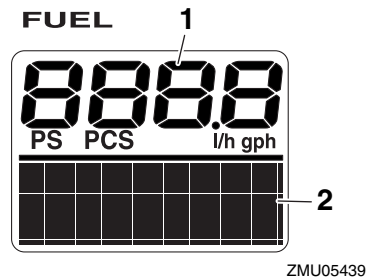
The fuel management meter has the functions of fuel flow meter, total consumption display, fuel economy display, and remaining fuel display. The chosen display is selected by using the “set” (set) and “mode” (mode) buttons as described in this section. For more information, see the operation manual originally supplied with the meter.

After the main switch is first turned on, all the displays come on as a test. After a few seconds, the gauge will change to normal operation.

For more information, see the operation manual originally supplied with the meter.



- 1. Set button
- 2. Mode button



- 1. Fuel flow meter
- 2. Multifunction display

EMU26803

Alert system

ECM00091

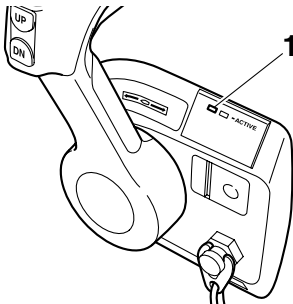
NOTICE

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.

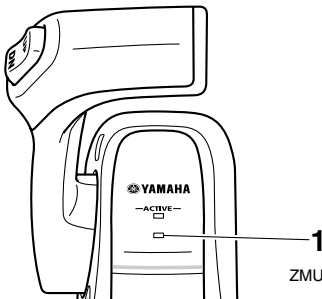
EMU35183

Digital Electronic Control alert

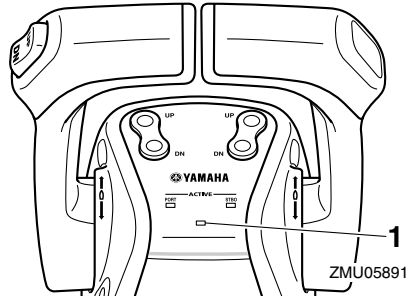
If during operation of the outboard motor any communication troubles between the digital electronic control and the outboard motor occur, the alert indicator will light. Even if there is no symptom of trouble on shifting or throttle, get back to the port soon and have a Yamaha dealer inspect or repair the outboard motor.



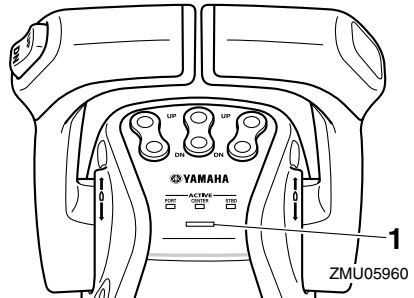
ZMU06227



ZMU05889



ZMU05891



ZMU05960

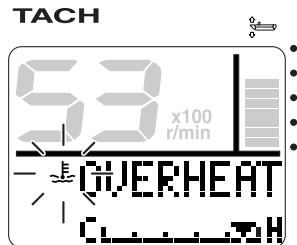
1. Digital electronic control-alert indicator

EMU35575

Overheat alert

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

- The engine speed will automatically decrease to about 2000 r/min.
- The overheat-alert indicator of the 6Y8 Multifunction Tachometer will light or blink.

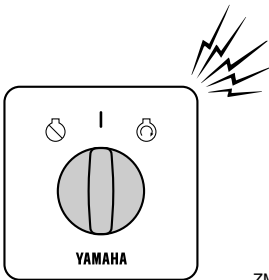


ZMU05421

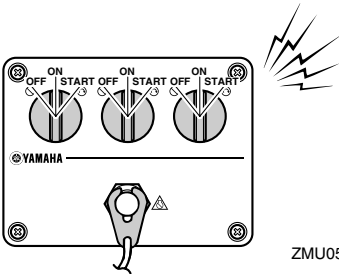
Engine control system

- The buzzer will sound.

Main station

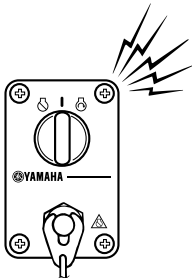


ZMU06297

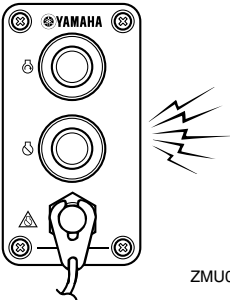


ZMU05989

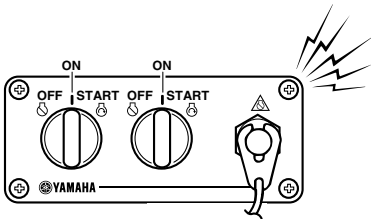
Sub station



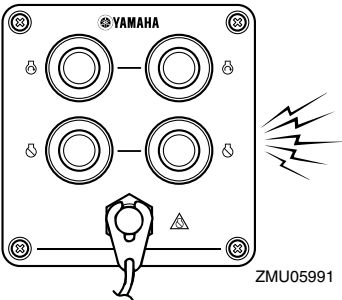
ZMU04583



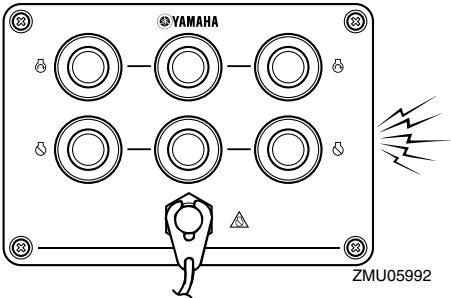
ZMU05990



ZMU05827



ZMU05991

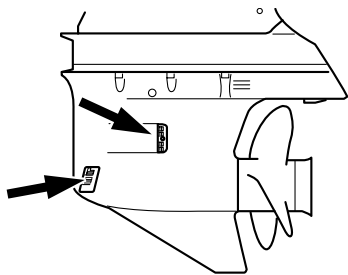


ZMU05992

Engine control system

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

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



ZMU05826

Twin engine drive or triple engine drive users:

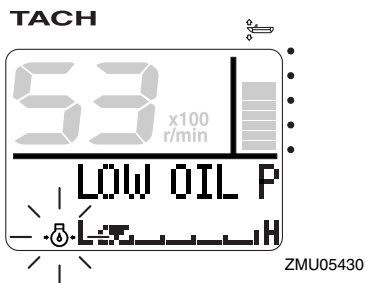
If the overheat alert system of one engine activates, the engine will slow down. To switch off the alert activation on the engine not affected by overheating, turn off the main switch of the engine overheating. If the alert system has activated, stop the engine and tilt the outboard motor up to check the cooling water inlet for clogging. If the alert system has still activated, tilt the overheated outboard motor up and return to the port.

EMU35844

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. The low oil pressure-alert indicator will light or blink.



- The buzzer will sound in the same way as during an overheating alert.

If the alert device 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.

Twin engine drive or triple engine drive users:

If the low oil pressure alert system of one engine activates, all of the engines will slow down and the buzzer will sound. To switch off the alert activation on the engine(s) not affected by low oil pressure, turn off the main switch of the engine with the low oil pressure.

Installation

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.

EWMO1590

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.**

EMU35811

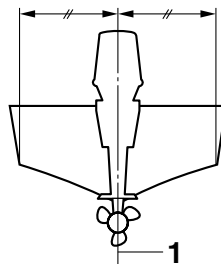
Mounting the outboard motor

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

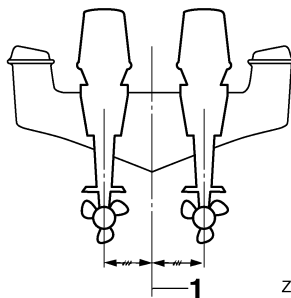
For twin engine boats, mount the outboard motors equidistant from the centerline.

For triple engine boats, mount the center outboard motor on the centerline (keel line), and the port side and starboard side outboard motors equidistant from the center outboard motor.

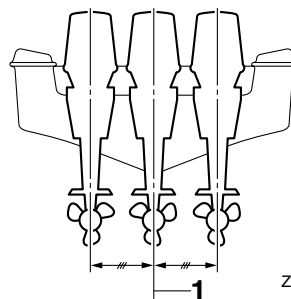
Consult your Yamaha dealer or boat manufacturer for further information on determining the proper mounting location.



ZMU01760



ZMU05141



ZMU05957

1. Center line (keel line)

EMU26931

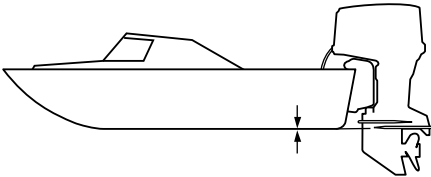
Mounting height (boat bottom)

The mounting height of your outboard motor affects its efficiency and reliability. If it is mounted too high, propeller ventilation may occur, which will reduce propulsion due to excessive propeller slip, and the water intakes for the cooling system may not get adequate water supply, which can cause

engine overheating. If the engine is mounted too low, water resistance (drag) will increase, thereby reducing engine efficiency and performance.

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

cruising. If the motor is operated continuously in the presence of airborne water spray, enough water could enter the engine through the intake opening on the cowling to cause severe engine damage. Eliminate the cause of the airborne water spray.



ZMU01762

ECM01630

NOTICE

- During water testing, check the buoyancy of the boat, at rest, with its maximum load. Check that the static water level on the exhaust housing is low enough to prevent water entry into the power head when water rises due to waves when the outboard is not running.
- 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

Operation

EMU36380

First-time operation

EMU36390

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. [ECM01780]

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 47.



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]

EMU27084

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. Correct break-in will help ensure proper performance and longer engine life.

TIP:

Failure to follow the break-in procedure could result in reduced engine life or even severe engine damage. Run the engine in the water, under load (in gear with a propeller installed) as follows. For ten 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 eight 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 67).

EMU36412

Checks before starting engine

EWWM01920



If any item in the 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. Over-

heating and serious engine damage can occur.

EMU36420

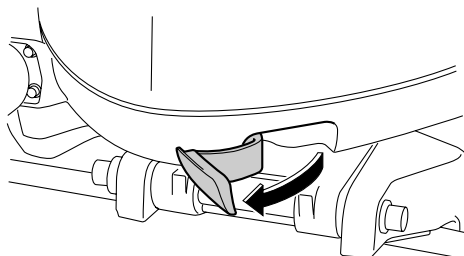
Fuel level

Be sure you have plenty of fuel for your trip. A good rule is to use 1/3 of your fuel to get to the destination, 1/3 to return, and to keep 1/3 as an emergency reserve. With the boat level on a trailer or in the water, turn the key to "ON" (on) and check the fuel level. For fuel filling instructions, see page 50.

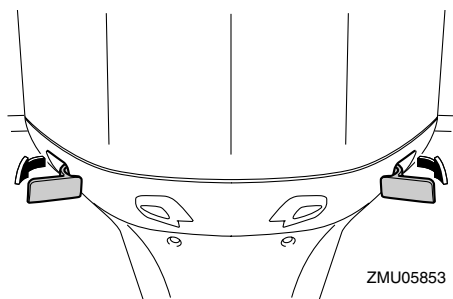
EMU36431

Remove cowling

For the following checks, remove the top cowling from the engine. To remove the engine cowling, release all the lock levers and lift off the cowling.



ZMU05852



ZMU05853

EMU36442

Fuel system

EWM00060



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

EWM00910



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.

EMU36450

Check for fuel leaks

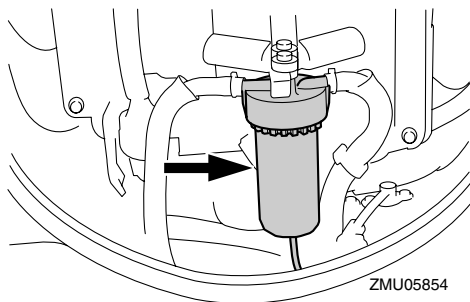
- Check under top cowling and in the boat for fuel leaks or gasoline fumes.
- Check fuel line connections to be sure they are tight.
- Check fuel lines for cracks, swelling, or other damage.

EMU36470

Check the fuel filter

Check that the fuel filter is clean and free of water. If enough water to raise the float ring is found in the fuel, or if a significant amount of debris is found, the fuel tank should be checked and cleaned by a Yamaha dealer.

Operation



EMU37670

Controls

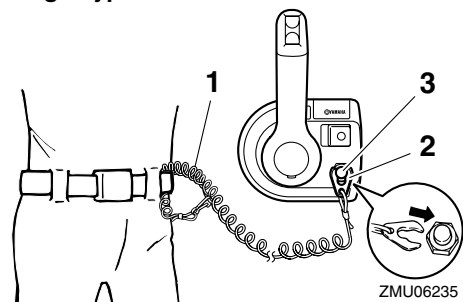
- Turn the steering wheel full-right and full-left. Make sure operation is smooth and unrestricted throughout the whole range with no binding or excessive free play.
- Operate the throttle levers several times to make sure there is no hesitation in their travel. Operation should be smooth over the complete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

EMU36922

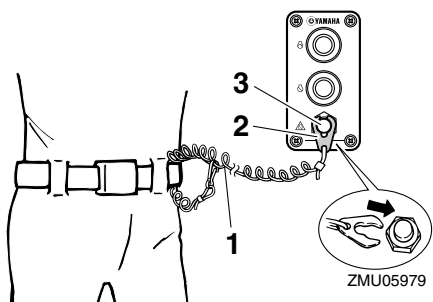
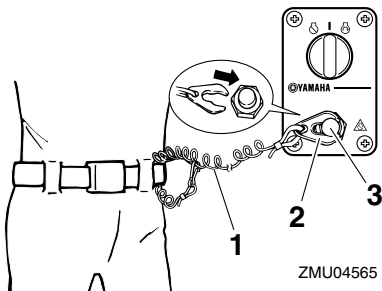
Engine shut-off cord (lanyard)

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

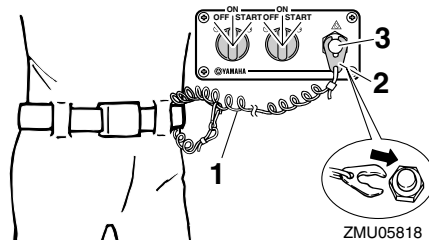
Single type



Single type



Twin type



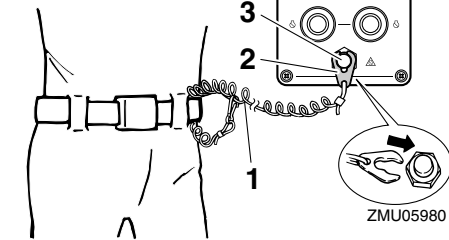
EMU37041

Engine oil

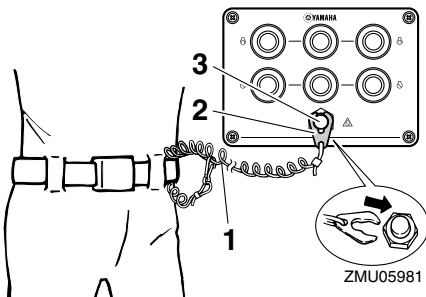
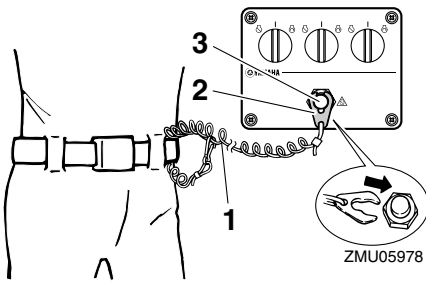
1. Put the outboard motor in an upright position (not tilted). **NOTICE: If the motor is not level, the oil level indicated on the dipstick may not be accurate.**

[ECM01790]

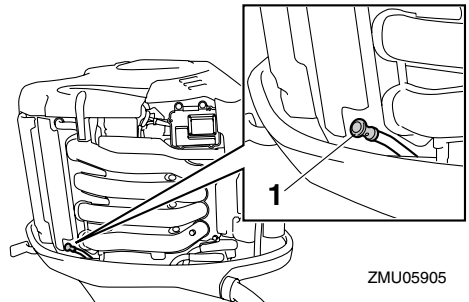
2. Remove the top cowling.
3. Remove oil dipstick and wipe it clean.
4. Insert the dipstick and remove it again. Be sure to completely insert the dipstick into the dipstick guide, otherwise the oil level measurement will be incorrect.
5. Check the oil level using the dipstick to be sure the level falls between the upper and lower marks. Consult your Yamaha dealer if the oil level is out of specified level or if it appears milky or dirty.



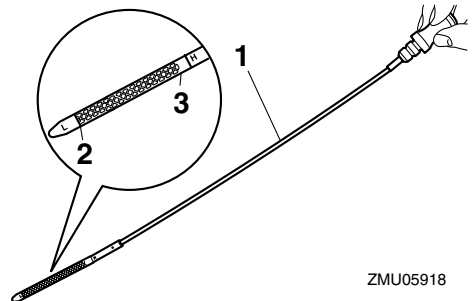
Triple type



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



1. Oil dipstick



1. Oil dipstick

Operation

2. Lower level mark
3. Upper level mark

EMU27151

Engine

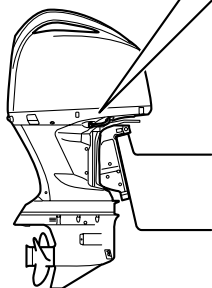
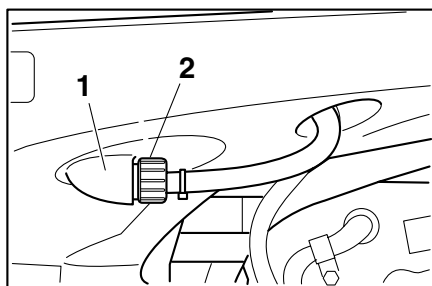
- Check the engine and engine mounting.
- Look for loose or damaged fasteners.
- Check the propeller for damage.
- Check for oil leaks.

EMU36490

Flushing device

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

[ECM01800]



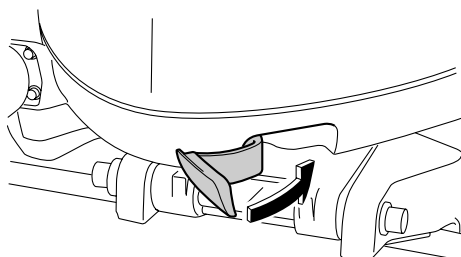
ZMU06057

1. Fitting
2. Flushing device

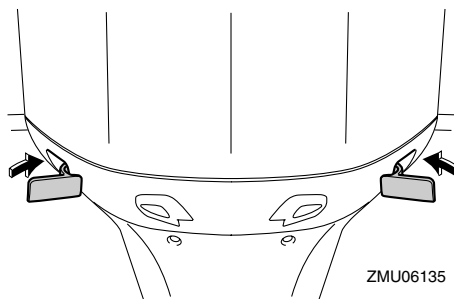
EMU36940

Install cowling

1. Be sure that all cowling lock levers are released.
2. Be sure that the rubber seal is seated all the way around the engine.
3. Place the cowling on top of the seal.
4. Check to be sure it fits properly in the rubber seal.
5. Move the levers to lock the cowling as shown. **NOTICE:** If the cowling is not installed correctly, water spray under the cowling can damage the engine, or the cowling can blow off at high speeds. [ECM01990]

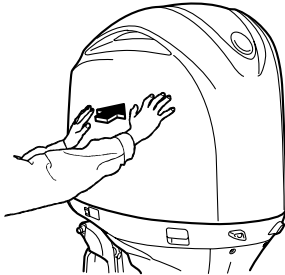


ZMU06134



ZMU06135

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.



ZMU05940

EMU35243

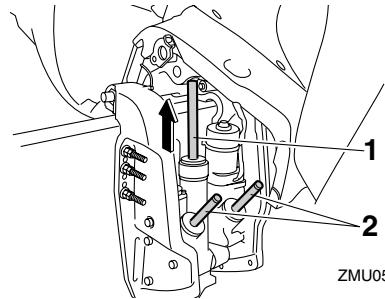
Checking power trim and tilt system

EWM01930

WARNING

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

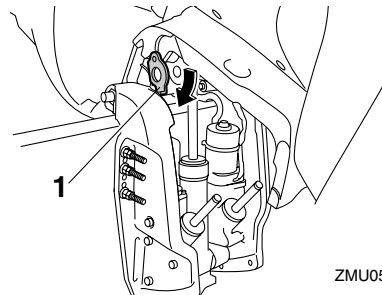
1. Check the power trim and tilt unit for any sign of oil leaks.
2. Operate each of the power trim and tilt switches on the digital electronic control and engine bottom cowling (if equipped) to check that all switches work.
3. Tilt the outboard motor up and check that the tilt rod and trim rods are extended completely.



ZMU05868

1. Tilt rod
2. Trim rods

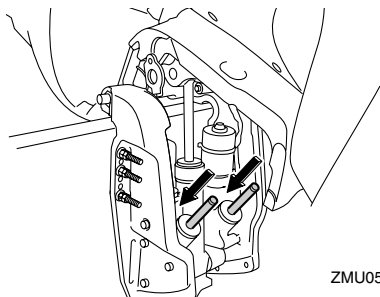
4. Use the tilt support lever to lock the motor in the up position. Operate the tilt down switch briefly so the motor is supported by the tilt support lever.



ZMU05869

1. Tilt support lever
5. Check that the tilt rod and trim rods are free of corrosion or other flaws.
6. Activate the tilt-down switch until the trim rods have retracted completely into the cylinders.

Operation



7. Activate the trim-up switch until the tilt rod is fully extended. Unlock the tilt support lever.
8. Tilt the outboard motor down. Check that the tilt rod and trim rods operate smoothly.

EMU36581

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.

EMU30022

Filling fuel

EWMO1830



- **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.

1. Stop the engine.
2. Be sure you are in a well-ventilated outdoor area, either securely moored or trailered.
3. Make sure no one is in the boat.
4. Do not smoke and keep away from sparks, flames, static electric discharge, or other sources of ignition.
5. If you use a portable container to store and dispense fuel, only use a locally approved GASOLINE container.
6. Touch the fuel nozzle to the filler opening or funnel to help prevent electrostatic sparks.
7. Fill the fuel tank, but do not overfill. Fuel can expand and overflow if the temperature increases.
8. Tighten the filler cap securely.
9. Wipe up any spilled gasoline immediately with dry rags. Dispose rags properly. According to local laws or regulations.

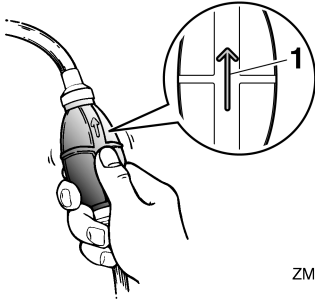
EMU27451

Operating engine

EMU31811

Priming fuel system

1. If there is a fuel joint or a fuel cock on the boat, firmly connect the fuel line to the joint or open the fuel cock.
2. Squeeze the primer pump, with the arrow pointing up, until you feel it become firm.



ZMU02025

1. Arrow

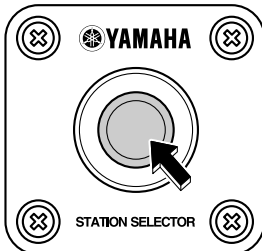
EMU35750

Change of station

For dual station boats, the station selector switch can select either the main station or sub station for the operating seat.

Only the selected station can operate the digital electronic control. The switch panel can start and stop the engine at both stations, regardless of the selected station.

1. Set all control levers to Neutral.
2. Turn the main switch to "ON" (on).
3. Push the station selector switch to select the station for operating the boat.



ZMU05976

4. The digital electronic control-active indicator for the selected station lights.

EMU27492

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.

EMU35866

Procedure for single station models

EWM01840

WARNING

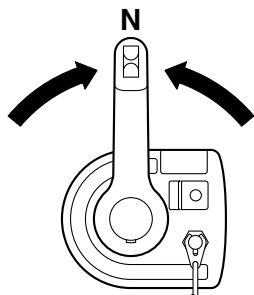
- Failure to attach engine shut-off cord could result in a runaway boat if operator is ejected. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg while operating. Do not attach the cord to clothing that could tear loose. Do not route the cord where it could become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

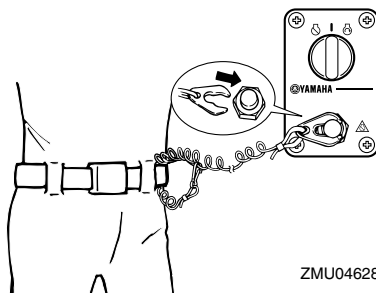
TIP:

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

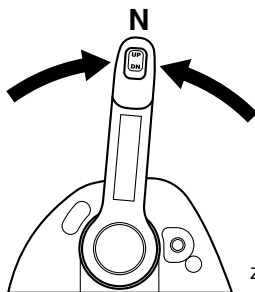
Operation



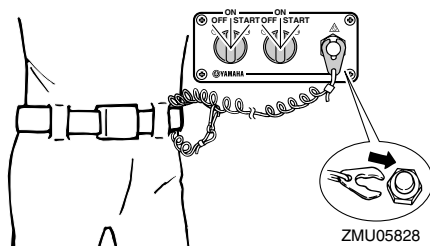
ZMU06236



ZMU04628

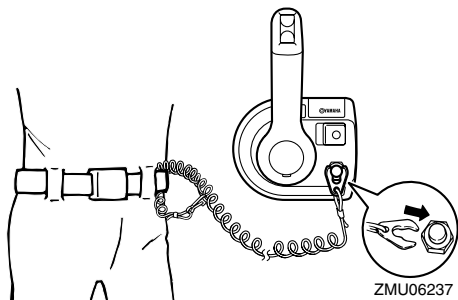


ZMU05829

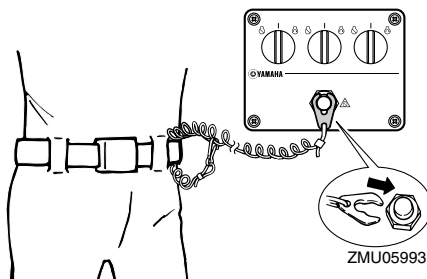


ZMU05828

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.



ZMU06237

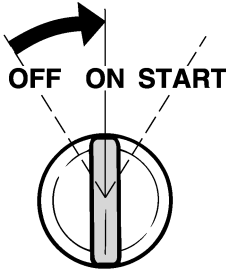


ZMU05993

3. Turn the main switch to "ON" (on) to make sure that the digital electronic control-active indicator lights. The engine can not be started when the digital electronic control-alert indicator lights.

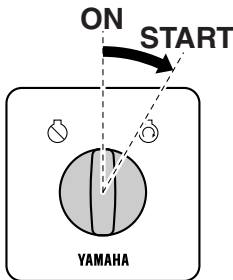
TIP:

When the main switch is turned to "ON" (on) with the clip removed from the engine shut-off switch, the buzzer will sound.

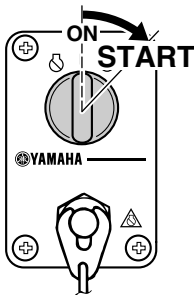


ZMU01773

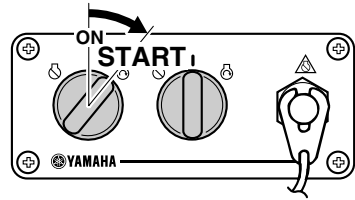
4. Turn the main switch to “START” (start), and hold it for a maximum of 5 seconds.



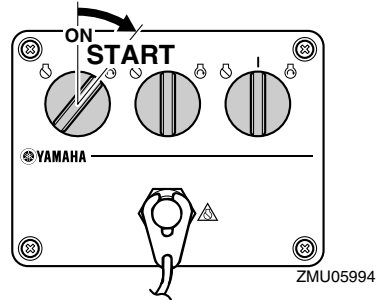
ZMU06246



ZMU04596



ZMU05830



ZMU05994

5. Immediately after the engine starts, release the main switch to return it to “ON” (on). **NOTICE:** Never turn the main switch to “START” (start) while the engine is running. Do not keep the starter motor turning for more than 5 seconds. If the starter motor is turned continuously for more than 5 seconds, the battery will be quickly discharged, thus making it impossible to start the engine. The starter can also be damaged. If the engine will not start after 5 seconds of cranking, return the main switch to “ON” (on), wait 10 seconds, then crank the engine again. [ECM00192]

EMU35922

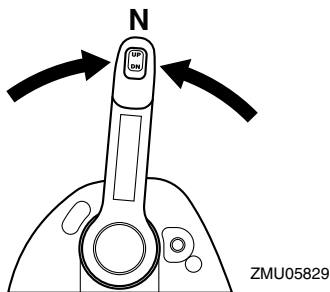
Procedure for dual station models (main station)

1. Place the control lever in “N” (neutral).

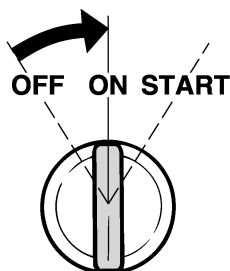
Operation

TIP:

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



2. Turn the main switch “ON” (on) to make sure that the digital electronic control-active indicator lights. The engine can not be started when the digital electronic control-alert indicator lights.



3. The procedure until starting the engine is the same as that of the single station models. **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]

TIP:

The sub station can start and stop the engine. However, it cannot operate the digital electronic control.

EMU35762

Procedure for dual station models (sub station)

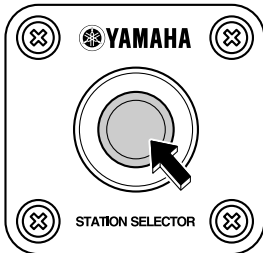
EWMO1840

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.

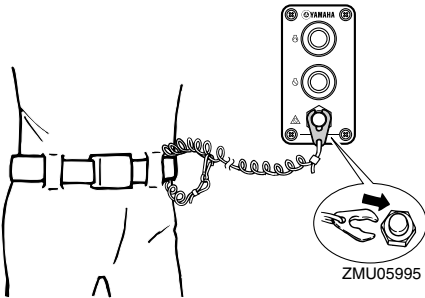
1. Turn the main switch of the main station to “ON” (on) to make sure that the digital electronic control-active indicator lights. The engine can not be started when the digital electronic control-alert indicator lights.
2. Place the control lever in “N” (neutral).
3. Push the station selector switch of the sub station. Station change is only possible when all control levers have been set to “N” (neutral). Make sure that the digital electronic control-active indicator

of the sub station lights.

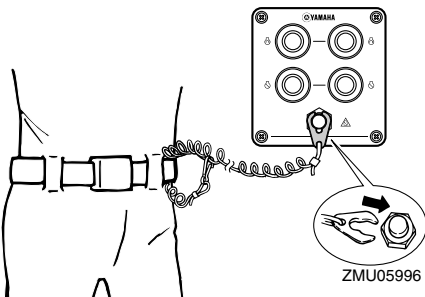


ZMU05976

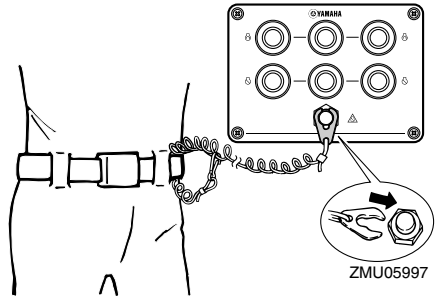
4. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg. Then install the clip on the other end of the cord into the engine shut-off switch.



ZMU05995

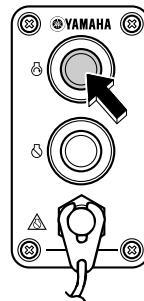


ZMU05996



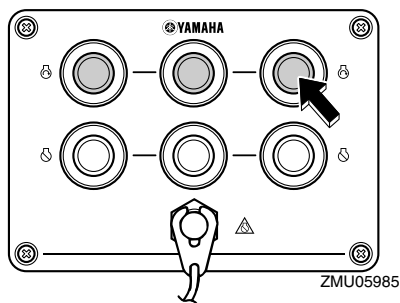
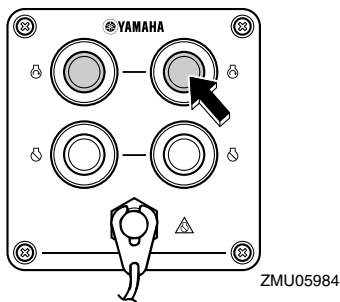
ZMU05997

5. Push the starter button to start the motor. **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]



ZMU05983

Operation



TIP:

The main station can start and stop the engine. However, it cannot operate the digital electronic control.

EMU36510

Checks after starting engine

EMU36520

Cooling water

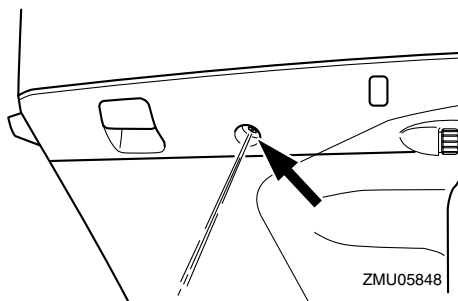
Check for a steady flow of water from the cooling water pilot hole. A continuous flow of water from the pilot hole shows that the water pump is pumping water through the cooling passages. If the cooling passages are frozen, it may take a while for water to start flowing out of the pilot hole.

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 wheth-

er 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.



Check that no water leaks from the joints between the exhaust cover, cylinder head, and body cylinder.

EMU27670

Warming up engine

EMU35264

Electric start models

After the engine has started, warm the engine up until the engine speed settles at idling speed.

EMU36530

Checks after engine warm-up

EMU36540

Shifting

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

EMU31721

Stop switches

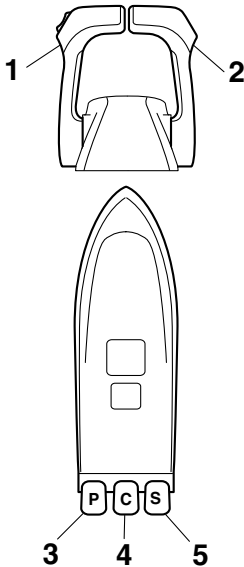
- Confirm that turning the main switch to the "OFF" (off) position stops the engine.
- Confirm that removing the clip from the engine shut-off switch stops the engine.
- Confirm that the engine cannot be started with the clip removed from the engine

shut-off switch.

EMU35880

Selecting outboard motor (triple engine)

After all engines have started, set all control levers to Neutral. Push the engine selector switch repeatedly to change the digital electronic control-active indicator and select the desired engine.



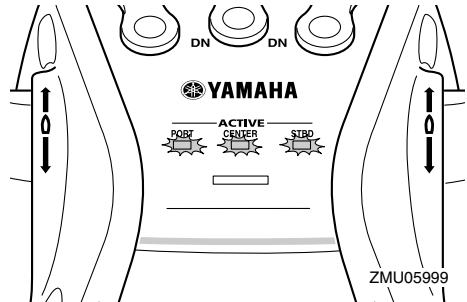
ZMU05998

1. Port side control lever
2. Starboard side control lever
3. Port side engine
4. Center engine
5. Starboard side engine

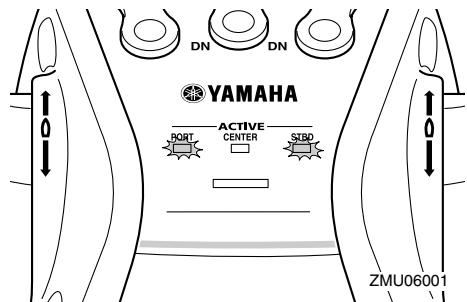
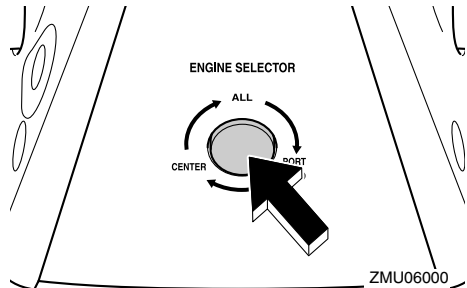
1. First, three engines can be operated.

TIP:

When all engines have started, the center engine will run at the average speed of port side and starboard side engines' speeds.

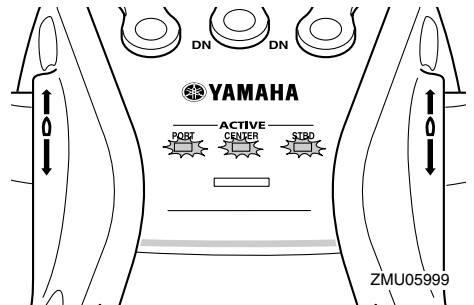
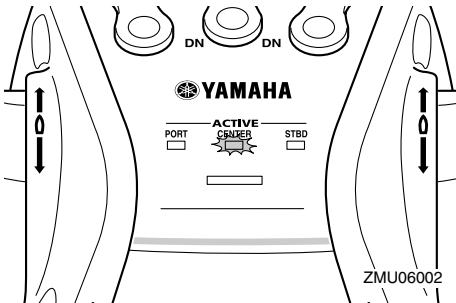
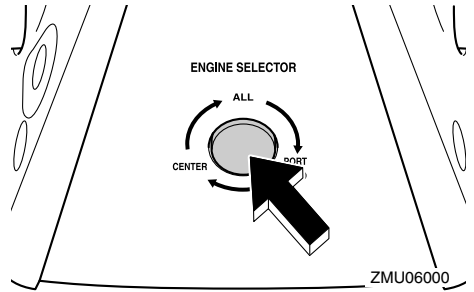
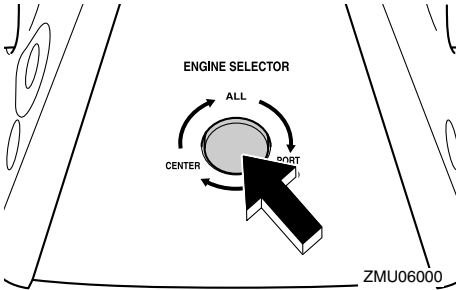


- Operate the port side engine using the port side control lever.
 - The center engine runs at the average speed of port side and starboard side engines' speeds.
 - Operate the starboard side engine using the starboard side control lever.
2. Push the engine selector switch once to operate the port side and starboard side engines.



Operation

- Operate the port side engine using the port side control lever.
 - The center engine runs at the idling speed.
 - Operate the starboard side engine using the starboard side control lever.
3. Push the engine selector switch twice to operate the center engine.



EMU35124

Shifting

EWMO0180



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

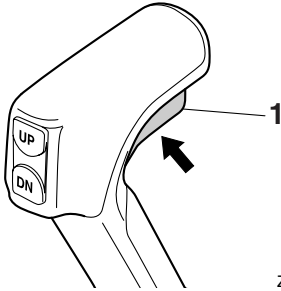
- The port side engine runs at the idling speed.
 - Operate the center engine using the port side control lever.
 - The starboard side engine runs at the idling speed.
4. Push the engine selector switch three times to operate the three engines.

Warm up the engine before shifting into gear. Until the engine is warm, the idle speed may be higher than normal. The control lever of the Digital electronic control can be operated even at high engine speeds. However, gear shifting will not work until the engine speed has automatically decreased to a speed at which actual gear shifting is possible. As a result, for quick gear shifting there could be a time lag when the gear is shifted until the engine speed has decreased sufficiently.

To shift out of neutral

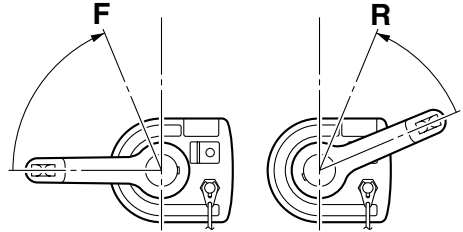
1. Pull the neutral interlock trigger up (if

equipped).



ZMU06285

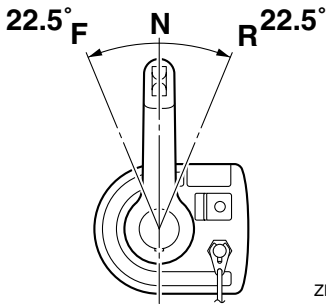
slows to idle speed.



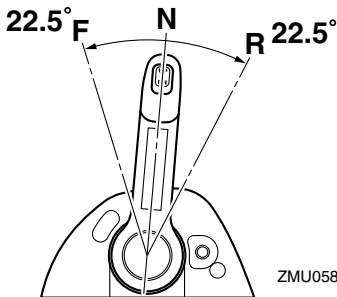
ZMU06239

1. Neutral interlock trigger

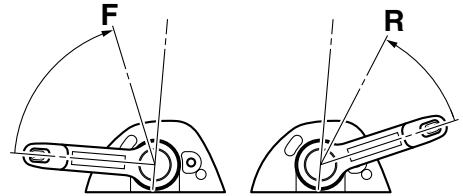
2. Move the control lever firmly and crisply forward (for forward gear) or backward (for reverse gear) 22.5° (a detent can felt).



ZMU06238

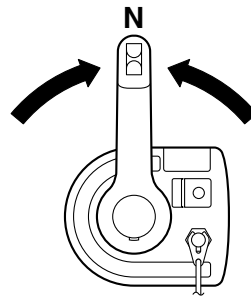


ZMU05831



ZMU05832

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

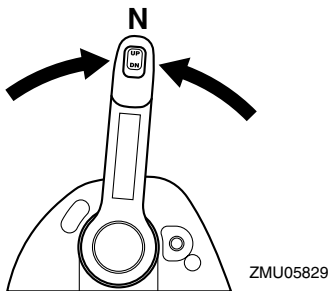


ZMU06236

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

1. Close the throttle so that the engine

Operation



EMU31742

Stopping boat

EWMO1510

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.

EMU35890

Operating the port / center / starboard engine

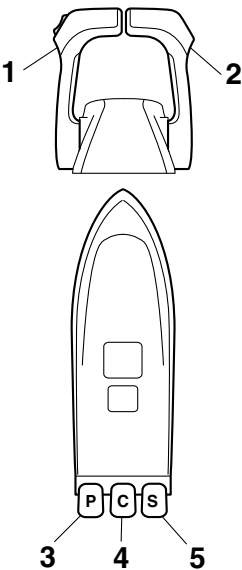
The outboard motor to be used can be selected with the main switch.

ECMO1740

NOTICE

Be sure to tilt the unoperated motor up. Otherwise water could enter the exhaust

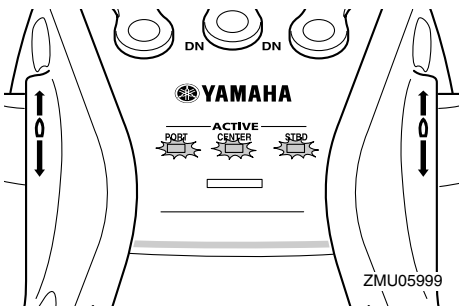
pipe due to the wave action, causing engine trouble.



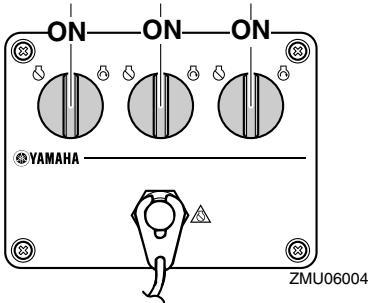
ZMU06003

1. Port side control lever
2. Starboard side control lever
3. Port side engine
4. Center engine
5. Starboard side engine

Operating three outboard motors

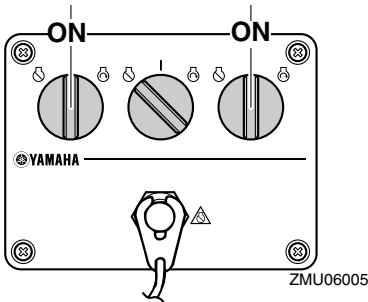
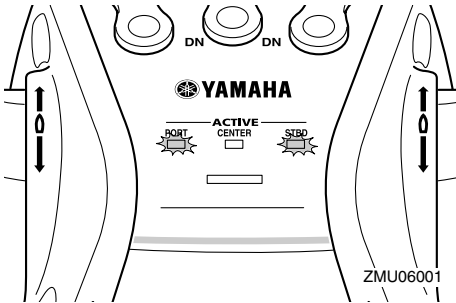


ZMU05999



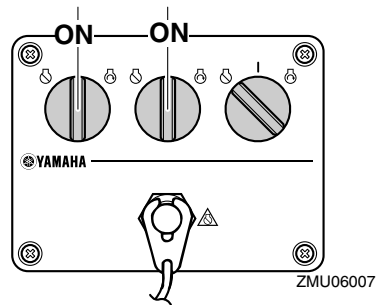
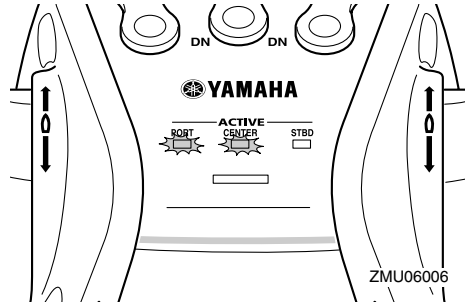
- Operate the port side engine using the port side control lever.
- When all engines have started, the center engine will run at the average speed of port side and starboard side engines' speeds.
- Operate the starboard side engine using the starboard side control lever.

Operating the port side engine and starboard side engine



- Operate the port side engine using the port side control lever.
- Operate the starboard side engine using the starboard side control lever.

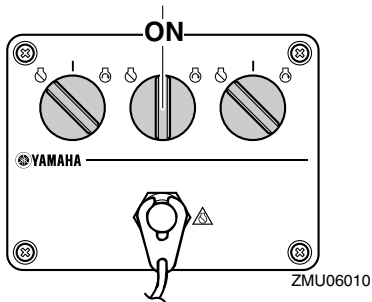
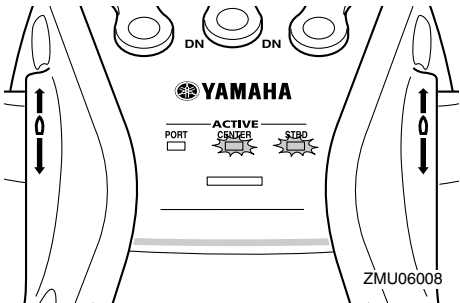
Operating the port side engine and center engine



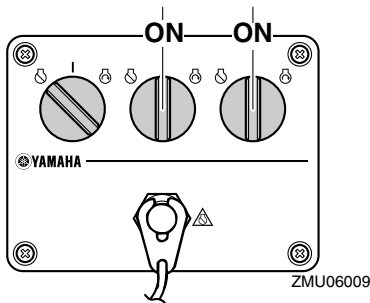
- Operate the port side engine using the port side control lever.
- Operate the center engine using the starboard side control lever.

Operation

Operating the center engine and starboard side engine

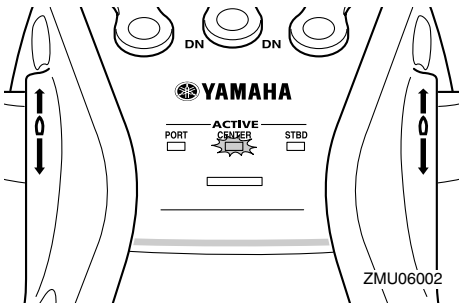


- Operate the center engine using the port side control lever.



- Operate the center engine using the port side control lever.
- Operate the starboard side engine using the starboard side control lever.

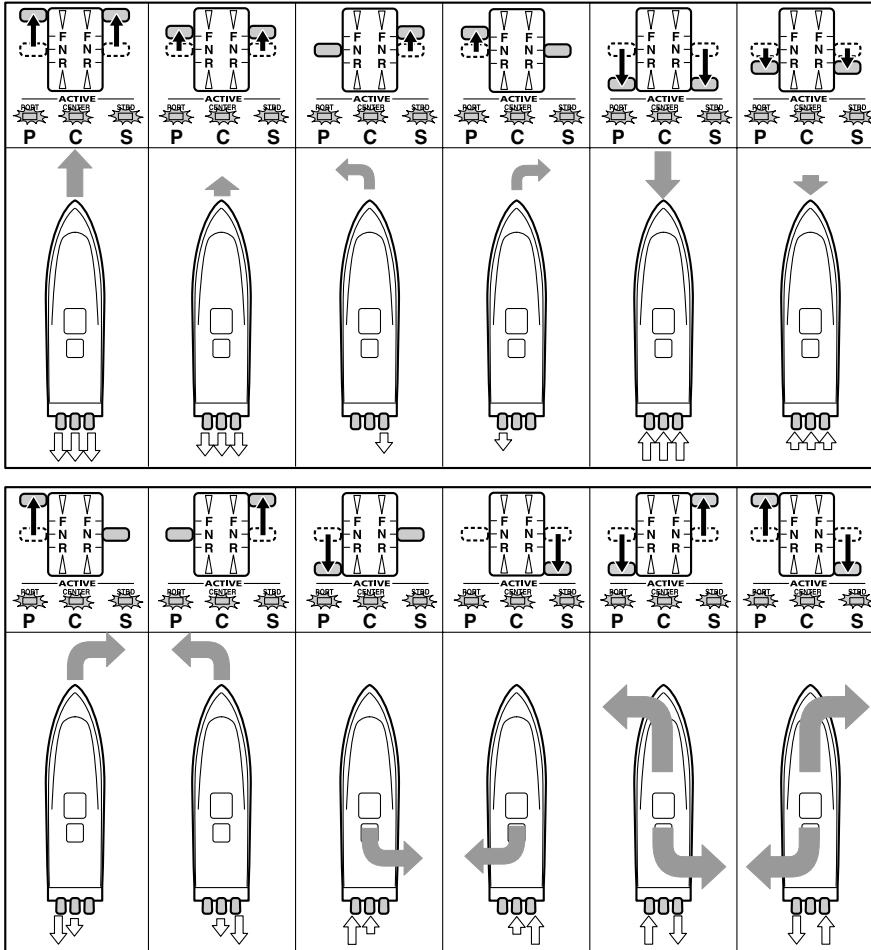
Operating the center engine



Boat direction

The illustrations below indicate the boat direction when operating the three outboard motors.

When using the port side engine, center engine and starboard side engine



ZMU06011

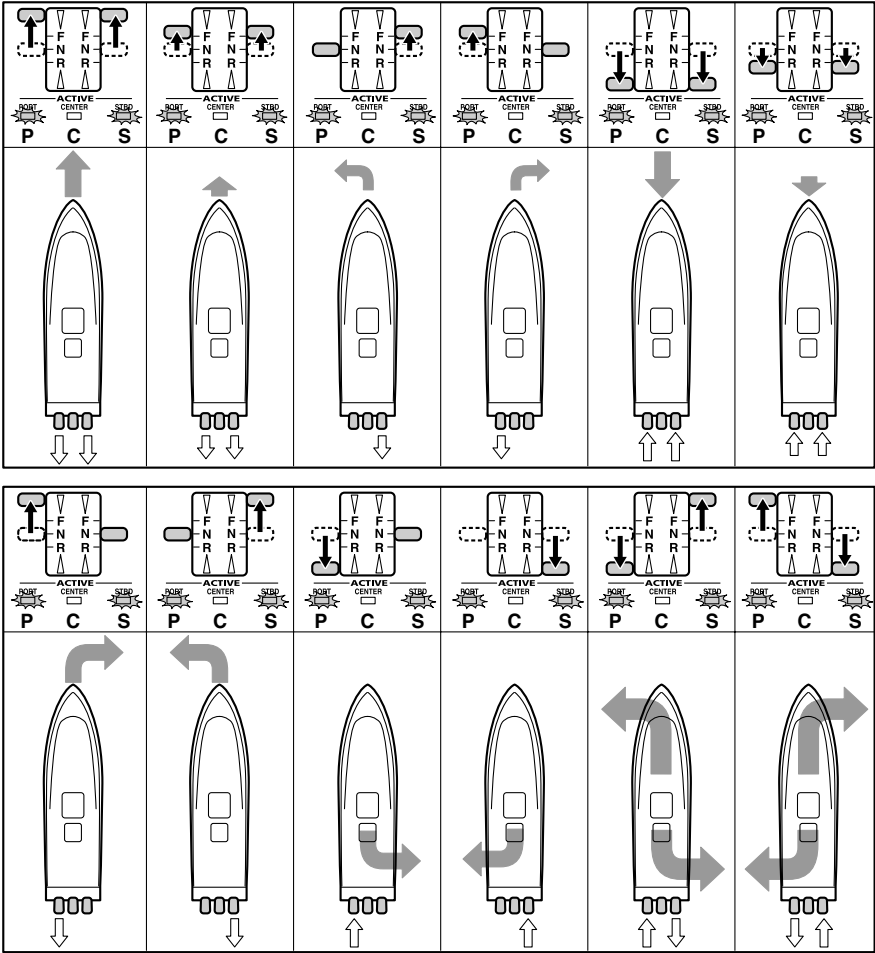
←:Boat direction and turning force

The size of the arrow is proportional to the turning force.

⇄:Propulsion

Operation

When using the port side engine and starboard side engine



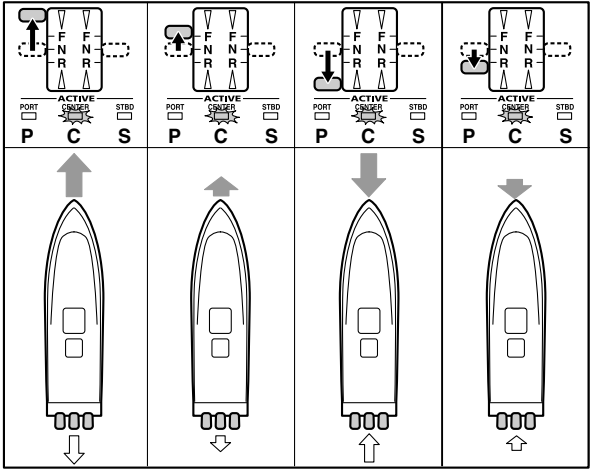
ZMU06012

↔:Boat direction and turning force

The size of the arrow is proportional to the turning force.

↔:Propulsion

When using the center engine



ZMU06013

↙: Boat direction and turning force

The size of the arrow is proportional to the turning force.

↔: Propulsion

Operation

EMU27821

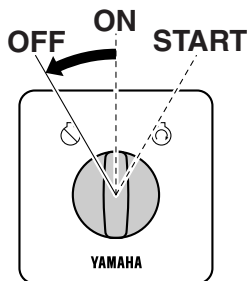
Stopping engine

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.

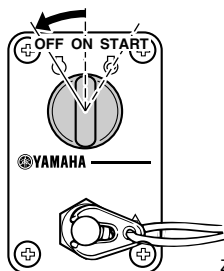
EMU35801

Procedure for single station models

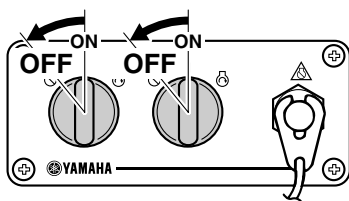
1. Turn the main switch to "OFF" (off).



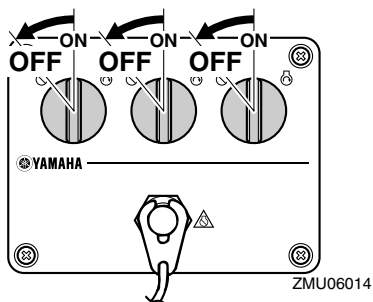
ZMU06247



ZMU04599



ZMU05833



ZMU06014

2. 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).

EMU35930

Procedure for dual station models (main station)

1. The procedure until stopping the engine is the same as that of the single station models.
2. Remove the key if the boat will be left unattended.

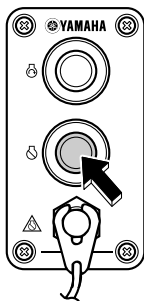
TIP:

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).

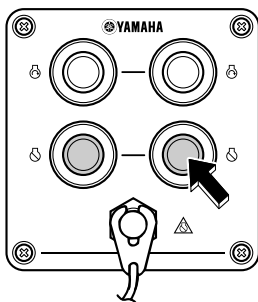
EMU35910

Procedure for dual station models (sub station)

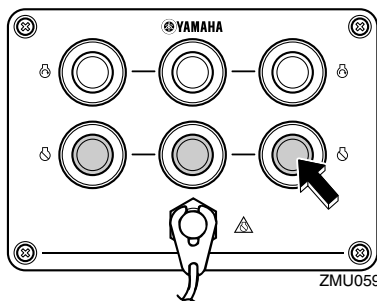
Push and hold the red engine stop button until the engine comes to a complete stop. When the engine has been stopped from the sub station, be sure to turn the main switch on the main station to "OFF".



ZMU05986



ZMU05987



ZMU05988

TIP:

The engine can also be stopped by pulling the engine shut-off cord and removing the clip from the engine shut-off switch.

EMU27862

Trimming outboard motor

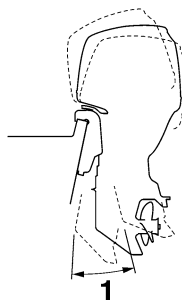
EWMO0740

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

EMU27885

Adjusting trim angle (Power trim and tilt)

EWMO0753

WARNING

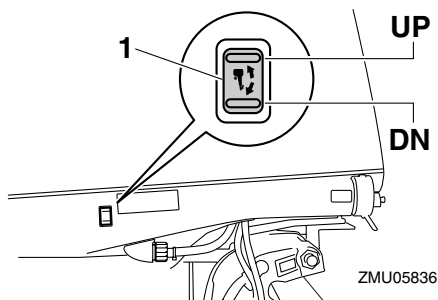
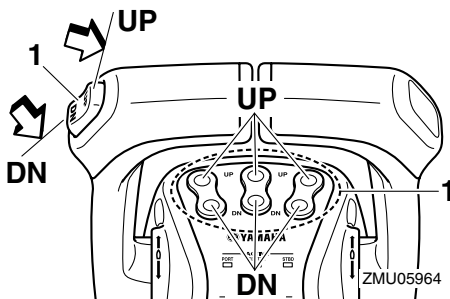
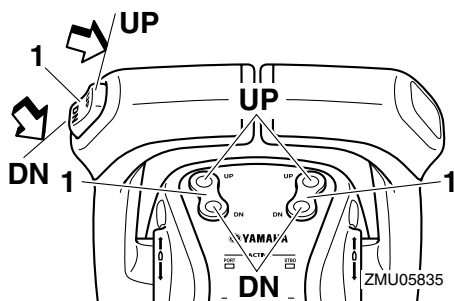
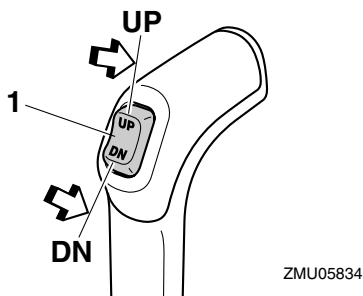
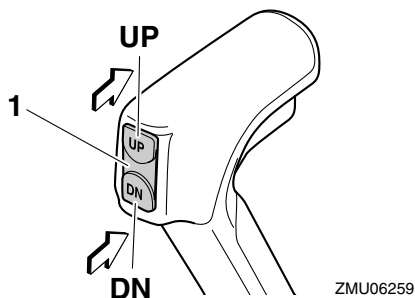
- Be sure all people are clear of the outboard motor when adjusting the trim angle. Body parts can be crushed between the motor and the clamp bracket when the motor is trimmed or tilted.
- Use caution when trying a trim position for the first time. Increase speed gradually and watch for any signs of instability or control problems. Improper trim

Operation

angle can cause loss of control.

- If equipped with a power trim and tilt switch located on the bottom cowling, use the switch only when the boat is at a complete stop with the engine off. Do not adjust the trim angle with this switch while the boat is moving.

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



1. Power trim and tilt switch

To raise the bow (trim-out), press the switch “UP” (up).

To lower the bow (trim-in), press the switch “DN” (down).

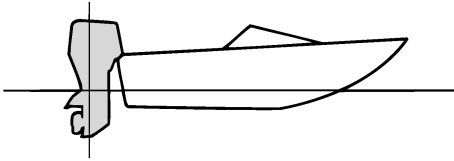
Make test runs with the trim set to different angles to find the position that works best for your boat and operating conditions.

EMU27911

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. The trim tab can also be adjusted to help offset this effect. When the bow of the boat is down, it is easier to accelerate from a standing start onto

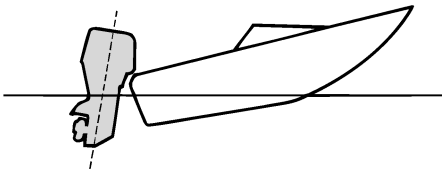
plane.



ZMU01784

Bow Up

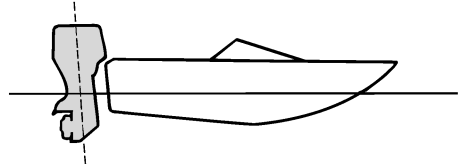
Too much trim-out puts the bow of the boat too high in the water. Performance and economy are decreased because the hull of the boat is pushing the water and there is more air drag. Excessive trim-out can also cause the propeller to ventilate, which reduces performance further, and the boat may “porpoise”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

EMU27944

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 case from damage by collision with obstructions, and also to reduce salt corrosion.

EWMO1541



WARNING

Be sure all people are clear of the outboard motor when tilting up and down. Body parts can be crushed between the motor and the clamp bracket when the motor is trimmed or tilted.

ECM00991

NOTICE

- Before tilting the outboard motor, follow the procedure under “Stopping engine” in this chapter. Never tilt the outboard motor while the engine is running. Severe damage from overheating can result.
- To prevent the cooling water passages from becoming frozen when the ambient temperature is 5°C or below, tilt the outboard motor up after it has been

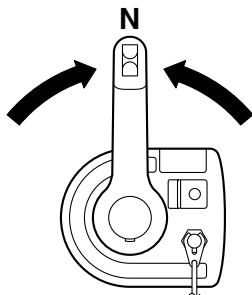
Operation

stopped 30 seconds or more.

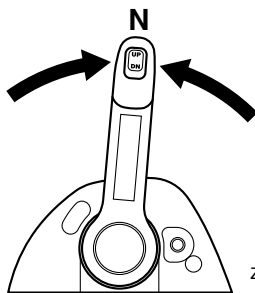
EMU35505

Procedure for tilting up (power trim and tilt models)

1. The main switch must be “ON” (on) for the power trim and tilt switch on the digital electronic control to operate.
2. Place the control lever in neutral.

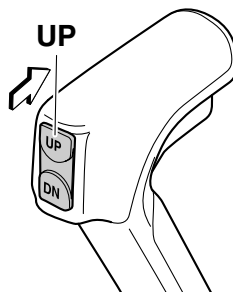


ZMU06236

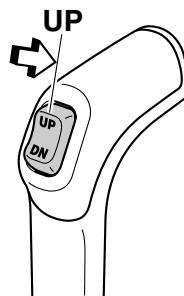


ZMU05829

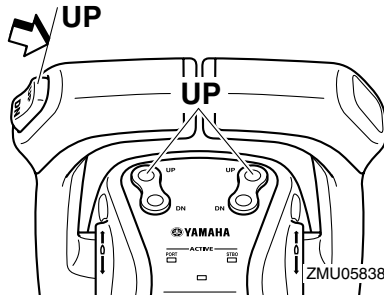
3. Press the power trim and tilt switch “UP” (up) until the outboard motor has tilted up completely.



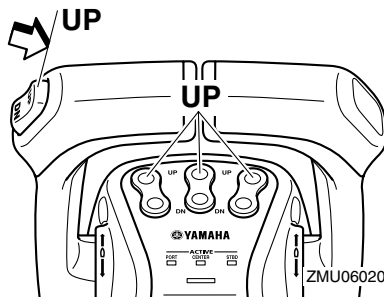
ZMU06280



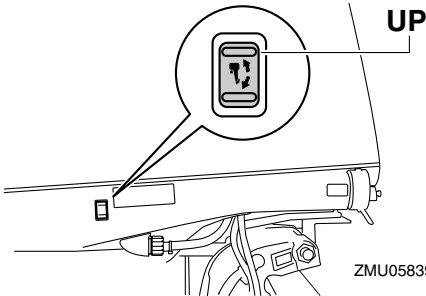
ZMU05837



ZMU05838

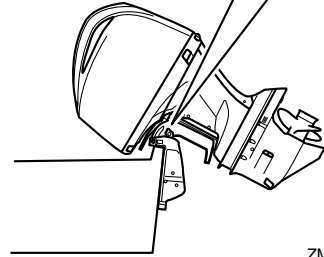
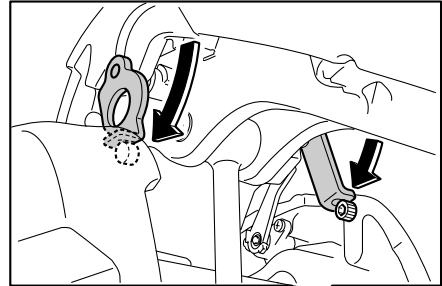


ZMU06020



4. Set the tilt support lever 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 75. [ECM01641]



ZMU05824

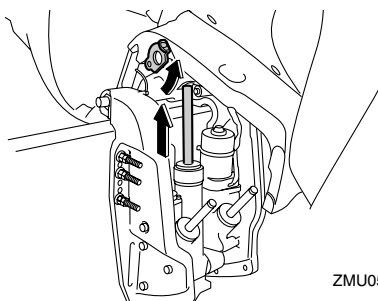
5. Models equipped with trim rods: Once the outboard motor is supported with the tilt support lever, press the power trim and tilt switch “DN” (down) to retract the trim rods. **NOTICE:** Be sure to retract the trim rods completely during mooring. This protects the rods from marine growth and corrosion which could damage the power trim and tilt mechanism. [ECM00251]

EMU35513

Procedure for tilting down (power trim and tilt models)

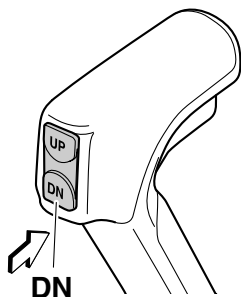
1. The main switch must be “ON” (on) for the power trim and tilt switch on the digital electronic control to operate.
2. Push the power trim and tilt switch “UP” (up) until the outboard motor is supported by the tilt rod and the tilt support lever becomes free.
3. Release the tilt support lever.

Operation

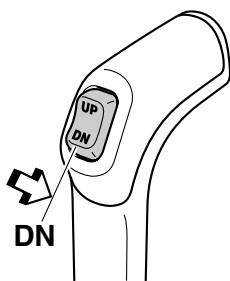


ZMU05856

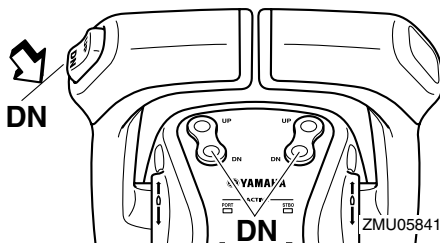
4. Push the power trim and tilt switch “DN” (down) to lower the outboard motor to the desired position.



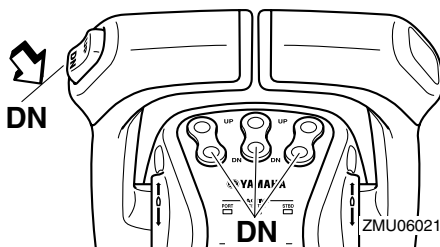
ZMU06258



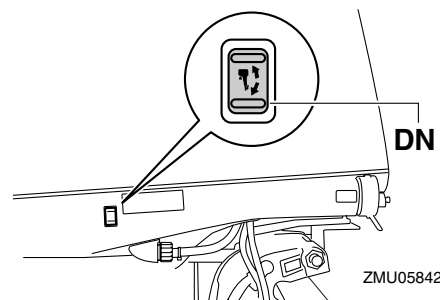
ZMU05840



ZMU05841



ZMU06021



ZMU05842

EMU28061

Shallow water

EMU32871

Power trim and tilt models

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

ECM01490

NOTICE

- If the engine speed is suddenly increased when the outboard motor is partially tilted up, the power trim and tilt

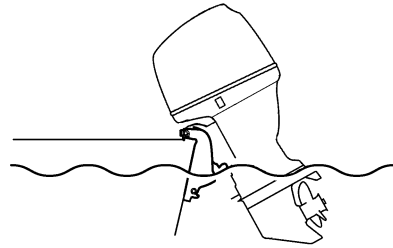
unit could be damaged.

- 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.

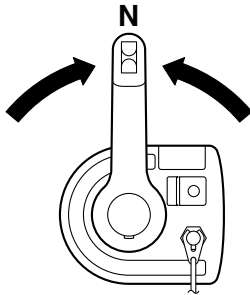
EMU35234

Procedure for power trim and tilt models

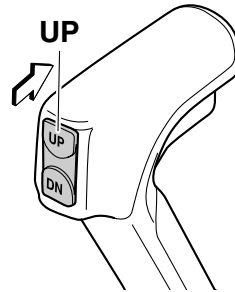
1. Place the control lever in neutral.



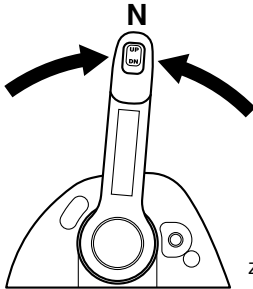
ZMU05173



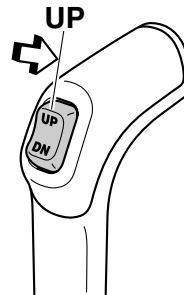
ZMU06236



ZMU06280

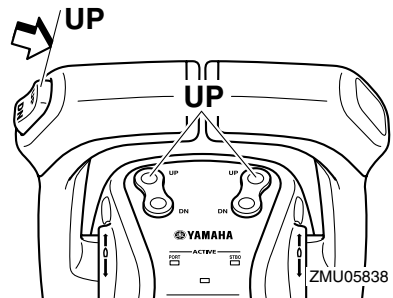


ZMU05829



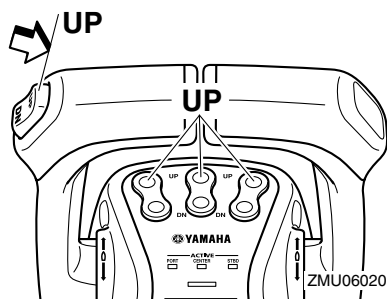
ZMU05837

2. Slightly tilt the outboard motor up to the desired position using the power trim and tilt switch. **WARNING! Using the power trim and tilt switch on the bottom cowling while the boat is moving or engine is on could increase the risk of falling overboard and could distract the operator, increasing the risk of collision with another boat or an obstacle.** [EWM01850]

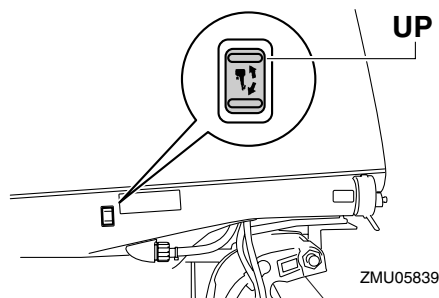


ZMU05838

Operation



rosion. Also rinse the outside of the outboard motor with fresh water.



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

EMU28194

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 and, if possible, rinse the power head under the cowling.

Cruising in muddy, turbid, or acidic water

Yamaha strongly recommends that you use the optional chromium-plated water pump kit (see page 15) 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 cor-

EMU31841

Transporting and storing outboard motor

ECM001860

WARNING

Leaking fuel is a fire hazard. When transporting and storing the outboard motor, close the fuel cock to prevent fuel from leaking. Never get under the engine while it is tilted. Severe injury could occur if the outboard motor accidentally falls.

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.

The outboard motor should be trailered 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.

EMU35580

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 fol-

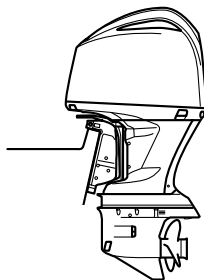
lowing procedures.

ECM01720

NOTICE

Store the outboard motor in a dry, well-ventilated place, not in direct sunlight.

Keep the outboard motor in the attitude shown when transporting and storing it.



ZMU05843

EMU28303

Procedure

EMU31380

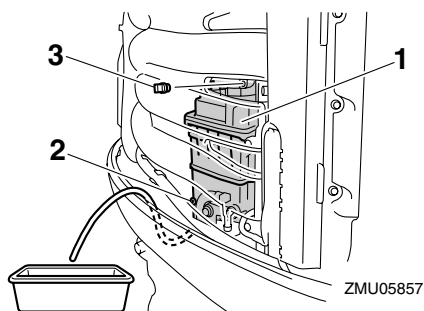
Draining the gasoline from the vapor separator

TIP:

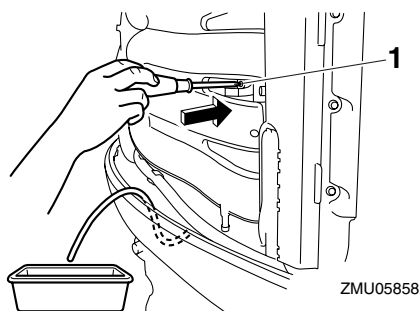
This procedure is performed while the top cowling is removed.

1. Drain the remaining gasoline in the vapor separator into a container. Loosen the drain screw, and then remove the cap. Push in the air valve with a screwdriver to introduce air into the float chamber, so that the gasoline will drain smoothly. Then, tighten the drain screw.

Maintenance



1. Vapor separator
2. Drain screw
3. Cap



1. Air valve

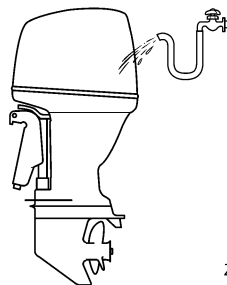
EMU31392

Washing the outboard motor

TIP:

This procedure is performed while the top cowling is installed.

1. Wash the outboard motor body using fresh water. **NOTICE: Do not spray water into the air intake.** [ECM01840]



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

EMU28402

Lubrication

1. Install the spark plug(s) and torque to proper specification. For information on spark plug installation, see page 83.
2. Change the gear oil. For instructions, see page 88. 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 82.

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.

EMU28443

Flushing power unit

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

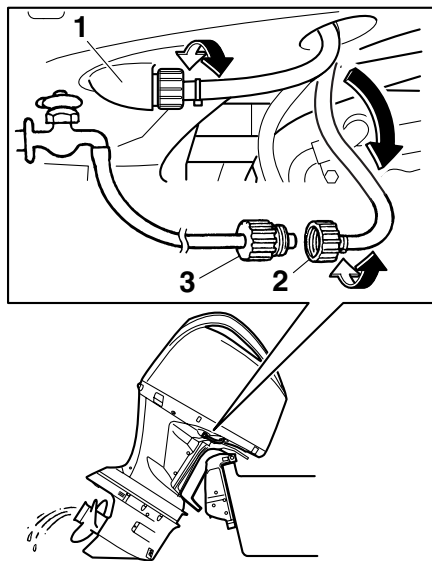
ECM01530

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 cowl.



ZMU05844

1. Fitting
 2. Garden hose adapter
 3. Garden hose connector
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 cowl. Tighten the connector securely. **NOTICE:** Do not leave the garden hose connector loose on the bottom cowl 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]

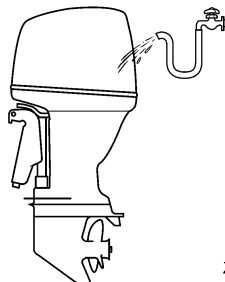
TIP:

- 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 75.

EMU28450

Cleaning the outboard motor

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



ZMU05174

TIP:

For cooling system flushing instructions, see page 75.

EMU28460

Checking painted surface of motor

Check the 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.

Maintenance

EMU2847B

Periodic maintenance

EWMO1871



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

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

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

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.

EMU34150

Severe operating conditions

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

- Operating continuously at or near maximum engine speed (rpm) for many hours
- Operating continuously at a low engine speed (rpm) for many hours
- Brief periods of rapid acceleration and deceleration followed by engine shut off before the engine has reached proper operating temperature
- Frequent quick acceleration and deceleration
- Frequent shifting
- Frequently starting and stopping the engine(s)
- Operation that fluctuates often between light and heavy cargo loads

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

EMU34445

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) (exhaust joint, cylinder head, thermostat cover)	Inspection or replacement as necessary		○		
Anodes (exhaust joint (inside), body cylinder, Rectifier Regulator cover)	Replacement				○
Anode(s) (casecrank cover, upper case, exhaust cover, cover joint)	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 clamp	Inspection		●/○		
Engine starting condition/Noise	Inspection	●/○	●/○		
Engine idling speed/ Noise	Inspection	●/○	●/○		

Maintenance

Item	Actions	Initial	Every			
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)	
Engine oil	Replacement	○	○			
Engine Oil filter (cartridge)	Replacement		○			
Fuel filter (can be disassembled)	Inspection or replacement as necessary	●/○	●/○			
Fuel line(High pressure)	Inspection	●	●			
Fuel line(High pressure)	Inspection or replacement as necessary	○	○			
Fuel line(Low pressure)	Inspection	●	●			
Fuel line(Low pressure)	Inspection or replacement as necessary	○	○			
Fuel pump	Inspection or replacement as necessary			○		
Fuel/oil leakage	Inspection	○	○			
Gear oil	Replacement	●/○	●/○			
Greasing points	Greasing	●/○	●/○			
Impeller/water pump housing	Inspection or replacement as necessary		○			
Impeller/water pump housing	Replacement			○		
OCV (Oil Control Valve) filter	Inspection and cleaning				○	
Power trim & tilt unit	Inspection	●/○	●/○			
Propeller/Propeller nut/Cotter pin	Inspection or replacement as necessary	●/○	●/○			
PCV (Pressure Control Valve)	Inspection or replacement as necessary		○			
Spark plug(s)	Inspection or replacement as necessary		●/○			
Water from the cooling water pilot hole	Inspection	●/○	●/○			
Thermostat	Inspection or replacement as necessary		○			
Timing belt	Inspection or replacement as necessary		○			
Valve clearance	Inspection and adjustment				○	

Maintenance

Item	Actions	Initial	Every			
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)	
Water inlet	Inspection	●/○	●/○			
Main switch/stop switch	Inspection or replacement as necessary	○	○			
Wire harness connections/Wire coupler connections	Inspection or replacement as necessary	○	○			
(Yamaha) Meter/gauge	Inspection	○	○			

EMU34451

Maintenance chart 2

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

Maintenance

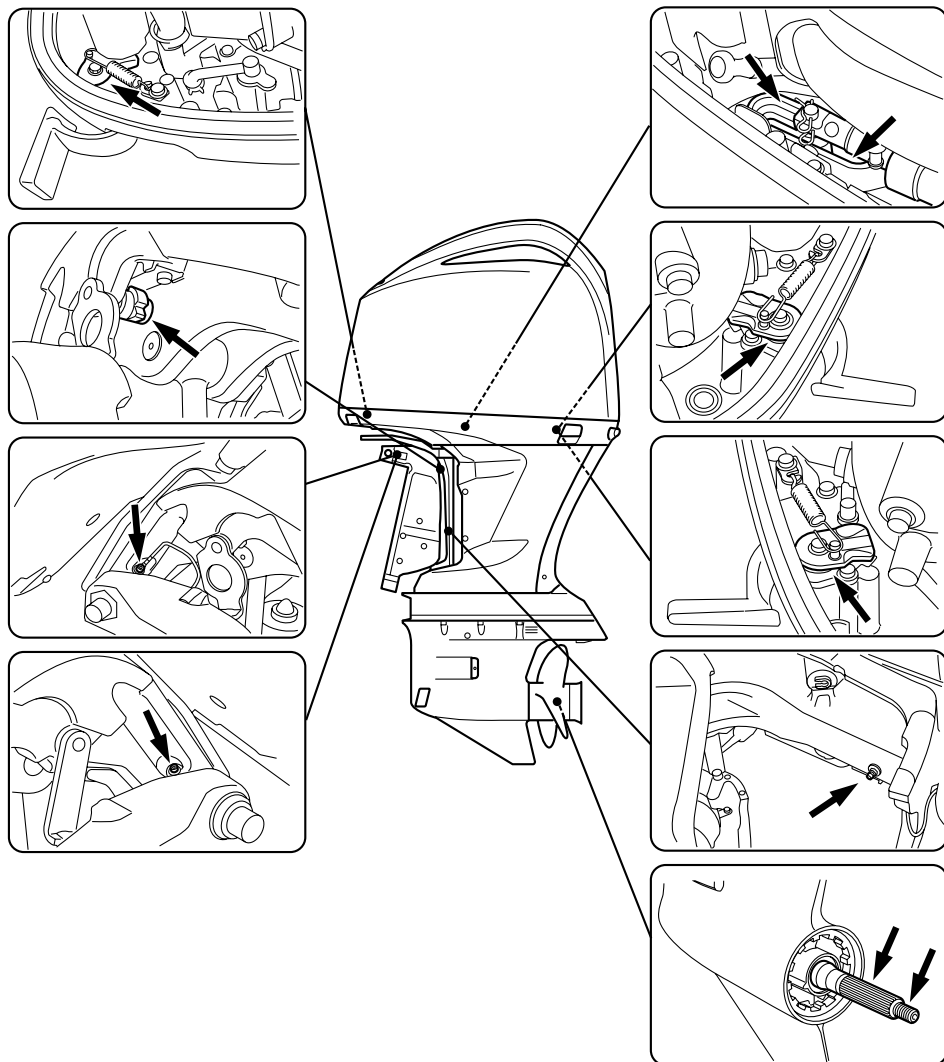
EMU28941

Greasing

Yamaha grease A (water resistant grease)

Yamaha grease D (corrosion resistant grease; for propeller shaft)

F300A, F350A, FL300A, FL350A



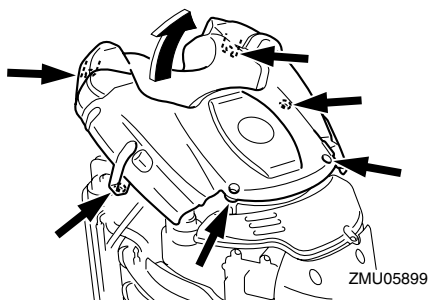
ZMU05859

EMU35062

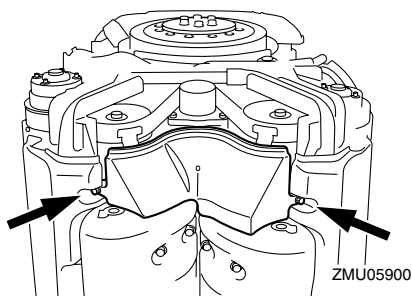
Cleaning and adjusting spark plug

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.

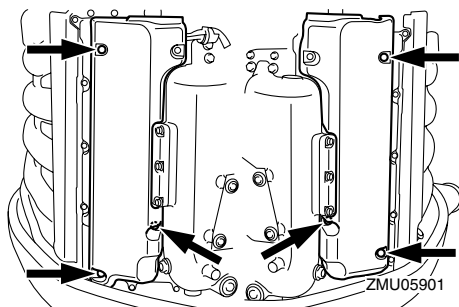
1. Remove the flywheel cover from the rear side.



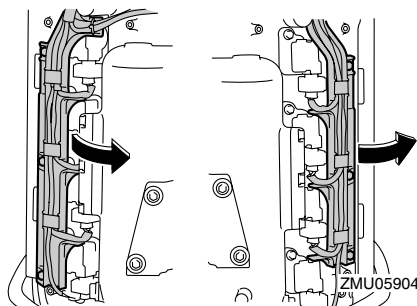
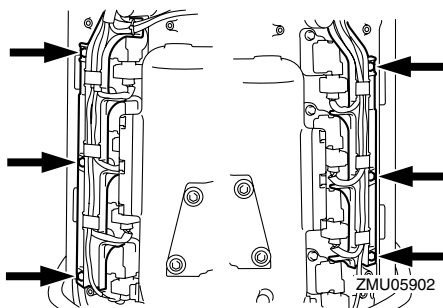
2. Remove the bolts to remove the rear cover.



3. Remove the bolts to remove the covers of both port and starboard sides.

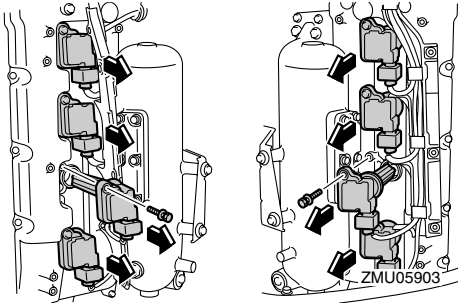


4. Remove the bolts to move the plate.



5. Remove the bolts that are securing the ignition coil, and then remove the ignition coil. Do not use any tools to remove or install the ignition coil, otherwise the ignition coil coupler may get damaged.

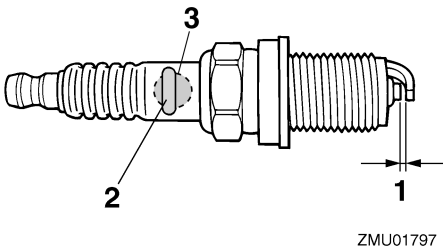
Maintenance



6. 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:
LFR6A-11

7. 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; adjust the gap to specification if necessary.



1. Spark plug gap

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

Spark plug gap:
1.0–1.1 mm (0.039–0.043 in)

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

Spark plug torque:
28.0 Nm (2.86 kgf-m, 20.7 ft-lb)

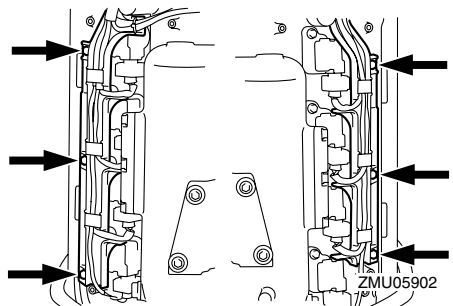
TIP:

If a torque-wrench is not available when you are fitting a spark plug, fully tighten a spark plug with a spark plug wrench. Then tighten 1/4 to 1/2 turn more. Have the spark plug adjusted to the correct torque as soon as possible with a torque-wrench.

9. Install the ignition coil and tighten the bolts.

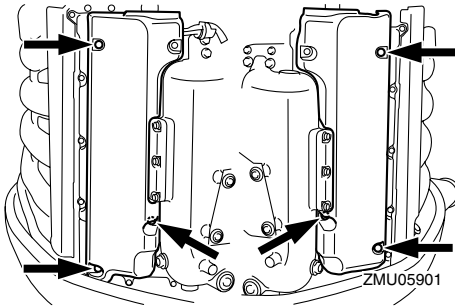
Bolt tightening torque:
9.0 Nm (0.9 kgf-m, 6.6 ft-lb)

10. Fasten the plate and install the bolts.



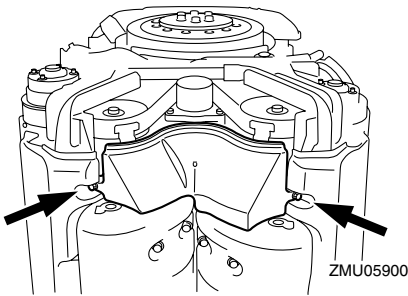
Bolt tightening torque:
8.0 Nm (0.8 kgf-m, 5.8 ft-lb)

11. Install the covers of both port and starboard sides, and tighten the bolts.



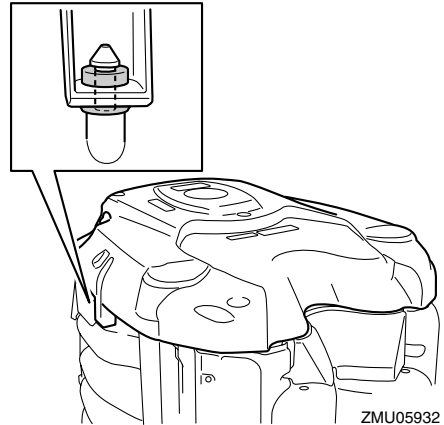
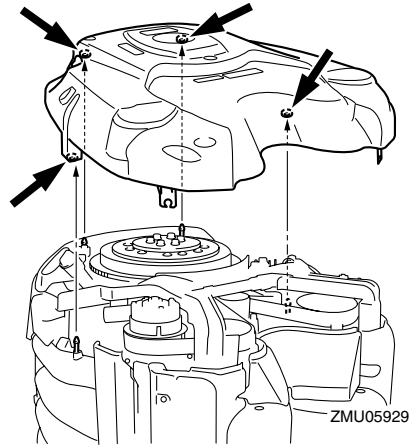
Bolt tightening torque:
8.0 Nm (0.8 kgf-m, 5.8 ft-lb)

12. Install the rear cover, and tighten the bolts.



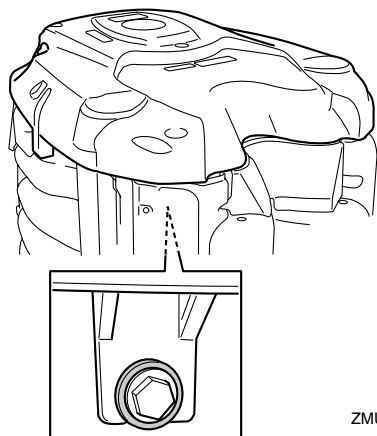
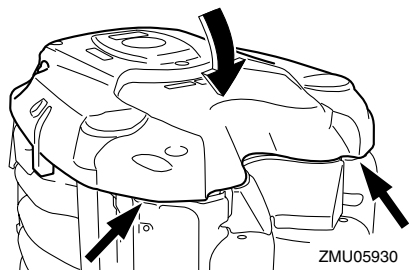
Bolt tightening torque:
8.0 Nm (0.8 kgf-m, 5.8 ft-lb)

13. Be sure to fit the 4 positions during installation.



14. Be sure to fit the 2 positions during installation.

Maintenance



EMU35590

Inspecting idling speed

ECM01690

NOTICE

This procedure must be performed while the outboard motor is in the water.

Perform this procedure using the 6Y8 Multi-function Tachometer. Results may vary depending on whether testing is conducted 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. Verify whether the idle speed is set to specification. For idle speed specifications, see page 10.

EMU35084

Changing engine oil

ECM01710

NOTICE

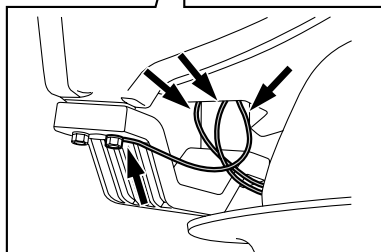
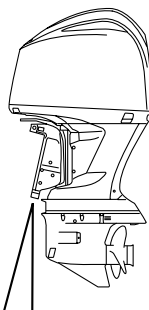
Change the engine oil after the first 20 hours of operation or 3 months, and every 100 hours or at 1-year intervals thereafter. Otherwise the engine will wear quickly.

Consult your Yamaha dealer for replacement of the engine oil filter and change of the engine oil.

EMU29112

Checking wiring and connectors

- Check that each grounding wire is properly secured.
- Check that each connector is engaged securely.



ZMU05867

EMU29173

Checking propeller

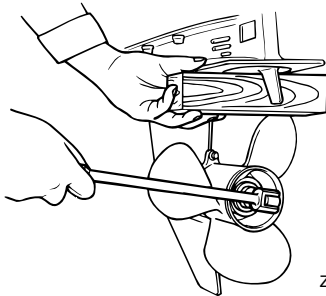
EWM01880

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.

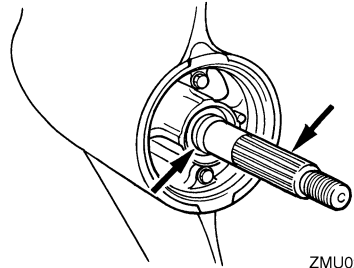
Do not use your hand to hold the propeller when loosening or tightening the propeller nut. Put a wood block between the anti-cavitation plate and the propeller to prevent the propeller from turning.



ZMU01897

Checkpoints

- Check each of the propeller blades for wear, 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.



ZMU02147

- Check the propeller shaft oil seal for damage.

EMU30661

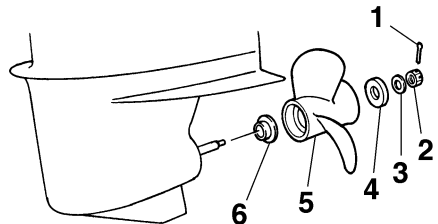
Removing propeller

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]



ZMU02148

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.

Maintenance

EMU30671

Installing propeller

EMU29243

Spline models

EWM00770



WARNING

On counter rotation models, be sure to use a propeller intended for counter-clockwise rotation. These propellers are identified with the letter “L” after the size indication on the propeller. Otherwise the boat could move in the opposite direction from that expected.

ECM00500

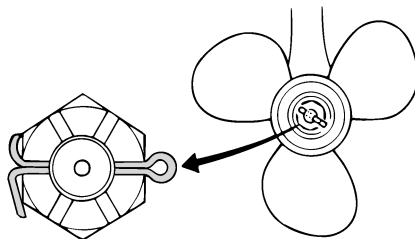
NOTICE

Be 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 thrust washer and propeller on the propeller shaft. **NOTICE:** Be sure to install the thrust washer before installing the propeller, otherwise the lower case and propeller boss could be damaged. [ECM01880]
3. Install the spacer and washer. Tighten the propeller nut to the specified torque.

Propeller nut tightening torque:
55.0 Nm (5.61 kgf-m, 40.6 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 installed. Otherwise the propeller can come off during operation. [ECM01890]



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.

EMU31913

Changing gear oil

EWM00800

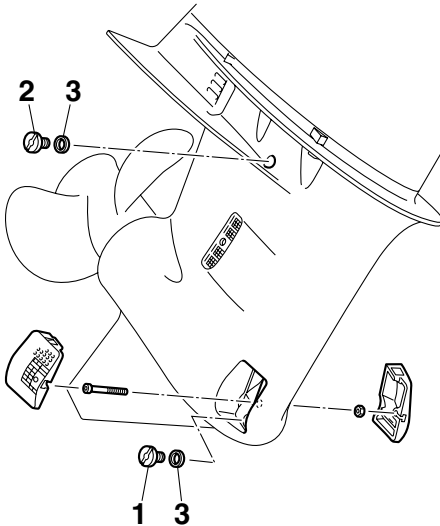


WARNING

- 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 cooling water inlet covers on both sides of the gear case. Be careful not to lose the bolt and nut.
4. Remove the gear oil drain screw and gasket. The screw is magnetic so a small quantity of metal particles on the end of the screw is normal. Simply remove them. **NOTICE:** If there is an ex-

cessive quantity of metal particles on the magnetic gear oil drain screw, this can indicate lower unit problem. Consult your Yamaha dealer. [ECM01900]



1. Gear oil drain screw
2. Oil level plug
3. Gasket

5. Remove the oil level plug and gasket to allow the oil to drain completely. **NO-TICE: Inspect the used oil after it has been drained. If the oil is milky, water is getting into the gear case which can cause gear damage. Consult a Yamaha dealer for repair of the lower unit seals.** [ECM00711]

TIP:

For disposal of used oil, consult your Yamaha dealer.

6. 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 or 80W-90, API GL-5

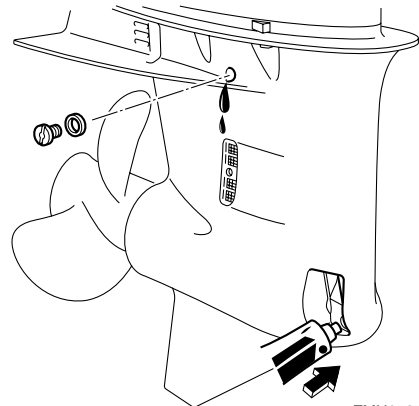
Gear oil quantity:

F300AET 1.520 L (1.607 US qt, 1.338 Imp.qt)

F350AET 1.520 L (1.607 US qt, 1.338 Imp.qt)

FL300AET 1.310 L (1.385 US qt, 1.153 Imp.qt)

FL350AET 1.310 L (1.385 US qt, 1.153 Imp.qt)



7. 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 Nm (0.9 kgf-m, 6.6 ft-lb)

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

Maintenance

drain screw.

Tightening torque:
9 Nm (0.9 kgf-m, 6.6 ft-lb)

9. Securely install the cooling water inlet covers on both sides of the gear case using the bolt and nut removed earlier.

Tightening torque:
2 Nm (0.2 kgf-m, 1.5 ft-lb)

EMU29312

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.

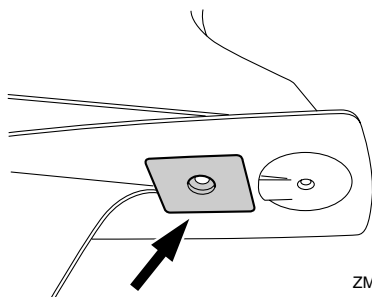
ECM00720

NOTICE

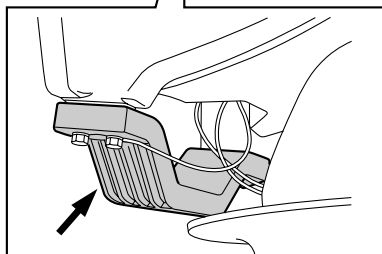
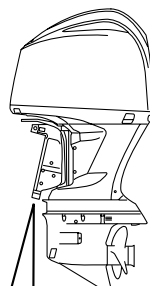
Do not paint anodes, as this would render them ineffective.

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.



ZMU05872



ZMU05873

EMU29322

Checking battery (for electric start models)

EWMO1900

WARNING

Battery electrolytic fluid 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.

Refer to page 12 for detailed safety information about batteries.

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

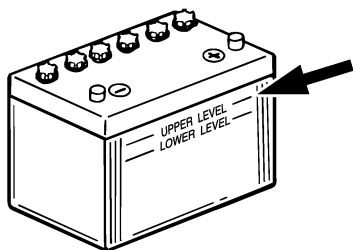
battery manufacturer's instructions.

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.**

[EWM01910]

EMU35603

Connecting the battery

EWM00570



WARNING

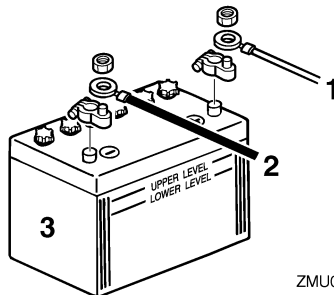
Mount the battery holder securely in a dry, well-ventilated, vibration-free location in the boat. Install a fully charged battery in the holder.

ECM01123

NOTICE

Reversal of the battery cables will damage the electrical parts.

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.



ZMU04407

1. Red cable
2. Black cable
3. Battery

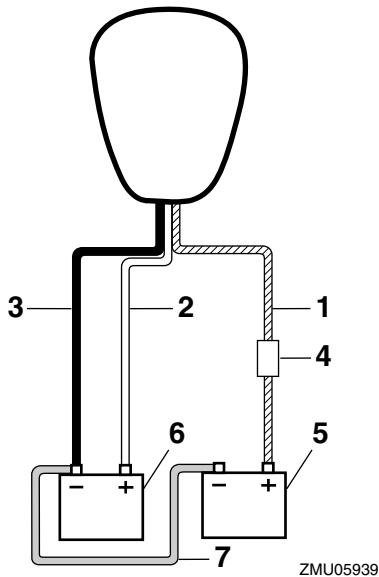
3. The electrical contacts of the battery and cables must be clean and properly connected, or the battery will not start the engine.

Connecting an accessory battery (optional)

1. If connecting an accessory battery, consult your Yamaha dealer about correct wiring. It is recommendable to install the fuse to the isolator lead as shown in the illustration. For the fuse size, be sure to follow local regulations. For example, for USA, the ABYC rules (E-11) should be observed.

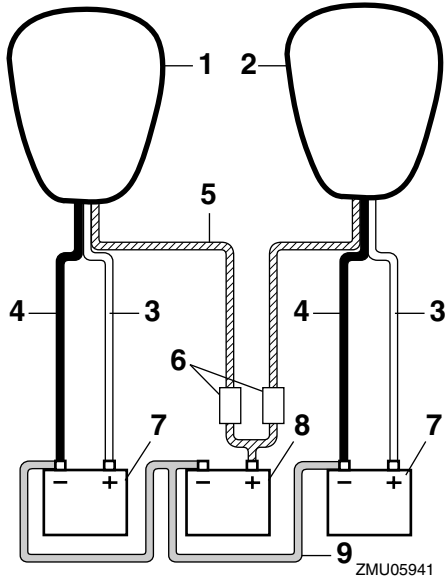
Maintenance

Single engine



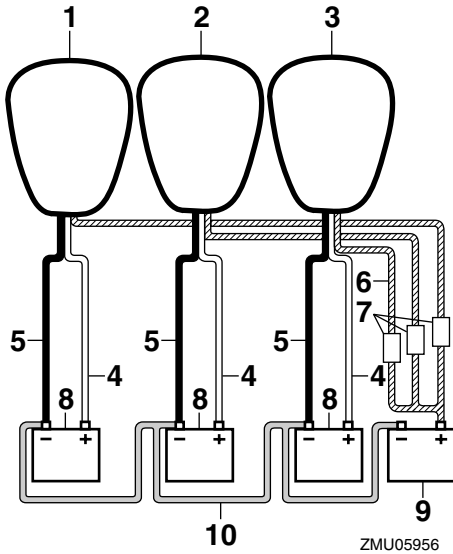
- 1. Isolator lead with circuit protection
- 2. Red cable
- 3. Black cable
- 4. Fuse
- 5. Battery for accessories
- 6. Battery for starting
- 7. Negative connecting cable

Twin engines



- 1. Starboard side engine
- 2. Port side engine
- 3. Red cable
- 4. Black cable
- 5. Isolator leads with circuit protection
- 6. Fuse
- 7. Battery for starting
- 8. Battery for accessories
- 9. Negative connecting cable

Triple engines



1. Starboard side engine
2. Center engine
3. Port side engine
4. Red cable
5. Black cable
6. Isolator leads with circuit protection
7. Fuse
8. Battery for starting
9. Battery for accessories
10. Negative connecting cable

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.

Trouble Recovery

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 51.

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.

Trouble Recovery

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 out-board 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.

Trouble Recovery

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

EMU29440

Impact damage

EWMO0870



WARNING

The outboard motor can be seriously damaged by a collision while operating or

trailing. 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. Inspect the control system and all components for damage. Also inspect the boat for damage.
3. Whether damage is found or not, return to the nearest harbor slowly and carefully.
4. Have a Yamaha dealer inspect the outboard motor before operating it again.

EMU35790

Running in an emergency (twin engines or triple engines)

Normally use all outboard motors together for cruising. When using only one or two engines in an emergency, be sure to keep the unused engine(s) tilted up and operate the other engine(s) at low speed.

ECMO1730

NOTICE

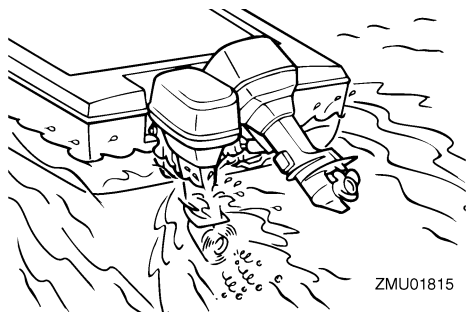
If the boat is operated with only one or two engines, be sure to tilt the unused engine(s) up. Otherwise water could enter the exhaust pipe due to the wave action, causing engine trouble.

TIP:

When maneuvering at low speed, such as

Trouble Recovery

near a dock, it is recommended to tilt the unused engine(s) down and to operate the unused engine(s) in neutral gear if possible.



EMU29473

Replacing fuse

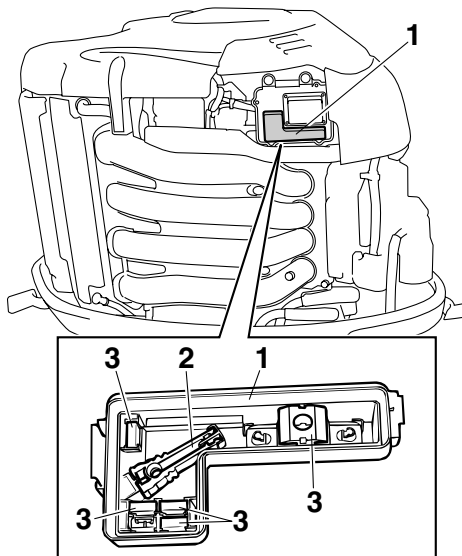
If a fuse has blown, remove the electrical cover, open the fuse holder and remove the fuse with a fuse puller (if equipped). Replace it with a spare one of the proper amperage.

EWM00631



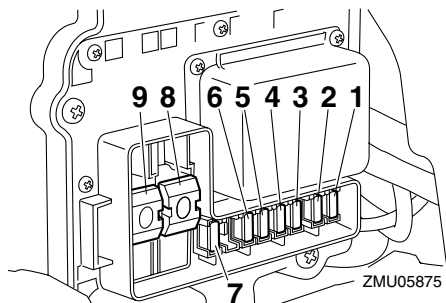
Substituting an incorrect fuse or a piece of wire could allow excessive current flow. This could cause electric system damage and a fire hazard.

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



ZMU05874

1. Electrical cover
2. Fuse puller
3. Spare fuse (10 A, 15 A, 20 A, 30 A, 60 A)



ZMU05875

1. Fuel feed pump fuse (10 A)
2. Ignition coil / Fuel injector / Variable camshaft timing / Engine ECM (Electronic control module) fuse (30 A)
3. Fuel pump fuse (15 A)
4. Starting switch (30 A)
5. Main switch / PTT switch / Remote control ECM (Electronic control module) fuse (20 A)

6. Shift actuator fuse (15 A)
7. Electric throttle valve fuse (10 A)
8. Engine main fuse (60 A)
9. Isolator fuse (60 A)

EMU35400

Power trim and tilt will not operate

If the engine cannot be tilted up or down with the power trim and tilt because of a discharged battery or a failure with the power trim and tilt unit, consult your Yamaha dealer.

EMU35612

Water separator-alert indicator blinks while cruising

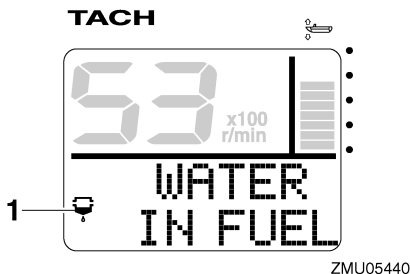
EWU01500

WARNING

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

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

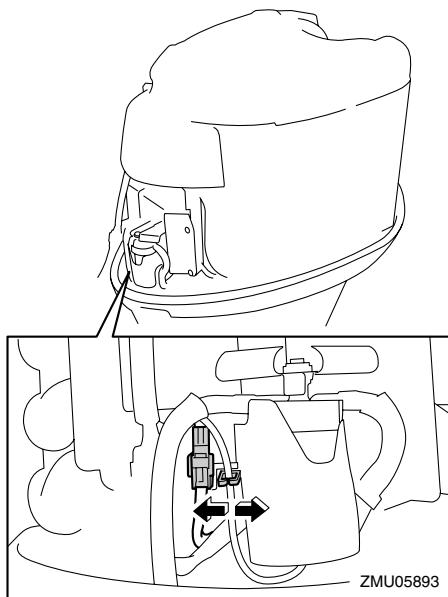
If the water separator-alert indicator on the 6Y8 Multifunction Tachometer blinks, perform the following procedure.



ZMU05440

1. Water separator-alert indicator

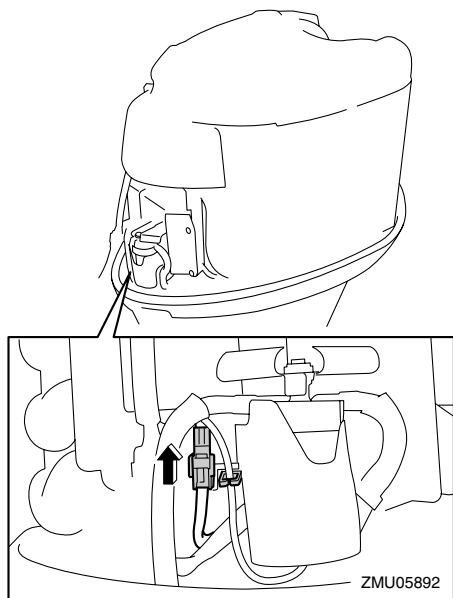
1. Stop the engine.
2. Remove the top cowling.
3. Disconnect the lead from the holder.



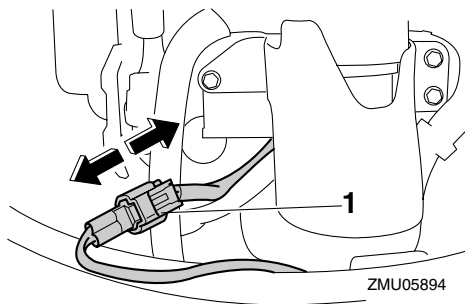
ZMU05893

4. Disconnect the water detection switch coupler from the holder.

Trouble Recovery

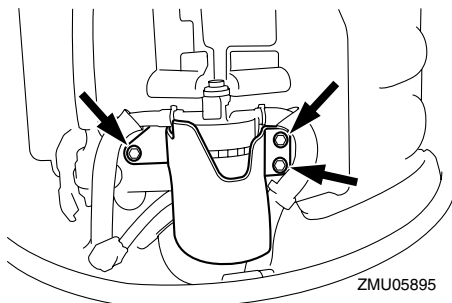


5. Disconnect the water detection switch coupler. **NOTICE: Be careful not to get any water on the water detection switch coupler, otherwise a malfunction could occur.** [ECM01950]



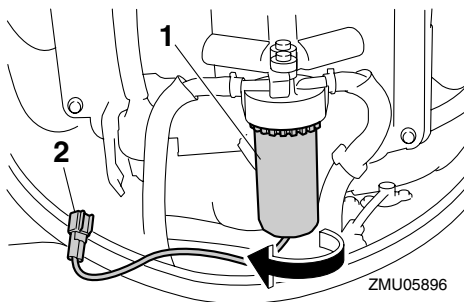
1. Water detection switch coupler

6. Remove the bolts to remove the cover.



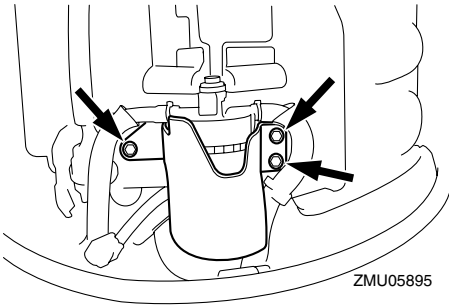
7. Unscrew the filter cup from the filter housing. **NOTICE: Be careful not to twist the water detection switch lead when unscrewing the filter cup.**

[ECM01960]



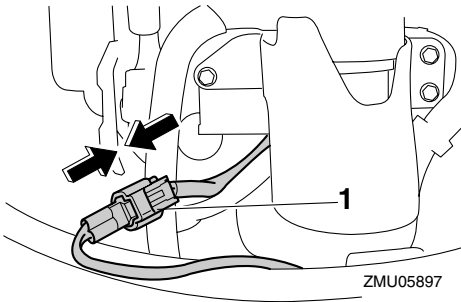
1. Filter cup
2. Water detection switch lead

8. Drain the water in the filter cup by soaking it up with a rag.
9. Firmly screw the filter cup onto the filter housing. **NOTICE: Be careful not to twist the water detection switch lead when screwing the filter cup onto the filter housing.** [ECM01970]
10. Install the cover, and tighten the bolts.

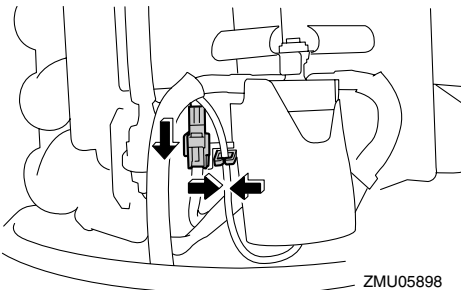


Bolt tightening torque:
8.0 Nm (0.8 kgf-m, 5.8 ft-lb)

11. Connect the water detection switch coupler securely until a click is heard.



1. Water detection switch coupler
12. Securely attach the water detection switch coupler to the holder.
13. Connect the lead to the holder.



14. Install the top cowling.
15. Start the engine and make sure that the water separator-alert indicator remains off. Have a Yamaha dealer inspect the outboard motor after returning to port.

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]



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