YAMAHA

F350A
FL350A
F350A2
FL350A2

OWNER'S MANUAL

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

6AW-28199-7A-E0

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

EMU25108

To the owner

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

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

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

EWM00782

⚠ WARNING

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

ECM00702

NOTICE

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

TIP:

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

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

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

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

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

TIP:

The F350AET, FL350AET, F350AET2, FL350AET2 and the standard accessories are used as a base for the explanations and illustrations in this manual. Therefore some items may not apply to every model.

EMU25122

F350A, FL350A, F350A2, FL350A2
OWNER'S MANUAL
©2013 by Yamaha Motor Co., Ltd.
1st Edition, November 2013
All rights reserved.
Any reprinting or unauthorized use without the written permission of Yamaha Motor Co., Ltd. is expressly prohibited.
Printed in Japan

Table of contents

Safety information 1
Outboard motor safety 1
Propeller 1
Rotating parts 1
Hot parts 1
Electric shock 1
Power trim and tilt 1
Engine shut-off cord (lanyard) 1
Gasoline 1
Gasoline exposure and spills 2
Carbon monoxide 2
Modifications 2
Boating safety 2
Alcohol and drugs 2
Personal flotation devices (PFDs) 2
People in the water 2
Passengers 2
Overloading 2
Avoid collisions 3
Weather 3
Passenger training 3
Boating safety publications 3
Laws and regulations 3

General information 4
Identification numbers record 4
Outboard motor serial number 4
Digital electronic control serial number 4
Key number 5
EC Declaration of Conformity (DoC) 5
CE Marking 5
C-Tick label 6
Read manuals and labels 7
Warning labels 7

Specifications and requirements 10
Specifications 10
Installation requirements 11
Boat horsepower rating 11
Mounting motor 11
Yamaha Security System 11
Digital electronic control requirements 12
Battery requirements 12
Battery specifications 12
Mounting battery 12
Multiple batteries 13
Propeller selection 13
Counter rotation models 13
Start-in-gear protection 13
Engine oil requirements 14
Fuel requirements 14
Gasoline 14
Anti-fouling paint 15
Motor disposal requirements 15
Emergency equipment 15
Emission control information 15
Star labels 16

Components 18
Components diagram 18
Remote control transmitter 23
Receiver 24
Yamaha Security System lock and unlock mode 24
Digital electronic control 25
Digital electronic control-active indicator 26
Digital electronic control-alert indicator 26
Control lever 27
Neutral interlock trigger 28
Free throttle switch 28
Throttle friction adjuster 29
Station selector switch 30
Engine selector switch 30
Engine shut-off cord (lanyard) and clip 31
Main switch 32
Start/Stop switch panel 33
All Start/Stop switch panel 34
Power trim and tilt switch on digital electronic control 34

Power trim and tilt switch on bottom cowling 35
Power trim and tilt switches 35
Tilt limiter 36
Tilt support lever for power trim and tilt model 36
Cowling lock lever (turn type) 36
Flushing device 37
Fuel filter 37

Instruments and indicators 39
6Y9 Multifunction Color Gauge 39
YAMAHA SECURITY SYSTEM indicator 39
Engine warm-up indicator 39
Engine synchronization indicator 39
Overheat alert 40
Low oil pressure-alert 40
Water separator alert 41
Low battery voltage-alert 41
Engine trouble alert 41
6Y8 Multifunction meters 42
6Y8 Multifunction tachometers 42
Yamaha Security System information 43
Low oil pressure-alert 43
Overheat alert 44
Water separator alert 44
Engine trouble alert 44
Low battery voltage-alert 44
6Y8 Multifunction speed & fuel meters 45
6Y8 Multifunction speedometers 45
6Y8 Multifunction fuel management meters 46
Optional meters 47

Engine control system 48
Alert system 48
Digital Electronic Control alert 48
Overheat alert 48
Low oil pressure alert 50
Water separator alert 51

Installation 52
Installation 52
Mounting the outboard motor 52

Operation 54
First-time operation 54
Fill engine oil 54
Breaking in engine 54
Getting to know your boat 54
Checks before starting engine 54
Fuel level 55
Remove cowling 55
Fuel system 55
Controls 56
Engine shut-off cord (lanyard) 56
Engine oil 56
Engine 57
Flushing device 57
Install cowling 57
Checking power trim and tilt system 58
Battery 59
Filling fuel 59
Operating engine 59
Sending fuel 60
Change of station 60
Starting engine 60
Checks after starting engine 66
Cooling water 66
Warming up engine 67
Electric start models 67
Checks after engine warm up 67
Shifting 67
Stop switches 67
Selecting outboard motor (triple engine) 67
Shifting 69
Stopping boat 70
Operating the port / center / starboard engine 70
Boat direction 74
Trolling 77
Adjusting trolling speed 77

Table of contents

Stopping engine 77
Procedure for single station models and dual station models (main station) 77
Procedure for dual station models (sub station) 79
Trimming outboard motor 80
Adjusting trim angle (Power trim and tilt) 80
Adjusting boat trim 81
Tilting up and down 82
Procedure for tilting up (power trim and tilt models) 82
Procedure for tilting down (power trim and tilt models) 84
Shallow water 85
Power trim and tilt models 85
Operating in other conditions 87

Maintenance 88
Transporting and storing outboard motor 88
Storing outboard motor 88
Procedure 88
Lubrication 89
Flushing power unit 89
Checking painted surface of outboard motor 90
Periodic maintenance 90
Replacement parts 90
Severe operating conditions 90
Maintenance chart 1 92
Maintenance chart 2 94
Greasing 95
Inspecting spark plug 96
Inspecting engine idle speed 97
Changing engine oil 98
Inspecting wiring and connectors 98
Checking propeller 98
Removing propeller 99
Installing propeller 99
Changing gear oil 101
Inspecting and replacing anode(s) 102
Checking battery (for electric start models) 103
Connecting the battery 103
Disconnecting the battery 105
Storing the battery 106

Trouble Recovery 107
Troubleshooting 107
Temporary action in emergency 110
Impact damage 110
Running in an emergency (twin engines or triple engines) 111
Replacing fuse 111
Power trim and tilt will not operate 112
Water separator-alert indicator blinks while cruising 112
Treatment of submerged motor 114

INDEX 115

EMU33623

Outboard motor safety

Observe these precautions at all times.

EMU36502

Propeller

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

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

EMU33631

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.

EMU33641

Hot parts

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

EMU33651

Electric shock

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

EMU33661

Power trim and tilt

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

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

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

EMU33672

Engine shut-off cord (lanyard)

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

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

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

EMU33811

Gasoline

Gasoline and its vapors are highly flammable and explosive. Always, refuel according to the procedure on page 59 to reduce the risk of fire and explosion.

EMU33821

Gasoline exposure and spills

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

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

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

EMU33901

Carbon monoxide

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

EMU33781

Modifications

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

EMU33741

Boating safety

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

EMU33711

Alcohol and drugs

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

EMU40281

Personal flotation devices (PFDs)

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

EMU33732

People in the water

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

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

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

EMU33752

Passengers

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

EMU33762

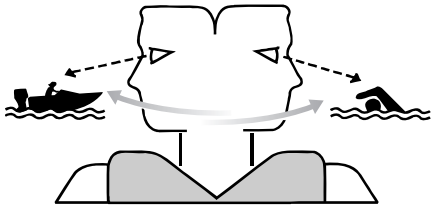
Overloading

Do not overload the boat. Consult the boat capacity plate or boat manufacturer for maximum weight and number of passengers. Be sure that weight is properly distributed according to the boat manufacturer's instructions. Overloading or incorrect weight distribution can compromise the boats handling and lead to an accident, capsizing or swamping.

EMU33773

Avoid collisions

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



ZMU06025

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

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

EMU33791

Weather

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

EMU33881

Passenger training

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

EMU33891

Boating safety publications

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

EMU33601

Laws and regulations

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

EMU25172

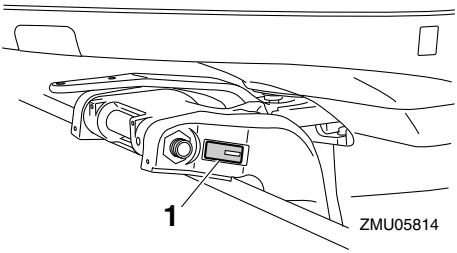
Identification numbers record

EMU25185

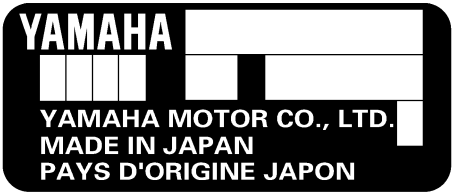
Outboard motor serial number

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



ZMU01692

EMU34944

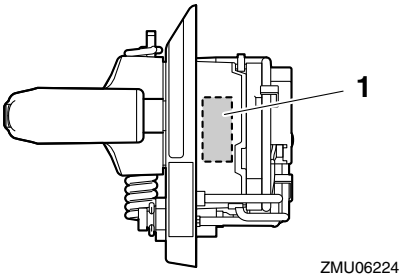
Digital electronic control serial number

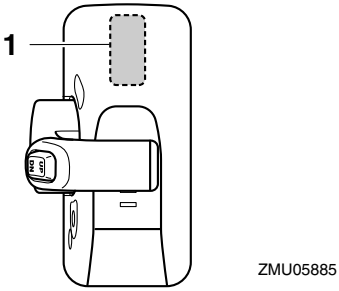
The digital electronic control serial number is stamped on the label attached to the digital electronic control box.

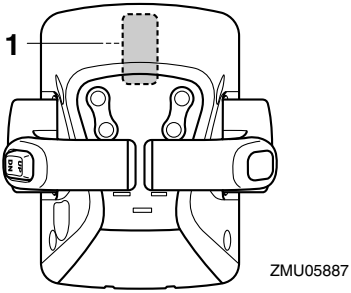
Record your digital electronic control serial number in the spaces provided to assist you in newly connecting the digital electronic control to the outboard motor.

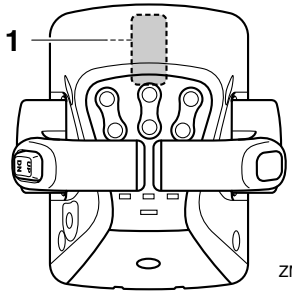
TIP:

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



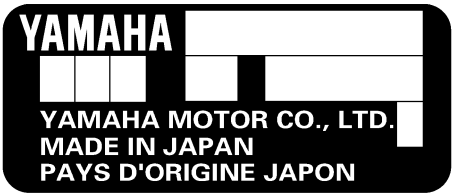






ZMU05958

1. Digital electronic control serial number location

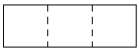


ZMU05917

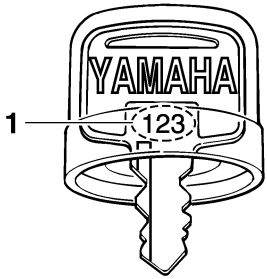
EMU25192

Key number

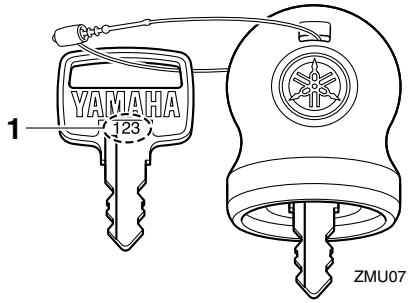
If a main key switch is equipped with the motor, the key identification number is stamped on your key as shown in the illustration. Record this number in the space provided for reference in case you need a new key.



ZMU01693



ZMU01694



ZMU07133

1. Key number

EMU37292

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;

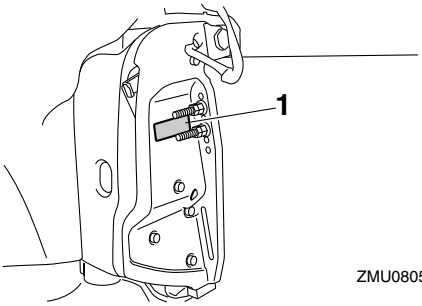
- Name of Engine Manufacture
- Model name
- Product code of model (Approved model code)
- Code of conformed directives

EMU25207

CE Marking

Outboard motors affixed with this “CE”marking conform with the directives of; 2006/42/EC, 94/25/EC - 2003/44/EC and

2004/108/EC.



ZMU08050

1. CE marking location

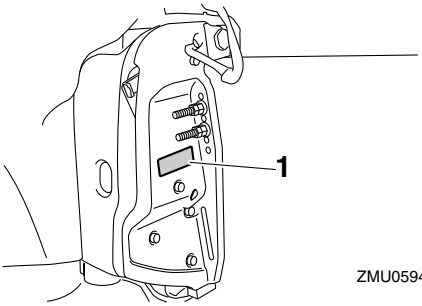
ZMU01697

ZMU06040

EMU25215

C-Tick label

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



ZMU05943

1. C-Tick label location

EMU33524

Read manuals and labels

Before operating or working on this outboard motor:

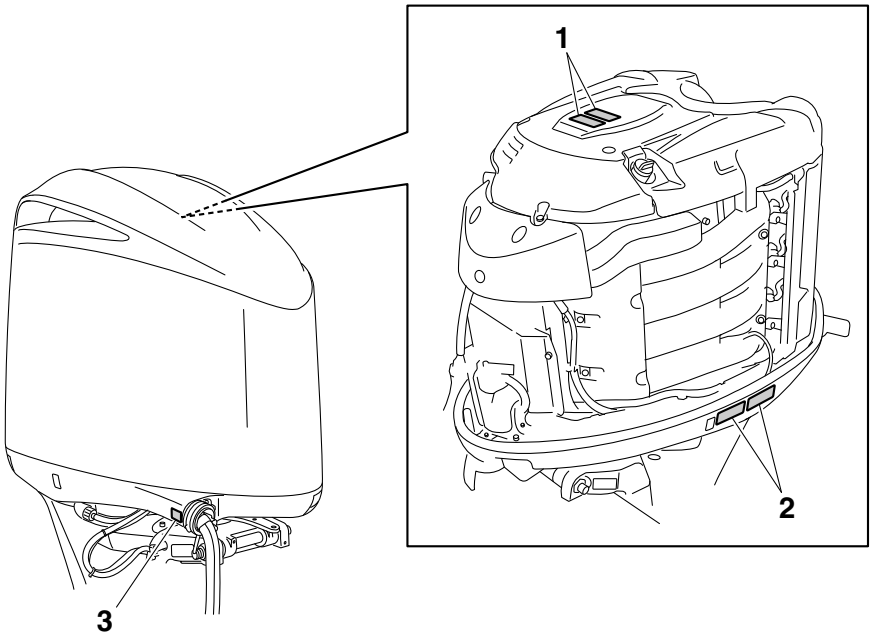
- Read this manual.
- Read any manuals supplied with the boat.
- Read all labels on the outboard motor and the boat.

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

EMU33834

Warning labels

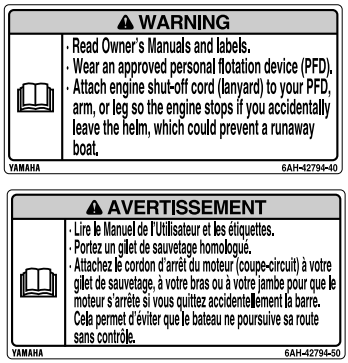
If these labels are damaged or missing, contact your Yamaha dealer for replacements.



ZMU05950

1

2



EMU34652

Contents of labels

The above warning labels mean as follows.

1

EWM01682

WARNING

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

2

EWM01672

WARNING

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

ZMU06191

EMU33851

Other labels

3

ZMU05710

EMU35133

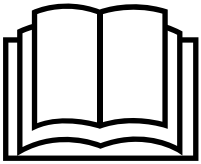
Symbols

The following symbols mean as follows.

Notice/Warning

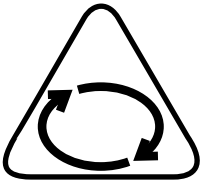
ZMU05696

Read Owner's Manual



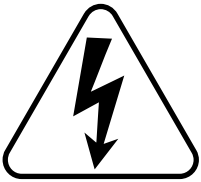
ZMU05664

Hazard caused by continuous rotation



ZMU05665

Electrical hazard



ZMU05666

EMU34522

Specifications

TIP:
"(AL)" stated in the specification data below represents the numerical value for the aluminum propeller installed.
Likewise, "(SUS)" represents the value for stainless steel propeller installed and "(PL)" for plastic propeller installed.

EMU2821U

Dimension and weight:
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)
Motor transom height X:
637 mm (25.1 in)
Motor transom height U:
764 mm (30.1 in)
Dry weight (SUS) X:
356 kg (785 lb)
Dry weight (SUS) U:
364 kg (802 lb)

Performance:
Full throttle operating range:
5000–6000 r/min
Rated power:
257.4 kW (350 HP)
Idle speed (in neutral):
600–700 r/min

Power unit:
Type:
4-stroke DOHC V8 32 valves
Total displacement:
5330 cm^3 (325.2 c.i.)
Bore × stroke:
94.0 × 96.0 mm (3.70 × 3.78 in)
Ignition system:
TCI
Spark plug (NGK):
LFR6A-11
Spark plug gap:
1.0–1.1 mm (0.039–0.043 in)
Steering system:
Remote steering
Starting system:
Electric starter
Starting carburetion system:
Fuel injection
Valve clearance IN (cold engine):
0.17–0.24 mm (0.0067–0.0094 in)
Valve clearance EX (cold engine):
0.31–0.38 mm (0.0122–0.0150 in)
Cold cranking amps (CCA/EN):
670–1080 A
Min. rated capacity (20HR/IEC):
110 Ah
Maximum generator output:
49 A

Lower unit:
Gear shift positions:
Forward-neutral-reverse
Gear ratio:
1.73(26/15)
Trim and tilt system:
Power trim and tilt
Propeller mark:
F350AET X
F350AET2 X
FL350AET XL
FL350AET2 XL

Fuel and oil:
Recommended fuel:
Premium unleaded gasoline
Min. research octane number (RON):
94

Recommended engine oil:
YAMALUBE 4 or 4-stroke outboard motor oil
Recommended engine oil grade 1:
SAE 10W-30/10W-40/5W-30
API SE/SF/SG/SH/SJ/SL
Engine oil quantity (without oil filter replacement):
6.3 L (6.66 US qt, 5.54 Imp.qt)
Engine oil quantity (with oil filter replacement):
6.5 L (6.87 US qt, 5.72 Imp.qt)
Lubrication system:
Wet sump
Recommended gear oil:
YAMALUBE outboard gear oil or Hypoid gear oil
Recommended gear oil grade:
SAE 80W API GL-5 / SAE 90 API GL-5
Gear oil quantity:
F350AET 1.520 L (1.607 US qt, 1.338 Imp.qt)
F350AET2 1.520 L (1.607 US qt, 1.338 Imp.qt)
FL350AET 1.310 L (1.385 US qt, 1.153 Imp.qt)
FL350AET2 1.310 L (1.385 US qt, 1.153 Imp.qt)

Tightening torque:
Spark plug:
28 Nm (2.86 kgf-m, 20.7 ft-lb)
Propeller nut:
54 Nm (5.51 kgf-m, 39.8 ft-lb)
Engine oil drain bolt:
27 Nm (2.75 kgf-m, 19.9 ft-lb)
Engine oil filter:
18 Nm (1.84 kgf-m, 13.3 ft-lb)

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

EMU33555

Installation requirements

EMU33565

Boat horsepower rating

EWM01561

WARNING

Overpowering a boat can cause severe instability.

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

EMU33572

Mounting motor

EWM01571

WARNING

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

Your dealer or other person experienced in proper rigging should mount the motor using correct equipment and complete rigging instructions. For further information, see page 52.

EMU38582

Yamaha Security System

ECM02461

NOTICE

The Yamaha Security System is sold in conformity with the relevant laws and regulations regarding radio wave transmission. Therefore, if this product is used

outside the country where it was sold, it may violate the laws or regulations regarding radio wave transmission in the country it is used in. For details, consult your Yamaha dealer.

This outboard motor is equipped with the Yamaha Security System to protect against theft, which consists of the receiver and remote control transmitter. The engine can not be started if the security system is in the lock mode, and only be started in the unlock mode. Consult your Yamaha dealer for installation of the receiver.

ZMU07305

EMU34954

Digital electronic control requirements

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

EWM01581

WARNING

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

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.

EMU25695

Battery requirements

EMU25723

Battery specifications

Cold cranking amps (CCA/EN):
670–1080 A
Min. rated capacity (20HR/IEC):
110 Ah

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

EMU36291

Mounting battery

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

[EWM01821]

EMU36301

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.

EMU41602

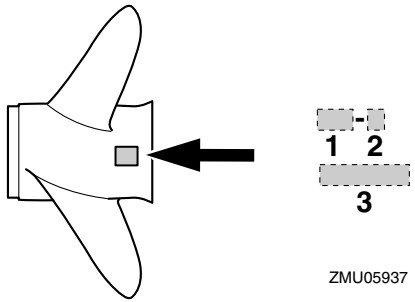
Propeller selection

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

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

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

To check the propeller, see page 98.



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

EMU36312

Counter rotation models

Standard outboard motors rotate clockwise. Counter rotation models rotate counterclockwise and are typically used in multiple motor setups.

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.**

[EWM01811]

For instructions on propeller removal and installation, see page 99 and 99.

EMU35141

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.

EMU41953

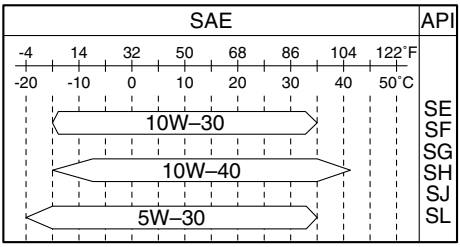
Engine oil requirements

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

Recommended engine oil:
YAMALUBE 4 or 4-stroke outboard motor oil
Recommended engine oil grade 1:
SAE 10W-30/10W-40/5W-30
API SE/SF/SG/SH/SJ/SL
Recommended engine oil grade 2:
SAE 15W-40/20W-40/20W-50
API SH/SJ/SL
Engine oil quantity (without oil filter replacement):
6.3 L (6.66 US qt, 5.54 Imp.qt)
Engine oil quantity (with oil filter replacement):
6.5 L (6.87 US qt, 5.72 Imp.qt)

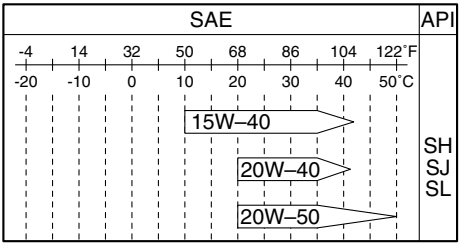
If oil grades listed under Recommended engine oil grade 1 are not available, select an alternative oil grade listed under Recommended engine oil grade 2.

Recommended engine oil grade 1



ZMU06854

Recommended engine oil grade 2



ZMU06855

EMU36361

Fuel requirements

EMU40202

Gasoline

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

Recommended fuel:
Premium unleaded gasoline
Min. research octane number (RON):
94

ECM01982

NOTICE

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

Gasohol

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

used in your outboard motor. All ethanol blends containing more than 10% ethanol can cause fuel system damage or cause engine starting and running problems. Yamaha does not recommend gasohol containing methanol because it can cause fuel system damage or engine performance problems.

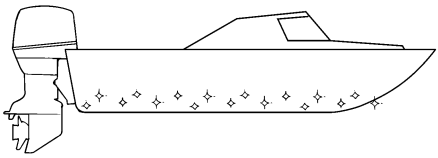
It is recommended that you install a water-separating marine fuel filter assembly (10 micron minimum) between your boat's fuel tank and outboard motor when using ethanol. Ethanol is known to allow moisture to be absorbed into boat fuel tanks and systems. Moisture in the fuel can cause corrosion of metallic fuel system components, starting and running complaints and require additional fuel system maintenance.

EMU36331

Anti-fouling paint

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

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



ZMU05176

EMU36342

Motor disposal requirements

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

EMU36353

Emergency equipment

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

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

Consult your Yamaha dealer for details.

EMU39001

Emission control information

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

EMU25232

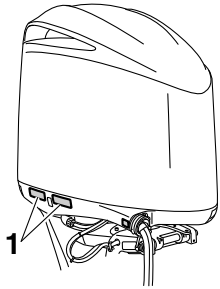
This engine conforms to U.S. Environmental Protection Agency (EPA) regulations for marine SI engines. See the label affixed to your engine for details.

EMU31562

Approval label of emission control certificate

This label is attached to the bottom cowling.

New Technology; (4-stroke) MFI



ZMU06024

1. Approval label location

EMISSION CONTROL INFORMATION		MFI
THIS ENGINE CONFORMS TO: CALIFORNIA AND U.S. EPA EXHAUST REGULATIONS FOR SI MARINE ENGINES. REFER TO THE OWNER'S MANUAL FOR MAINTENANCE SPECIFICATIONS AND ADJUSTMENTS. MEETS U.S. EPA EVAP STANDARDS USING CERTIFIED COMPONENTS.		
FAMILY:	FELs(HC+NOx / CO): / g/kW-hr	MAX POWER: kW
DISPLACEMENT: liters	IDLE SPEED: ± rpm IN NEUTRAL	
SPARK PLUG:	SPARK PLUG GAP (mm):	
FUEL: GASOLINE	VALVE LASH (mm) IN: EX:	
YAMAHA MOTOR CO.,LTD.		

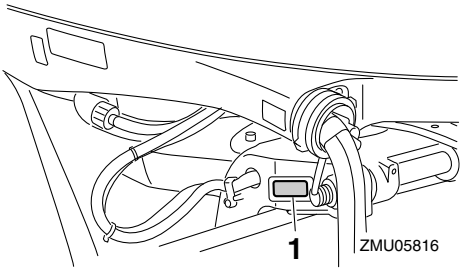
INFORMATION ANTIPOLLUTION		MFI
CE MOTEUR EST CONFORME AUX NORMES D'ÉMISSIONS: EPA DES É.-U. ET DE LA CALIFORNIE POUR MOTEURS MARINS À ÉTINCELLE. POUR LES SPÉCIFICATIONS ET LES RÉGLAGES À EFFECTUER, CONSULTEZ LE MANUEL DU PROPRIÉTAIRE. INSTALLÉ AVEC LES COMPOSANTS HOMOLOGUÉS, IL SATISFAIT AUX NORMES EVAP EPA DES É.-U.		
FAMILLE :	FELs(HC+NOx / CO): / g/kW-h	PUISS. MAX. : kW
CYLINDRÉE : litre	RALENTI : ± tr/mm AU POINT MORT	
BOUGIE :	BOUGIE-ÉCARTEMENT (mm) :	
CARBURANT : ESSENCE	JEU DE SOUPAPES (mm) ADM: ÉCH:	
YAMAHA MOTOR CO.,LTD.		

ZMU06895

EMU25264

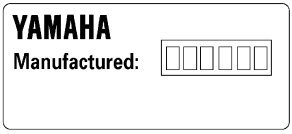
Manufactured date label

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



ZMU05816

1. Manufactured date label location

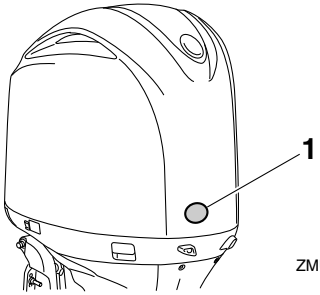


ZMU01701

EMU25275

Star labels

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



ZMU05817

1. Star labels location

EMU40331

One Star—Low Emission

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

ZMU01702

EMU40341

Two Stars—Very Low Emission

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

ZMU01703

EMU40351

Three Stars—Ultra Low Emission

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

ZMU01704

EMU33862

Four Stars—Super Ultra Low Emission

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

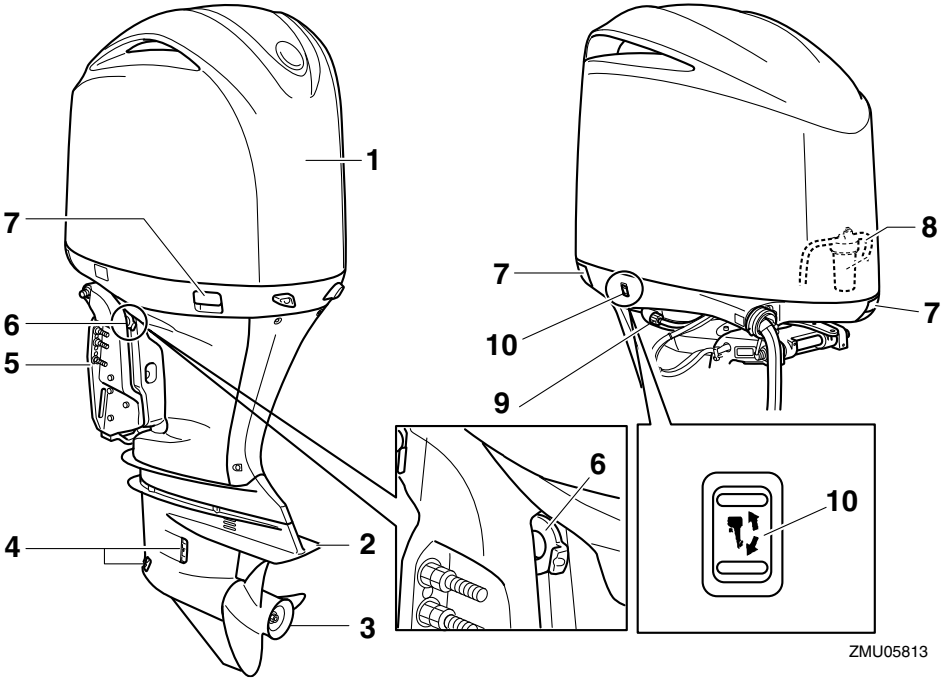
ZMU05663

EMU2579Z

Components diagram

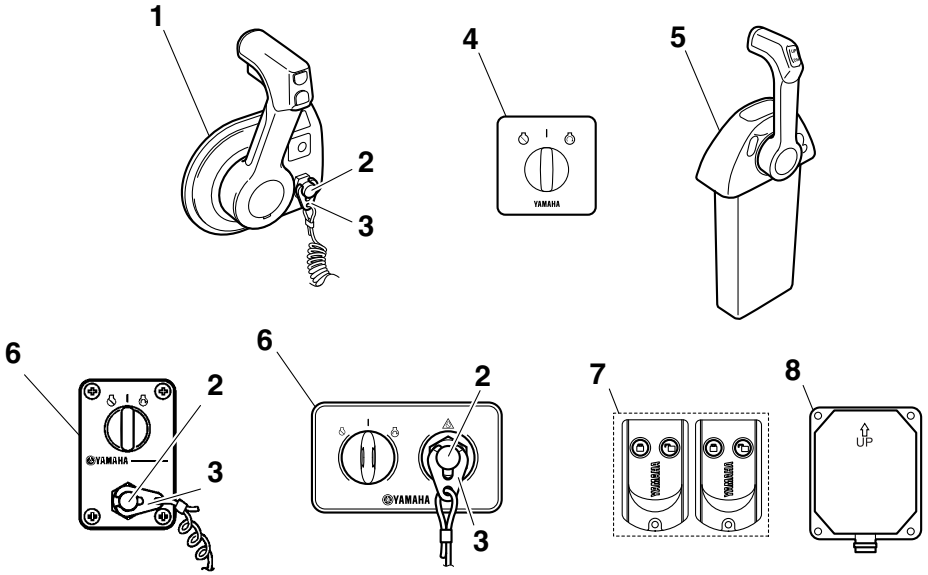
TIP:

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



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

Single station models (single type)

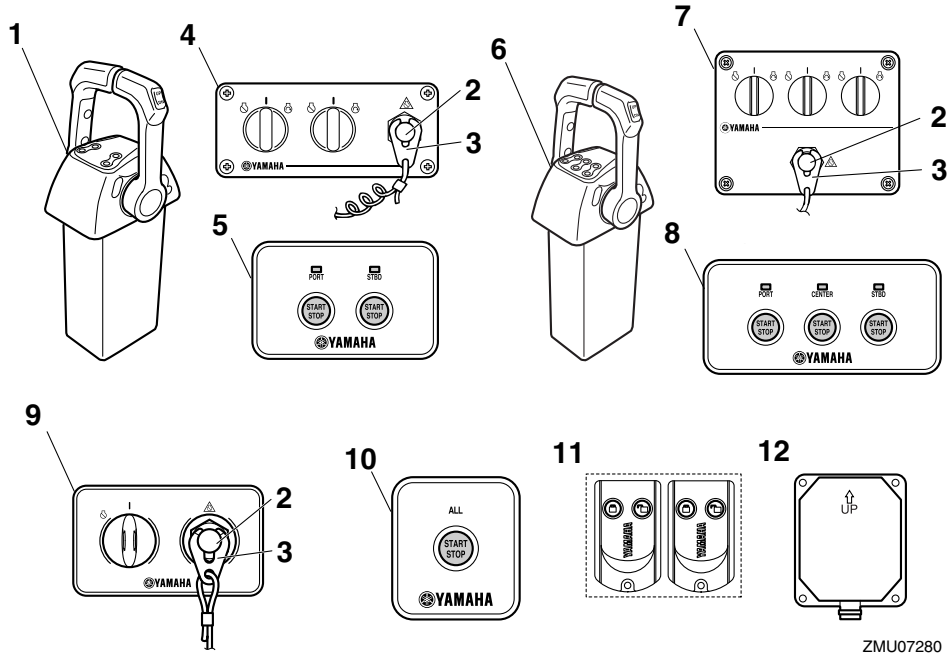


ZMU07273

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

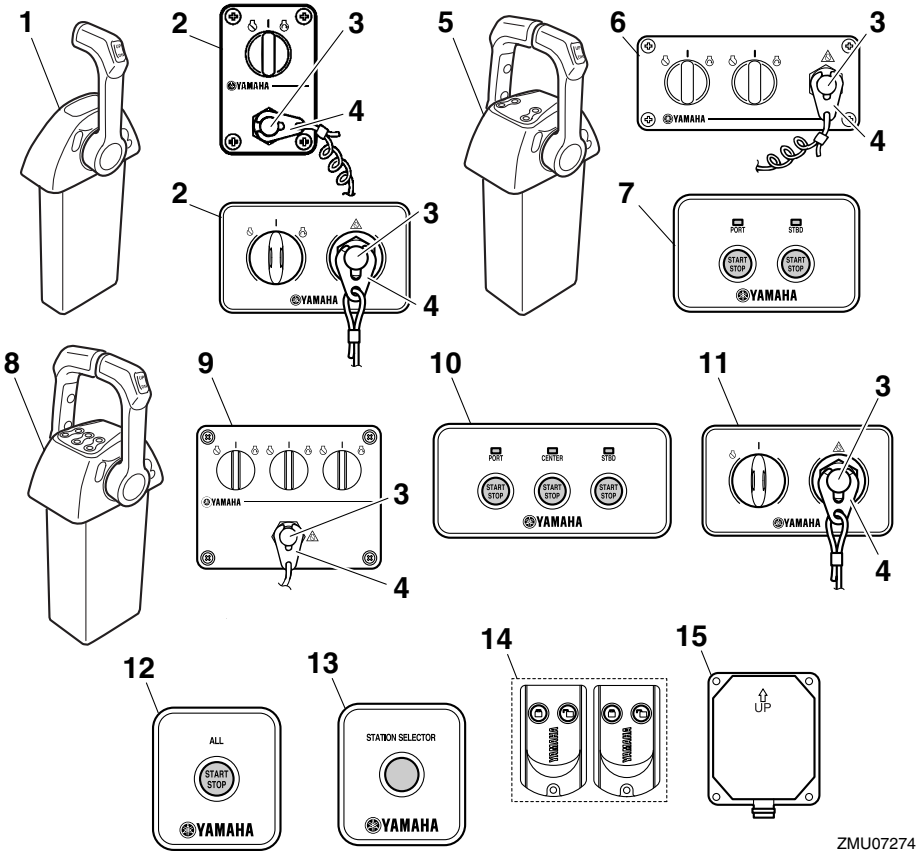
Components

Single station models (twin/triple type)



1. Digital electronic control (twin type)*
2. Engine shut-off switch*
3. Clip*
4. Switch panel (for use with twin type)*
5. Start/Stop switch panel (for use with twin type)*
6. Digital electronic control (triple type)*
7. Switch panel (for use with triple type)*
8. Start/Stop switch panel (for use with triple type)*
9. Switch panel (for use with twin/triple type)*
10. All Start/Stop switch panel (for use with twin/triple type)*
11. Remote control transmitter*
12. Receiver*

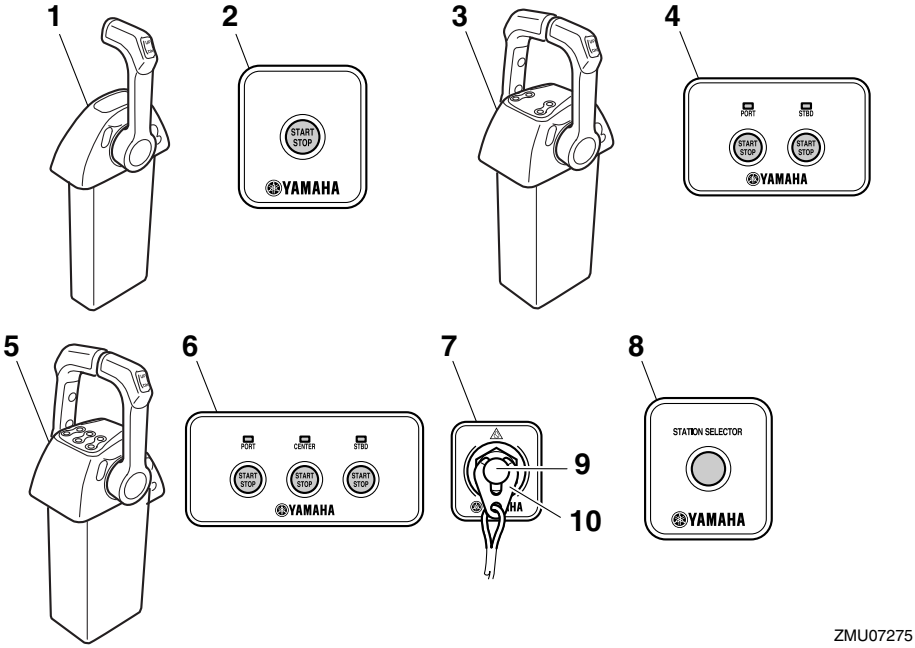
Dual station models / main station



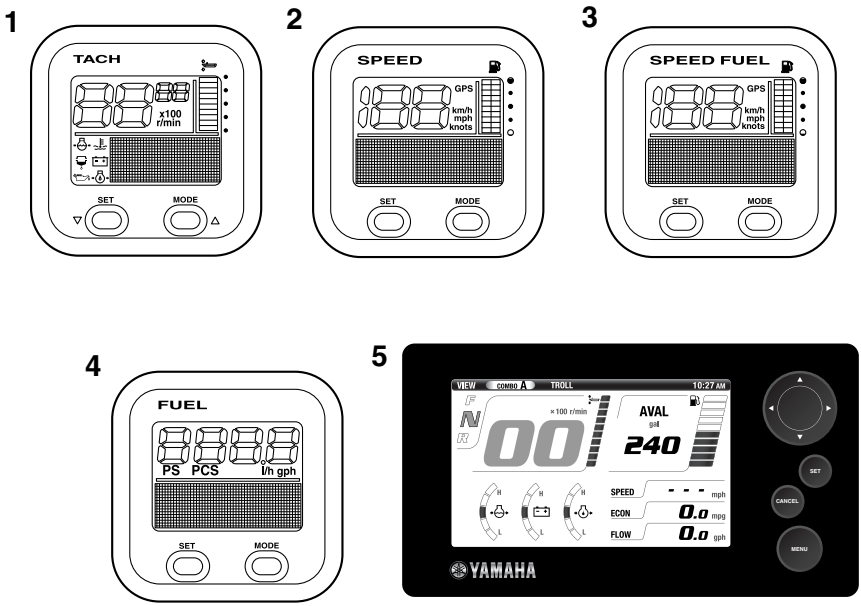
1. Digital electronic control (single type)*
2. Switch panel (for use with single type)*
3. Engine shut-off switch*
4. Clip*
5. Digital electronic control (twin type)*
6. Switch panel (for use with twin type)*
7. Start/Stop switch panel (for use with twin type)*
8. Digital electronic control (triple type)*
9. Switch panel (for use with triple type)*
10. Start/Stop switch panel (for use with triple type)*
11. Switch panel (for use with twin/triple type)*
12. All Start/Stop switch panel (for use with twin/triple type)*
13. Station selector switch panel
14. Remote control transmitter*
15. Receiver*

Components

Dual station models / sub station



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



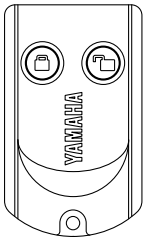
ZMU07266

1. Tachometer unit (Square type)*
2. Speedometer unit (Square type)*
3. Speed & fuel meter unit (Square type)*
4. Fuel management meter unit (Square type)*
5. 6Y9 Multifunction Color Gauge*

EMU38592

Remote control transmitter

The lock and unlock modes of the Yamaha Security System are selected using the remote control transmitter. While the engine is running, input from the remote control transmitter is not received.



ZMU06455

Store the remote control transmitter carefully so it will not be lost.

ECM02101

NOTICE

- **The remote control transmitter is not completely waterproof. Do not submerge the transmitter or operate it underwater. If the transmitter is submerged, dry it with a soft, dry cloth,**

and then check that it is operating properly. If the transmitter is not operating properly, contact a Yamaha dealer.

- **Keep the remote control transmitter away from high temperatures and do not place it in direct sunlight.**
- **Do not drop the remote control transmitter, subject it to strong shocks, or place any heavy items on it.**
- **Use a soft, dry cloth to clean the remote control transmitter. Do not use detergent, alcohol, or other chemicals.**
- **Do not attempt to disassemble the remote control transmitter yourself. Otherwise, the transmitter may not operate properly. If the transmitter needs a new battery, contact a Yamaha dealer.**
- **If you have lost the remote control transmitter, consult your Yamaha dealer. Keep the least 2 transmitters at all the time. If you have lost both transmitters, consult your Yamaha dealer.**

TIP:

- Since the receiver is programmed to recognize the internal code from this transmitter only, the security system setting can only be changed with this transmitter. If the remote control transmitter does not operate properly, contact a Yamaha dealer.
- Replace the battery cell after 1 year, and every two years thereafter as a standard measure.
- Refer to local hazardous waste regulations when disposing of transmitter batteries.
- The Yamaha Security System permits to register up to 5 remote control transmitters. Consult your yamaha dealer for details.

EMU38602

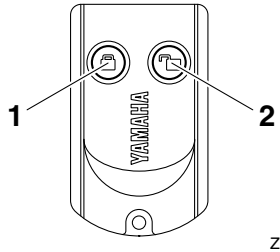
Receiver

The receiver control the ECM (Electronic control module) to prevent the engine from starting. Consult your Yamaha dealer for installation of the receiver.

EMU41611

Yamaha Security System lock and unlock mode

The Yamaha Security System settings are selected by pressing the lock or unlock button on the remote control transmitter briefly.



ZMU06456

1. Lock button
2. Unlock button

LOCK

When the lock button on the remote control transmitter is pressed briefly, the beeper sounds once. This indicates the lock mode is selected and the engine cannot be started. The lock mode is selected only when the main switch is in the "OFF" (off) position.

UNLOCK

When the unlock button on the remote control transmitter is pressed briefly, the beeper sounds twice. This indicates the unlock mode is selected and the engine can be started.

Yamaha Security System mode	Number of beeps	Main switch	Engine can be started
Lock	1 beep	"OFF"	NO
Unlock	2 beeps	"OFF"/ "ON"	YES

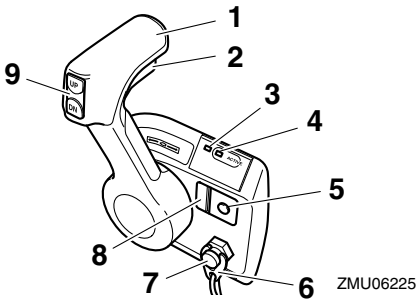
Yamaha Security System mode	Digital electronic control-active indicator
Lock	Off
Unlock	Light

EMU35944

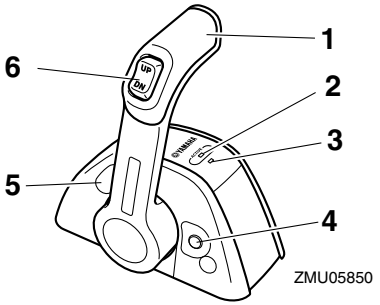
Digital electronic control

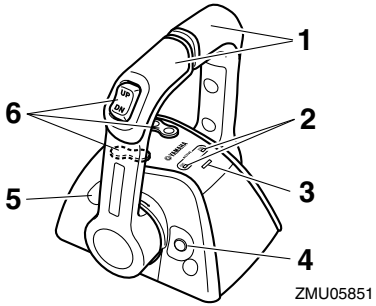
The digital electronic control actuates the shifter, the throttle and remote electrical operations. Make sure that the active indicator lights and that the digital electronic control unit is correctly connected to the outboard motor.

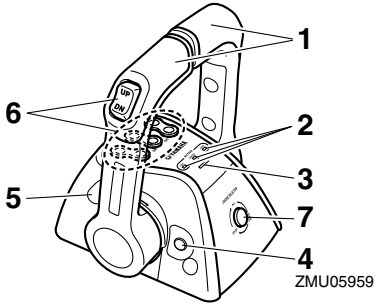
The digital electronic controls of the main station and sub station have the same functions.



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







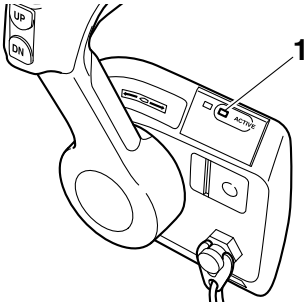
1. Control lever
2. Digital electronic control-active indicator
3. Digital electronic control-alert indicator
4. Free throttle switch
5. Throttle friction adjuster
6. Power trim and tilt switch
7. Engine selector switch

EMU34974

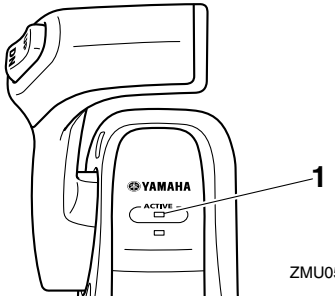
Digital electronic control-active indicator

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

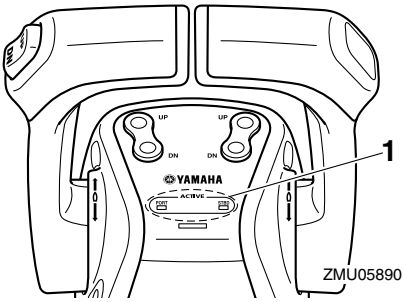
- **Lights:** Operation of both shift and throttle possible.
- **Blinks (when the gear shift is in neutral only):** Shift not operable. Only throttle operation available.
- **Off:** Shift and throttle not operable.



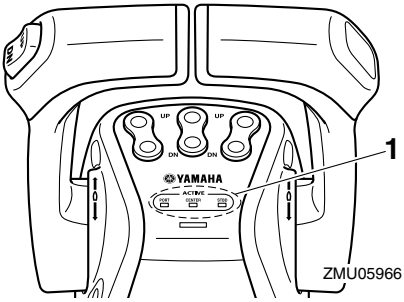
ZMU06276



ZMU05888



ZMU05890



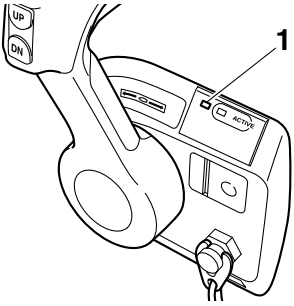
ZMU05966

1. Digital electronic control-active indicator

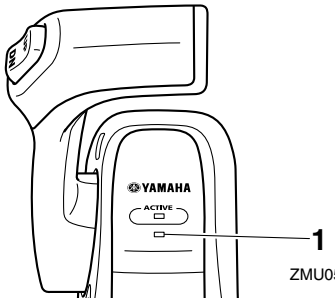
EMU34985

Digital electronic control-alert indicator

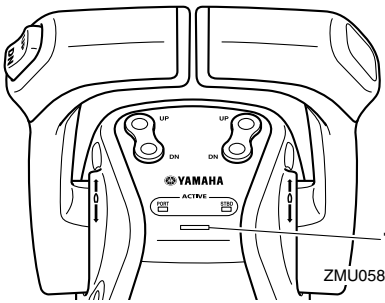
The digital electronic control-alert indicator lights when trouble occurs in the connection between the digital electronic control and outboard motor. Consult your Yamaha dealer for details.



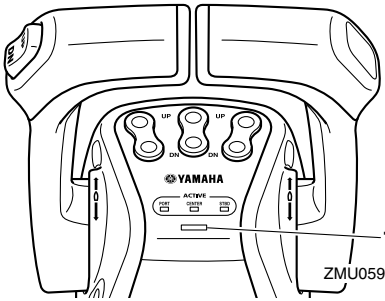
ZMU06227



ZMU05889



ZMU05891



ZMU05960

1. Digital electronic control-alert indicator

EMU35823

Control lever

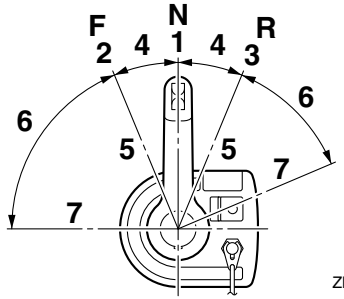
Moving the lever forward from the neutral position engages forward gear. Pulling the lever back from neutral engages reverse. The engine will continue to run at idle until the lever is moved 22.5° (a detent can be felt). Moving the lever farther opens the throttle, and the engine will begin to accelerate.

Digital electronic control for twin type has the function to automatically synchronize both engine speeds.

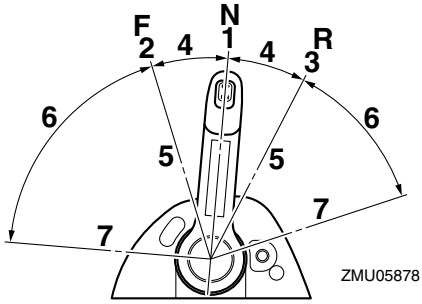
Also digital electronic control for triple type has the function to automatically synchronize the engine speeds of the center engine and starboard side engine, adapting the port side engine speed.

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

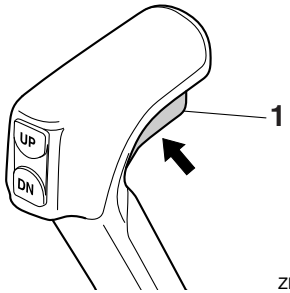
1. Neutral "**N**"
2. Forward "**F**"
3. Reverse "**R**"
4. Shift

5. Fully closed
6. Throttle
7. Fully open

EMU26202

Neutral interlock trigger

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



ZMU06285

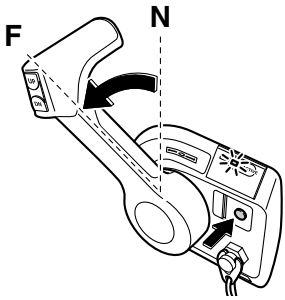
1. Neutral interlock trigger

EMU35833

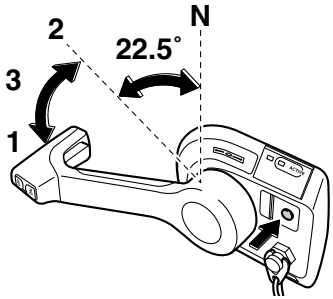
Free throttle switch

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



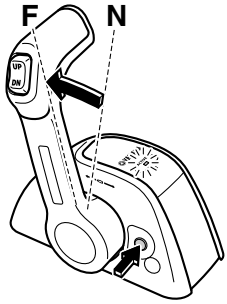
ZMU06231



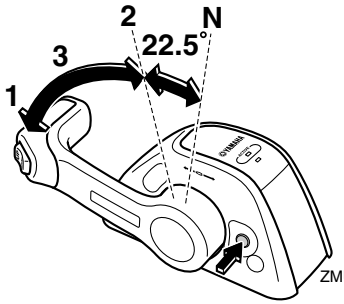
ZMU06232

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

Single type



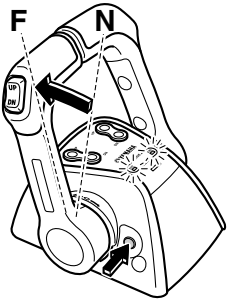
ZMU05880



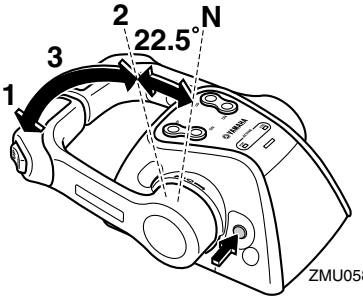
ZMU05881

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

Twin type



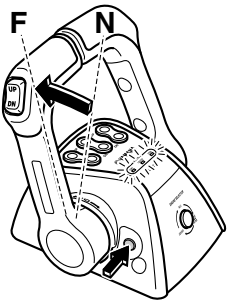
ZMU05882



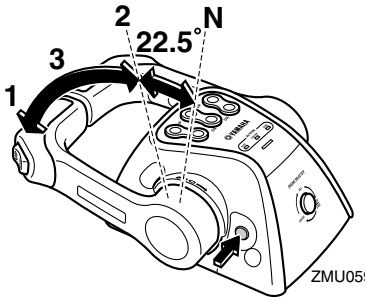
ZMU05883

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

Triple type



ZMU05961



ZMU05962

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.

EMU35873

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.

EWM01771

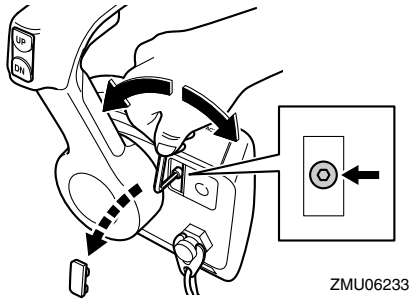
WARNING

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

ver could move freely and cause an accident.

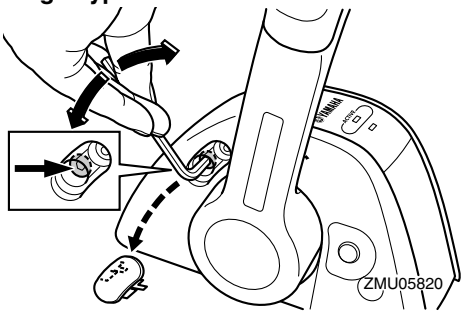
- **Do not overtighten the friction adjuster. If there is too much resistance, it could be difficult to move the control lever, which could result in an accident.**

Single type



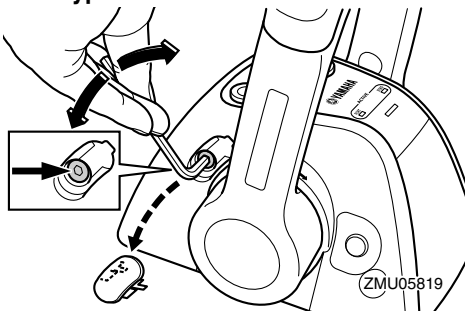
ZMU06233

Single type



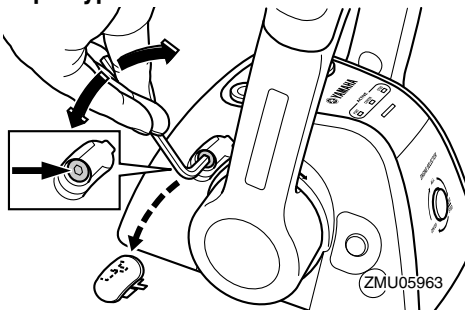
ZMU05820

Twin type



ZMU05819

Triple type



ZMU05963

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

EMU35712

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 electronic 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).

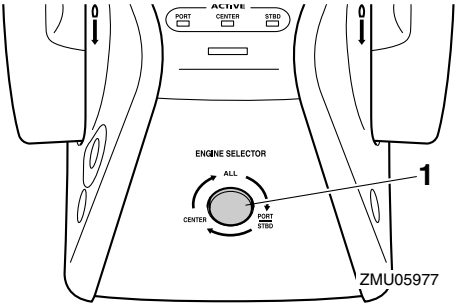
ZMU07141

EMU35721

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

EMU35775

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.

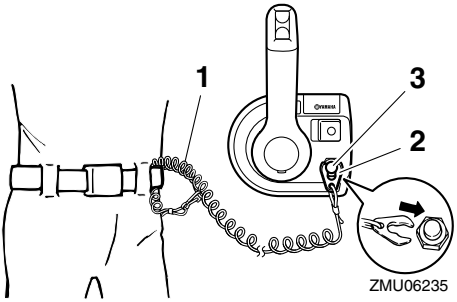
EWM01791

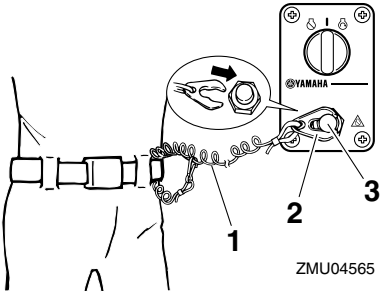
WARNING

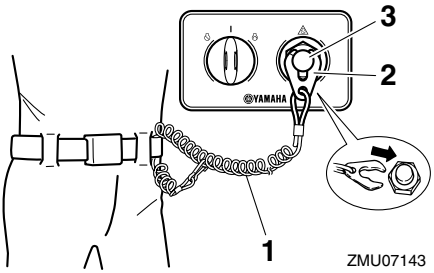
- **Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg while operating.**
- **Do not attach the cord to clothing that could tear loose. Do not route the cord where it could become entangled, preventing it from functioning.**
- **Avoid accidentally pulling the cord 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.**

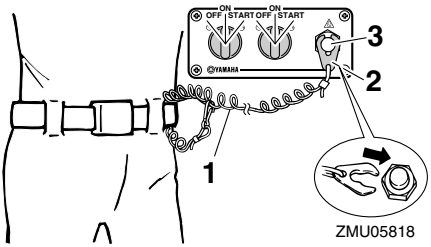
TIP:

The engine cannot be started with the clip removed.

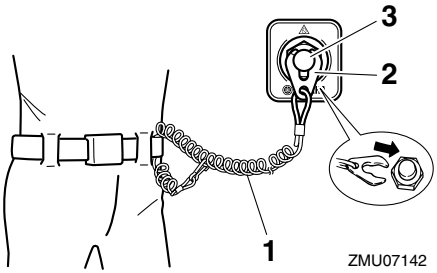




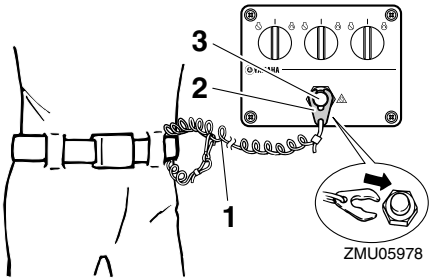




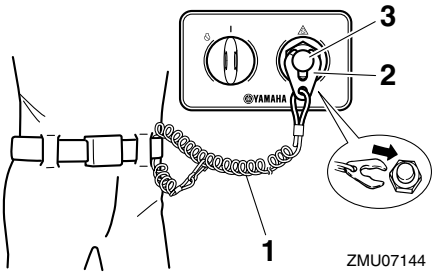
ZMU05818



ZMU07142



ZMU05978



ZMU07144

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

EMU35783

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.

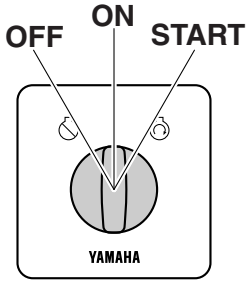
- "ON" **(on)**

With the main switch in the "ON" (on) position, the electrical circuits are on, and the key cannot be removed. The engine can be started by pressing the Start/Stop button.

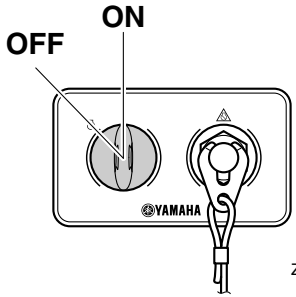
- "START" **(start)**

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.

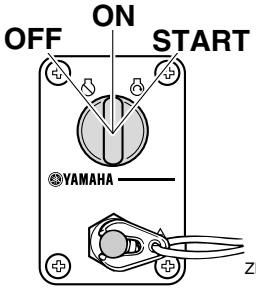
Single type



ZMU06245

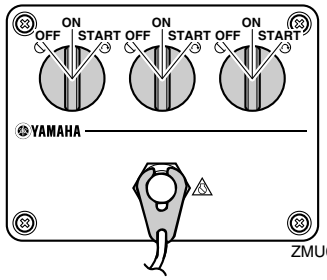


ZMU07146

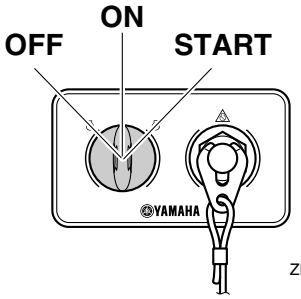


ZMU04567

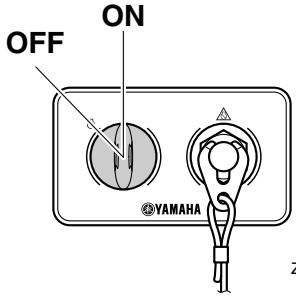
Triple type



ZMU05982

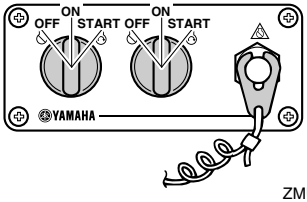


ZMU07145



ZMU07146

Twin type



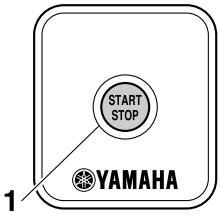
ZMU05821

EMU42081

Start/Stop switch panel

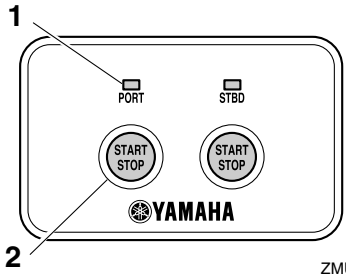
The engine can be started or turned off by pressing the Start/Stop button. For twin and triple type, it is possible to start or turn off individual engine. The indicator for the corresponding engine will come on.

- **PORT:**Port side engine
- **CENTER:**Center engine
- **STBD:**Starboard side engine

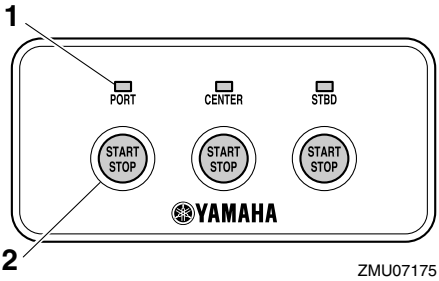


ZMU07173

1. Start/Stop button



ZMU07174



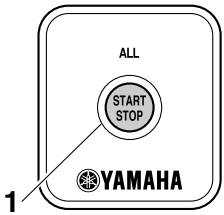
ZMU07175

1. Indicator
2. Start/Stop button

EMU41632

All Start/Stop switch panel

The Start/Stop button allows all engines to start or turn off.



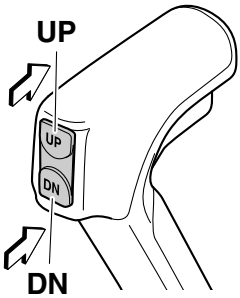
ZMU07176

1. All Start/Stop button

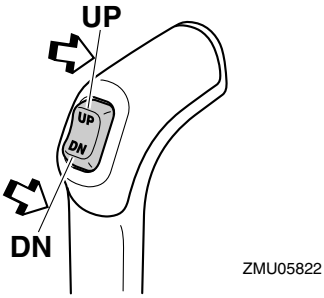
EMU35154

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 80 and 82.



ZMU06234



EMU26156

Power trim and tilt switch on bottom cowling

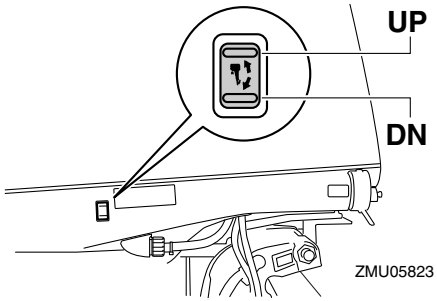
The power trim and tilt switch is located on the side of the bottom cowling. Pushing the switch "**UP**" (up) trims the outboard motor up, and then tilts it up. Pushing the switch "**DN**" (down) tilts the outboard motor down and trims it down. When the switch is released, the outboard motor will stop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

For instructions on using the power trim and tilt switch, see page 82.

EWM01032

WARNING

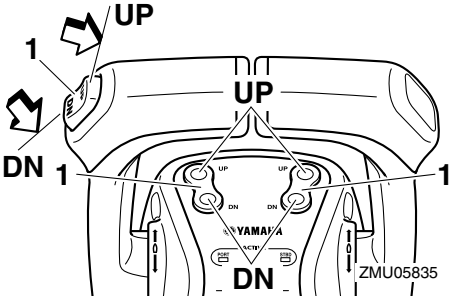
Use the power trim and tilt switch located on the bottom cowling only when the boat is at a complete stop with the engine off. Attempting to use this switch while the boat is moving could increase the risk of falling overboard and could distract the operator, increasing the risk of collision with another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

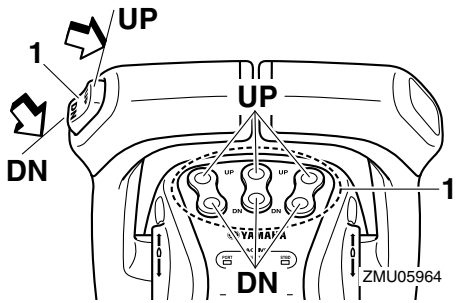


EMU35852

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 80 and 82.

EMU35041

Tilt limiter

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

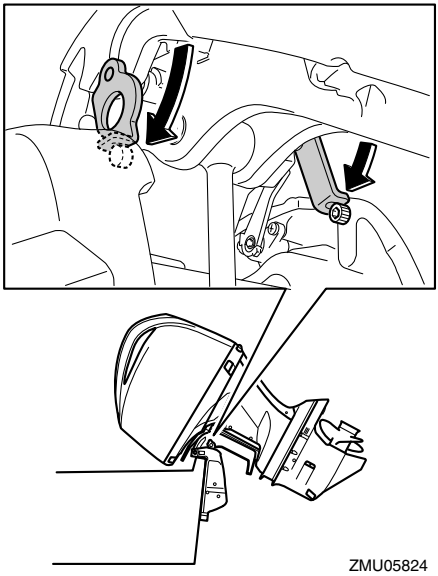
TIP:

Consult your Yamaha dealer about changing the setting.

EMU35031

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.



ECM00661

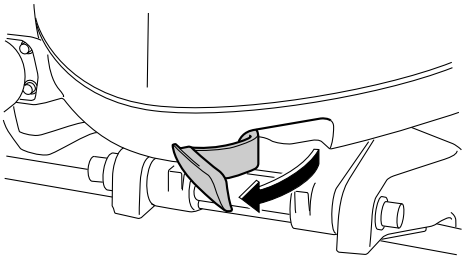
NOTICE

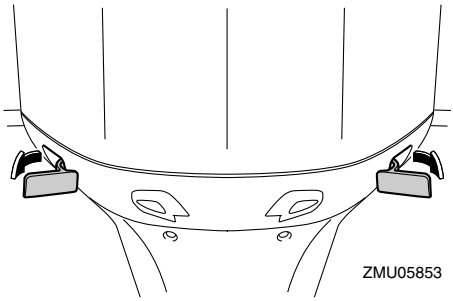
Do not use the tilt support lever or knob when trailering the boat. The outboard motor could shake loose from the tilt support and fall. If the motor cannot be trailered in the normal running position, use an additional support device to secure it in the tilt position.

EMU35054

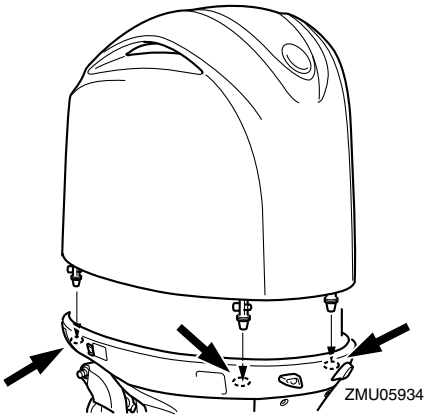
Cowling lock lever (turn type)

To remove the top cowling, turn the cowling lock levers at the front and side 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.

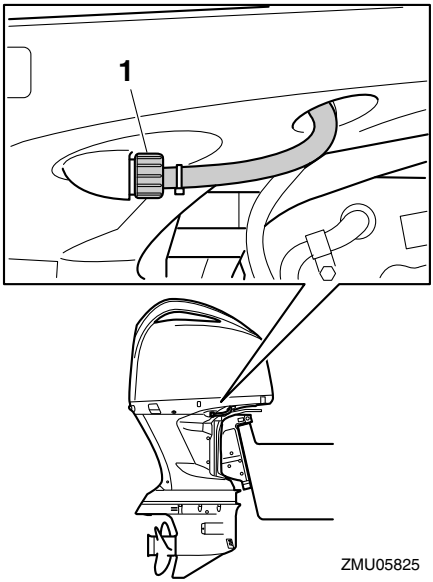

ZMU05934

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.

EMU26464

Flushing device

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



ZMU05825

1. Flushing device

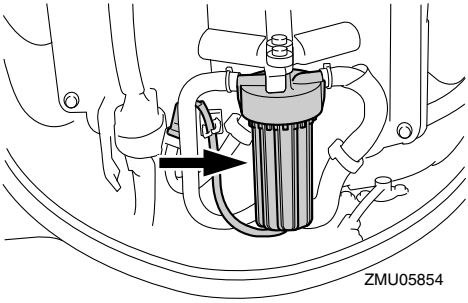
TIP:

For details on usage, see page 89.

EMU41311

Fuel filter

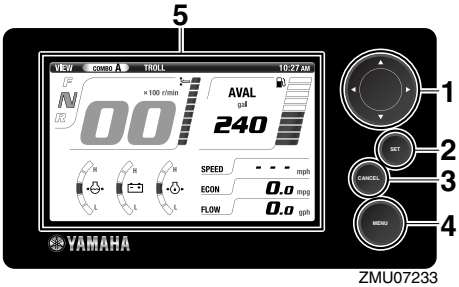
The fuel filter functions to remove foreign material and separate water from the fuel. If water separated from the fuel exceeds a specific volume, the alert system will activate. For further information, see page 51.


ZMU05854

EMU41782

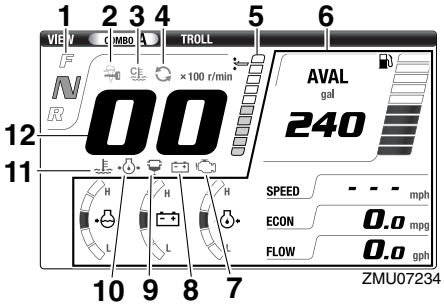
6Y9 Multifunction Color Gauge

The 6Y9 Multifunction Color Gauge (hereinafter called the Multi-Display) shows engine status and alert information. The display of optional items can be changed. This manual mainly covers the alert display. For information on other settings or changing the display, see the 6Y9 Multifunction Color Gauge owner's manual.



ZMU07233

1. Arrow keys
2. Set button
3. Cancel button
4. Menu button
5. Display



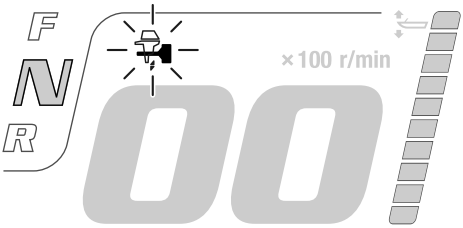
ZMU07234

1. Shift position display
2. YAMAHA SECURITY SYSTEM indicator
3. Engine warm-up indicator
4. Engine synchronization indicator
5. Trim meter
6. Optional items
7. Engine trouble-alert indicator
8. Low battery voltage-alert indicator
9. Water separator-alert indicator
10. Low oil pressure-alert indicator
11. Overheat-alert indicator
12. Tachometer

EMU41641

YAMAHA SECURITY SYSTEM indicator

This indicator appears when the YAMAHA SECURITY SYSTEM is in lock mode. Make sure it is off before starting the engine.

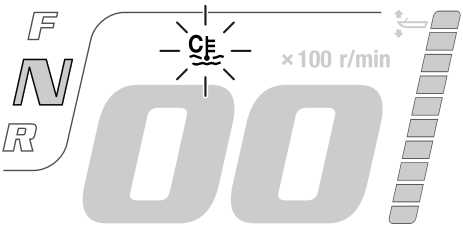


ZMU07235

EMU41651

Engine warm-up indicator

This indicator appears while the engine is being warmed up and goes off when warming-up is finished.



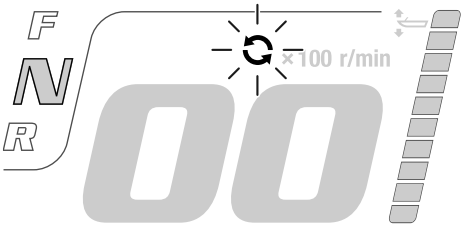
ZMU07236

EMU42091

Engine synchronization indicator

In multiple engine types, this display appears

while the engines are under engine synchronization control. It goes off when engine synchronization control is released.

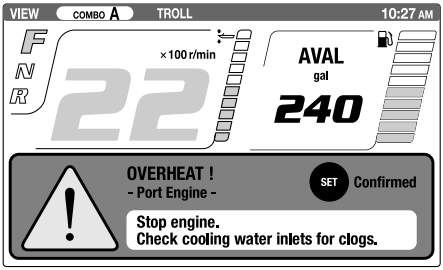


ZMU07237

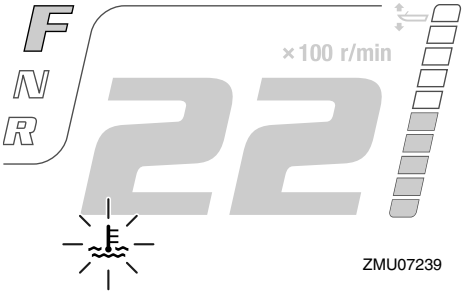
EMU41681

Overheat alert

If the engine temperature rises too high while cruising, the pop-up window will appear. Press the "**set**" (set) button to change to normal display, and the overheat-alert indicator will start to blink. The engine speed will automatically decrease to about 2000 r/min.



ZMU07238



ZMU07239

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

ECM01593

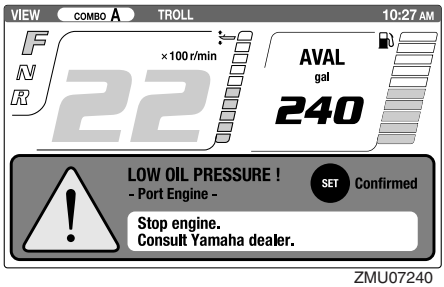
NOTICE

- **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.**

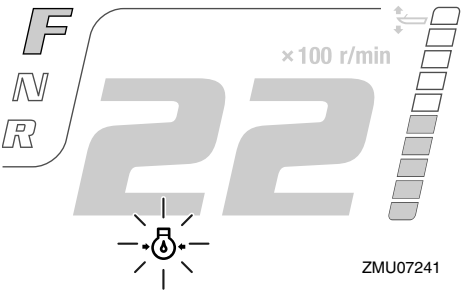
EMU41691

Low oil pressure-alert

If the engine oil pressure drops too low, the pop-up window will appear. Press the "**set**" (set) button to change to normal display, and the low oil pressure-alert indicator will start to blink. The engine speed will automatically decrease to about 2000 r/min.



ZMU07240



ZMU07241

Stop the engine immediately if the buzzer sounds and the low oil pressure-alert device has activated. 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.

ECM01602

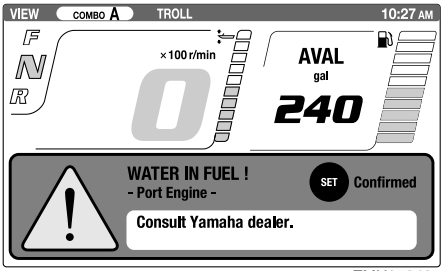
NOTICE

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

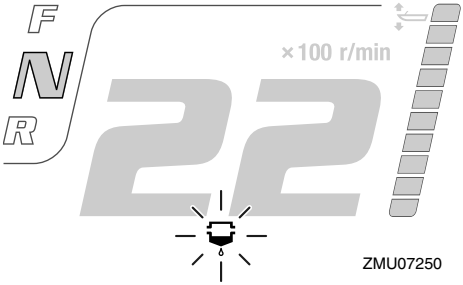
EMU41701

Water separator alert

The pop-up window will appear if water has accumulated in the water separator (fuel filter) while cruising. Press the "**set**" (set) button to change to normal display, and the water separator-alert indicator will start to blink.



ZMU07242



ZMU07250

Stop the engine immediately and see page 110 of this manual to drain the water from the fuel filter. Get back to the port soon and consult a Yamaha dealer immediately.

ECM00911

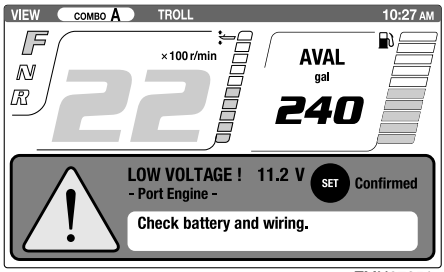
NOTICE

Gasoline mixed with water could cause damage to the engine.

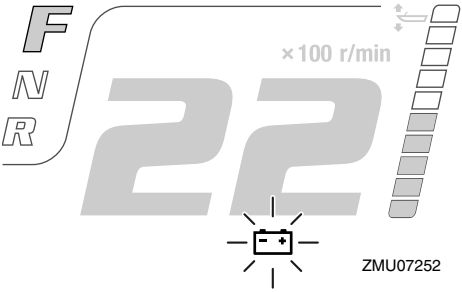
EMU41721

Low battery voltage-alert

The pop-up window will be displayed if the battery voltage drops. Press the "**set**" (set) button will change to the normal display and the battery voltage-alert indicator will start to blink.



ZMU07251



ZMU07252

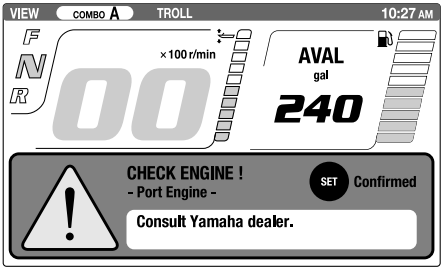
Get back to the port soon if the low battery voltage-alert device has activated. For charging the battery, consult your Yamaha dealer.

EMU41711

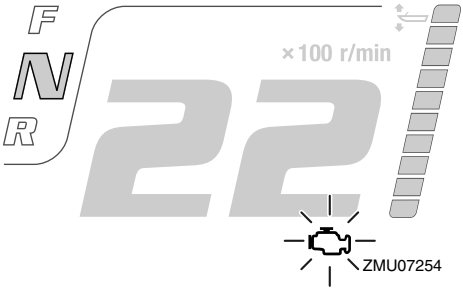
Engine trouble alert

The pop-up window will appear if the engine

malfunctions while cruising. Press the "**set**" (set) button to change to normal display, and the engine trouble-alert indicator will start to blink.



ZMU07253



ZMU07254

Return to port and consult a Yamaha dealer immediately.

EMU31654

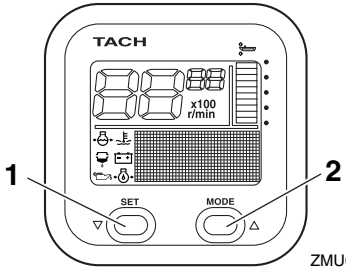
6Y8 Multifunction meters

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.

EMU36185

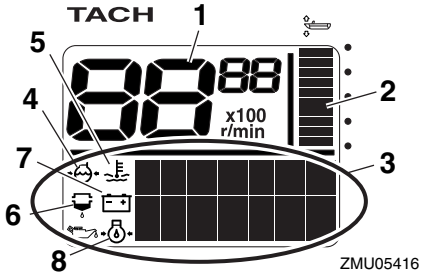
6Y8 Multifunction tachometers

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 the cooling water pressure sensor is installed, the unit can also show the cooling water pressure display. However, even if the cooling water pressure sensor is not installed, the cooling water pressure display can be shown by connecting an optional sensor to the unit. For the optional sensor, consult your Yamaha dealer. The tachometer unit is available in round or square types. Check your tachometer unit type.



ZMU05415

1. Set button
2. Mode button



ZMU05416

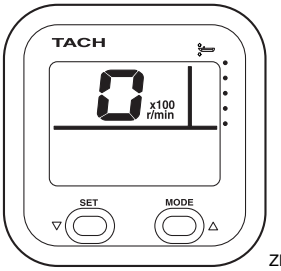
1. Tachometer
2. Trim meter
3. Multifunction display
4. Cooling water pressure
5. Cooling water/engine temperature
6. Water detection-alert indicator
7. Battery voltage
8. Oil pressure (4-stroke models)

EMU38623

Yamaha Security System information

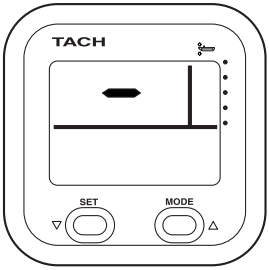
Turn the main switch to the "ON" (on) position, the currently selected Yamaha Security System mode (Lock / Unlock) will show on the display.

Unlock mode



ZMU06457

Lock mode

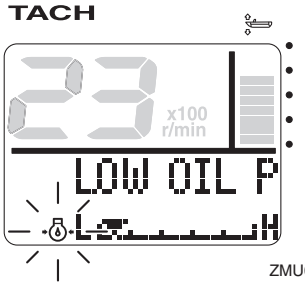


ZMU06459

EMU36131

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.



ZMU05430

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

ECM01602

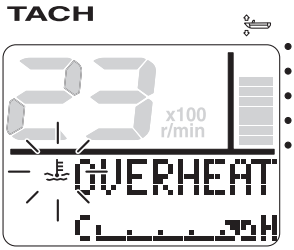
NOTICE

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

EMU36222

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.



ZMU05421

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

ECM01593

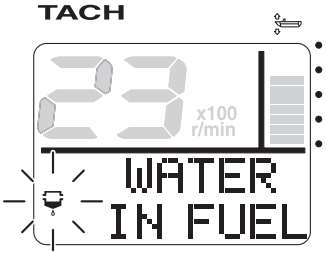
NOTICE

- **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.**

EMU36151

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 110 of this manual to drain the water from the fuel filter. Get back to the port soon and consult a Yamaha dealer immediately.



ZMU05423

ECM00911

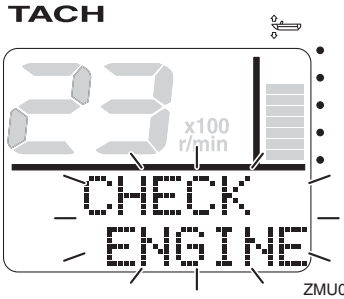
NOTICE

Gasoline mixed with water could cause damage to the engine.

EMU36161

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.



ZMU05425

ECM00921

NOTICE

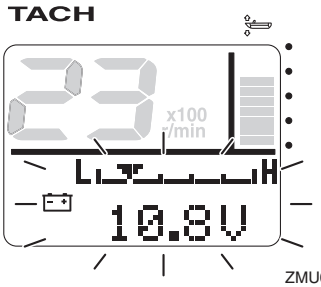
In such an event, the engine will not operate properly. Consult a Yamaha dealer immediately.

EMU36171

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 de-

vice has activated. For charging the battery, consult your Yamaha dealer.



ZMU05427

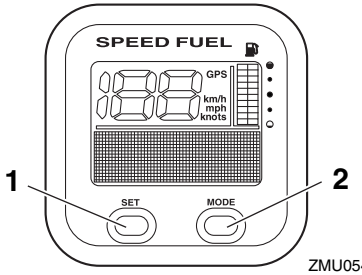
EMU36233

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 display. The chosen display is selected by using the "**set**" (set) and "**mode**" (mode) buttons as described in this section. If the speed sensor is installed, the unit can also show the trip display. However, even if the speed sensor is not installed, the trip display can be shown by connecting an optional sensor to the unit. In addition, if optional sensors are connected to the unit, water surface temperature display, depth display, and clock will also be available. For the optional sensors, consult your Yamaha dealer.

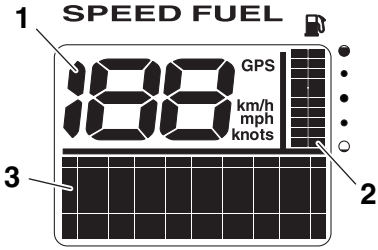
The speed & fuel meter unit is available in round or square types. Check your speed & fuel meter unit type for operation information. After the main switch is first turned on, all the displays come on as a test. After a few seconds, the gauge will change to normal operation.

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



ZMU05432

1. Set button
2. Mode button



ZMU05433

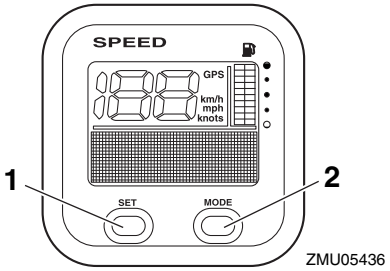
1. Speedometer
2. Fuel meter
3. Multifunction display

EMU36242

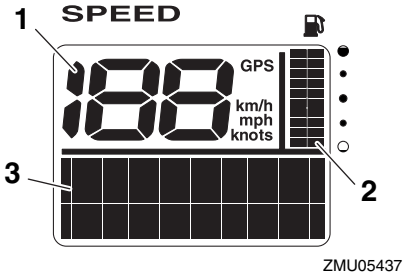
6Y8 Multifunction speedometers

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 the speed sensor is installed, the unit can also show the trip display. However, even if the speed sensor is not installed, the trip display can be shown

by connecting an optional sensor to the unit. In addition, if optional sensors are connected to the unit, 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.



1. Set button
2. Mode button

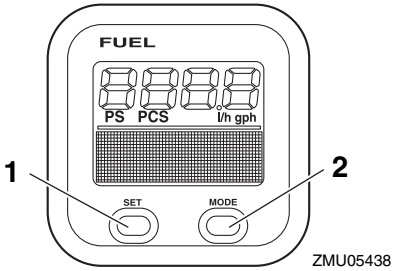


1. Speedometer
2. Fuel meter
3. Multifunction display

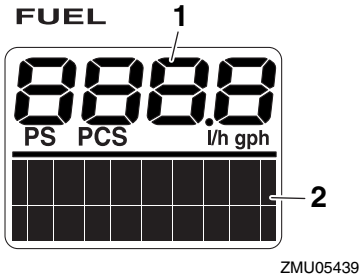
EMU36251

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

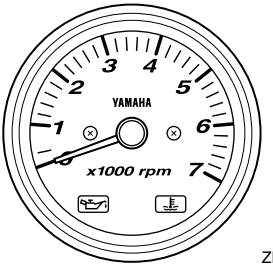
2. Multifunction display

EMU41731

Optional meters

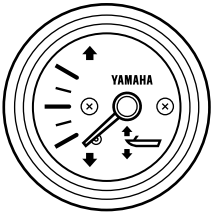
Various meters can be installed onto the outboard motor according to user preference. For details, consult your Yamaha dealer.

Analog tachometer



ZMU07245

Trim meter



ZMU04581

EMU26804

Alert system

ECM00092

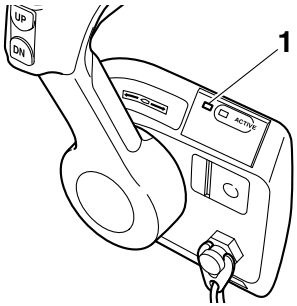
NOTICE

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.

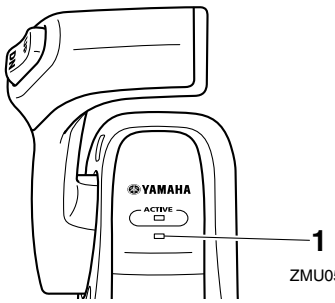
EMU35185

Digital Electronic Control alert

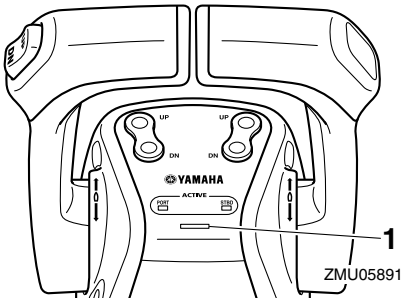
If during operation of the outboard motor any communication troubles between the digital electronic control and the outboard motor occur, the alert indicator will light. Even if there is no symptom of trouble on shifting or throttle, get back to the port soon and have a Yamaha dealer inspect or repair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



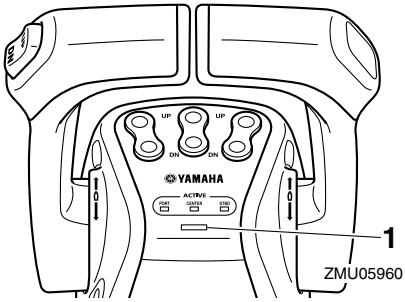
ZMU06227



ZMU05889



ZMU05891



ZMU05960

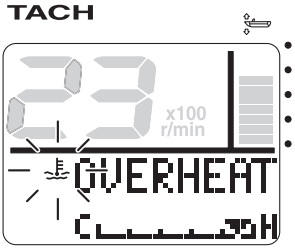
1. Digital electronic control-alert indicator

EMU42112

Overheat alert

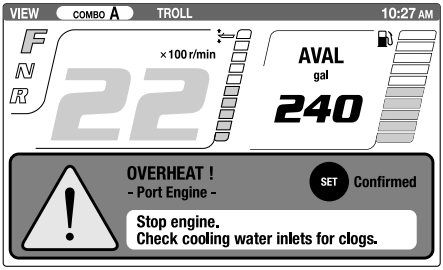
This engine has an overheat-alert device. If the engine temperature rises too high, the alert device will activate.

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

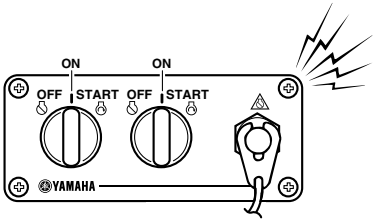


ZMU05421

- The pop-up window will appear on the Multi-Display.

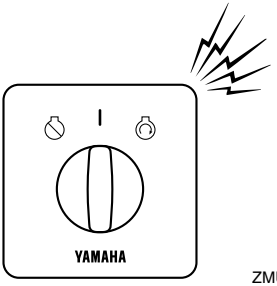


ZMU07238

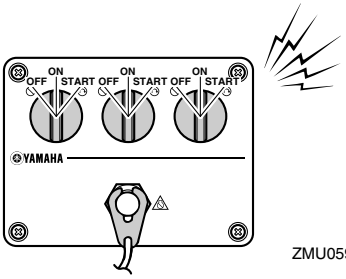


ZMU05827

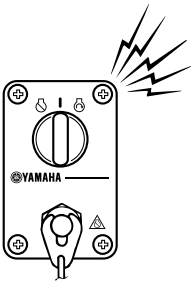
- The buzzer will sound.



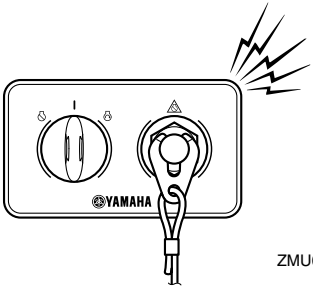
ZMU06297



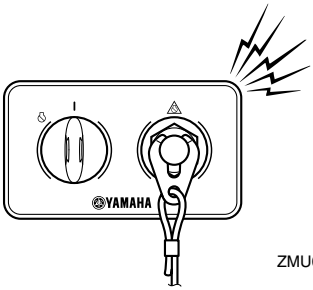
ZMU05989



ZMU04583

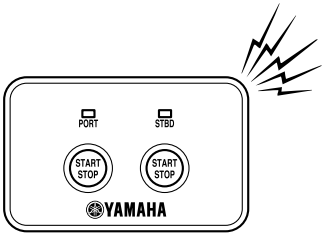


ZMU07155

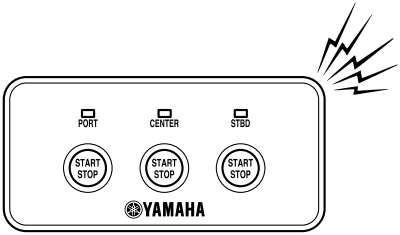


ZMU07156

ZMU07332



ZMU07333



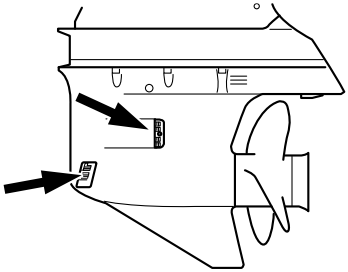
ZMU07334

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.

Multiple 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.



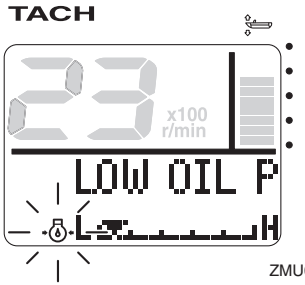
ZMU05826

EMU42131

Low oil pressure alert

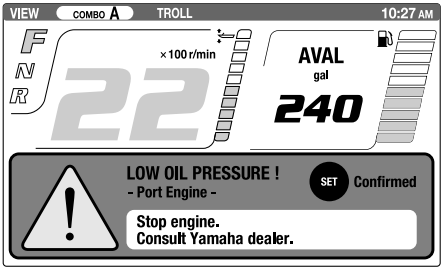
If the oil pressure drops too low, the alert device will activate.

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



ZMU05430

- The pop-up window will appear on the Multi-Display.



ZMU07240

- 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.

Multiple engine drive users:

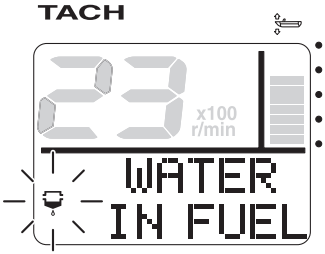
If the low oil pressure alert system of one engine activates, all of the engines will slow down and the buzzer will sound. To switch off the alert activation on the engine(s) not affected by low oil pressure, turn off the main switch of the engine with the low oil pressure.

EMU42151

Water separator alert

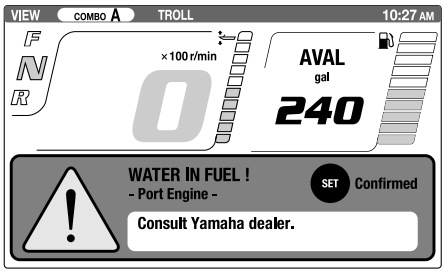
The outboard motor is equipped with a water separator alert system. If water separated from the fuel exceeds a specific volume, the alert system will activate.

- The water separator-alert indicator of the 6Y8 Multifunction Tachometer will come on or blink.



ZMU05423

- The pop-up window will appear on the Multi-Display.



ZMU07242

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

If the alert system has activated, stop the engine and see page 110 of this manual to drain the water from the fuel filter. Get back to the port soon and consult a Yamaha dealer immediately.

ECM02471

NOTICE

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

EMU26903

Installation

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

EWM01591

WARNING

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

EMU35812

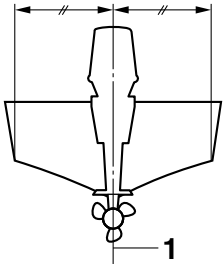
Mounting the outboard motor

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.

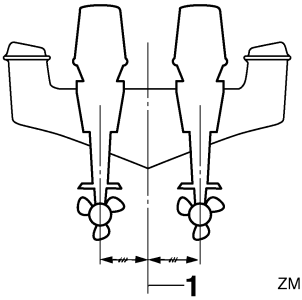
For twin engine boats, mount the outboard motors equidistant from the centerline.

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.

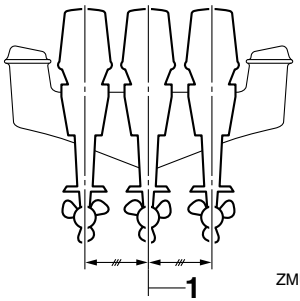
Consult your Yamaha dealer or boat manufacturer for further information on determining the proper mounting location.



ZMU01760



ZMU05141



ZMU05957

1. Center line (keel line)

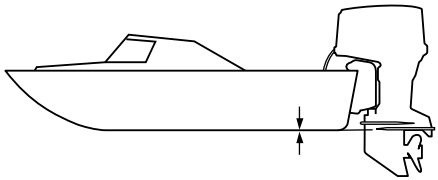
EMU26935

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.



ZMU01762

ECM01635

NOTICE

- **Make sure that the idle hole is high enough to prevent water from entering the engine even if the boat is stationary with the maximum load.**
- **Incorrect engine height or obstructions to the smooth flow of water (such as the design or condition of the boat, or accessories, such as transom ladders or depth finder transducers) can create airborne water spray while the boat is cruising. If the outboard motor is operated continuously in the presence of airborne water spray, enough water could enter the engine through the air intake opening in the top cowling to cause severe engine damage. Remove the cause of the airborne water spray.**

EMU36382

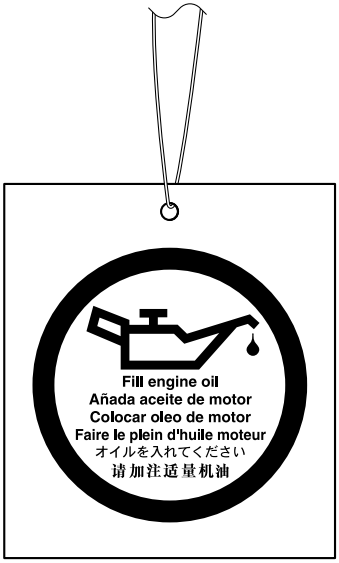
First-time operation

EMU36393

Fill engine oil

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

The engine is shipped with the following tag, which should be removed after engine oil is filled for the first time. For more information on checking the engine oil level, see page 56.



ZMU01710

EMU30175

Breaking in engine

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

EMU27086

Procedure for 4-stroke models

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

TIP:

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

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

EMU36402

Getting to know your boat

All boats have unique handling characteristics. Operate cautiously while you learn how your boat handles under different conditions and various trim angles (see page 80).

EMU36414

Checks before starting engine

EWM01922

WARNING

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

dent could occur.

ECM00121

NOTICE

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

EMU36422

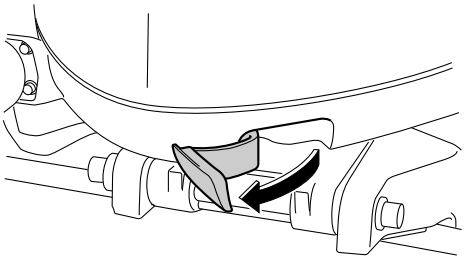
Fuel level

Be sure you have plenty of fuel for your trip. A good rule is to use 1/3 of your fuel to get to the destination, 1/3 to return, and to keep 1/3 as an emergency reserve. With the boat level on a trailer or in the water, turn the key to "ON" (on) and check the fuel level. For fuel filling instructions, see page 59.

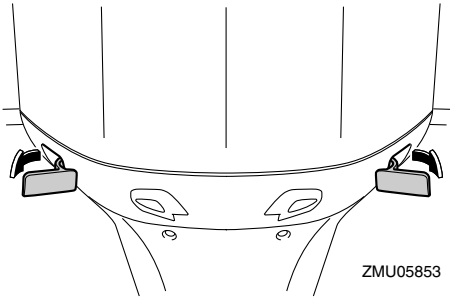
EMU36433

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

EMU36443

Fuel system

EWM00061

WARNING

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

EWM00911

WARNING

Leaking fuel can result in fire or explosion.

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

EMU36452

Check for fuel leaks

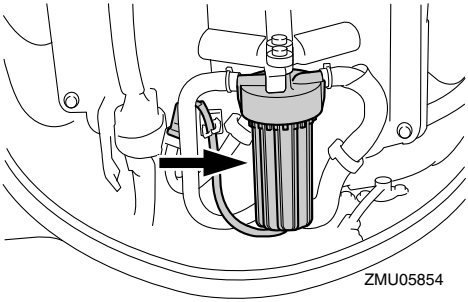
- Check for fuel leaks or gasoline fumes in the boat.
- Check for fuel leakage from the fuel system.
- Check the fuel tank and fuel lines for cracks, swellings, or other damages.

EMU36472

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.



EMU41771

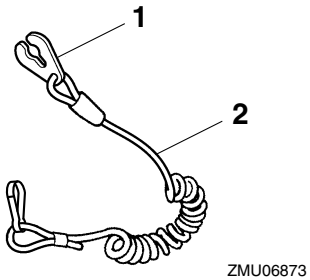
Controls

- Turn the main switch "ON" (on) and make sure that the Digital electronic control-active indicator comes on.
- 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.

EMU40363

Engine shut-off cord (lanyard)

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

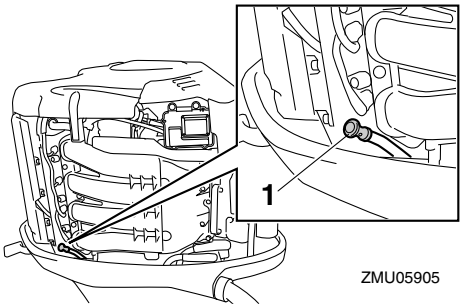


1. Clip
2. Cord

EMU40994

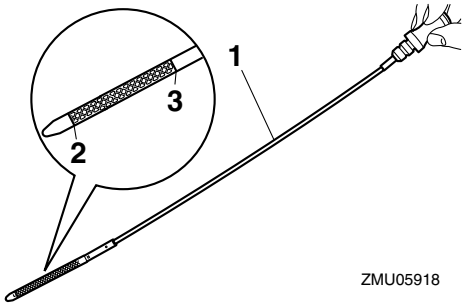
Engine oil

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



1. Oil dipstick

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



1. Oil dipstick

2. Lower mark
3. Upper mark

EMU27154

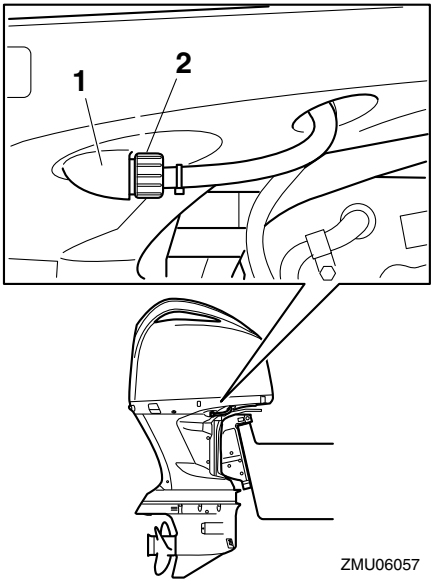
Engine

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

EMU36494

Flushing device

Check that the flushing device's garden hose connector is securely screwed on to the fitting on the bottom cowling. ***NOTICE:*** **If the garden hose connector is not properly connected, cooling water can leak out and the engine can overheat during operation.** [ECM01802]

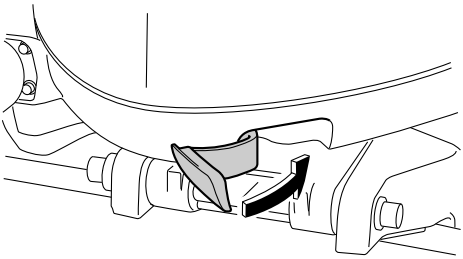


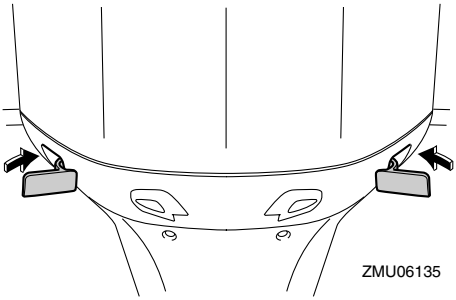
1. Fitting
2. Flushing device

EMU36942

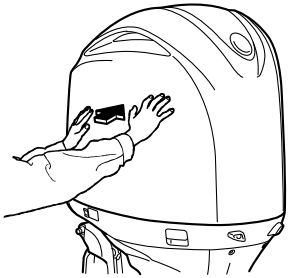
Install cowling

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 top cowling is not installed correctly, water spray under the top cowling can damage the engine, or the top cowling can blow off at high speeds.** [ECM01992]





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.



EMU35245

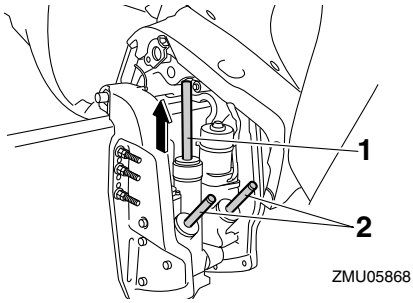
Checking power trim and tilt system

EWM01931

WARNING

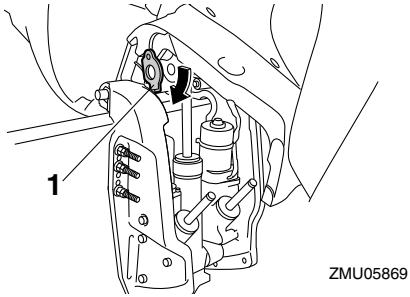
- **Never get under the lower unit while it is tilted, even when the tilt support lever is locked. Severe injury could occur if the outboard motor accidentally falls.**
- **Body parts can be crushed between the motor and the clamp bracket when the motor is trimmed or tilted.**
- **Be sure no one is near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

1. Check the power trim and tilt unit for any sign of oil leaks.
2. Operate each of the power trim and tilt switches 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.



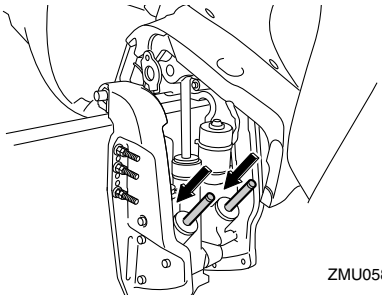
1. Tilt rod
2. Trim rods

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.



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.



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.

EMU36583

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.

EMU30027

Filling fuel

EWM01831

WARNING

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

1. Make sure that the engine is stopped.
2. Make sure that the boat is in a well-ventilated outdoor area, either securely moored or trailered.
3. Make sure that 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. **WARNING! Do not overfill. Otherwise fuel can expand and overflow if the temperature increases.** [EWM02611]
8. Tighten the fuel tank cap securely.
9. Wipe up any spilled gasoline immediately with dry rags. Dispose of rags properly according to local laws or regulations.

EMU27453

Operating engine

EWM00421

WARNING

- **Before starting the engine, make sure that the boat is tightly moored and that you can steer clear of any obstructions. Be sure there are no swimmers in the water near you.**
- **When the air vent screw is loosened, gasoline vapor will be released. Gasoline is highly flammable, and its vapors are flammable and explosive. Refrain from smoking, and keep away from open flames and sparks while loosen-**

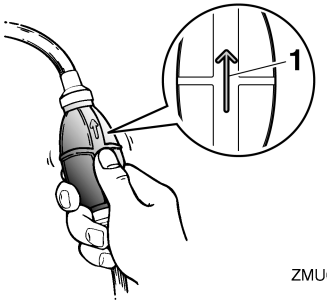
ing the air vent screw.

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

EMU31814

Sending fuel

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



ZMU02025

1. Arrow

EMU35751

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.

ZMU07141

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

EMU27495

Starting engine

EWM01601

WARNING

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

EMU41791

Start-up checks

Place the control lever in neutral and turn the main switch to "ON" (on). Make sure that no alert-indicator comes on. If the buzzer sounds and the water separator-alert indicator blinks, consult your Yamaha dealer immediately.

EMU42161

Procedure for single station models

EWM01841

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, pre-**

venting it from functioning.

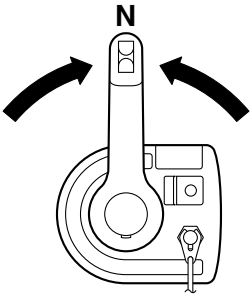
- **Avoid accidentally pulling the cord during normal operation. Loss of engine power means the loss of most steering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.**

1. If equipped with the Yamaha Security System: If the lock mode of the Yamaha Security System is selected, use the remote control transmitter to select the unlock mode. Short beep will sound twice when unlocking the Yamaha Security System. For further information, see page 24.

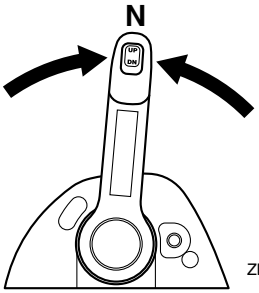
TIP:

- If you lost track of the current security mode, press the lock or unlock button to reset the security system.
- The signal transmission range of the remote control transmitter varies depending on the mounting position of the receiver. To operate the Yamaha Security System correctly, use the transmitter as close as possible from the receiver.
- If Yamaha Security System may not operate correctly, repeat the activating procedure once again.

2. Place the control lever in "**N**" (neutral).



ZMU06236

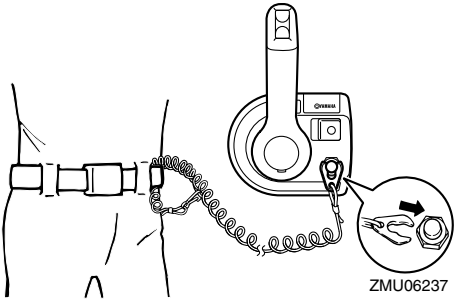


ZMU05829

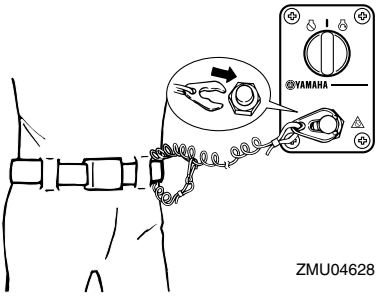
TIP:

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

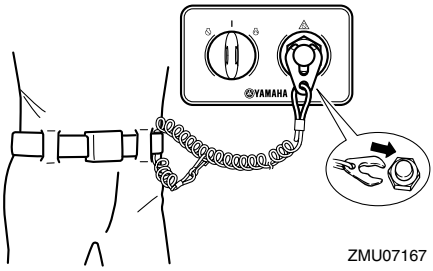
3. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg. Then install the clip on the other end of the cord into the engine shut-off switch.



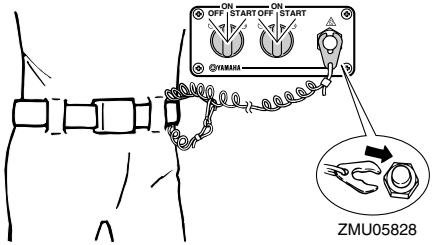
ZMU06237



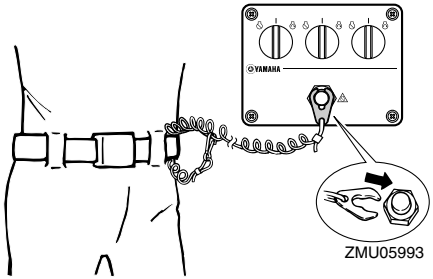
ZMU04628



ZMU07167

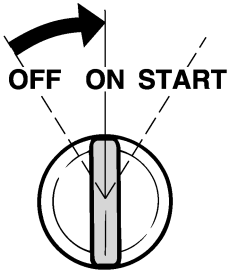


ZMU05828



ZMU05993

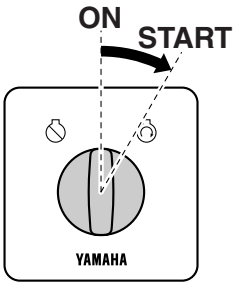
4. Turn the main switch to "ON" (on) to make sure that the digital electronic control-active indicator lights. The engine can not be started when the digital electronic control-alert indicator lights.



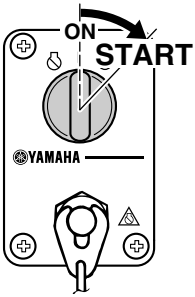
ZMU01773

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

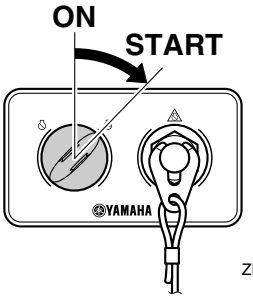
[ECM00193]



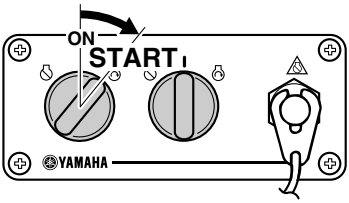
ZMU06246



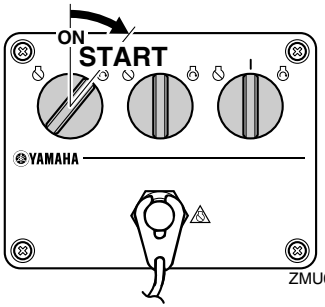
ZMU04596



ZMU07169

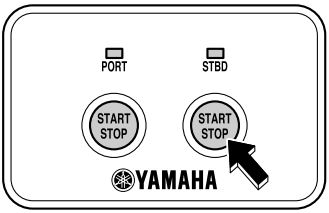


ZMU05830

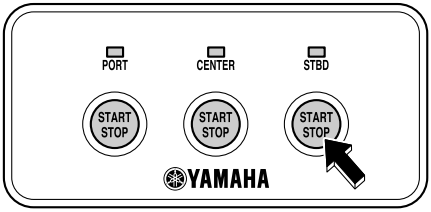


ZMU05994

When starting the engine using the Start/Stop button, press the button to start the engine. The indicator for the starting engine will come on.



ZMU07148



ZMU07149

When starting the engine using the Start/Stop button on the All Start/Stop panel, press the button to start the all engines.

ZMU07150

TIP:

- When the main switch is turned to "START" (start) with the clip removed from the en-

gine shut-off switch, the buzzer will sound.
- Except the single type, if the clip is not installed to the engine shut off switch, the buzzer will sound when the Start/Stop button is pressed.
- Except the single type, if one of the engines has started, it can be stopped by pressing the Start/Stop button on the All start/Stop panel.

EMU42171

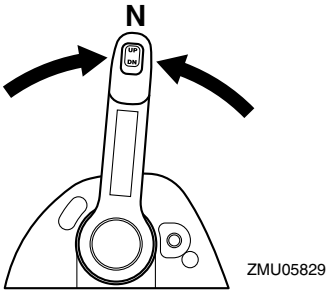
Procedure for dual station models (main station)

1. If equipped with the Yamaha Security System: If the lock mode of the Yamaha Security System is selected, use the remote control transmitter to select the unlock mode. Short beep will sound twice when unlocking the Yamaha Security System. For further information, see page 24.

TIP:

- If you lost track of the current security mode, press the lock or unlock button to reset the security system.
- The signal transmission range of the remote control transmitter varies depending on the mounting position of the receiver. To operate the Yamaha Security System correctly, use the transmitter as close as possible from the receiver.
- If Yamaha Security System may not operate correctly, repeat the activating procedure once again.

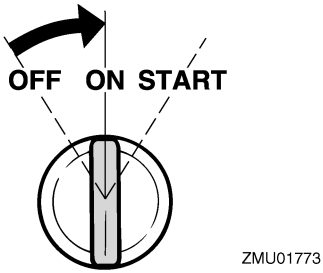
2. Place the control lever in "**N**" (neutral).



TIP:

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

3. 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.



4. 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. [ECM00193]

TIP:

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

EMU42181

Procedure for dual station models (sub station)

EWM01841

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.**

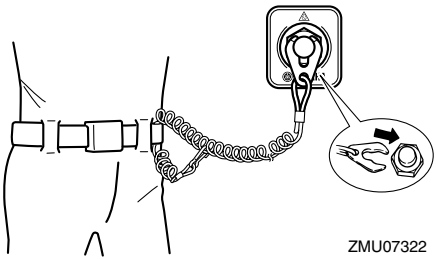
1. If equipped with the Yamaha Security System: If the lock mode of the Yamaha Security System is selected, use the remote control transmitter to select the unlock mode. Short beep will sound twice when unlocking the Yamaha Security System. For further information, see page 24.
2. Turn the main switch 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.
3. Place the control lever in "N" (neutral).
4. 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.

ZMU07141

TIP:

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

5. 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.

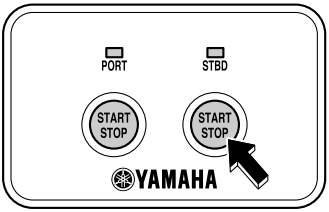


ZMU07322

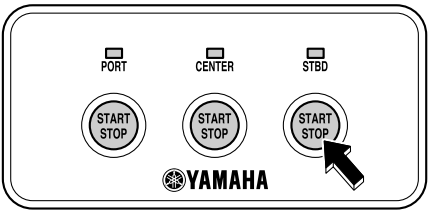
6. Press the Start/Stop button to start the engine. The indicator for the starting engine will come on. ***NOTICE:*** **Do not**

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 Start/Stop button, wait 10 seconds, then crank the engine again. [ECM02491]

ZMU07147



ZMU07148



ZMU07149

TIP:

If the clip is not installed to the engine shut off switch, the buzzer will sound when the Start/Stop button is pressed.

EMU36511

Checks after starting engine

EMU41361

Cooling water

Check for a steady flow of water from the cooling water pilot hole. A continuous flow of water from the cooling water pilot hole shows that the water pump is pumping water through the cooling water passages.

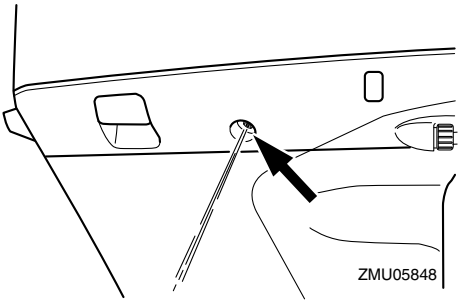
TIP:

When the engine is started, there may be a slight delay before water flows from the cooling water pilot hole.

ECM02251

NOTICE

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



ZMU05848

EMU27671

Warming up engine

EMU41811

Electric start models

After the engine has started, warm up the engine until the engine speed settles at idling speed. The engine warming-up indicator is shown on the Multi-Display while the engine warms up. For further information, see page 39.

EMU36532

Checks after engine warm up

EMU36542

Shifting

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

EMU41821

Stop switches

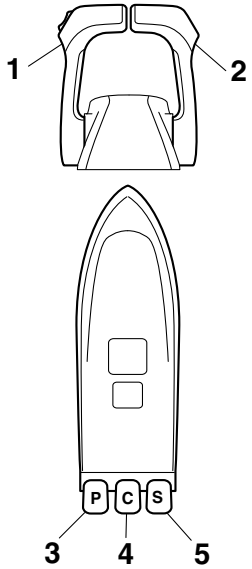
Perform the following procedure to check that the main switch and engine shut-off switch operate properly.

- Check that the engine stops when the main switch is turned to the "OFF" (off) position, or press the Start/Stop button.
- Check that the engine stops when the clip is pulled from the engine shut-off switch.
- Check that the engine cannot be started with the clip removed from the engine shut-off switch.

EMU35881

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.



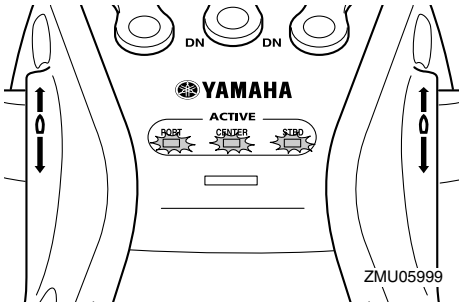
ZMU05998

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.



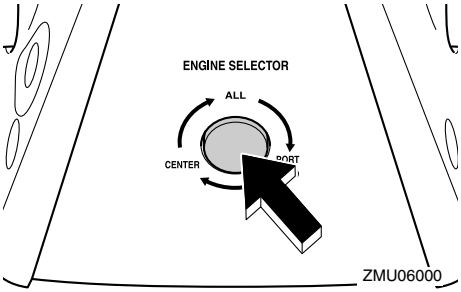
ZMU05999

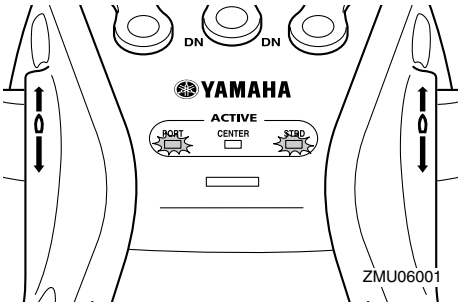
- Operate the port side engine using the port

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.

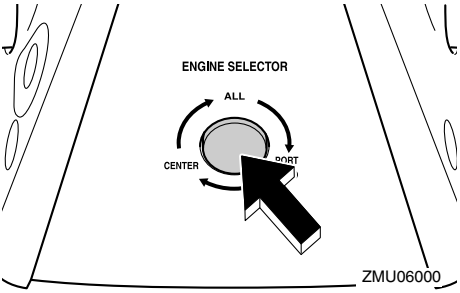
2. Push the engine selector switch once to operate the port side and starboard side engines.

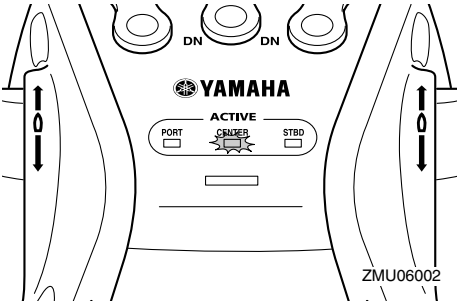




- Operate the port side engine using the port side control lever.
- The center engine runs at the idling speed.
- Operate the starboard side engine using the starboard side control lever.

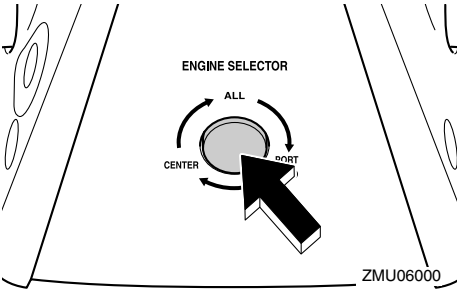
3. Push the engine selector switch twice to operate the center engine.

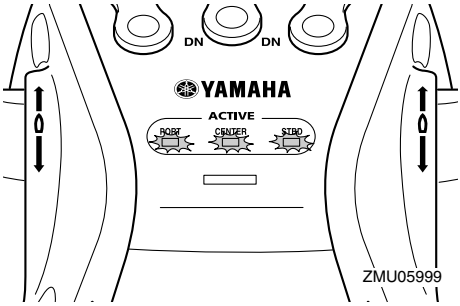




- The port side engine runs at the idling speed.
- Operate the center engine using the port side control lever.
- The starboard side engine runs at the idling speed.

4. Push the engine selector switch three times to operate the three engines.





EMU35125

Shifting

EWM00181

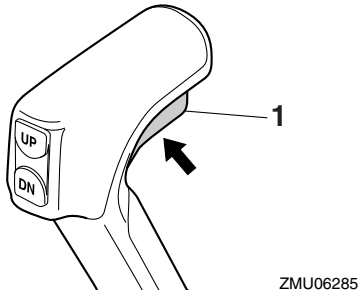
WARNING

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

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.

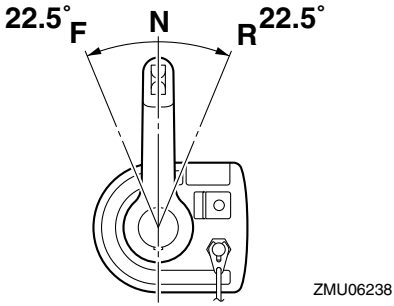
To shift out of neutral

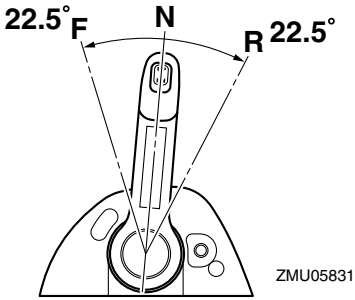
1. Pull the neutral interlock trigger up (if equipped).



1. Neutral interlock trigger

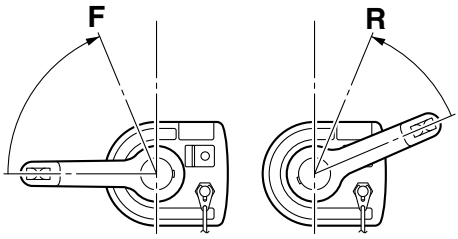
2. Move the control lever firmly and crisply forward (for forward gear) or backward (for reverse gear) 22.5° (a detent can felt).



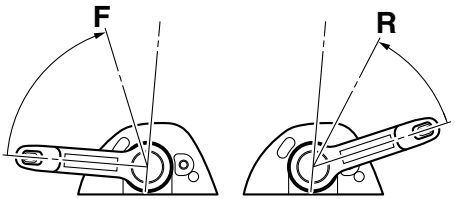


To shift from in gear (forward/reverse) to neutral

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

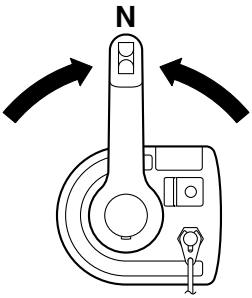


ZMU06239

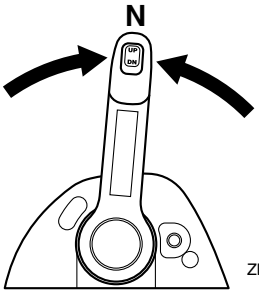


ZMU05832

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



ZMU06236



ZMU05829

EMU31743

Stopping boat

EWM01511

WARNING

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

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

EMU35892

Operating the port / center / starboard engine

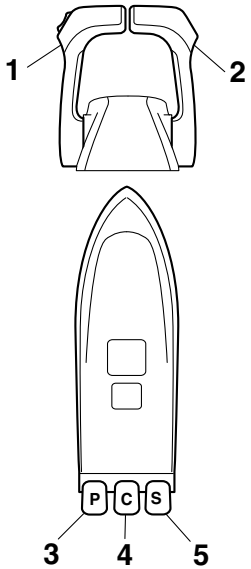
The outboard motor to be used can be selected with the main switch or Start/Stop button.

ECM01741

NOTICE

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

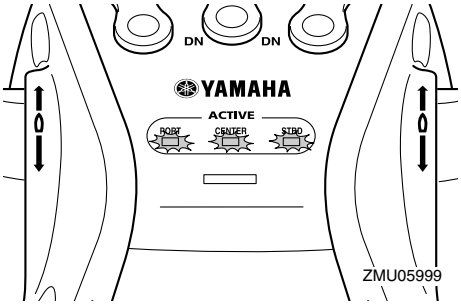
pipe due to the wave action, causing engine trouble.



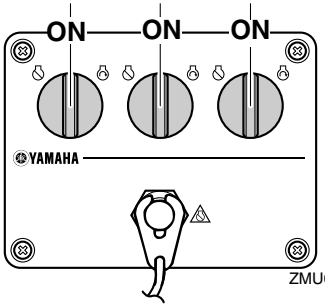
ZMU06003

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

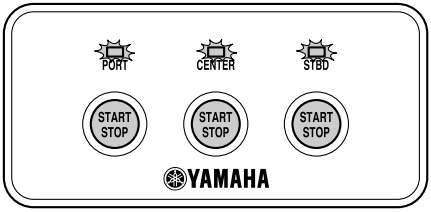
Operating three outboard motors



ZMU05999



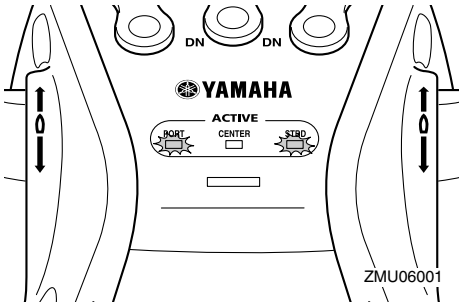
ZMU06004



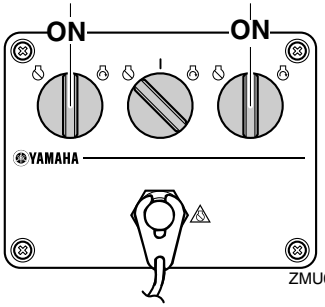
ZMU07323

- 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.

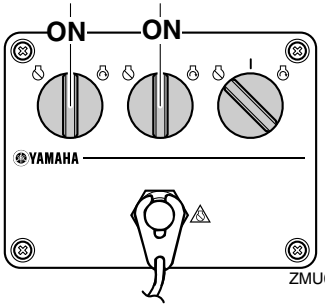
Operating the port side engine and starboard side engine



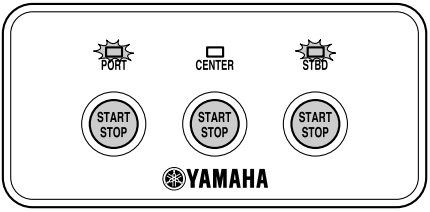
ZMU06001



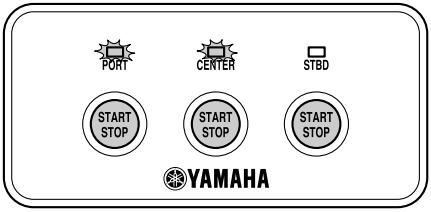
ZMU06005



ZMU06007



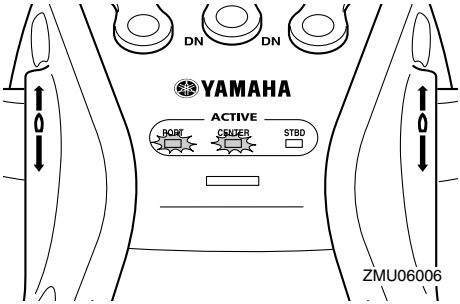
ZMU07324



ZMU07325

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

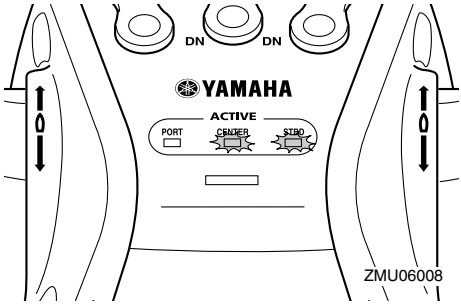
Operating the port side engine and center engine



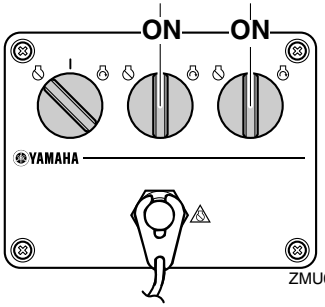
ZMU06006

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

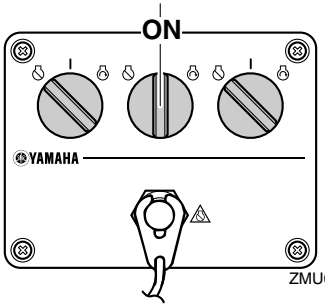
Operating the center engine and starboard side engine



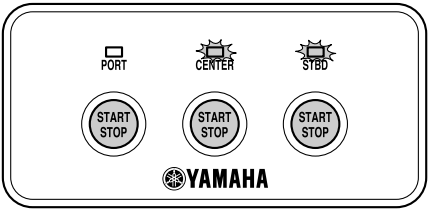
ZMU06008



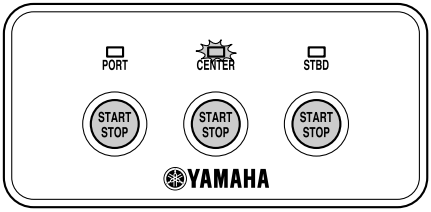
ZMU06009



ZMU06010



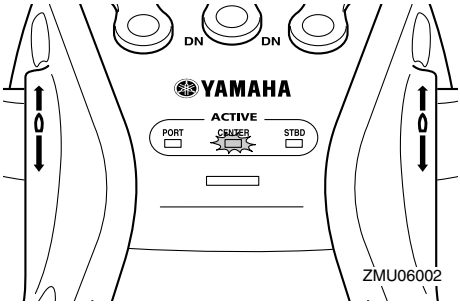
ZMU07326



ZMU07327

- 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



ZMU06002

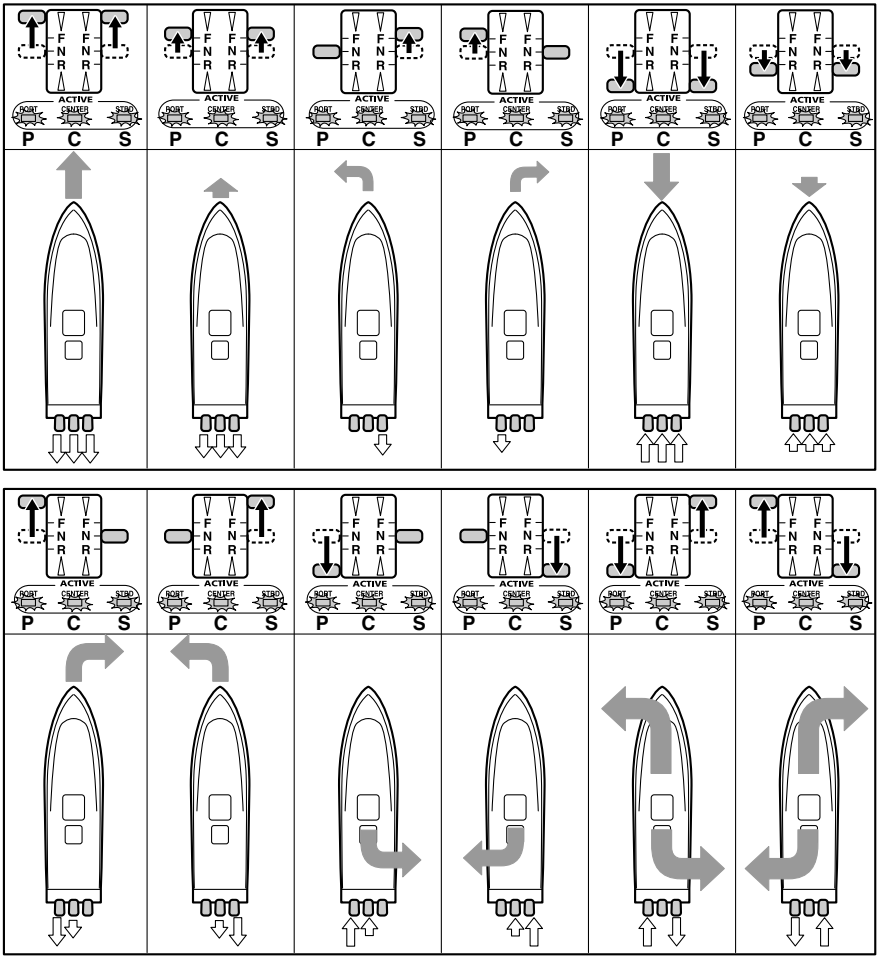
- Operate the center engine using the port side control lever.

EMU35902

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



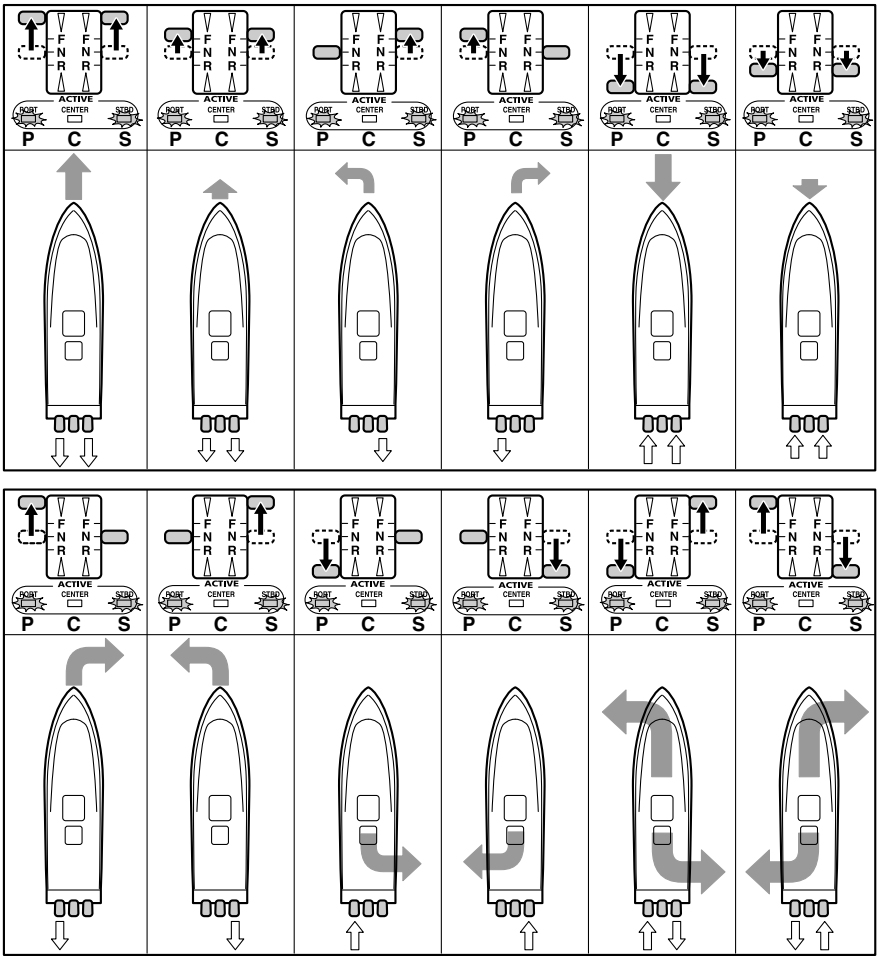
ZMU06011

⬅:Boat direction and turning force

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

⇦:Propulsion

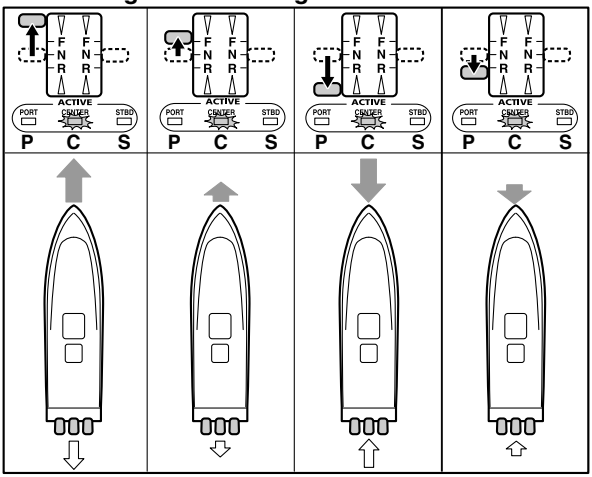
When using the port side engine and starboard side engine



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

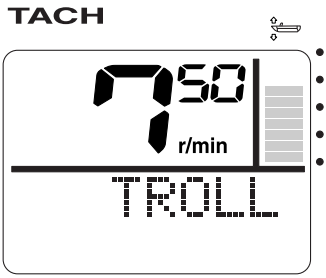
EMU30881

Trolling

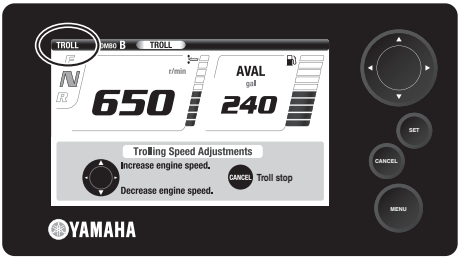
EMU41832

Adjusting trolling speed

When the control lever is either in the forward position or in the reverse position and the throttle is in the fully closed position, you can randomly adjust the trolling speed between 600 r/min and 1000 r/min by increasing or decreasing it approximately by 50 r/min. The display will show the engine speed when the engine speed is increased from the fully closed position during trolling speed setting mode. When the throttle is returned to the fully closed position, the display will show the trolling speed again. When the engine is turned off or when the engine speed exceeds 3000 r/min, trolling speed setting mode will be released.
For details, see the attached operation manual.



ZMU05931



ZMU07256

TIP:

- Trolling is affected by currents and other operating conditions and may differ from the actual engine speed.
- When warming up a cold engine, the trolling speed cannot be decreased below the specified engine idle speed.

EMU27822

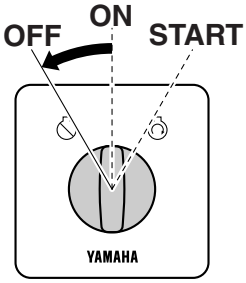
Stopping engine

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

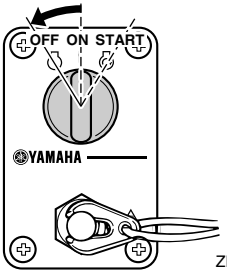
EMU42193

Procedure for single station models and dual station models (main station)

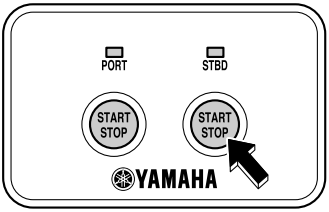
1. The engine can be turned off either by pressing the Start/Stop button or by turning the main switch to the “**OFF**” (off) position. After the engine has been turned off using the Start/Stop button, turn the main switch to the “**OFF**” (off) position.



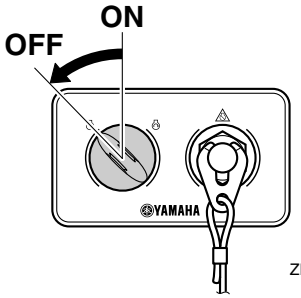
ZMU06247



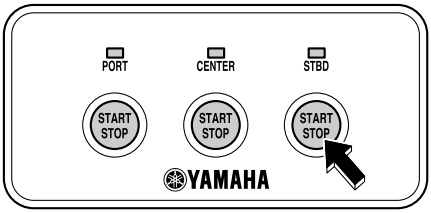
ZMU04599



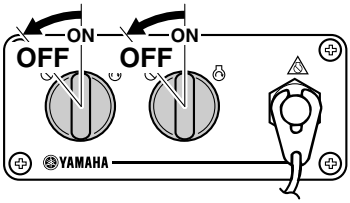
ZMU07148



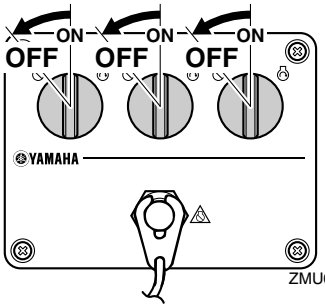
ZMU07171



ZMU07149



ZMU05833



ZMU06014

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).

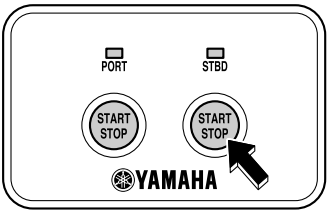
2. If equipped with the Yamaha Security System: When you leave your boat, set the Yamaha Security System to the lock mode by pressing the lock button of the remote control transmitter. Short beep will sound once when locking the security system. The lock mode is selected only when the main switch is in the "OFF" (off) position. For further information, see page 24. **WARNING! Do not set the Yamaha Security System in the lock mode when you stop the engine at offshore.** [EWM02151]
3. Remove the key if the boat will be left unattended.

EMU42201

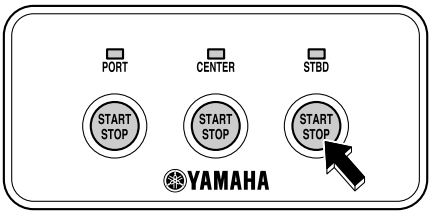
Procedure for dual station models (sub station)

1. Press the Start/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".

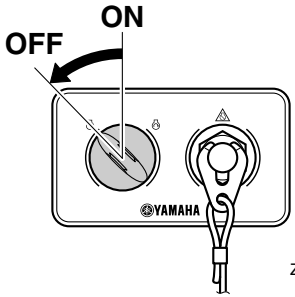
ZMU07147



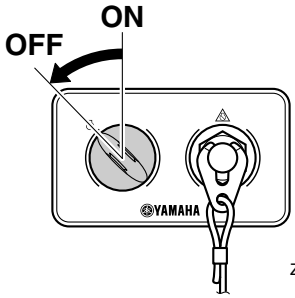
ZMU07148



ZMU07149



ZMU07171



ZMU07172

TIP:

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

2. If equipped with the Yamaha Security System: When you leave your boat, set the Yamaha Security System to the lock mode by pressing the lock button of the remote control transmitter. Short beep will sound once when locking the security system. The lock mode is selected only when the main switch is in the "OFF" (off) position. For further information, see page 24. **WARNING! Do not set the Yamaha Security System in the lock mode when you stop the engine at offshore.** [EWM02151]
3. Remove the key if the boat will be left unattended.

EMU27863

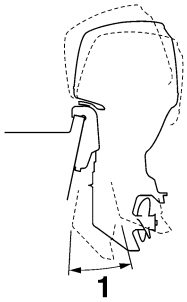
Trimming outboard motor

EWM00741

WARNING

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

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



ZMU05170

1. Trim operating angle

EMU27889

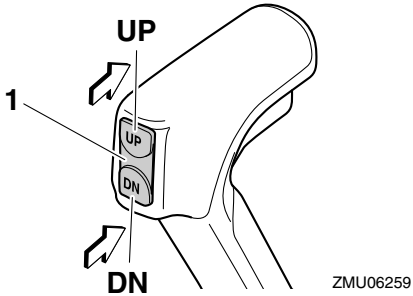
Adjusting trim angle (Power trim and tilt)

EWM00754

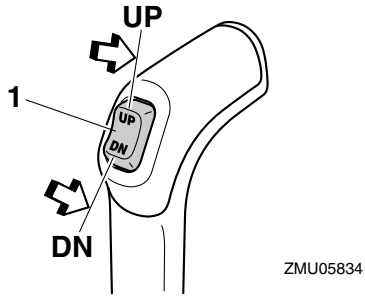
WARNING

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

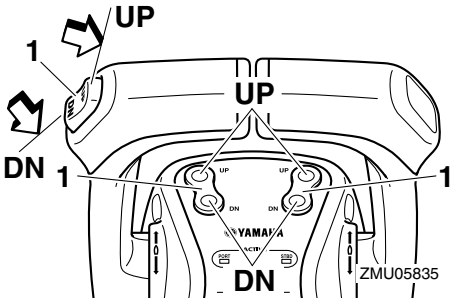
Adjust the outboard motor trim angle using the power trim and tilt switch.

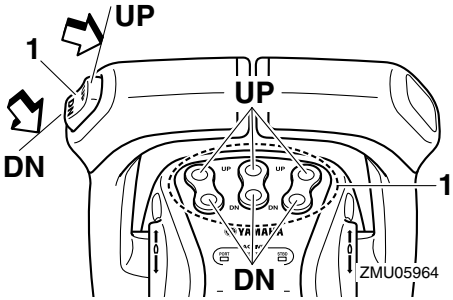


ZMU06259



ZMU05834





1. Power trim and tilt switch

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

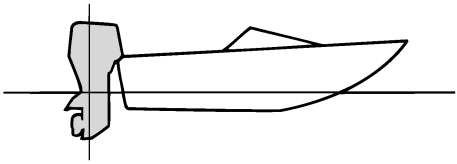
To lower the bow (trim-in), press the switch "**DN**" (down).

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

EMU27913

Adjusting boat trim

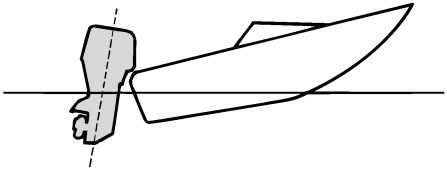
When the boat is on plane, a bow-up attitude results in less drag, greater stability and efficiency. This is generally when the keel line of the boat is up about 3 to 5 degrees. With the bow up, the boat may have a greater tendency to steer to one side or the other. Compensate for this as you steer.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



ZMU01784

Bow Up

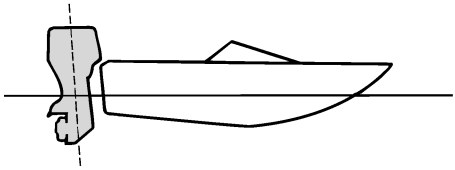
Too much trim-out puts the bow of the boat too high in the water. Performance and economy are decreased because the hull of the boat is pushing the water and there is more air drag. Excessive trim-out can also cause the propeller to ventilate, which reduces performance further, and the boat may "porpoise"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



ZMU01785

Bow Down

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



ZMU01786

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

EMU27948

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.

EWM01544

WARNING

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

ECM00993

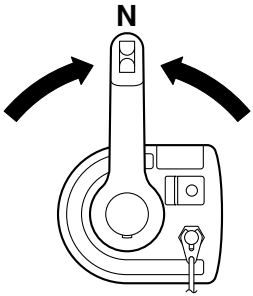
NOTICE

- **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 (41°F) or below, tilt the outboard motor up after it has been stopped 30 seconds or more.**

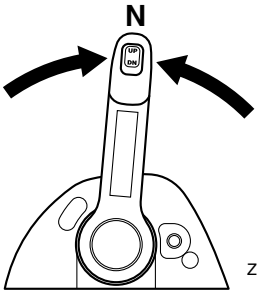
EMU3550B

Procedure for tilting up (power trim and tilt models)

1. Place the control lever in neutral.

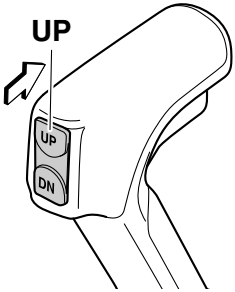


ZMU06236

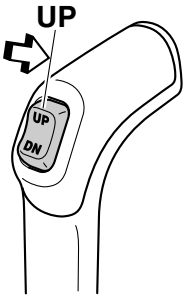


ZMU05829

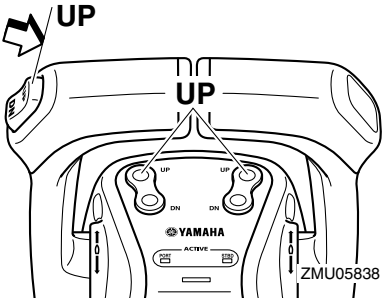
2. Press the power trim and tilt switch "**UP**" (up) until the outboard motor has tilted up completely.



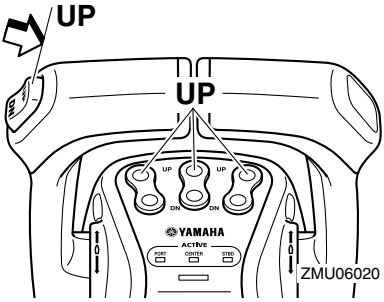
ZMU06280



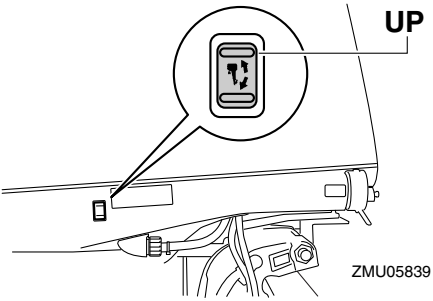
ZMU05837



ZMU05838

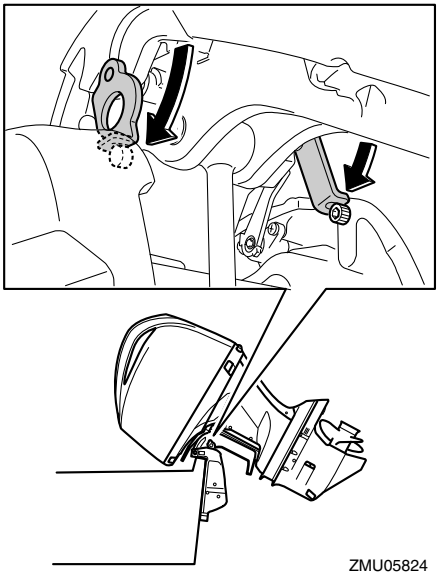


ZMU06020



ZMU05839

3. 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.** [EWM00263] ***NOTICE:* Do not use the tilt support lever or knob when trailering the boat. The outboard motor could shake loose from the tilt support and fall. If the motor cannot be trailered in the normal running position, use an additional support device to secure it in the tilt position. For more detailed information, see page 88.** [ECM01642]


ZMU05824

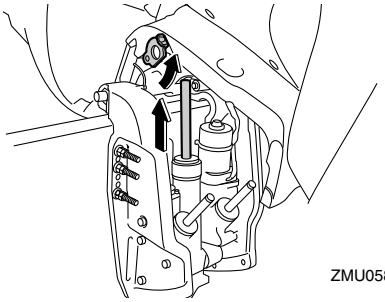
4. Once the outboard motor is supported with the tilt support lever, press the power trim and tilt switch "**DN**" (down) to retract the trim rods. ***NOTICE:* Make sure**

that the trim rods retracts completely during mooring. This protects the rods from marine growth and corrosion, which could damage the power trim and tilt mechanism. [ECM00253]

EMU35517

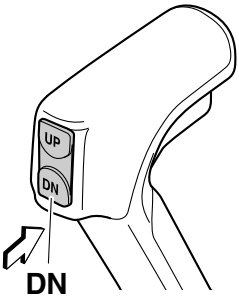
Procedure for tilting down (power trim and tilt models)

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

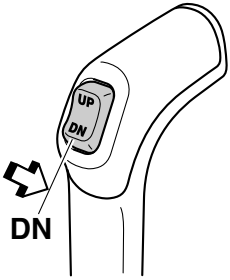


ZMU05856

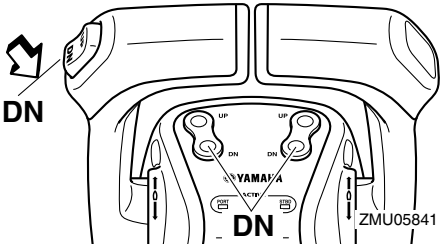
3. Push the power trim and tilt switch "**DN**" (down) to lower the outboard motor to the desired position.



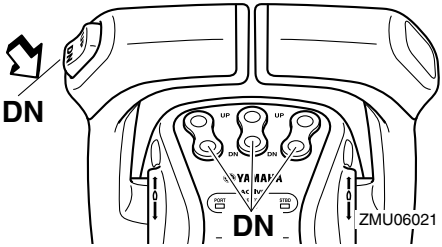
ZMU06258



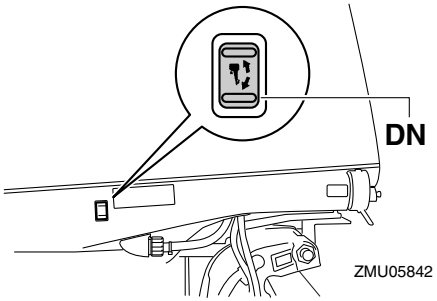
ZMU05840



ZMU05841



ZMU06021



ZMU05842

EMU28063

Shallow water

EMU42221

Power trim and tilt models

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

ECM01491

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.**

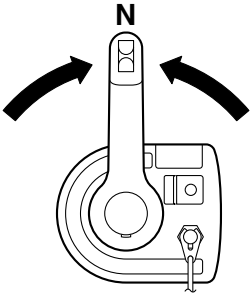
TIP:

When the outboard motor is partially tilted up for shallow water operation, the engine speed may be controlled around 2500 r/min. This occurs due to protect the power trim and tilt unit and does not indicate a malfunction. For instructions on de-activating the engine speed control system, see page 86.

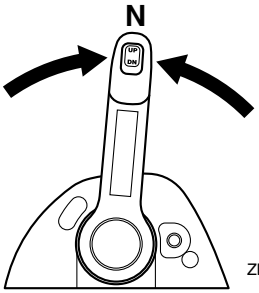
EMU35237

Procedure for power trim and tilt models

1. Place the control lever in neutral.

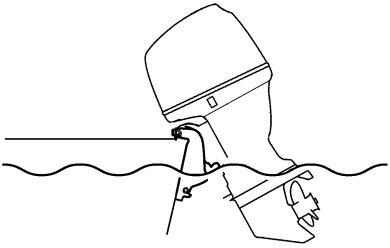


ZMU06236

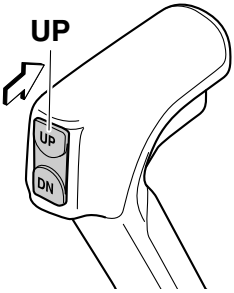


ZMU05829

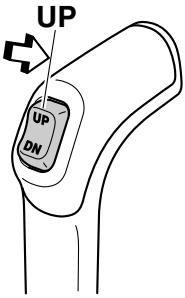
2. Slightly tilt the outboard motor up to the desired position using the power trim and tilt switch. **WARNING! Using the power trim and tilt switch on the bottom cowling while the boat is moving or engine is on could increase the risk of falling overboard and could distract the operator, increasing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



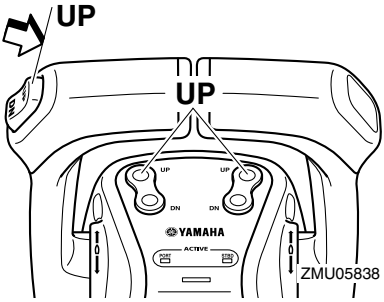
ZMU05173



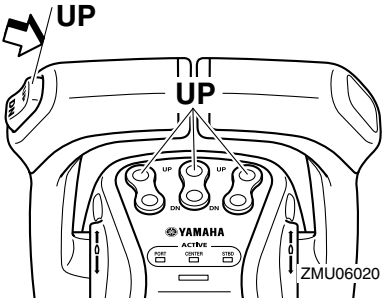
ZMU06280



ZMU05837



ZMU05838



ZMU06020

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.

EMU42232

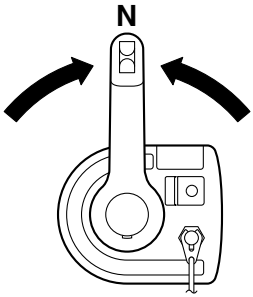
De-activating the engine speed control system

ECM02501

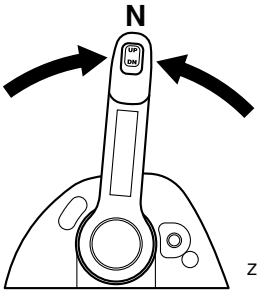
NOTICE

This procedure must be done out of the shallow water. Otherwise, the outboard motor may hits an object in the water as tilting down.

1. Close the throttle so that the engine slows to idle speed.
2. After the engine is at idle speed in gear move the control lever firmly and crisply into the neutral position.

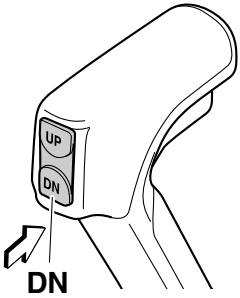


ZMU06236

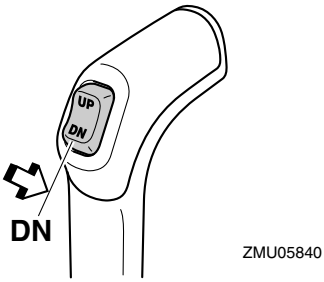


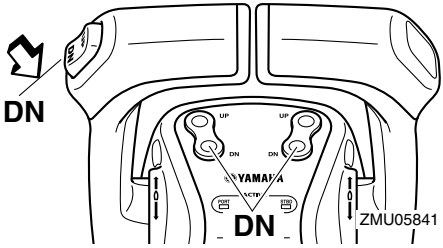
ZMU05829

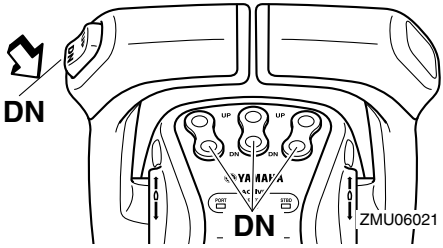
3. Press the power trim and tilt switch and tilt the outboard motor fully down.



ZMU06258







EMU41371

Operating in other conditions

Operating in salt water

After operating in saltwater, brackish water, or water high in other minerals, flush the cooling system with fresh water to minimize corrosion and clogging of the cooling water passages with deposits. Also, rinse the exterior of the outboard motor with fresh water.

Operating in water containing mud, sand, silt, debris, or vegetation

Mud, sand, silt, debris, and vegetation in the water may restrict water flow into the cooling water inlet covers or clog internal water passages. Check and clean the cooling water inlet covers frequently when operating in these conditions. Flush the engine with clean, fresh water after use in these environments. Consult your dealer if normal water flow can not be restored by cleaning the cooling water inlet covers or flushing with fresh water.

EMU31845

Transporting and storing outboard motor

EWM02641

WARNING

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

ECM02441

NOTICE

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

Leaking fuel is a fire hazard. When trailering the boat, close the fuel valve to prevent fuel from leaking.

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

When the outboard motor is tilted prolonged time for mooring or trailering the boat, close the fuel valve.

EMU35581

Storing outboard motor

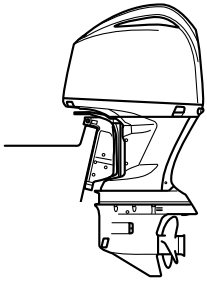
When storing your Yamaha outboard motor for prolonged periods of time (2 months or longer), several important procedures must be performed to prevent excessive damage. It is advisable to have your outboard motor serviced by an authorized Yamaha dealer prior to storage. However, you, the owner, with a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

ECM01721

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

EMU28306

Procedure

EMU41321

Draining the gasoline from the vapor separator

Gasoline in the vapor separator must be drained before storing the outboard motor.

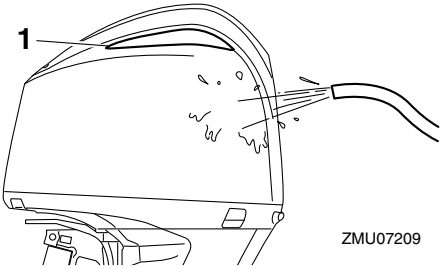
Have a Yamaha dealer drain the gasoline from the vapor separator.

EMU41142

Cleaning the outboard motor

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

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



1. Air intake

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

EMU28403

Lubrication

1. Install the spark plug(s) and torque to proper specification. For information on spark plug installation, see page 96.
2. Change the gear oil. For instructions, see page 101. 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 95.

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.

EMU28446

Flushing power unit

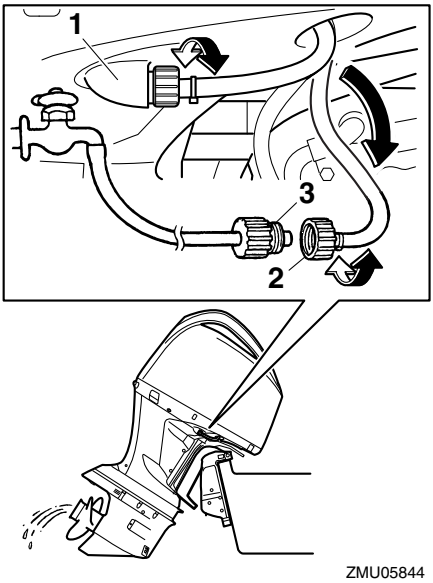
Perform this procedure right after operation for the most thorough flushing.

ECM01531

NOTICE

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

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



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

2. Screw the garden hose adapter onto a garden hose, which is connected to a fresh water supply, and then connect it to the garden hose connector.

3. With the engine off, turn on the water tap and let the water flush through the cooling passages for about 15 minutes. Turn off the water and disconnect the garden hose adapter from the garden hose connector.
4. Reinstall the garden hose connector onto the fitting on the bottom cowling. Tighten the connector securely. ***NOTICE:*** **Do not leave the garden hose connector loose on the bottom cowling fitting or let the hose hang free during normal operation. Water will leak out of the connector instead of cooling the engine, which can cause serious overheating. Be sure the connector is tightened securely on the fitting after flushing the engine.** [ECM00542]

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 88.

EMU28462

Checking painted surface of outboard motor

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

EMU2847D

Periodic maintenance

EWM01872

WARNING

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

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

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

EMU28512

Replacement parts

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

EMU34152

Severe operating conditions

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

- Operating continuously at or near maximum engine speed (rpm) for many hours

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

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

EMU34448

Maintenance chart 1

TIP:

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

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

Item	Actions	Initial	Every		
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)
Anode(s) (external)	Inspection or replacement as necessary		●/○		
Anode(s) (cylinder head, thermostat cover)	Inspection or replacement as necessary		○		
Anode(s) (exhaust joint, cylinder block, crankcase cover, Rectifier Regulator cover)	Replacement				○
Anode(s) (upper case)	Replacement				○
Battery (electrolyte level, terminal)	Inspection	●/○	●/○		
Battery (electrolyte level, terminal)	Fill, charging or replacing as necessary		○		
Cooling water leakage	Inspection or replacement as necessary	○	○		
Cowling lock lever	Inspection		●/○		
Engine starting condition/noise	Inspection	●/○	●/○		
Engine idle speed/noise	Inspection	●/○	●/○		
Engine oil	Replacement	○	○		
Engine oil filter (cartridge)	Replacement		○		

Item	Actions	Initial	Every		
		20 hours (3 months)	100 hours (1 year)	300 hours (3 years)	500 hours (5 years)
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/engine oil leakage	Inspection	○	○		
Gear oil	Replacement	●/○	●/○		
Greasing points	Greasing	●/○	●/○		
Clamp bracket bolt (through tube)	Inspection and greasing		○		
Impeller/water pump housing	Inspection or replacement as necessary		○		
Impeller/water pump housing	Replacement			○	
OCV (Oil Control Valve) filter	Replacement				○
Power trim and 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				○
Cooling water inlet	Inspection	●/○	●/○		

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

EMU34452

Maintenance chart 2

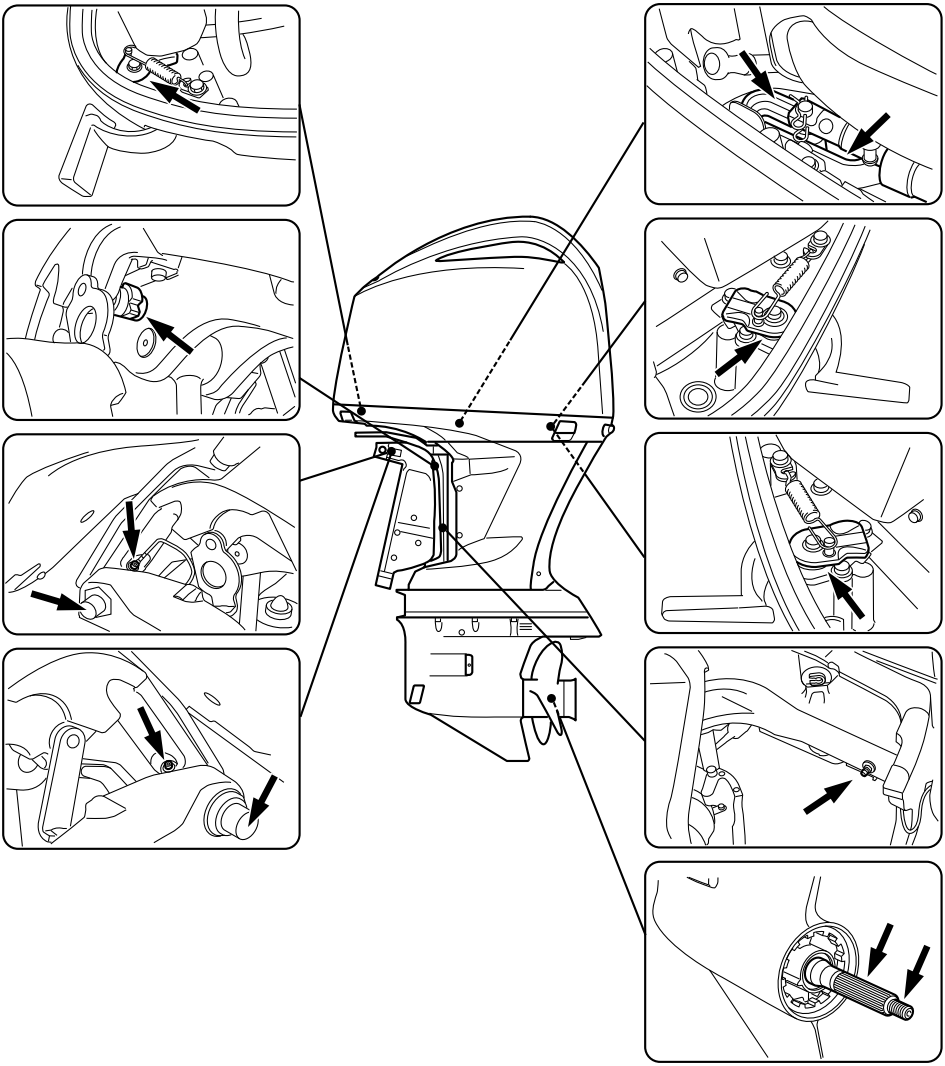
Item	Actions	Every
		1000 hours
Exhaust guide/exhaust manifold	Inspection or replacement as necessary	○
Timing belt	Replacement	○

EMU28944

Greasing

Yamaha grease A (water resistant grease)

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



ZMU05859

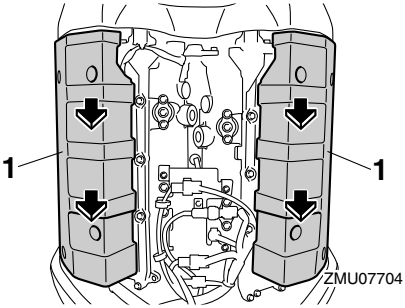
EMU44282

Inspecting spark plug

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

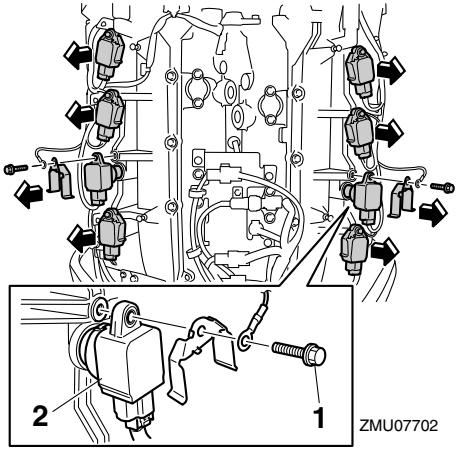
To remove the spark plug

1. Remove the covers of both port and starboard sides.



1. Cover

2. Remove the bolt that is securing the ignition coil, and then remove the ignition coil. ***NOTICE:*** **Do not use any tools to remove or install the ignition coil. Otherwise, the ignition coil coupler could be damaged.** [ECM02331]



1. Bolts
2. Ignition coil

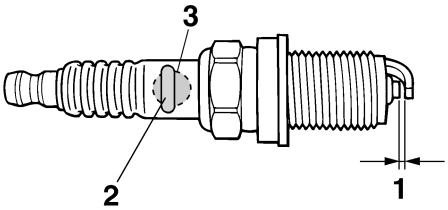
3. Remove the spark plug. **WARNING! When removing or installing a spark plug, be careful not to damage the insulator. A damaged insulator could allow external sparks, which could lead to explosion or fire.** [EWM00562]

To check the spark plug

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

Standard spark plug: LFR6A-11

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



ZMU01797

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

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

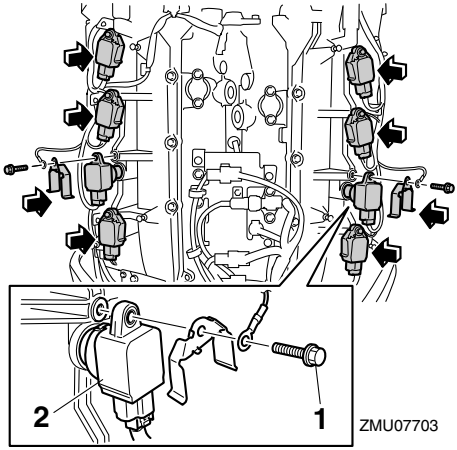
To install the spark plug

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

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

TIP:
If a torque-wrench is not available when you are reinstalling a spark plug, a good estimate of the correct torque is 1/12 turn past finger-tight. When you are installing a new spark plug, a good estimate of the correct torque is 1/2 to 2/3 turn past finger-tight.

3. Install the ignition coil, and then tighten the bolt to the specified torque.

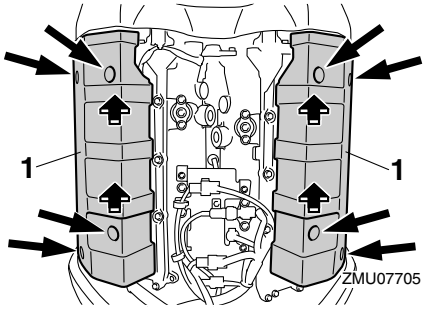


ZMU07703

1. Bolt
2. Ignition coil

Bolt tightening torque:
9 Nm (0.92 kgf-m, 6.6 ft-lb)

4. Fit the four positions and install the covers of both port and starboard sides securely.



ZMU07705

1. Cover

EMU41872

Inspecting engine idle speed

ECM01691

NOTICE

This procedure must be performed while

the outboard motor is in the water.

Inspect the engine idle speed using the meter that is equipped on the boat. 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. Inspect the engine idle speed. If the engine idle speed is out of specification, consult a Yamaha dealer or other qualified mechanic.

Idle speed (in neutral):
600–700 r/min

EMU35085

Changing engine oil

ECM01711

NOTICE

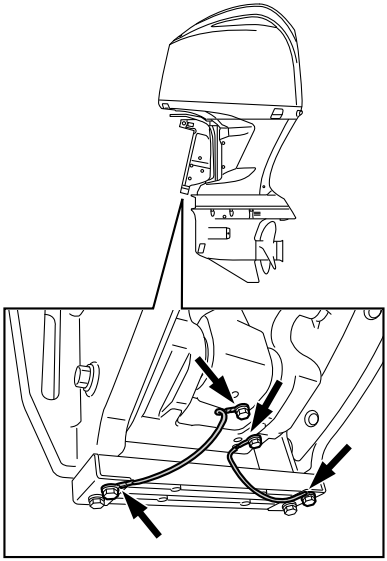
Change the engine oil after the first 20 hours of operation or 3 months, and every 100 hours or at 1-year intervals thereafter. Otherwise the engine will wear quickly.

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

EMU29115

Inspecting wiring and connectors

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



ZMU05867

EMU29175

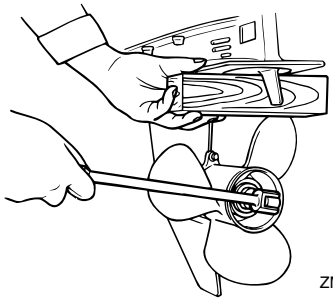
Checking propeller

EWM01882

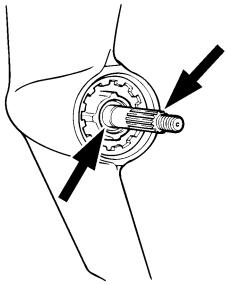
WARNING

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

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


ZMU01897

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


ZMU01803

- Check the propeller shaft oil seal for damage.

EMU30663

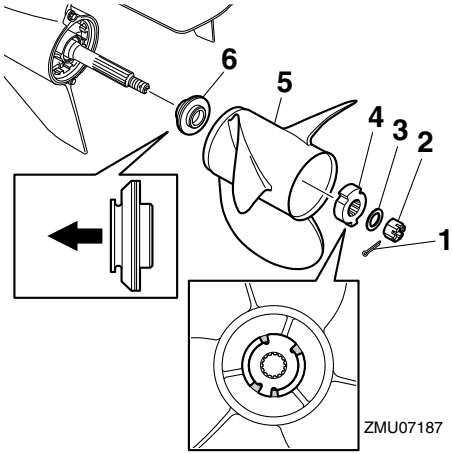
Removing propeller

EMU29198

Spline models

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

   [EWM01891]



ZMU07187

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

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

EMU30673

Installing propeller

EMU42243

Spline models

EWM00771

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.

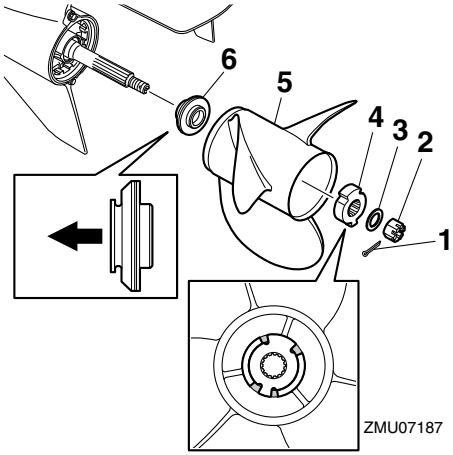
ECM00502

NOTICE

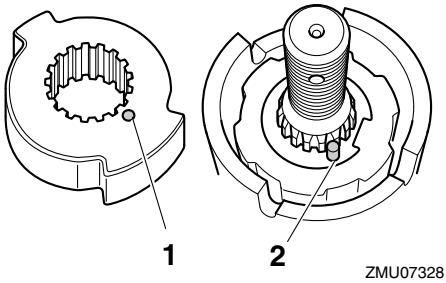
Make sure to use a new cotter pin and bend the ends over securely. Otherwise, the propeller could come off during oper-

ation 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:*** **Make sure to install the thrust washer before installing the propeller. Otherwise, the lower case and propeller boss could be damaged.** [ECM01882]
3. If there is a pin on the damper, align with the hole in the spacer. Install the spacer and washer. Tighten the propeller nut to the specified torque.



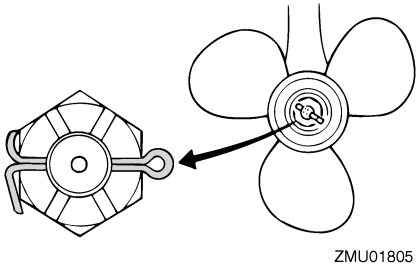
1. Cotter pin
2. Propeller nut
3. Washer
4. Spacer
5. Propeller
6. Thrust washer



1. Hole
2. Pin

Propeller nut tightening torque:
54 Nm (5.51 kgf-m, 39.8 ft-lb)

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



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.

EMU31918

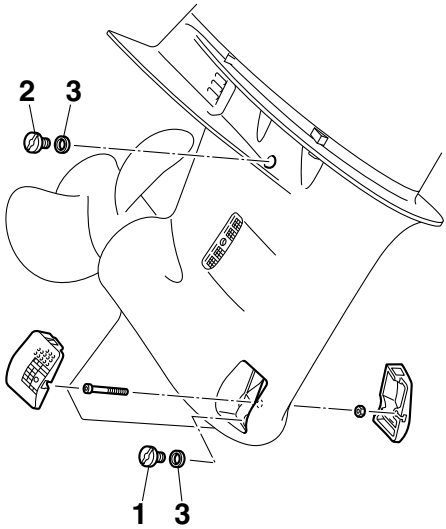
Changing gear oil

EWM00801

WARNING

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

1. Tilt the outboard motor so that the gear oil drain screw is at the lowest point possible.
2. Place a suitable container under the gear case.
3. Remove the 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 excessive quantity of metal particles on the magnetic gear oil drain screw, this can indicate lower unit problem. Consult your Yamaha dealer.** [ECM01901]



ZMU05870

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

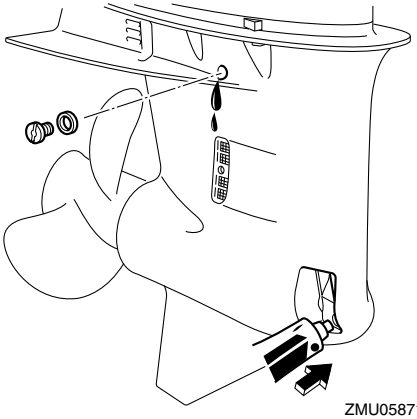
5. Remove the oil level plug and gasket to allow the oil to drain completely. ***NOTICE:*** **Check the used gear oil after it has been drained. If the gear oil is milky or contains water or a large amount of metal particles, the gear case may be damaged. Have a Yamaha dealer check and repair the outboard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

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:
YAMALUBE outboard gear oil or Hypoid gear oil
Recommended gear oil grade:
SAE 80W API GL-5 / SAE 90 API GL-5
Gear oil quantity:
F350AET 1.520 L (1.607 US qt, 1.338 Imp.qt)
F350AET2 1.520 L (1.607 US qt, 1.338 Imp.qt)
FL350AET 1.310 L (1.385 US qt, 1.153 Imp.qt)
FL350AET2 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 (0.92 kgf-m, 6.6 ft-lb)

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

Tightening torque:
9 Nm (0.92 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:
2.0 Nm (0.20 kgf-m, 1.5 ft-lb)

EMU29317

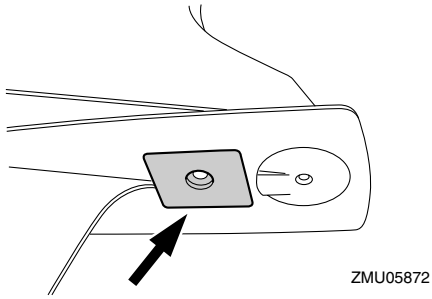
Inspecting and replacing anode(s)

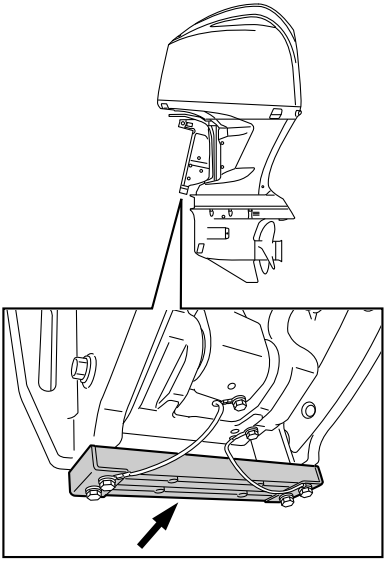
Yamaha outboard motors are protected from corrosion by sacrificial anodes. Inspect the external anodes periodically. Remove scales from the surfaces of the anodes. Consult a Yamaha dealer for replacement of external anodes.

ECM00721

NOTICE

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





ZMU05873

TIP:

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

EMU29324

Checking battery (for electric start models)

EWM01903

WARNING

Battery electrolyte is poisonous and caustic, and batteries generate explosive hydrogen gas. When working near the battery:

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

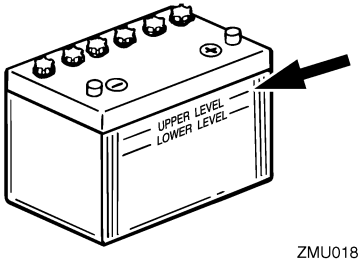
The procedure for checking the battery varies for different batteries. This procedure contains typical checks that apply to many batteries, but you should always refer to the battery manufacturer's instructions.

ECM01921

NOTICE

A poorly maintained battery will quickly deteriorate.

1. Check the electrolyte level.



ZMU01810

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

[EWM01913]

EMU35606

Connecting the battery

EWM00573

WARNING

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

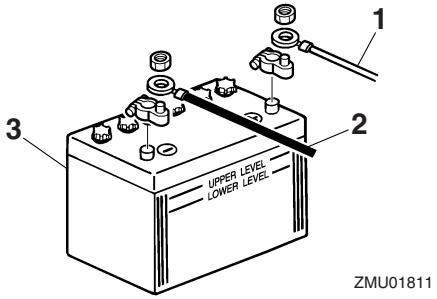
ECM01125

NOTICE

Do not reverse the battery cables. Other-

wise, the electrical parts could be damaged.

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



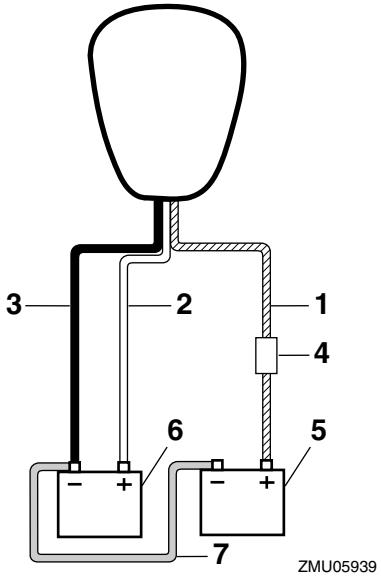
1. Red cable
2. Black cable
3. Battery

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)

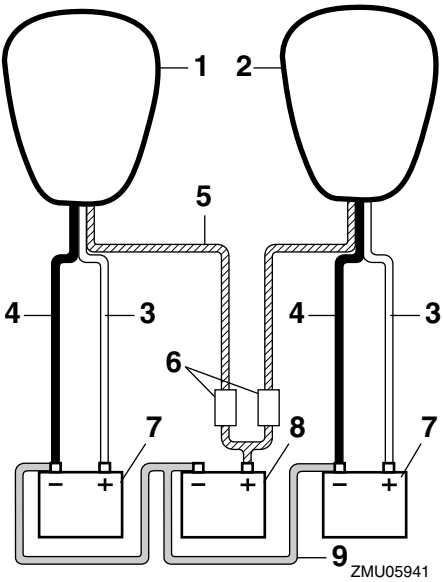
1. If connecting an accessory battery, consult your Yamaha dealer about correct wiring. It is recommendable to install the fuse to the isolator lead as shown in the illustration. For the fuse size, be sure to follow local regulations. For example, for USA, the ABYC rules (E-11) should be observed.

Single engine



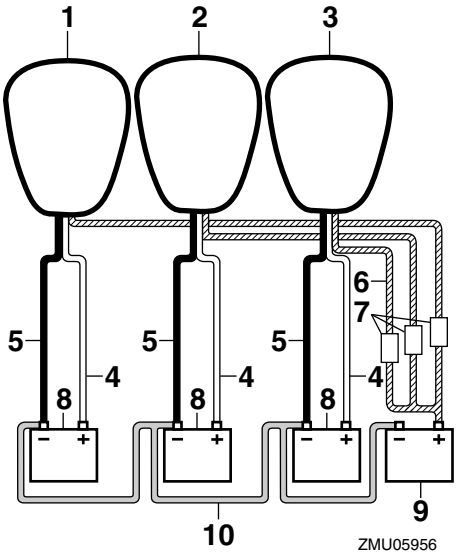
1. Isolator lead with circuit protection
2. Red cable
3. Black cable
4. Fuse
5. Battery for accessories
6. Battery for starting
7. Negative connecting cable

Twin engines



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

EMU29372

Disconnecting the battery

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

3. Disconnect the positive cable(s) and remove the battery from the boat.
4. Clean, maintain, and store the battery according to the manufacturer's instructions.

EMU38661

Storing the battery

When storing your Yamaha outboard motor for prolonged periods of time (2 months or longer), remove the battery and store it in a cool, dry place.

Check the battery and charge it if necessary.

EMU41561

Troubleshooting

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

The Yamaha Security System does not operate correctly.
Q. Is receiver within the communicating range from the remote control transmitter?
A. Operate remote control transmitter within the communicating range from the receiver.

Q. Is main switch "**ON**" position?
A. Turn main switch to "**OFF**" position.

Q. Is communication obstructing objects such as other source of communication machine or metal close by?
A. Operate remote control transmitter away from the other source of communication machine or metal.

Q. Is remote control transmitter registered?
A. Use remote control transmitter registered with the receiver.

Q. Has the battery cell of the remote control transmitter discharged?
A. Operate from spare remote control transmitter or replace battery cell by a Yamaha dealer.

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

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

Starter will not operate.
Q. Is your Yamaha Security System in the lock mode?
A. Set the security system to the unlock mode. For further information, see page 24.

Q. Does the Digital electronic control-alert indicator come on?
A. Have serviced by a Yamaha dealer.

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

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

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

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

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

Engine will not start (starter operates).
Q. Is clip on engine shut-off cord (lanyard) in-

stalled?
A. Install clip to engine shut-off switch.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Alert buzzer sounds or indicator lights.

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

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

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

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

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

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

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

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

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

Engine power loss.

Q. Is propeller damaged?
A. Have propeller repaired or replaced.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Q. Is engine not responding properly to control lever position?
A. Have serviced by a Yamaha dealer.

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

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

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

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

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

EMU29434

Temporary action in emergency

EMU29442

Impact damage

EWM00871

WARNING

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

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

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

EMU35791

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.

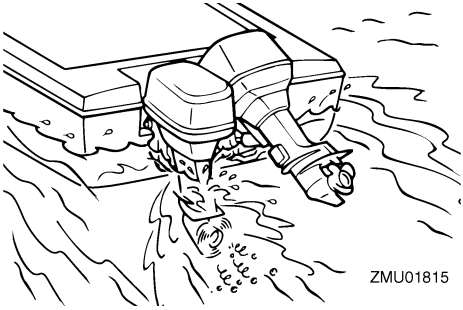
ECM01731

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 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.



EMU29475

Replacing fuse

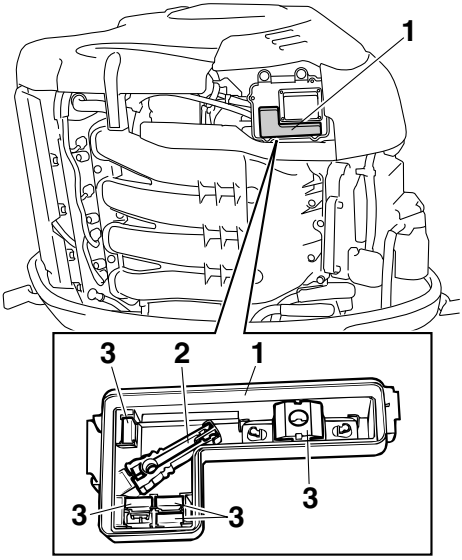
If a fuse has blown, remove the electrical cover, open the fuse holder and remove the fuse with a fuse puller (if equipped). Replace it with a spare one of the proper amperage.

EWM00632

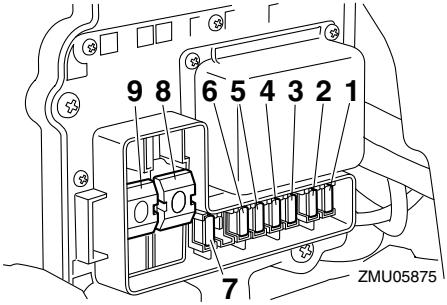
WARNING

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

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



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



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 / Digital electronic 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)

EMU35401

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.

EMU35614

Water separator-alert indicator blinks while cruising

EWM01501

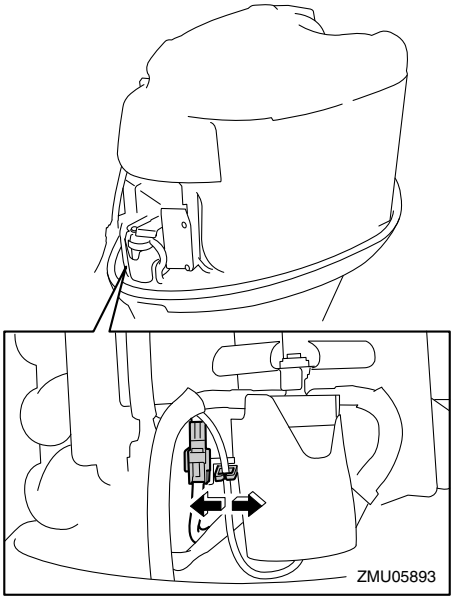
WARNING

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

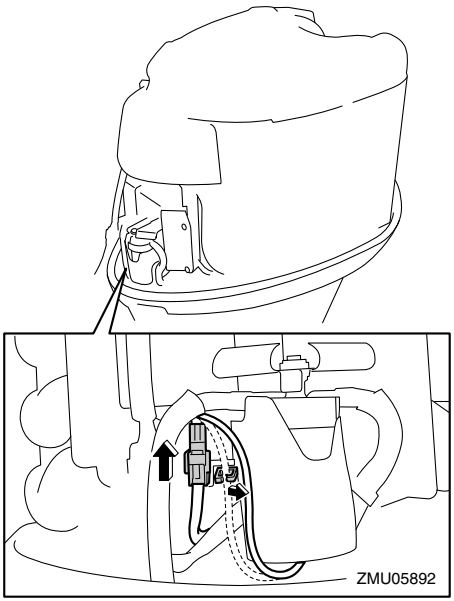
- **Do not perform this procedure on a hot or running engine. Allow the engine to cool.**
- **There will be fuel in the fuel filter. Keep away from sparks, cigarettes, flames or other sources of ignition.**
- **This procedure will allow some fuel to spill. Catch fuel in a rag. Wipe up any spilled fuel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

If the water separator-alert indicator blinks, perform the following procedure.

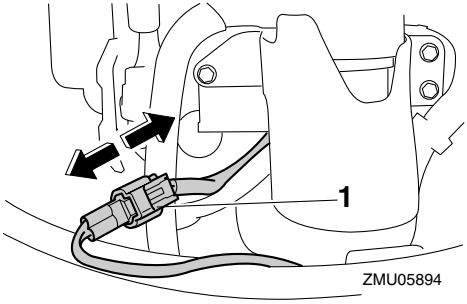
1. Stop the engine.
2. Remove the top cowling.
3. Disconnect the lead from the holder.



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

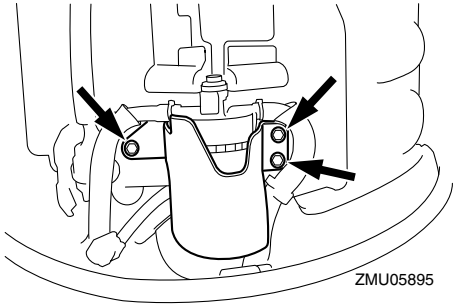


5. Disconnect the water detection switch coupler. ***NOTICE:*** **Be careful not to get any water on the water detection switch coupler, otherwise a malfunction could occur.** [ECM01951]

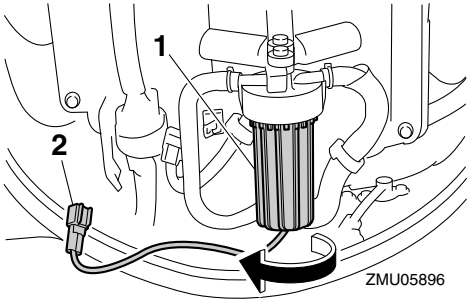


1. Water detection switch coupler

6. Remove the bolts to remove the cover.

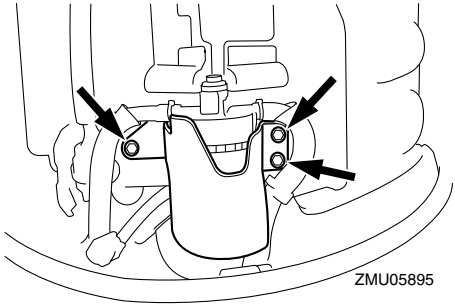


7. Unscrew the filter cup from the filter housing. ***NOTICE:*** **Be careful not to twist the water detection switch lead when unscrewing the filter cup.** [ECM01961]



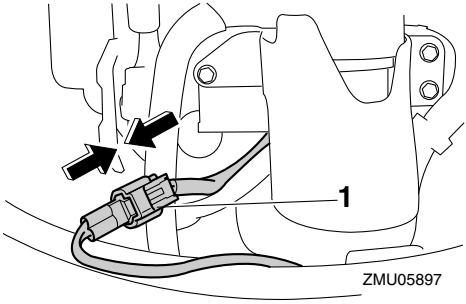
1. Filter cup
2. Water detection switch lead

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.** [ECM01971]
10. Install the cover, and tighten the bolts.



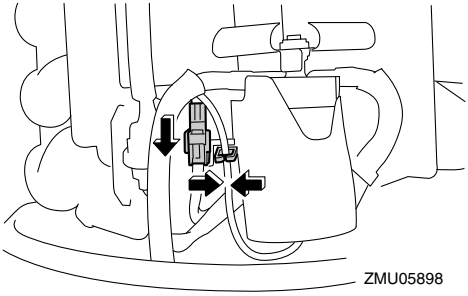
Bolt tightening torque:
8 Nm (0.82 kgf-m, 5.9 ft-lb)

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.

EMU33502

Treatment of submerged motor

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

6

6Y8 Multifunction fuel management meters 46
6Y8 Multifunction meters 42
6Y8 Multifunction speed & fuel meters 45
6Y8 Multifunction speedometers 45
6Y8 Multifunction tachometers 42
6Y9 Multifunction Color Gauge..... 39

A

Alcohol and drugs 2
Alert system 48
All Start/Stop switch panel 34
Anode(s), inspecting and replacing..... 102
Anti-fouling paint 15
Approval label of emission control certificate 15
Avoid collisions 3

B

Battery 59
Battery, checking (electric start models) 103
Battery, connecting 103
Battery, disconnecting 105
Battery requirements 12
Battery, storing..... 106
Boat direction..... 74
Boat horsepower rating..... 11
Boating safety 2
Boating safety publications 3
Breaking in engine 54

C

Carbon monoxide 2
CE Marking 5
Checks after engine warm up 67
Checks after starting engine 66
Checks before starting engine 54
Cleaning the outboard motor 89
Components diagram 18
Control functions, checking..... 56
Cooling water..... 66
Cowling, installing 57
Cowling lock lever 36
Cowling, removing 55
C-Tick label 6

D

De-activating the engine speed control system 86
Digital electronic control..... 25
Digital electronic control-active indicator 26
Digital Electronic Control alert 48
Digital electronic control-alert indicator 26
Digital electronic control requirements..... 12
Digital electronic control serial number 4
Draining the gasoline from the vapor separator 88

E

EC Declaration of Conformity (DoC)..... 5
Electric shock..... 1
Emergency equipment 15
Emergency, running in an 111
Emergency, temporary action in 110
Emission control information..... 15
Engine, checking 57
Engine idle speed, inspecting 97
Engine oil 56
Engine oil, changing 98
Engine oil, filling 54
Engine oil requirements 14
Engine selector switch 30
Engine shut-off cord (lanyard) 1, 56
Engine shut-off cord (lanyard) and clip 31
Engine synchronization indicator 39
Engine trouble alert..... 41, 44
Engine warm-up indicator 39

F

Filling fuel..... 59

INDEX

First-time operation 54
Flushing device 37, 57
Flushing power unit 89
Free throttle switch 28
Fuel filter 37
Fuel filter, checking 55
Fuel leaks, checking for 55
Fuel level 55
Fuel requirements 14
Fuel system 55
Fuse, replacing 111

G

Gasoline 1, 14
Gasoline exposure and spills 2
Gear oil, changing 101
Greasing 95

H

Hot parts 1

I

Identification numbers record 4
Impact damage 110
Installation requirements 11

K

Key number 5

L

Laws and regulations 3
Low battery voltage-alert 41, 44
Low oil pressure alert 50
Low oil pressure-alert 40, 43
Lubrication 89

M

Main switch 32
Maintenance chart 1 92
Maintenance chart 2 94
Manufactured date label 16
Modifications 2
Motor disposal requirements 15
Mounting height 52
Mounting motor 11
Mounting the outboard motor 52

N

Neutral interlock trigger 28

O

Operating engine 59
Operating in salt water or other conditions 87
Operating the port / center / starboard engine 70
Optional meters 47
Outboard motor (painted surface), checking 90
Outboard motor safety 1
Outboard motor, selecting 67
Outboard motor serial number 4
Overheat alert 40, 44, 48
Overloading 2

P

Passengers 2
Passenger training 3
People in the water 2
Periodic maintenance 90
Personal flotation devices (PFDs) 2
Power trim and tilt 1
Power trim and tilt switch (bottom cowling) 35
Power trim and tilt switch (digital electronic control) 34
Power trim and tilt switches 35
Power trim and tilt system, checking 58
Power trim and tilt will not operate 112
Propeller 1
Propeller, checking 98
Propeller (counter rotation models) 13
Propeller, installing 99
Propeller, removing 99
Propeller selection 13

R

Read manuals and labels 7

Remote control lever 27
Remote control transmitter 23
Replacement parts 90
Rotating parts 1

S

Sending fuel 60
Severe operating conditions 90
Shallow water 85
Shifting 69
Shifting
(checks after engine warm up) 67
Spark plug, inspecting 96
Specifications 10
Star labels 16
Start-in-gear protection 13
Starting engine 60
Start/Stop switch panel 33
Station, changing 60
Station selector switch 30
Stopping boat 70
Stopping engine 77
Stop switches 67
Storing outboard motor 88
Submerged outboard motor 114

T

Throttle friction adjuster 29
Tilting up and down 82
Tilt limiter 36
Tilt support lever 36
Transporting and storing
outboard motor 88
Trimming outboard motor 80
Trolling 77
Troubleshooting 107

W

Warming up engine 67
Warning labels 7
Water separator alert 41, 44, 51
Water separator-alert
indicator blinks while cruising 112
Weather 3
Wiring and connectors, inspecting 98

Y

Yamaha Security System 11
YAMAHA SECURITY SYSTEM
indicator 39
Yamaha Security System
information 43
Yamaha Security System
lock and unlock mode 24

Printed in Japan
December 2013–0.1 × 1

Printed on recycled paper