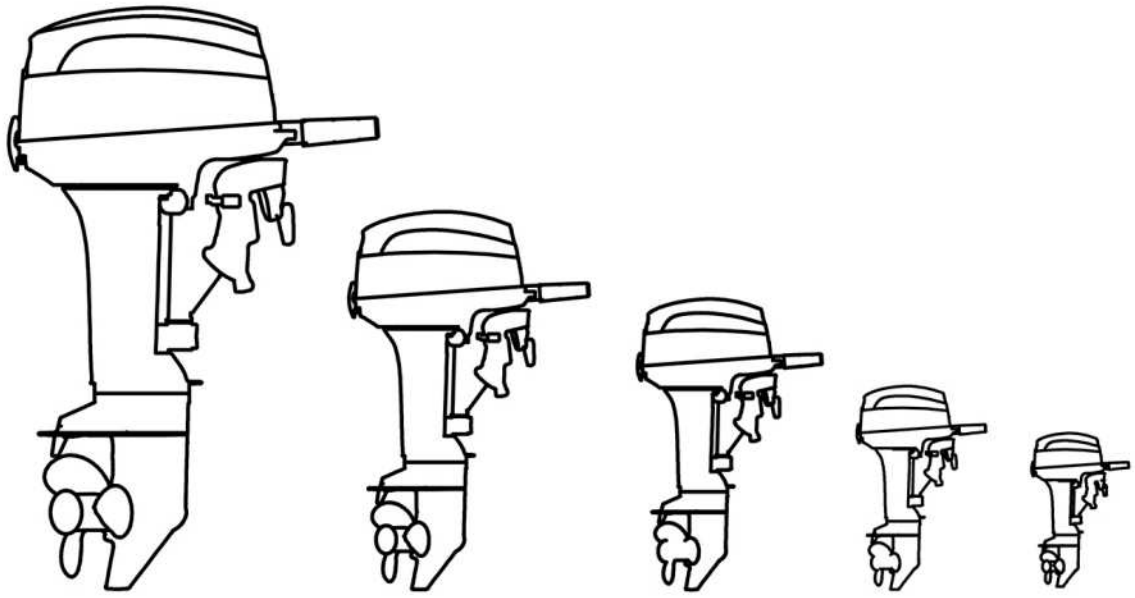
Owner's Manual

F5 F6



FOCUS ON DETAILS
ENJOY THE QUALITY

To the owner

Thank you for choosing outboard motor of this brand . 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 Outboard. If you have any question about the operation or maintenance of your outboard motor, please consult dealer.

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

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING

Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the outboard motor.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the outboard motor.

NOTE:

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

Company 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 dealer.

To ensure long product life , 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.

NOTE:

The F6B 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.

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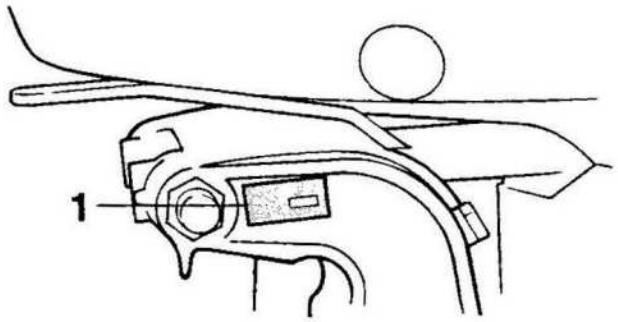
Table of contents

General information

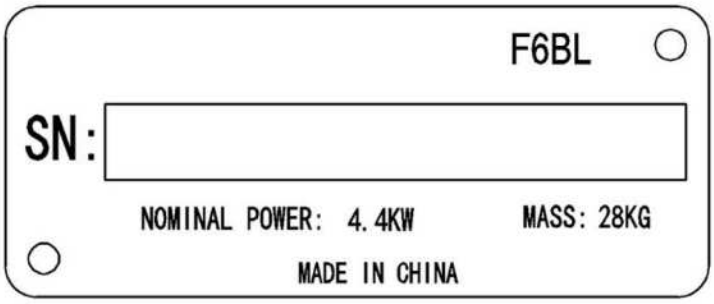
Identification numbers record

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 dealer or for reference in case your outboard motor is stolen.



1. Outboard motor serial number location



Read manuals and labels

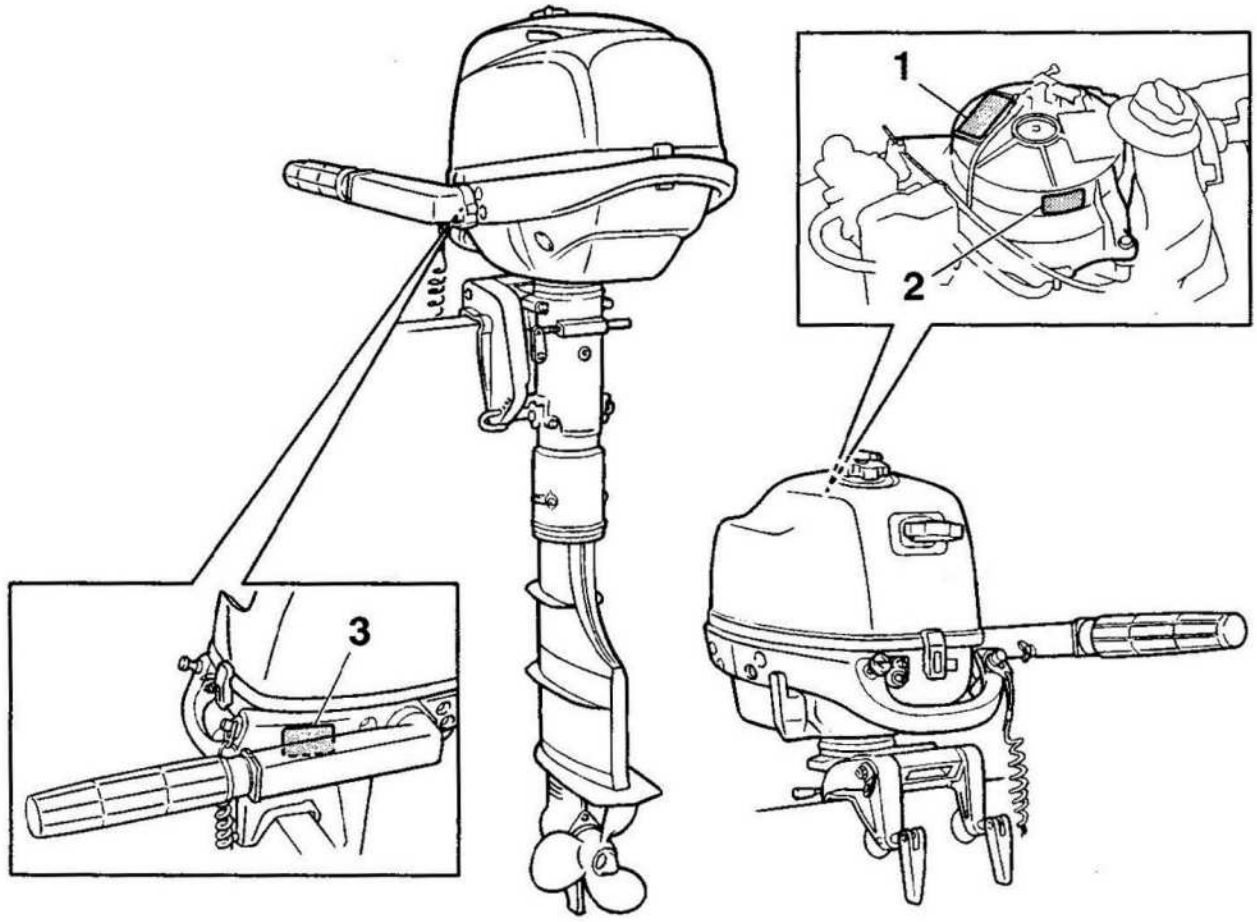
Before operating or working on this motor:

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

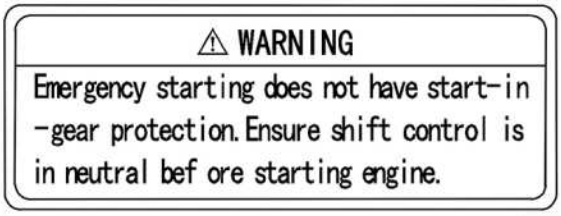
If you need any additional information, contact your dealer.

Warning labels

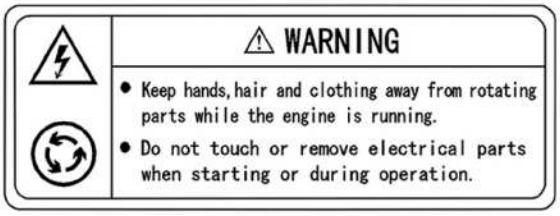
If these labels are damaged or missing, contact your dealer for replacements.



1



2



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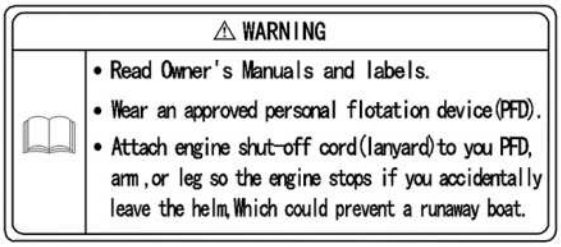


Contents of labels

The above warning labels mean as follows.

1

⚠ WARNING

Emergency starting does not have start-in-gear protection. Ensure shift control is in neutral before starting engine.

2

⚠ 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.**

3

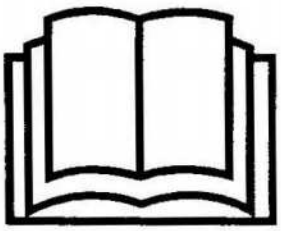
⚠ WARNING

- **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.**

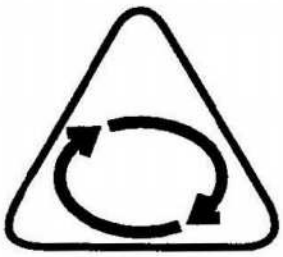
Symbols
The following symbols mean as follows.

Caution/Warning

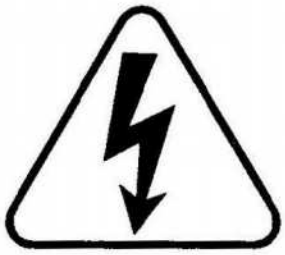
Read Operator's Manual



Hazard caused by continuous rotation

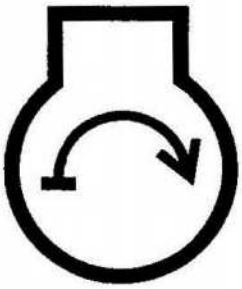


Electrical hazard



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

Engine start/ Engine cranking



Safety information

Observe these precautions at all times.

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.

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.

Electric shock

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

Engine shut-off cord

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.

Gasoline

Gasoline and its vapors are highly flammable and explosive. Always, refuel according to the procedure on page 22 to reduce the risk of fire and explosion.

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.

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.

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.

Boating safety

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

Alcohol and drugs

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

Personal flotation devices

Have an approved personal flotation device (PFD) on board for every occupant.
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.

People in the water

Always watch carefully for people in the water, such as swimmers, skiers, or divers, whenever the engine is running. When someone is in the water near the boat, shift into neutral and shut off the motor.
Stay away from swimming areas. Swimmers can be hard to see.
The propeller can keep moving even when the motor is in neutral. Shut off the engine when a person is in the water near you.

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.

Overloading

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

Avoid collisions

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

Safety information

Weather

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

Passenger training

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

Boating safety publications

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

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.

Fueling instructions

⚠ WARNING

GASOLINE AND ITS VAPORS ARE HIGHLY FLAMMABLE AND EXPLOSIVE!

- **Do not smoke when refueling, and keep away from sparks, flames, or other sources of ignition.**
- **Stop engine before refueling.**
- **Refuel in a well-ventilated area. Refuel portable fuel tanks off the boat.**
- **Take care not to spill gasoline. If gasoline spills, wipe it up immediately with dry rags.**
- **Do not overfill the fuel tank.**
- **Tighten the filler cap securely after refueling.**
- **If you should swallow some gasoline, inhale a lot of gasoline vapor, or get gasoline in your eyes, get immediate medical attention.**
- **If any gasoline spills onto your skin, immediately wash with soap and water. Change clothing if gasoline spills on it.**
- **Touch the fuel nozzle to the filler opening or funnel to help prevent electrostatic sparks.**

CAUTION:

Use only new clean gasoline which has been stored in clean containers and is not contaminated with water or foreign matter.

Gasoline

Recommended gasoline:
Regular unleaded gasoline

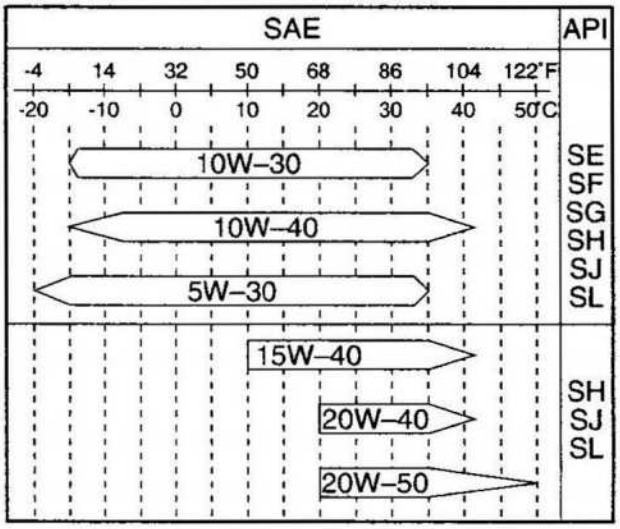
If knocking or pinging occurs, use a different brand of gasoline or premium unleaded fuel. If unleaded gasoline is not available, then premium gasoline can be used. If leaded gasoline is usually used, engine valves and related parts should be inspected after every 100 hours of operation.

Engine oil

Recommended engine oil:
4-stroke motor oil with a combination of the following SAE and API oil classifications
Engine oil type SAE:
10W-30 or 10W-40
Engine oil grade API:
SE, SF, SG, SH, SJ, SL
Engine oil quantity (excluding oil filter):
0.5 L (0.53 US qt) (0.44 Imp.qt)

NOTE:

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



CAUTION:

All 4-stroke engines are shipped from the factory without engine oil.

Installation requirements

Boat horsepower rating

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

⚠ WARNING

Overpowering a boat can cause severe instability.

Mounting motor

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 18.

⚠ 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.**

Propeller selection

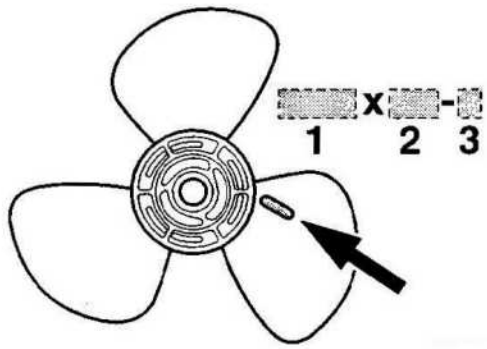
Next to selecting an outboard, choosing the right propeller is one of the most important purchasing decisions a boater can make. The type, size, and design of your propeller have a direct impact on acceleration, top speed, fuel economy, and even engine life. manufactures propellers for every outboard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

Your outboard motor came with a propeller chosen to perform well over a range of applications, but there may be uses where a different propeller would be more appropriate.

Your 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, chose a larger pitch propel ler for a smaller operating load and a smaller pitch propeller for a heavier load. If you carry loads

that vary widely, chose the propeller that lets the engine run in the proper range for your maximum load but remember that you may need to reduce your throttle setting to stay within the recommended engine speed range when carrying lighter loads.
For instructions on propeller removal and installation, see page 48.



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

Start-in-gear protection

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

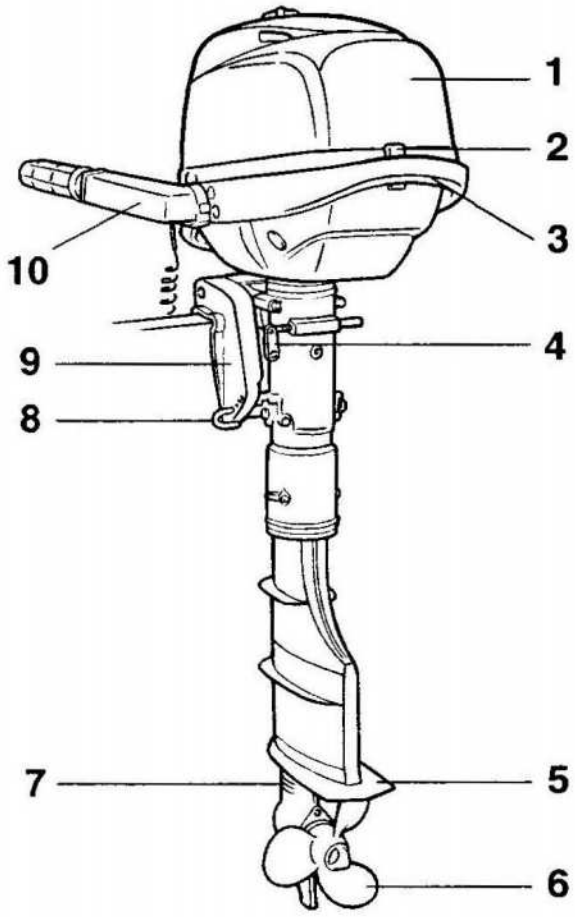
Basic components

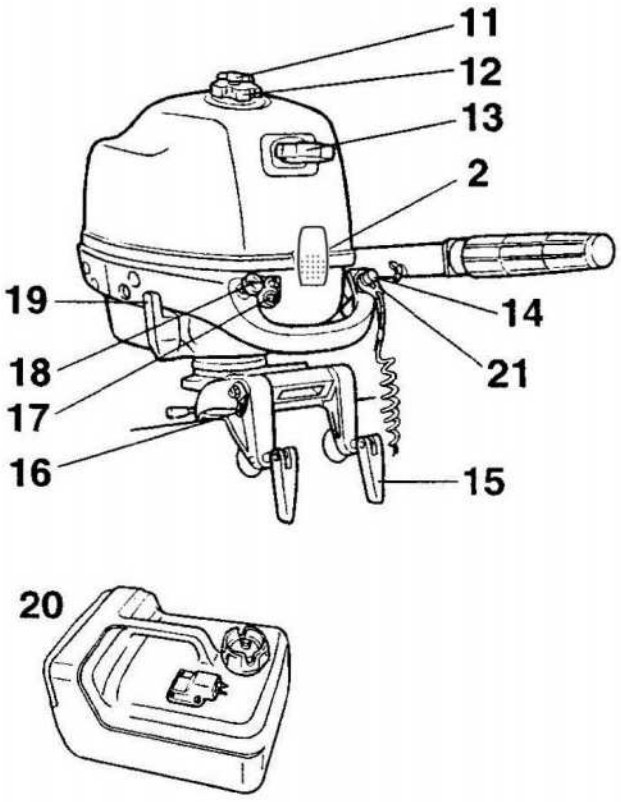
Main components

NOTE:

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

F5B F6B





1. Top cowling
2. Top cowling lock lever
3. Carrying handle
4. Steering friction screw
5. Anti-cavitation plate
6. Propeller
7. Cooling water inlet
8. Trim rod
9. Clamp bracket
10. Tiller handle
11. Air vent screw
12. Fuel tank cap
13. Manual starter handle
14. Engine stop button/Engine shut-off switch
15. Clamp screw
16. Rope attachment
17. Fuel joint
18. Choke knob
19. Gear shift lever
20. Fuel tank*
21. Clip

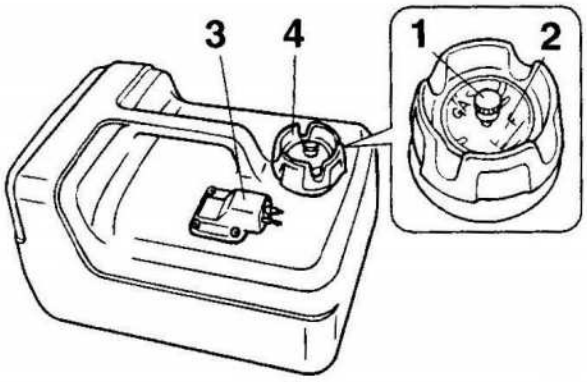
Fuel tank

If your model was equipped with a portable

fuel tank, its function is as follows.

⚠ WARNING

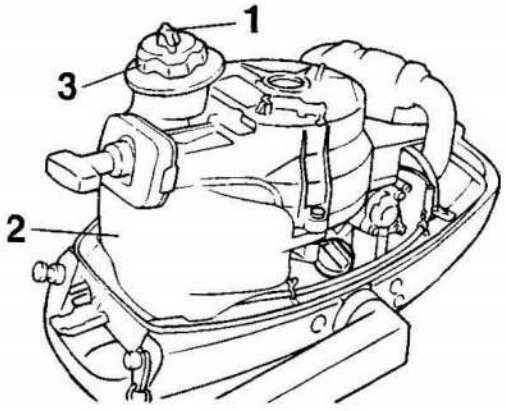
The fuel tank supplied with this engine is its dedicated fuel reservoir and must not be used as a fuel storage container. Commercial users should conform to relevant licensing or approval authority regulations.



1. Air vent screw
2. Fuel gauge
3. Fuel joint
4. Fuel tank cap

Fuel tank

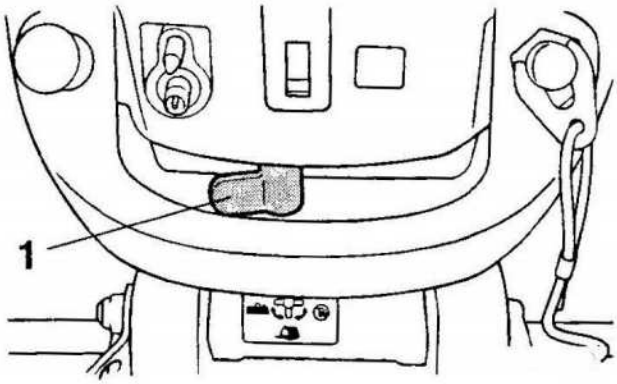
If your model included a fuel tank, its parts and functions are as follows.



1. Air vent screw
2. Built-in fuel tank
3. Fuel tank cap

Fuel cock

The fuel cock turns on and off the supply of fuel from the fuel tank to the engine.

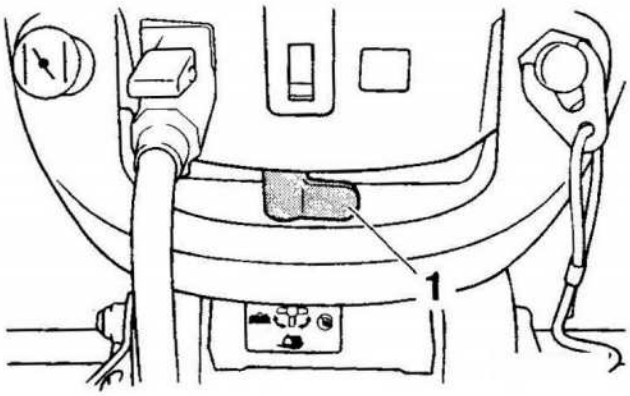


1. Fuel cock

Close

To stop fuel flow to the engine, turn the lever or knob to close position.

Always turn the lever or knob to close position when the engine is not running.



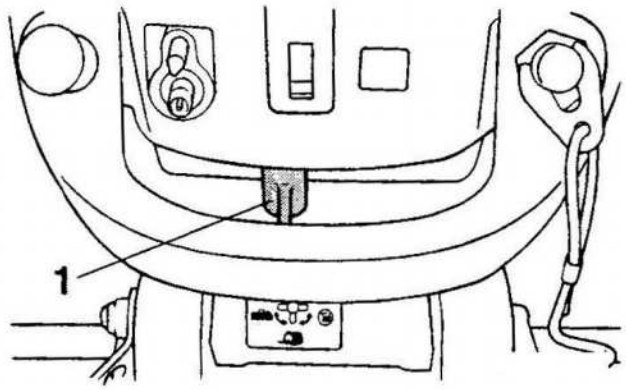
1. Close position

Open

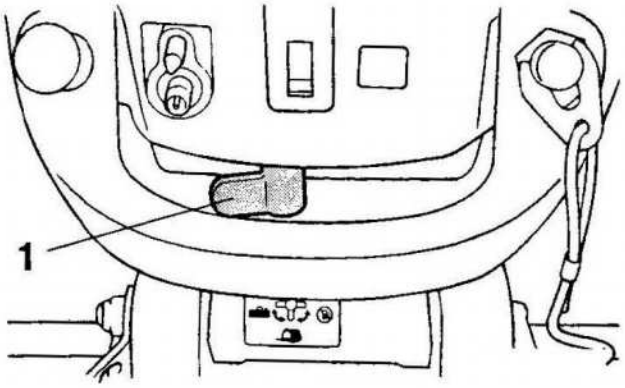
The fuel cock has two open positions, one for selecting fuel flow from the built-in fuel tank, and one for an external tank.

Fuel flows to the carburetor with the lever or knob in either open position. These are the normal running positions.

Basic components



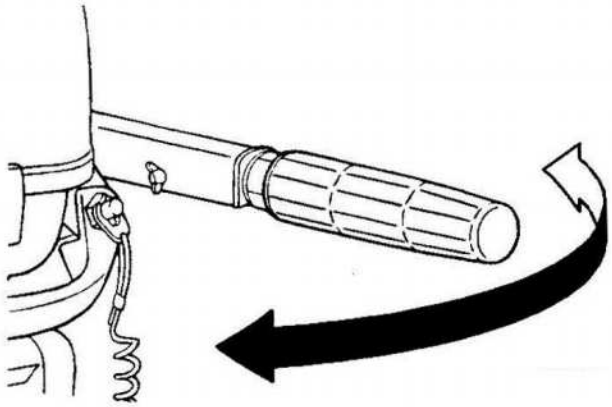
1. "OPEN" position for the built-in tank



1. "OPEN" position for the portable tank

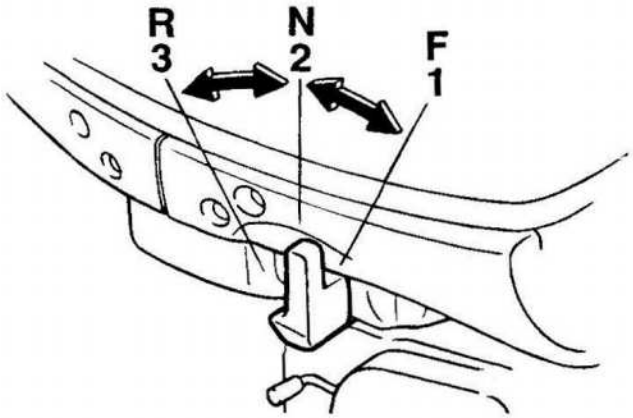
Tiller handle

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



Gear shift lever

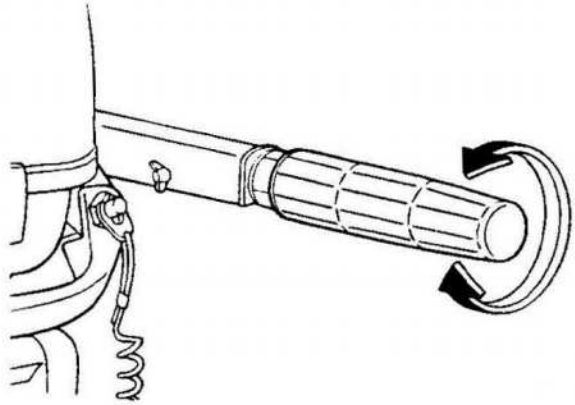
Pulling the gear shift lever towards you puts the engine in forward gear so that the boat moves ahead. Pushing the lever away from you puts the engine in reverse gear so that the boat moves astern.



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

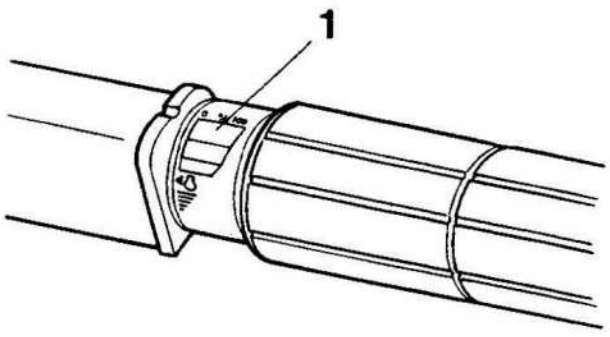
Throttle grip

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



Throttle indicator

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



1. Throttle indicator

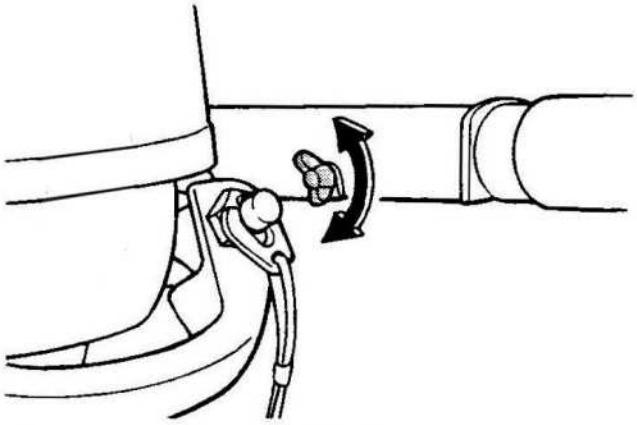
Throttle friction adjuster

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

To increase resistance, turn the adjuster clockwise. To decrease resistance, turn the adjuster counterclockwise.

⚠ WARNING

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



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

Engine shut-off switch

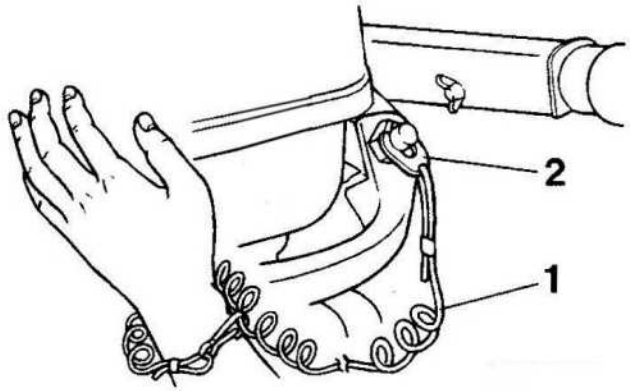
The clip must be attached to the engine shut-off switch for the engine to run. The cord should be attached to a secure place on the operator's clothing, or arm or leg. Should the operator fall overboard or leave the helm, the cord will pull out the clip, stopping ignition to the engine. This will prevent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

⚠ WARNING

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

NOTE:

The engine cannot be started with the clip removed.

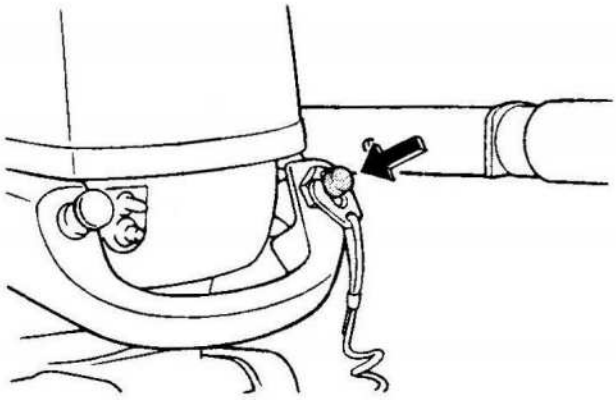


1. Cord

2. Clip

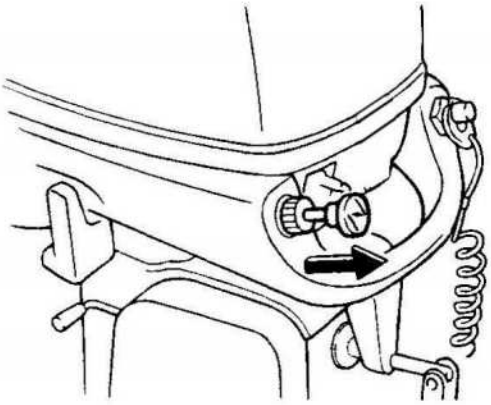
Engine stop button

To open the ignition circuit and stop the engine, push this button.



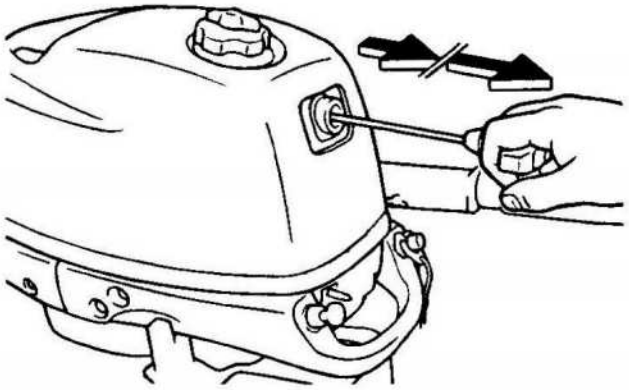
Choke knob for pull type

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



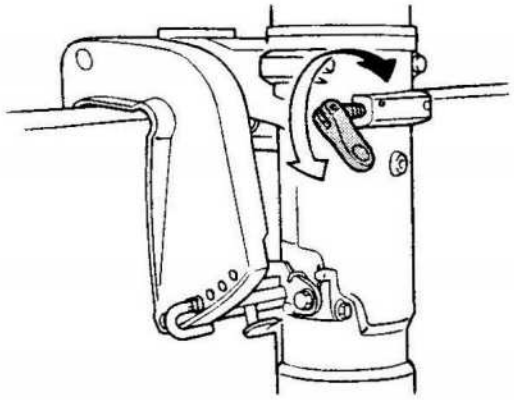
Manual starter handle

To start the engine, first gently pull the handle out until resistance is felt. From that position, then pull the handle straight out quickly to crank the engine.



Steering friction adjuster

A friction device provides adjustable resistance to the steering mechanism, and can be set according to operator preference. An adjusting screw or bolt is located on the swivel bracket.



To increase resistance, turn the adjuster clockwise.

To decrease resistance, turn the adjuster counterclockwise.

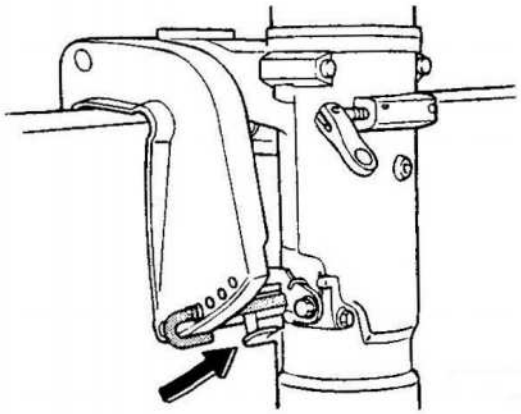
⚠ WARNING

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

Trim rod (tilt pin)

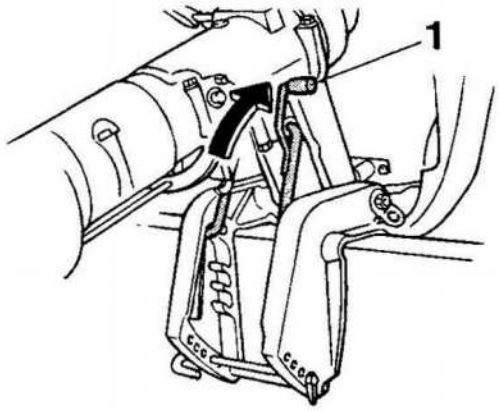
The position of the trim rod determines the minimum trim angle of the outboard motor in

relation to the transom.



Tilt lock mechanism

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

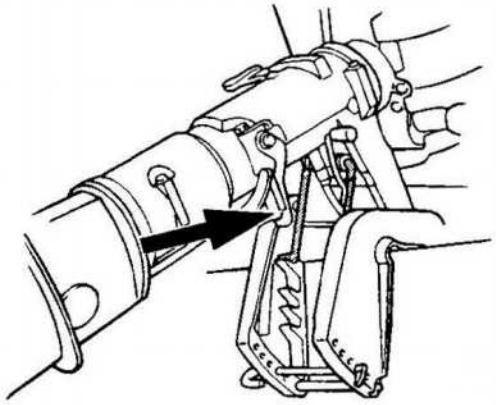


1. Tilt lock lever

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

Tilt support bar

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

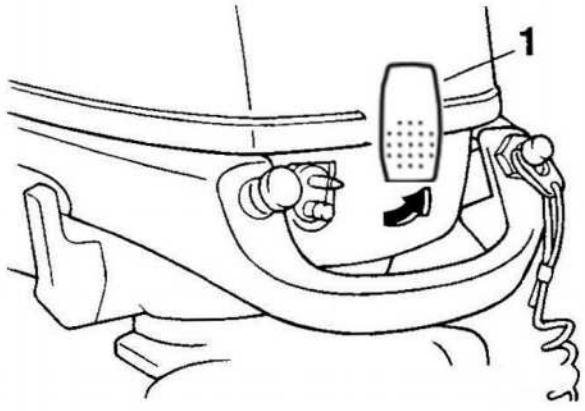


CAUTION:

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

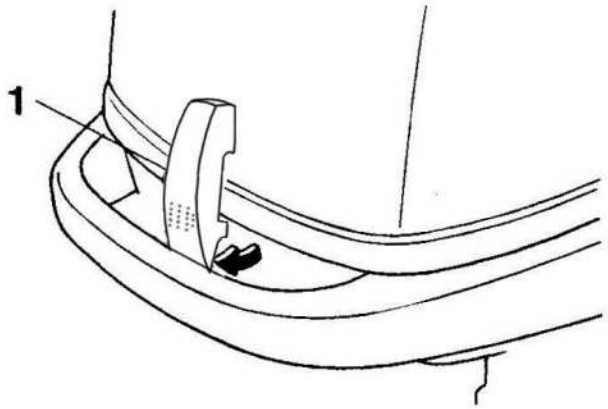
Top cowling lock lever (pull up type)

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



1. Top cowling lock lever(s)

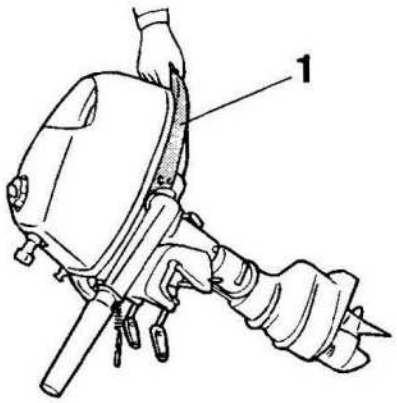
Basic components



1. Top cowling lock lever(s)

Carrying handle

A carrying handle is provided on the rear of the outboard motor. It enables you to carry the outboard motor easily with one hand.



1. Carrying handle

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.

⚠ WARNING

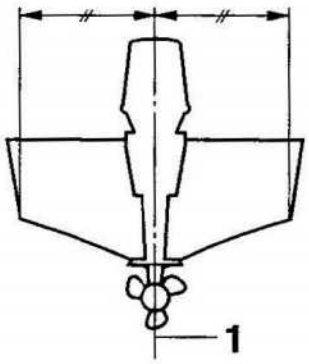
- **Overpowering a boat could cause severe instability. Do not install an outboard motor with more horsepower than the maximum rating on the capacity plate of the boat. If the boat does not have a capacity plate, consult the boat manufacturer.**
- **Improper mounting of the outboard motor could result 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.**

Mounting the outboard motor

⚠ WARNING

Your dealer or other person experienced in proper outboard motor mounting should show you how to mount your outboard motor.

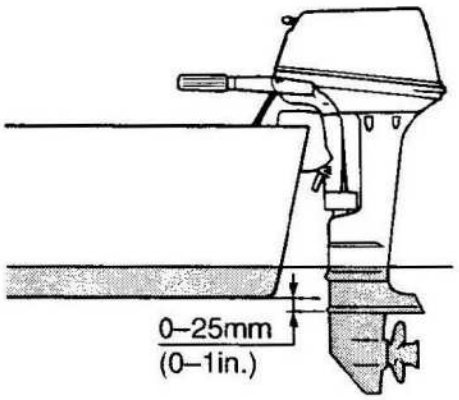
The outboard motor should be mounted so that the boat is well balanced. Otherwise, the boat could be hard to steer. For single-engine boats, mount the outboard motor on the centerline (keel line) of the boat.



1. Center line (keel line)

Mounting height

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



CAUTION:

- **During water testing, check the buoyancy of the boat, at rest, with its maximum load. Check that the static water level on the exhaust housing is low enough to prevent water entry into the power head when water rises due to waves when the outboard is not running.**
- **Incorrect engine height or obstructions to the smooth flow of water (such as the design or condition of the boat, or accessories such as transom ladders or depth finder transducers) can create airborne water spray while the boat is cruising. If the motor is operated continuously in the presence of airborne water spray, enough water could enter the engine through the intake opening on the cowling to cause severe engine damage. Eliminate the cause of the airborne water spray.**

NOTE:

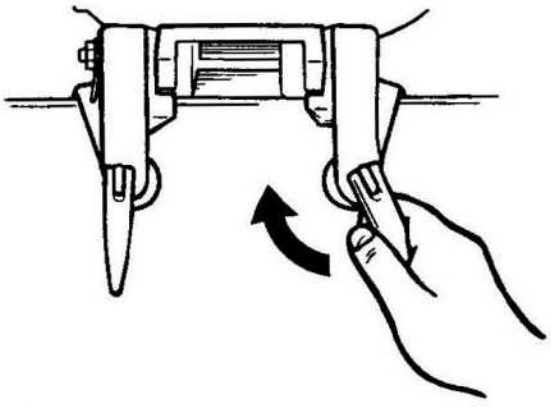
- The optimum mounting height of the outboard motor is affected by the boat and motor combination and the desired use. Test runs at different heights can help determine the optimum mounting height. Consult your dealer or boat man ufacturer for further information on deter mining the proper mounting height.
- For instructions on setting the trim angle of the outboard motor, see page 28.

Clamping the outboard motor

1. Place the outboard motor on the transom so that it is positioned as close to the center as possible. Tighten the transom clamp screws evenly and securely. Occasionally check the clamp screws for tightness during operation of the outboard motor because they could become loose due to engine vibration.

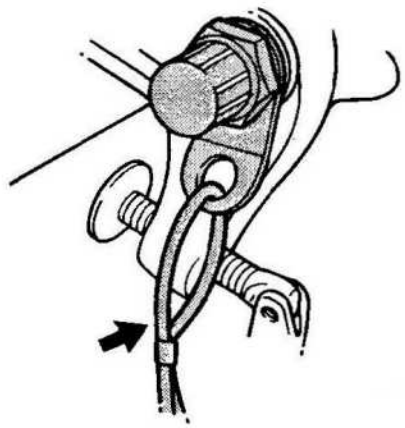
⚠ WARNING

Loose clamp screws could allow the outboard motor to fall off or move on the transom. This could cause loss of control and serious injury. Make sure the transom screws are tightened securely. Occasionally check the screws for tightness during operation.



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

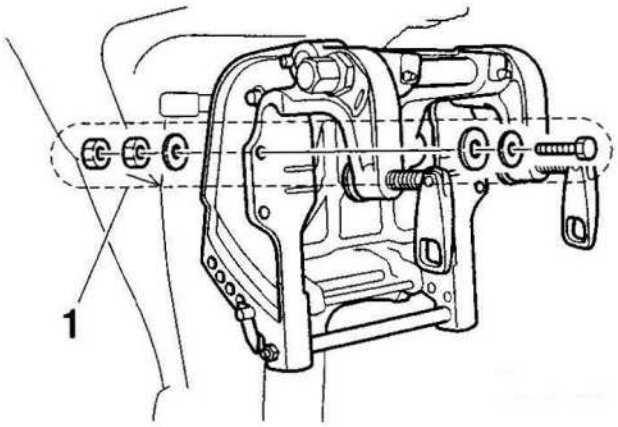
if it accidentally falls off the transom.



3. Secure the clamp bracket to the transom using the bolts provided with the outboard (if packed). For details, consult your dealer.

⚠ WARNING

Avoid using bolts, nuts or washers other than those contained in the engine packaging. If used, they must be of at least the same quality of material and strength and must be tightened securely. After tightening, test run the engine and check their tightness.



1. Bolts

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.

CAUTION:

Failure to follow the break-in procedure could result in reduced engine life or even severe engine damage.

Procedure for 4-stroke models

Your new engine requires a period of ten-hours break-in to allow mating surfaces of moving parts to wear in evenly. Correct break-in will help ensure proper performance and longer engine life.

NOTE:

Failure to follow the break-in procedure could result in reduced engine life or even severe engine damage. Run the engine in the water, under load (in gear with a propeller installed) as follows. For ten hours for breaking in engine avoid extended idling, rough water and crowded areas.

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

Pre-operation checks

⚠ WARNING

If any item in the pre-operation check is not working properly, have it inspected and repaired before operating the outboard motor. Otherwise an accident could occur.

CAUTION:

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

Fuel

- Check to be sure you have plenty of fuel for your trip.
- Make sure there are no fuel leaks or gasoline fumes.
- Check fuel line connections to be sure they are tight.
- Be sure the fuel tank is positioned on a secure, flat surface, and that the fuel line is not twisted or flattened, or likely to contact sharp objects.

Controls

- Check throttle, shift, and steering for proper operation before starting the engine.
- The controls should work smoothly, without binding or unusual free play.
- Look for loose or damaged connections.
- Check operation of the starter and stop switches when the outboard motor is in the water.

Stop switches

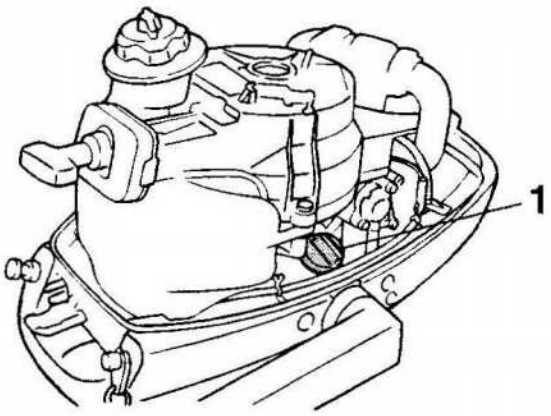
- Confirm that turning the main switch to the "OFF" (off) position stops the engine.
- Confirm that removing the clip from the engine shut-off switch stops the engine.
- Confirm that the engine cannot be started with the clip removed from the engine shut-off switch.

Engine

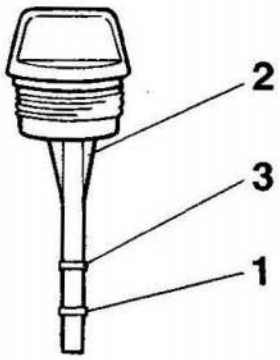
- Check the engine and engine mounting.
- Look for loose or damaged fasteners.
- Check the propeller for damage.

Checking the engine oil level

1. Put the outboard motor in an upright position (not tilted).
2. Remove oil dipstick and wipe it clean.
3. Completely insert the dipstick and remove it again.
4. Check the oil level using the dipstick to be sure the level falls between the upper and lower marks. Fill with oil if it is below the lower mark, or drain to the specified level if it is above the upper mark.



1. Oil dipstick



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

NOTE:

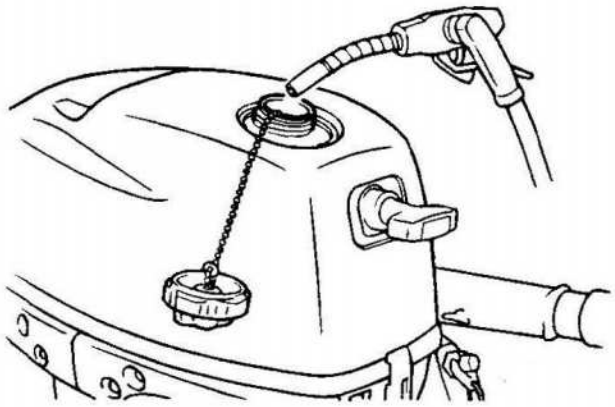
Be sure to completely insert the dipstick into the dipstick guide.

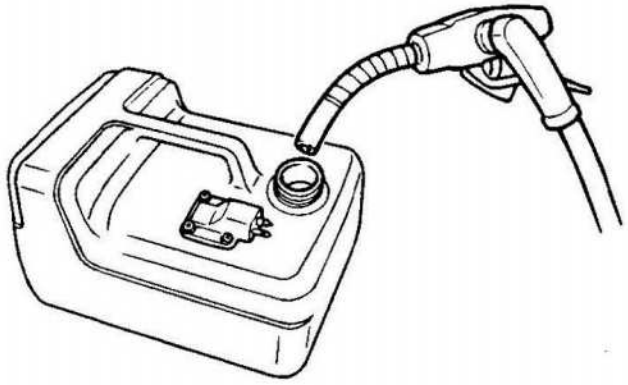
Filling fuel

⚠ WARNING

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

1. Remove the fuel tank cap.
2. Carefully fill the fuel tank.



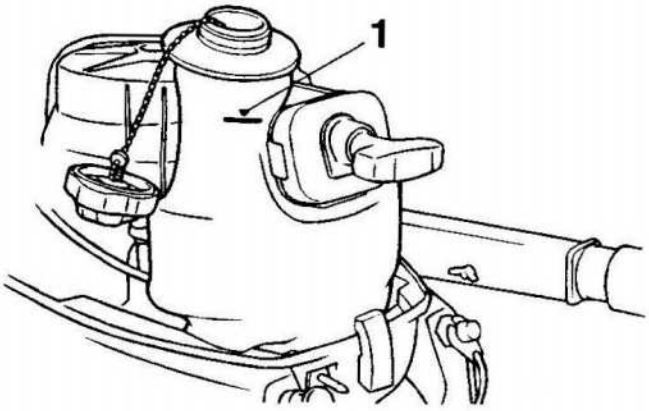


3. Securely close the cap after filling the tank. Wipe up any spilled fuel.

Fuel tank capacity:
1.1 L (0.29 US gal) (0.24 Imp.gal)

NOTE:

The upper fuel level mark is indicated on the built-in fuel tank.



1. Upper level mark

Operating engine

Feeding fuel

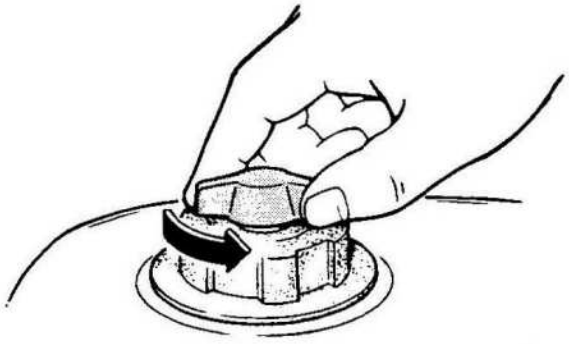
⚠ WARNING

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

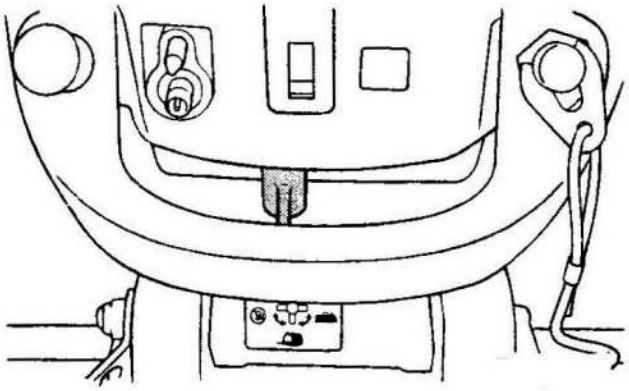
water near you.

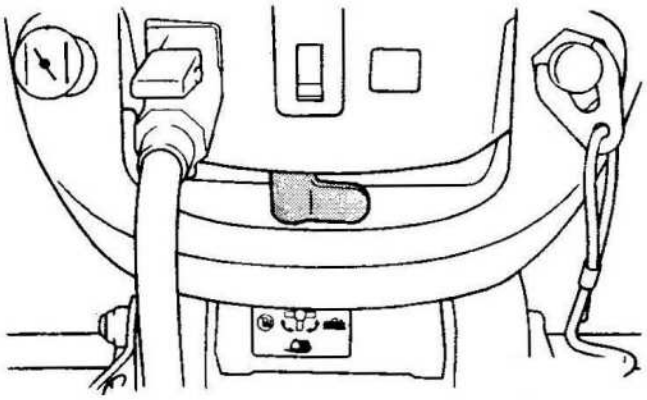
- **When the air vent screw is loosened, gasoline vapor will be released. Gasoline is highly flammable, and its vapors are flammable and explosive. Refrain from smoking, and keep away from open flames and sparks while loosening the air vent screw.**
- **This product emits exhaust gases which contain carbon monoxide, a colorless, odorless gas which could cause brain damage or death when inhaled. Symptoms include nausea, dizziness, and drowsiness. Keep cockpit and cabin areas well ventilated. Avoid blocking exhaust outlets.**

1. For the built in tank, loosen the air vent screw on the fuel tank cap by one turn. For the external fuel tank, loosen it on the fuel tank cap by 2 or 3 turns.

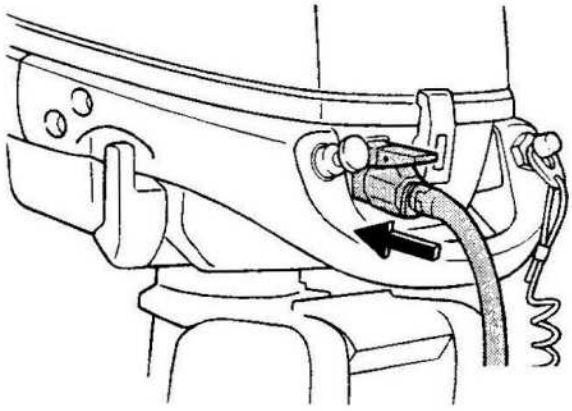


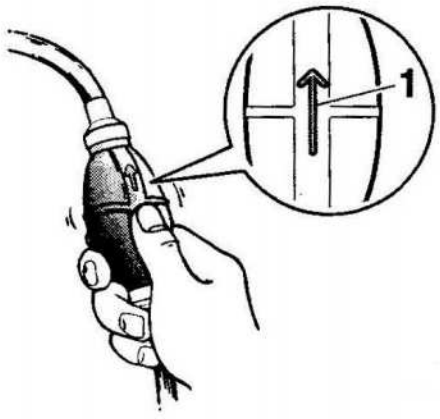
2. Select the fuel tank using the fuel cock or open the fuel cock.





3. If you are using an external fuel tank, connect the fuel joints securely and squeeze the primer pump, with the arrow pointing up, until you feel it become firm (if equipped the fuel joint).





1. Arrow

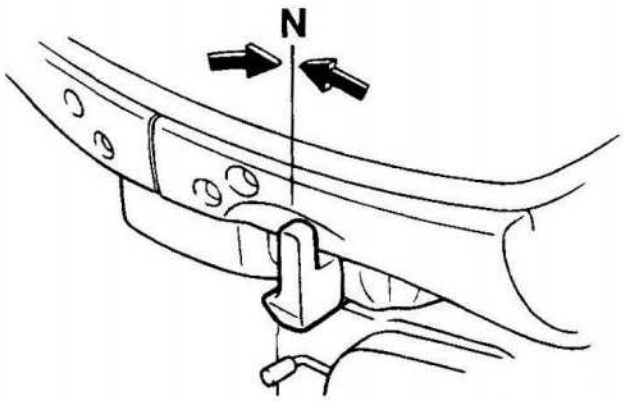
Starting engine

⚠ 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.

Manual start models (tiller control)

1. Place the gear shift lever in neutral.



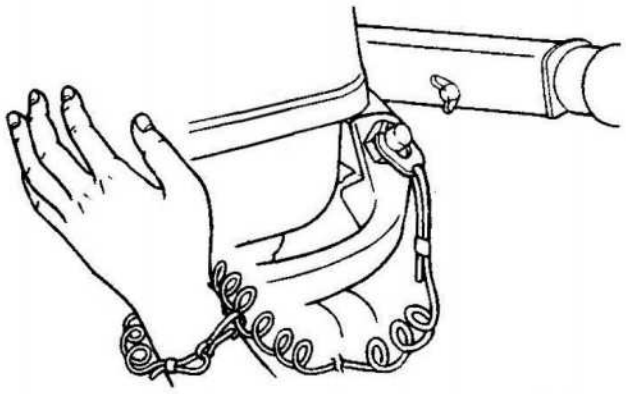
NOTE:

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

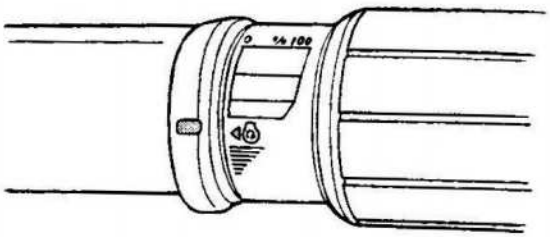
2. Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg. Then install the clip on the other end of the cord into the engine shut-off switch.

⚠ WARNING

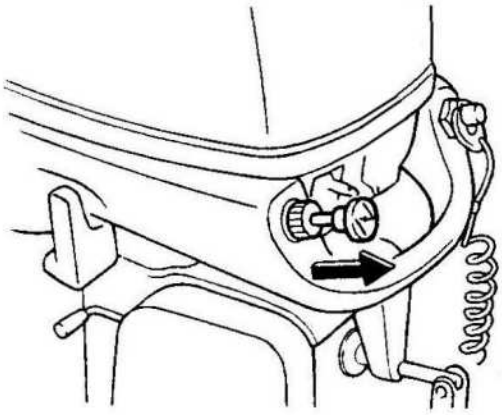
- **Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg while operating.**
- **Do not attach the cord to clothing that could tear loose. Do not route the cord where it could become entangled, preventing it from functioning.**
- **Avoid accidentally pulling the cord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



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



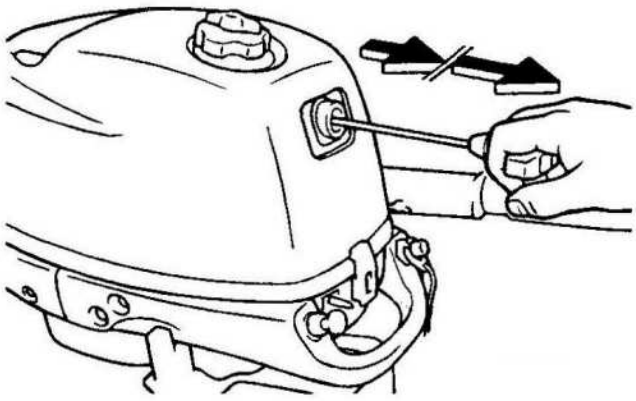
4. Pull out / turn the choke knob fully. After the engine starts, replace / return the knob to the home position.



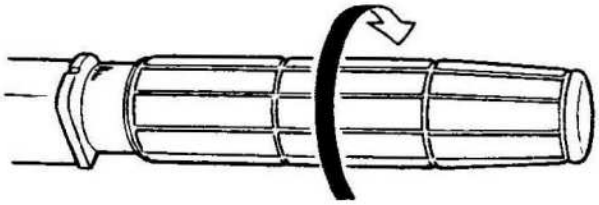
NOTE:

- It is not necessary to use the choke when starting a warm engine.
- If the choke knob is left in the **"START"** (start) position while the engine is running, the engine will run poorly or stall.

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



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



NOTE:

- When the engine is cold, it needs to be warmed up. For further information, see page 25.
- If the engine does not start on the first try, repeat the procedure. If the engine fails to start after 4 or 5 tries, see page 53. Also, if the engine is warm and fails to start, open the throttle halfway and try to start the engine again.

Warming up engine

Warming up (Manual start models)

1. After starting the engine, return the choke knob to the halfway position. For approximately the first 5 minutes after starting, warm up the engine by operating at one fifth throttle or less. After the engine has warmed up, push the choke knob in fully. Failure to do so will shorten engine life.

NOTE:

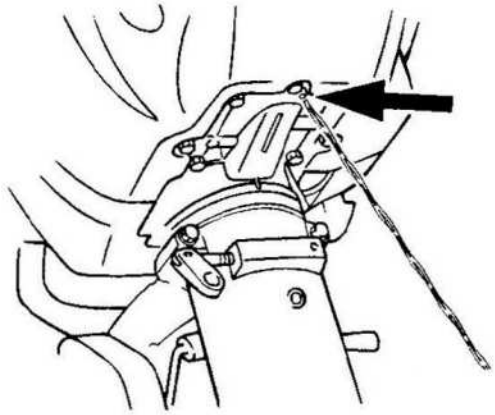
- If the choke knob is left pulled out after the engine starts, the engine will stall.
- In temperatures of -5°C or less, leave the choke knob pulled out fully for approximately 30 seconds after starting.

2. Check for a steady flow of water from the

cooling water pilot hole.

CAUTION:

A continuous flow of water from the cooling water pilot hole shows that the water pump is pumping water through the cooling passages. If water is not flowing out of the 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 dealer if the problem cannot be located and corrected.



Shifting

⚠ WARNING

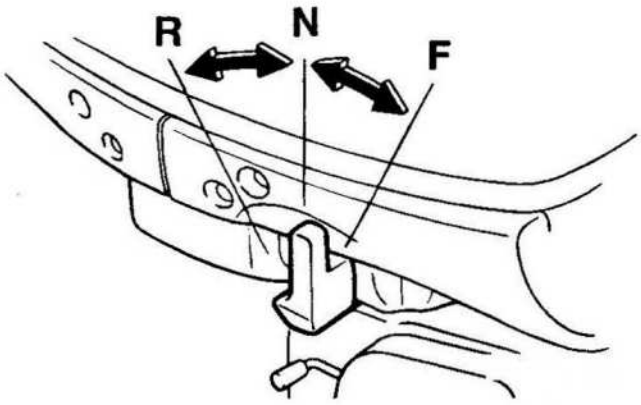
Before shifting, make sure there are no swimmers or obstacles in the water near you.

CAUTION:

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

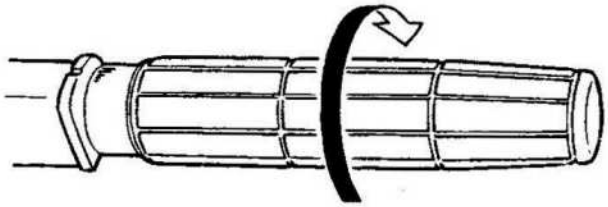
To shift out of neutral

1. Move the gear shift lever firmly and crisply forward (for forward gear) or backward (for reverse gear).

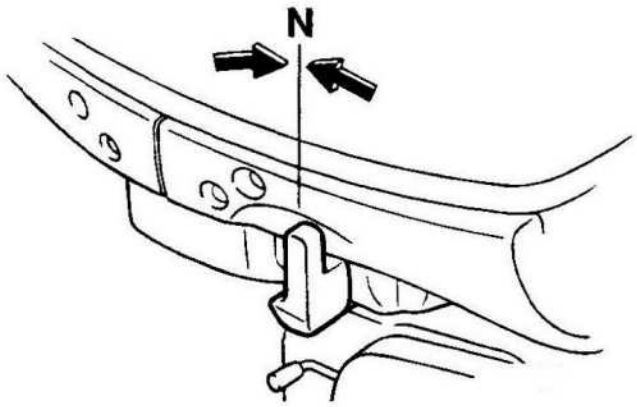


To shift from in gear (forward/reverse) to neutral

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



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



NOTE:

The outboard motor can turn 360° in its bracket (full-pivot system). The boat can also be backed up by simply turning the outboard motor around 180° with the steering handle facing toward you.

Stopping boat

⚠ 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.**

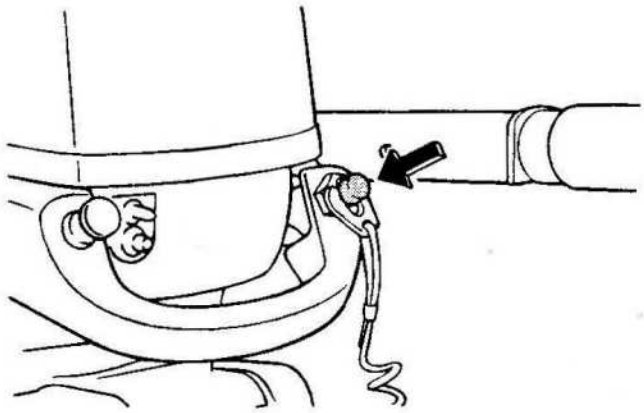
The boat is not equipped with a separate braking system. Water resistance stops it after the throttle lever is moved back to idle. The stopping distance varies depending on gross weight, water surface conditions, and wind direction.

Stopping engine

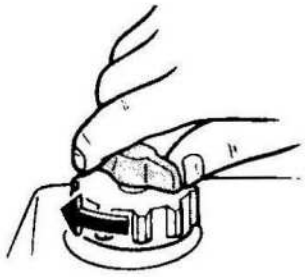
Before stopping the engine, first let it cool off for a few minutes at idle or low speed. Stopping the engine immediately after operating at high speed is not recommended.

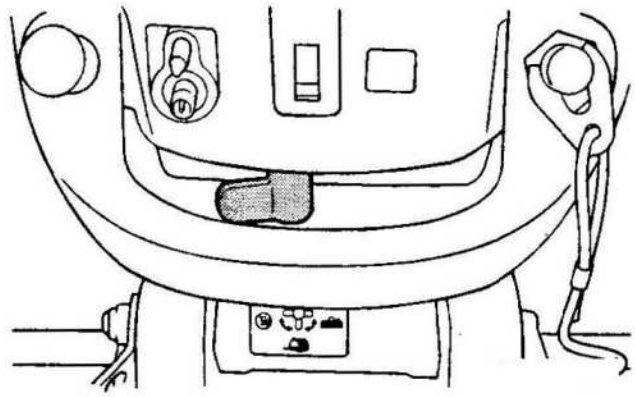
Procedure

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

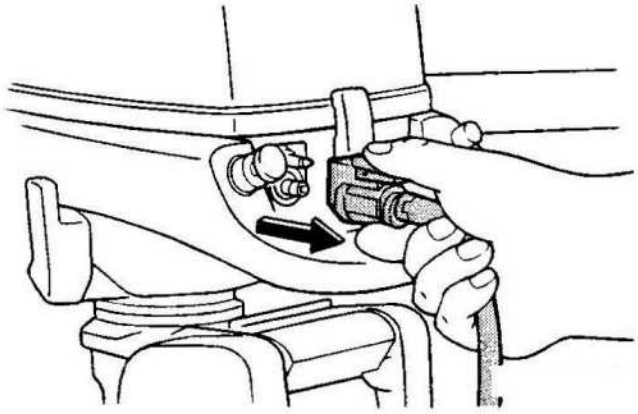


2. After stopping the engine, tighten the air vent screw on the fuel tank cap and set the fuel cock lever or knob to the closed position, if equipped.





3. Disconnect the fuel line if you are using an external fuel tank.



NOTE:

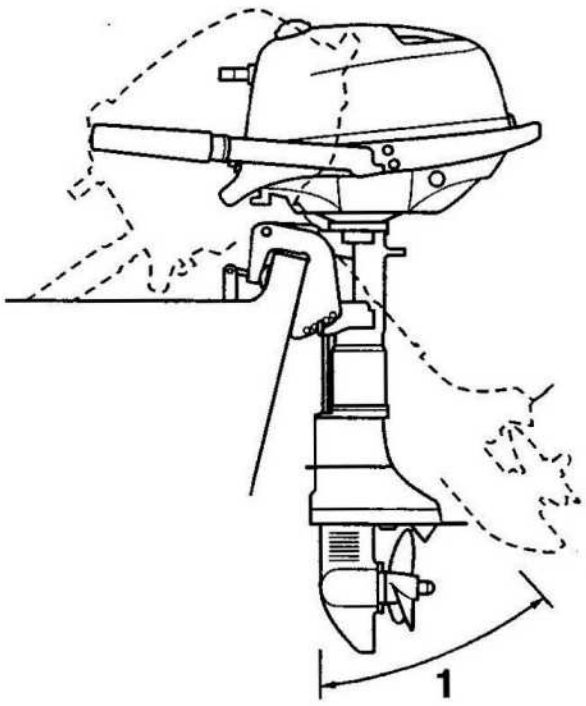
If the outboard motor is equipped with an engine shut-off cord, the engine can also be stopped by pulling the cord and removing the clip from the engine shut-off switch.

Trimming outboard motor

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.

⚠ 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.



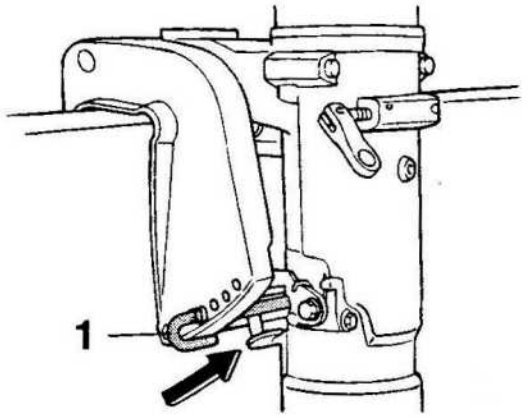
1. Trim operating angle

Adjusting trim angle for manual tilt models

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

1. Stop the engine.
2. Tilt the outboard motor up, and then re-

move the trim rod from the clamp bracket.



1. Trim rod

3. Reposition the rod in the desired hole.

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

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

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

⚠ WARNING

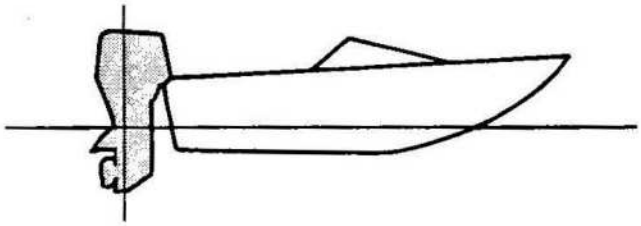
- **Stop the engine before adjusting the trim angle.**
- **Use care to avoid being pinched when removing or installing the rod.**
- **Use caution when trying a trim position for the first time. Increase speed gradually and watch for any signs of instability or control problems. Improper trim angle can cause loss of control.**

NOTE:

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

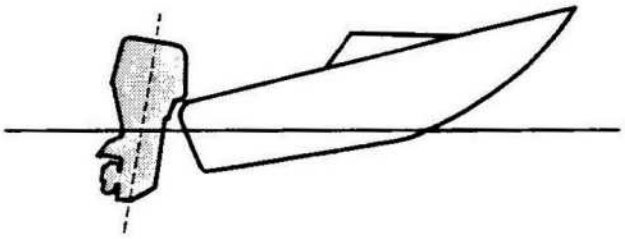
Adjusting boat trim

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



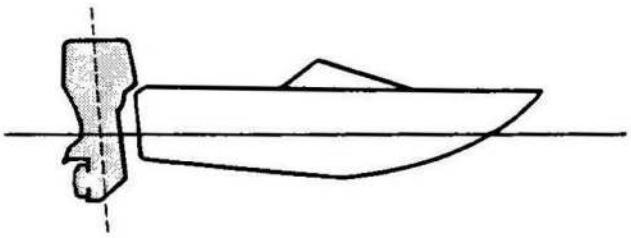
Bow Up

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.



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.

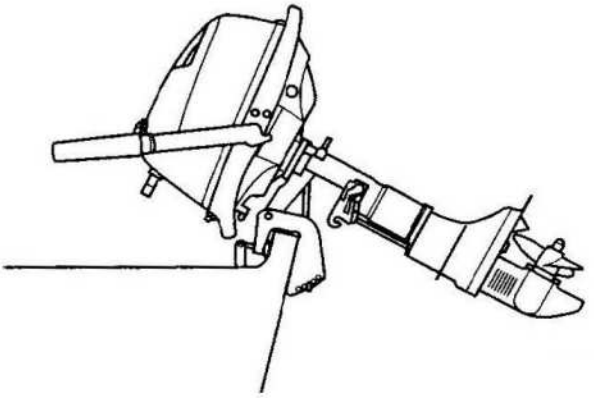


NOTE:

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

Tilting up and down

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



⚠ WARNING

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

⚠ WARNING

Leaking fuel is a fire hazard. Tighten the air vent screw and place the fuel cock in the closed position if the outboard motor will be tilted for more than a few minutes. Otherwise fuel may leak.

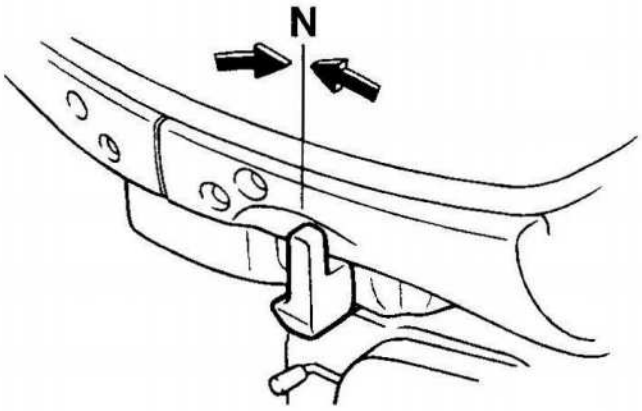
CAUTION:

- **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.**
- **Do not tilt up the engine by pushing the tiller handle because this could break the handle.**
- **Keep the power unit higher than the propeller at all times. Otherwise water could run into the cylinder and cause damage.**
- **The outboard motor cannot be tilted**

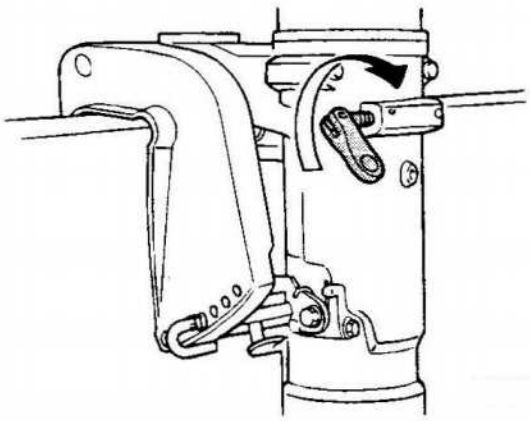
when in reverse or when the outboard motor is turned 180° (facing the rear).

Procedure for tilting up (manual tilt models)

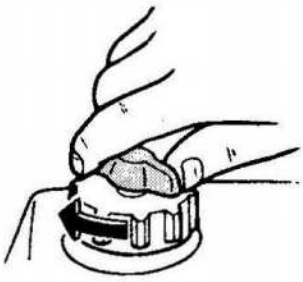
1. Place the gear shift lever in neutral (if equipped) and face the outboard motor forward.

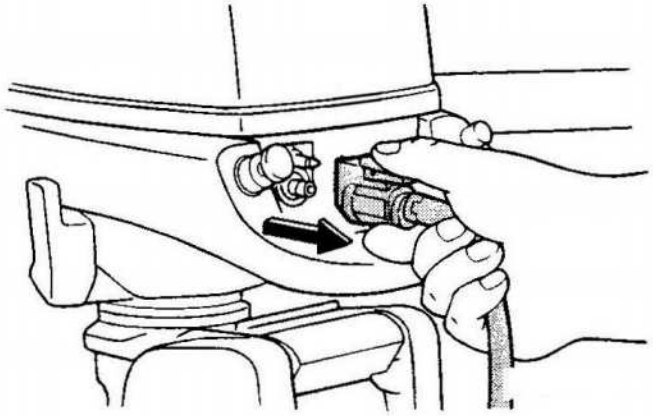


2. Tighten the steering friction adjuster by turning it clockwise to prevent the motor from turning freely.

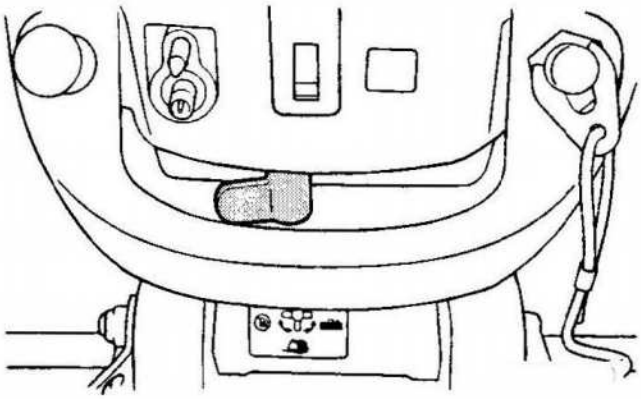


3. Tighten the air vent screw.

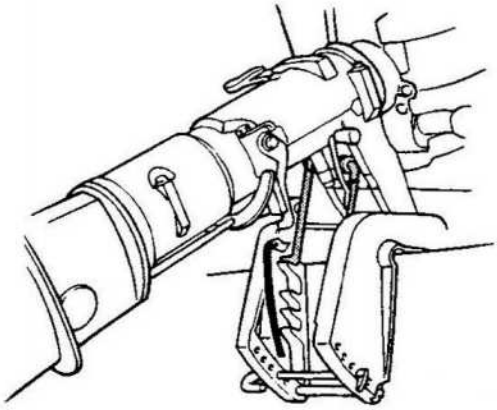




4. Close the fuel cock.



5. Tilt support bar equipped models: Hold the rear of the top cowling or the carrying handle (if equipped) with one hand and tilt the outboard motor up fully until the tilt support bar automatically locks.



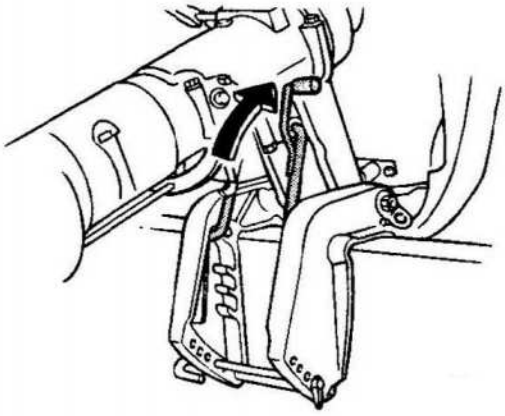
6. Tilt support knob equipped models: Hold the rear of the top cowling with one hand, fully tilt the outboard motor up, and push the tilt support knob into the clamp bracket.
7. Tilt support lever equipped models: Hold the carrying handle and tilt the engine up fully until the tilt support lever automatically locks.

NOTE:

Tilt support lever/bar equipped models: If the motor is not facing forward, the tilt support lever/bar cannot automatically turn to the locked position. If the tilt support lever/bar does not automatically lock, swing the motor a little to the left and right.

Procedure for tilting down (manual tilt models)

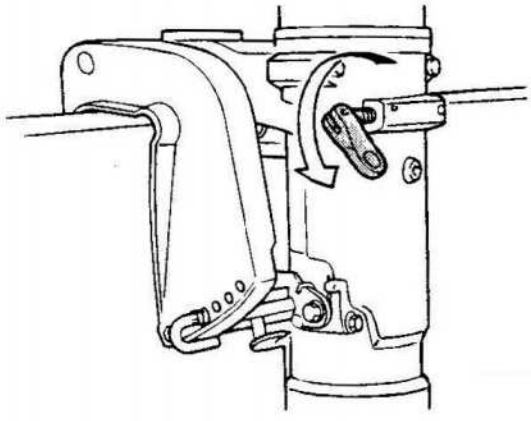
1. Slightly tilt the outboard motor up.
2. If equipped with the tilt support bar: Slowly tilt the outboard motor down while pulling the tilt support bar lever up.



3. If equipped with the tilt support knob: Pull the knob out, and then slowly tilt the outboard motor down.
4. If equipped with the tilt support lever: Slowly tilt the outboard motor down while pulling the tilt support lever up.
5. Loosen the steering friction adjuster by turning it counterclockwise, and adjust the steering friction according to operator preference.

⚠ WARNING

If there is too much resistance it could be difficult to steer, which could result in an accident.



Cruising in shallow water

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

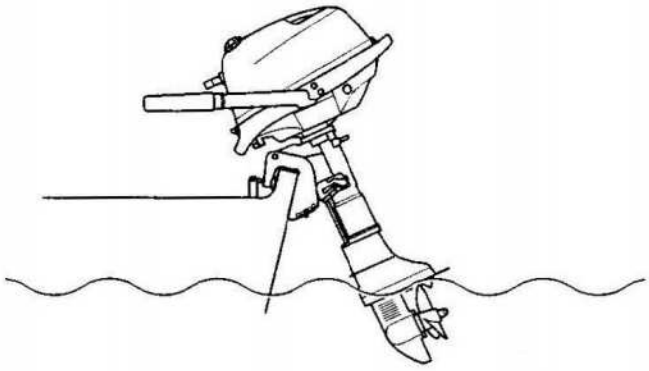
Cruising in shallow water (manual tilt models)

⚠ WARNING

- **Place the gear shift in neutral before using the shallow water cruising system.**
- **Run the boat at the lowest possible speed when using the shallow water cruising system. The tilt lock mechanism does not work while the shallow water cruising system is being used. Hitting an underwater obstacle could cause the outboard motor to lift out of the water, resulting in loss of control.**
- **Do not rotate the outboard motor 180° and operate the boat in reverse. Place the gear shift in reverse to operate the boat in reverse.**
- **Use extra care when operating in reverse. Too much reverse thrust can cause the outboard motor to lift out of the water, increasing the chance of accident and personal injury.**
- **Return the outboard motor to its normal position as soon as the boat is back in deeper water.**

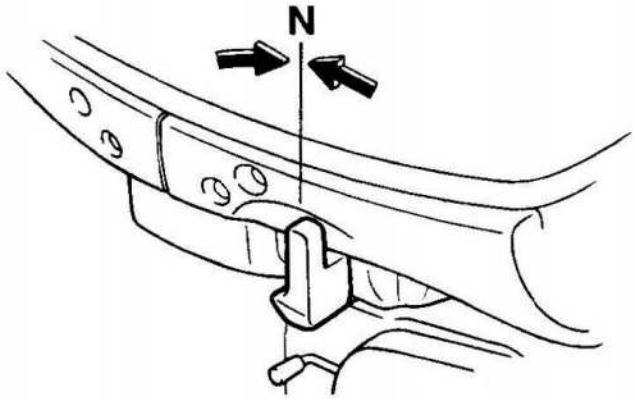
CAUTION:

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.

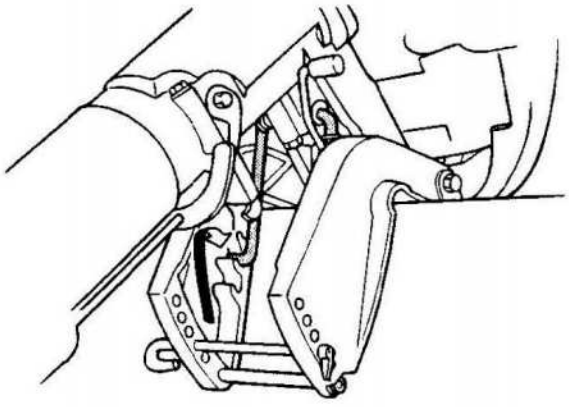


Procedure

1. Place the gear shift lever in neutral and face the outboard motor forward.

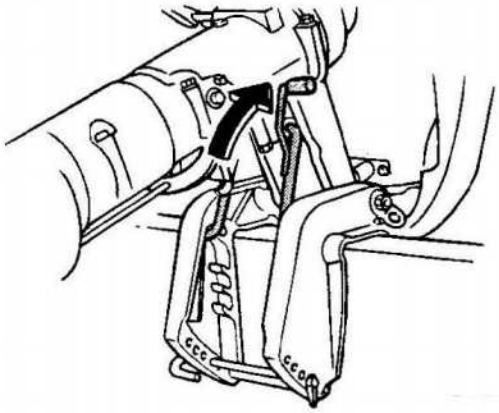


2. Slightly tilt the outboard motor up until the tilt support bar automatically turns to the lock position to support the engine.



3. To lower the outboard motor to the normal running position, first slightly tilt the outboard motor up. Then pull up the tilt support bar lever and slowly tilt the en-

gine down.



NOTE:

The outboard motor is equipped with 2 or 3 positions for shallow water cruising.

Cruising in other conditions

Cruising in salt water

After operating in salt water, flush the cooling water passages with fresh water to prevent them from becoming clogged. Also rinse the outside of the outboard motor with fresh water and, if possible, rinse the power head under the cowling.

Cruising in muddy or turbid water

Strongly recommends that you use the optional chromium-plated water pump kit (available for V4 and large engines) if you use the outboard motor in water with a lot of sediment in it, such as muddy or other turbid (cloudy) water.

Cruising in acidic water

Water in some areas can be acidic. After operating in such water, flush the cooling passages with fresh water to prevent corrosion. Also rinse the outside of the outboard motor with fresh water.

Specifications

NOTE:

"(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.

NOTE:

"*" means, select the engine oil referring to the chart of engine oil paragraph. For further information, see page 8.

Dimension:

Overall length:
750 mm (29.5 in)
Overall width:
403 mm(15.9 in)
Overall height L:
1167 mm (46.0 in)
Overall height S:
1040mm (40.9 in)
Transom height L:
562 mm (22.1 in)
Transom height S:
435 mm(17.1 in)
Weight (AL) L:
28.0 kg (61.7lb)
Weight (AL) S:
27.0 kg (60.0lb)

Performance:

Full throttle operating range:
4500-5500 r/min
Maximum output:
4.4 kW@5000 r/min (6HP)
3.7 kW@5000r/min(5HP)

Engine:

Type:
4-stroke S
Displacement:
139.0 cm^3
Bore × stroke:
62.0 × 46.0 mm (2.44 × 1.81 in)
Ignition system:
TCI
Spark plug with resistor (NGK):
CR6HSB
Spark plug gap:
0.6–0.7 mm (0.024–0.028 in)
Control system:
Tiller
Starting system:
Manual
Starting carburetion system:
Choke valve

Drive unit:

Gear positions:
Forward-neutral-reverse
Gear ratio:
2.08 (27/13)
Trim and tilt system:
Manual tilt

Fuel and oil:

Recommended fuel:
Regular unleaded gasoline
Fuel tank capacity (built in type):
1.1 L (0.29 US gal) (0.24 Imp.gal)
Recommended engine oil:
4-stroke outboard motor oil
Recommended engine oil group 1*:
SAE 10W-30/10W-40/5W-30
API SE/SF/SG/SH/SJ/SL
Recommended engine oil group 2*:
SAE 15W-40/20W-40/20W-50
API SH/SJ/SL
Lubrication:
Wet sump

Engine oil quantity (excluding oil filter):
0.5 L (0.53 US qt) (0.44 Imp.qt)
Recommended gear oil:
Hypoid gear oil SAE#90
Gear oil quantity:
100.0 cm^3 (3.38 US oz) (3.53 Imp.oz)

Tightening torque for engine:

Spark plug:
25.0 Nm (18.4 ft-lb) (2.55 kgf-m)
Engine oil drain bolt:
18.0 Nm (13.3 ft-lb) (1.84 kgf-m)

Transporting and storing outboard motor

⚠ WARNING

- **Leaking fuel is a fire hazard. When transporting and storing the outboard motor, close the air vent screw and fuel cock to prevent fuel from leaking.**
- **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.**

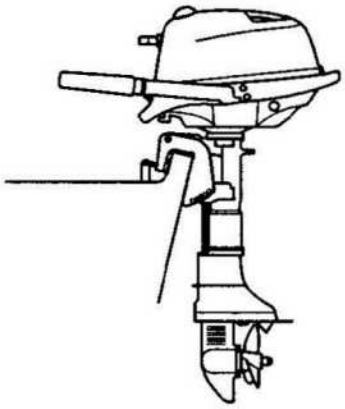
⚠ WARNING

Never get under the lower unit while it is tilted, even if a motor support bar is used. Severe injury could occur if the outboard motor accidentally falls.

CAUTION:

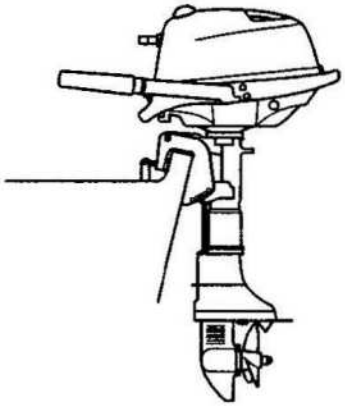
Do not use the tilt support lever or knob when trailering the boat. The outboard motor could shake loose from the tilt support and fall. If the motor cannot be trailered in the normal running position, use an additional support device to secure it in the tilt position.

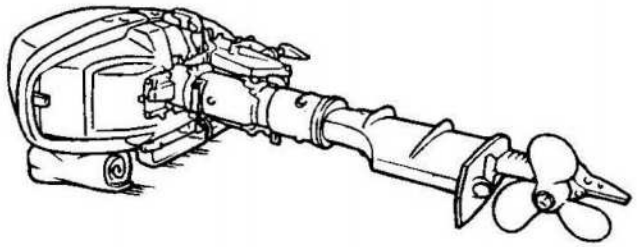
The outboard motor should be trailered and stored in the normal running position. If there is insufficient road clearance in this position, then trailer the outboard motor in the tilt position using a motor support device such as a transom saver bar. Consult your dealer for further details.

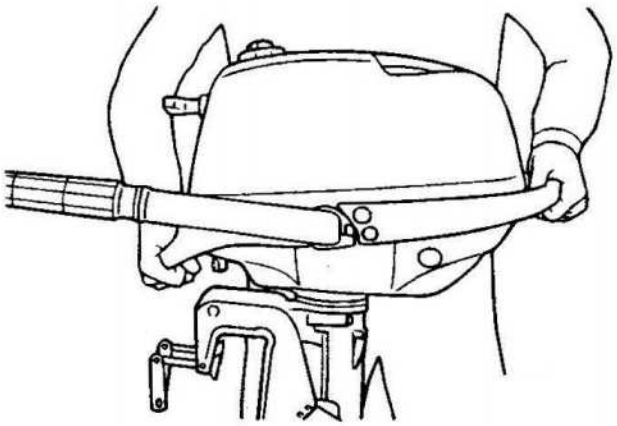


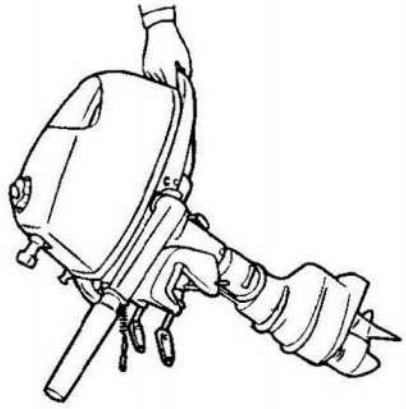
Clamp screw mounting models

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









NOTE:

Place a towel or something similar under the outboard motor to protect it from damage.

Storing outboard motor

When storing your 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 dealer prior to storage. However, you, the owner, with a minimum of tools, can perform the fol lowing procedures.

CAUTION:

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

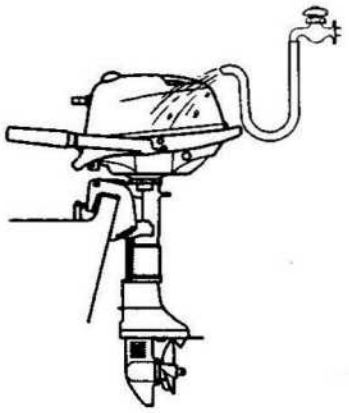
Procedure

Flushing in a water tank

CAUTION:

Do not run the engine without supplying it with cooling water. Either the engine water pump will be damaged or the engine will be damaged from overheating. Before starting the engine, be sure to supply water to the cooling water passages.

1. Wash the outboard motor body using fresh water. For further information, see page 39.

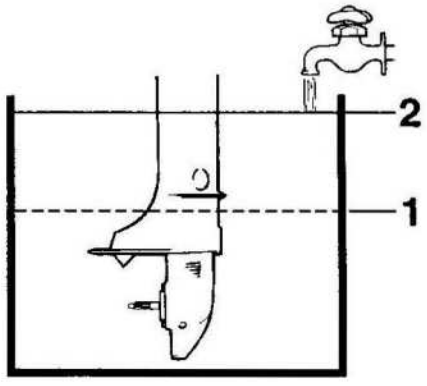


2. Place the fuel cock in the closed position and disconnect the fuel line if equipped. Tighten the air vent screw, if equipped.
3. Completely drain the fuel from the built-in fuel tank (built-in tank models).

NOTE:

Dispose of old gasoline according to local regulations.

4. Remove the engine top cowling and fogging hole cap.
5. Install the outboard motor on the test tank.



1. Lowest water level
2. Water surface

6. Fill the tank with fresh water to above the level of the anti-cavitation plate.

CAUTION:

If the fresh water level is below the level of the anti-cavitation plate, or if the water supply is insufficient, engine seizure may occur.

7. Run the engine at a fast idle for a few minutes in neutral position.

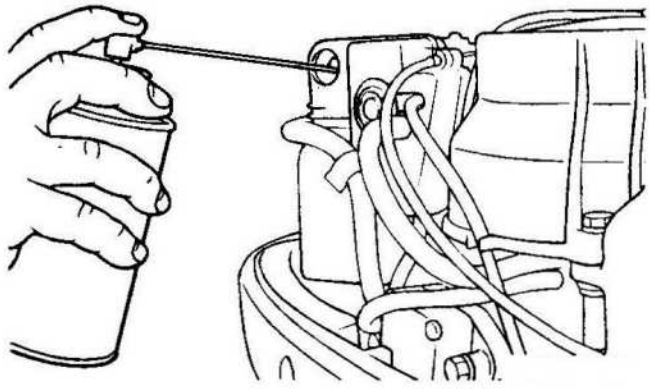
⚠ WARNING

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

8. Just prior to turning off the engine, quickly spray "Fogging Oil" into the carburetor. When properly done, the engine will smoke excessively and almost stall.

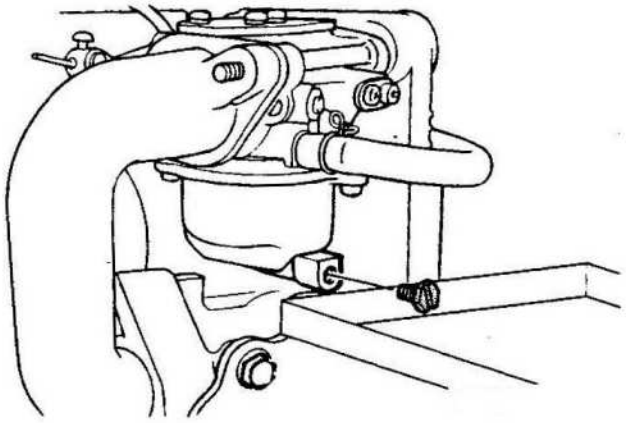
NOTE:

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



9. If "Fogging Oil" is not available, run the engine at a fast idle until the fuel system empties and the engine stops.
10. Loosen the air vent screw by one turn. Place the fuel cock in the open position.

11. Loosen the drain screw and completely drain the gasoline in the carburetor into the prepared container.



12. Tighten the drain screw.
13. Place the fuel cock in the closed position. Tighten the air vent screw.
14. If "Fogging Oil" is not available, remove the spark plug. Pour a teaspoonful of clean engine oil into the cylinder. Crank several times manually. Replace the spark plug.
15. Remove the outboard motor from the test tank.
16. Install the top cowling and fogging hole cap.
17. Drain the cooling water completely out of the motor. Clean the body thoroughly.

NOTE:

Store the fuel tank in a dry, well-ventilated place, not in direct sunlight.

Lubrication

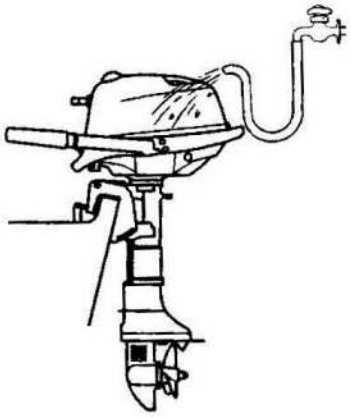
1. Install the spark plug(s) and torque to proper specification. For information on spark plug installation, see page 44.
2. Change the gear oil. For instructions, see page 50. Inspect the oil for the presence of water that indicates a leaky seal. Seal replacement should be performed by an authorized dealer prior to use.
3. Grease all grease fittings. For further details, see page 44.

NOTE:

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

Cleaning the outboard motor

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



NOTE:

For cooling system flushing instructions, see page 36.

Checking painted surface of motor

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

Periodic maintenance

⚠ WARNING

Be sure to turn off the engine when you perform maintenance unless otherwise specified. If you are not familiar with machine servicing, this work should be done

by your dealer or other qualified mechanic.

Replacement parts

If replacement parts are necessary, use only genuine 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. genuine parts and accessories are available from your dealer.

Severe operating conditions

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

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

Outboard motors operating under any of these above conditions require more frequent maintenance. 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.

Maintenance

Maintenance chart 1

NOTE:

- 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 dealer.

Item	Actions	Initial	Every		
		20 hours (3 months)	100 hours (1 years)	300 hours (3 years)	500 hours (5 years)
Anode(s) (external)	Inspection or replacement as necessary		●/○		
Anode(s) (thermostat cover)	Inspection or replacement as necessary		○		
Cooling water leakage	Inspection or replacement as necessary	○	○		
Cowling clamp	Inspection		●/○		
Engine starting condition/Noise	Inspection	●/○	●/○		
Engine idling speed/ Noise	Inspection	●/○	●/○		
Engine oil	Replacement	●/○	●/○		
Fuel filter (inside built-in fuel tank)	Inspection and cleaning as necessary		○		
Fuel filter (disposal type)	Replacement		●/○		
Fuel pump	Inspection or replacement as necessary			○	
Fuel/oil leakage	Inspection	○	○		
Fuel pipe	Inspection or replacement as necessary	○	○		
Fuel pipe	Replacement			○	

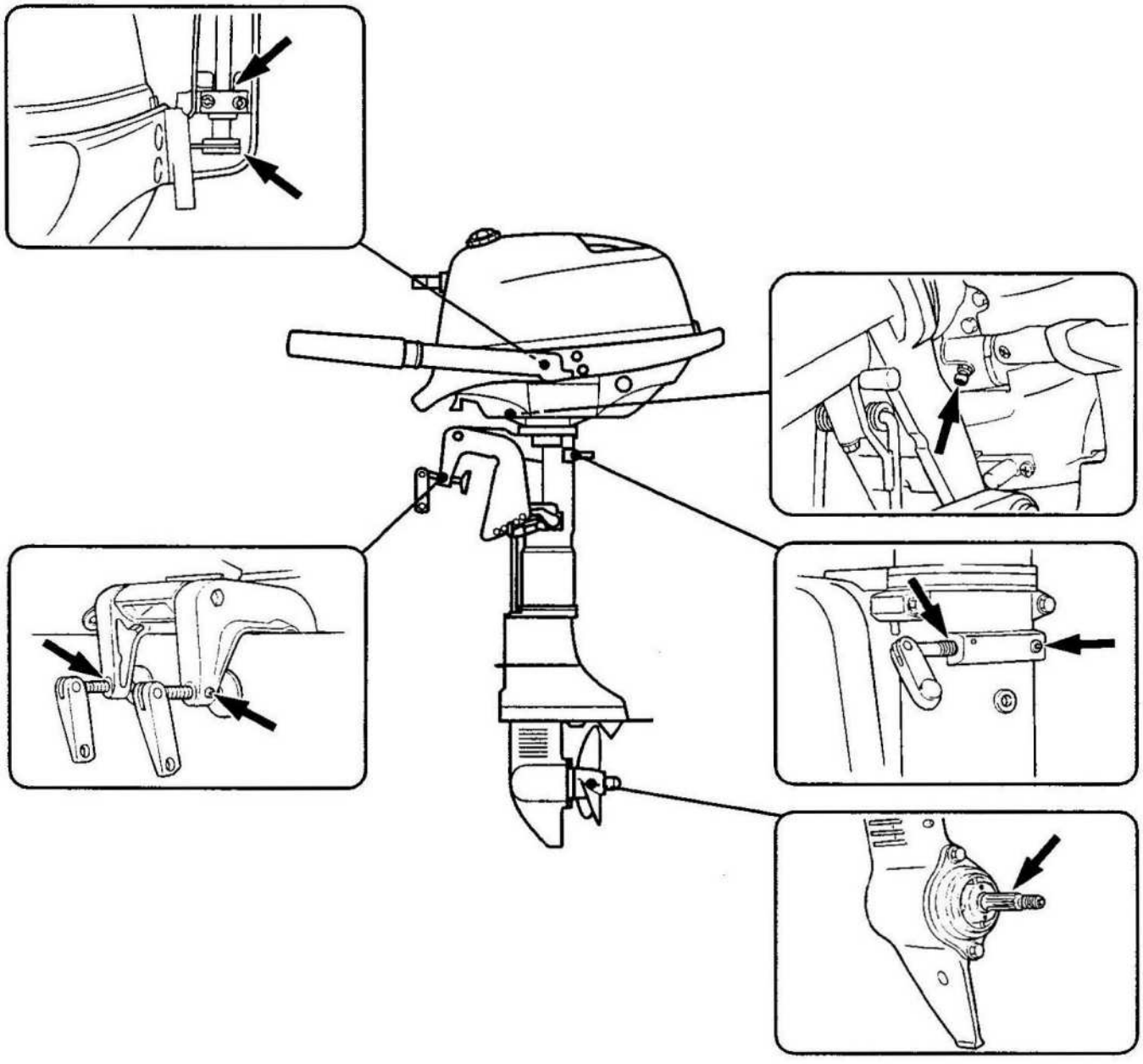
Item	Actions	Initial	Every		
		20 hours (3 months)	100 hours (1 years)	300 hours (3 years)	500 hours (5 years)
Gear oil	Replacement	●/○	●/○		
Greasing points	Greasing	●/○	●/○		
Impeller/water pump housing	Inspection or replacement as necessary		○		
Impeller/water pump housing	Replacement			○	
Propeller/Propeller nut/ Cotter pin	Inspection or replacement as necessary	●/○	●/○		
Shift link/shift cable	Inspection, adjustment or replacement as necessary	○	○		
Spark plug(s)	Inspection, adjustment or replacement as necessary		●/○		
Spark plug caps/high tention cordes	Inspection or replacement as necessary	○	○		
Pilot water	Inspection	●/○	●/○		
Throttle link/Throttle cable/Throttle pick-up timing	Inspection, adjustment or replacement as necessary	○	○		
Thermostat	Inspection or replacement as necessary		○		
Timing belt	Inspection or replacement as necessary		○		
Valve clearance	Inspection and adjustment				○
Water inlet	Inspection	●/○	●/○		
Main switch/stop switch/choke switch	Inspection or replacement as necessary	○	○		
Wire harness connections/Wire coupler connections	Inspection or replacement as necessary	○	○		
Fuel tank	Inspection and cleaning as necessary		○		
Fuel tank (built-in tank)	Inspection and cleaning as necessary		○		

Maintenance chart 2

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

Greasing

grease A (water resistant grease)
grease D (corrosion resistant grease; for propeller shaft)
F6B



Cleaning and adjusting 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.

⚠ WARNING

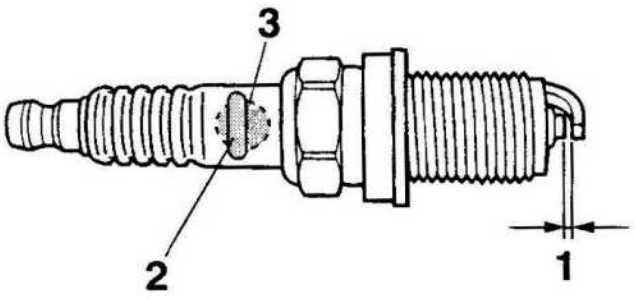
The engine will still be very hot when it has just been turned off. Take extremely care so that neither you nor anyone else gets burnt. To avoid burns, work on the

engine when it has cooled down.

The spark plug is an important engine component and is easy to inspect. The condition of the spark plug can indicate something about the condition of the engine. For example, if the center electrode porcelain is very white, this could indicate an intake air leak or carburetion problem in that cylinder. Do not attempt to diagnose any problems yourself. Instead, take the outboard motor to a dealer. You should periodically remove and inspect the spark plug because heat and deposits will cause the spark plug to slowly break down and erode. If electrode erosion becomes excessive, or if carbon and other deposits are excessive, you should replace the spark plug with another of the correct type.

Standard spark plug:
CR6HS

Before fitting the spark plug, measure the electrode gap with a wire thickness gauge; adjust the gap to specification if necessary.



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

Spark plug gap:
0.6–0.7 mm (0.024–0.028 in)

When fitting the plug, always clean the gasket surface and use a new gasket. Wipe off any dirt from the threads and screw in the spark plug to the correct torque.

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

NOTE:

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

Checking fuel system

⚠ WARNING

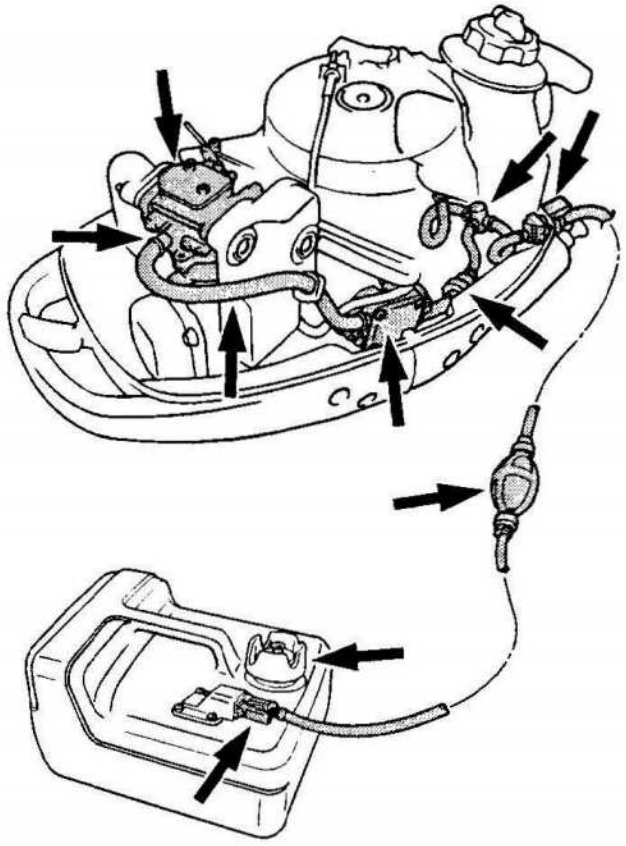
Gasoline and its vapors are highly flammable and explosive. Keep away from sparks, cigarettes, flames, or other sources of ignition.

⚠ 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.**

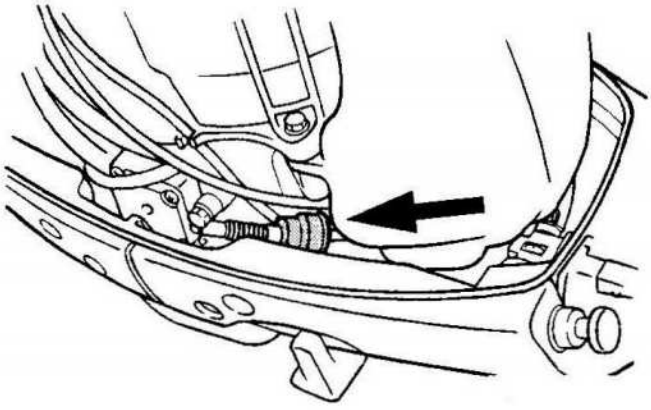
Check the fuel lines for leaks, crack, or malfunction. If a problem is found, your dealer or other qualified mechanic should repair it immediately.



Checkpoints
- Fuel system parts leakage
- Fuel line joint leakage
- Fuel line cracks or other damage
- Fuel connector leakage

Checking fuel filter

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



Inspecting idling speed

⚠ WARNING

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

CAUTION:

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

A diagnostic tachometer should be used for this procedure. Results may vary depending on whether testing is conducted with the flushing attachment, in a test tank, or with the outboard motor in the water.

1. Start the engine and allow it to warm up fully in neutral until it is running smoothly.

NOTE:

Correct idling speed inspection is only possible if the engine is fully warmed up. If not warmed up fully, the idle speed will measure higher than normal. If you have difficulty verifying the idle speed, or the idle speed requires adjustment , consult dealer or other qualified mechanic.

2. Verify whether the idle speed is set to specification. For idle speed specifications, see page 35.

Changing engine oil

⚠ WARNING

- **Avoid draining the engine oil immediately after stopping the engine. The oil**

is hot and should be handled with care to avoid burns.

- **Be sure the outboard motor is securely fastened to the transom or a stable stand.**

CAUTION:

- **Do not overfill the oil, and be sure the outboard motor is upright (not tilted) when checking and changing the engine oil.**
- **If the oil level is above the upper level mark, drain until the level meets the specified capacity. Overfilling the oil could cause leakage or damage.**

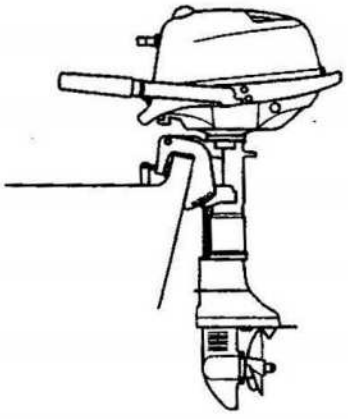
CAUTION:

Change the engine oil after the first 10 hours of operation, and every 100 hours or at 6-month intervals thereafter. Otherwise the engine will wear quickly.

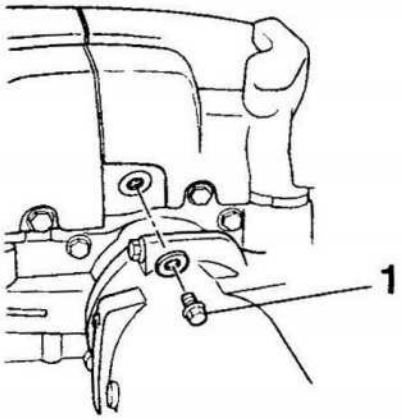
NOTE:

Change the engine oil when the oil is still warm.

1. Put the outboard motor in an upright position (not tilted).



2. Prepare a suitable container that holds a larger amount than the engine oil capacity. Loosen and remove the drain screw while holding the container under the drain hole. Then remove the oil filler cap. Let the oil drain completely. Wipe up any spilled oil immediately.



1. Drain screw

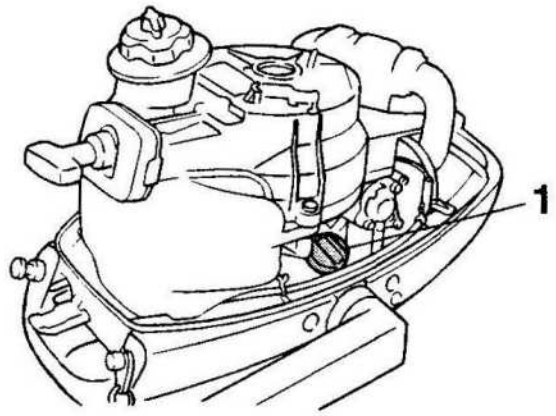
3. Put a new gasket on the oil drain screw. Apply a light coat of oil to the gasket and install the drain screw.

Tightening torque:
See page 35

NOTE:

If a torque wrench is not available when you are installing the drain plug, finger tighten the bolt just until the gasket comes into contact with the surface of the drain hole. Then tighten 1/4 - 1/2 turn. Have the drain plug torqued to the correct value with a torque wrench as soon as possible.

4. Add the correct amount of oil through the filler hole. Install the filler cap.



1. Oil filler cap

Engine oil grade/capacity:
See page 35

5. Start the engine and make sure that there are no oil leaks.
6. Turn off the engine and wait 3 minutes. Recheck the oil level using the dipstick to be sure the level falls between the upper and lower marks. Fill with oil if it is below the lower mark, or drain to the specified level if it is above the upper mark.

NOTE:

- For disposal of used oil consult your dealer.
- The oil should be changed more often when the engine is operated under adverse conditions such as extended trolling.

Checking wiring and connectors

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

Exhaust leakage

Start the engine and check that no exhaust leaks from the joints between the exhaust cover, cylinder head, and body cylinder.

Water leakage

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

Engine oil leakage

Check for oil leaks on the around the engine.

NOTE:

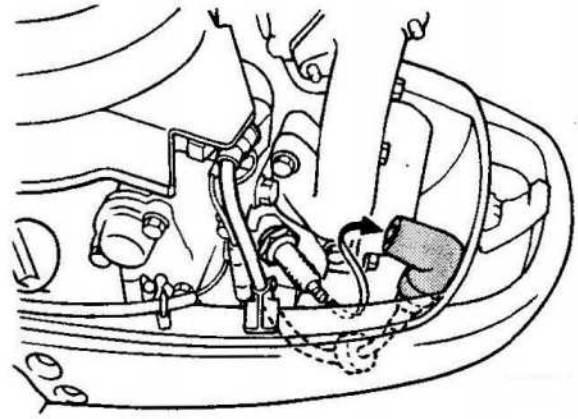
If any leaks are found, consult your dealer.

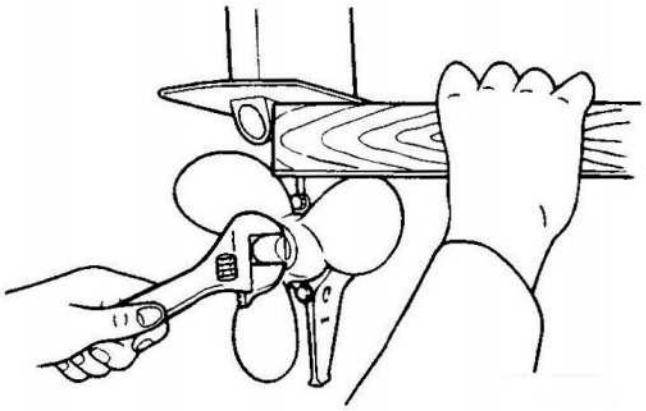
Checking propeller

⚠ WARNING

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

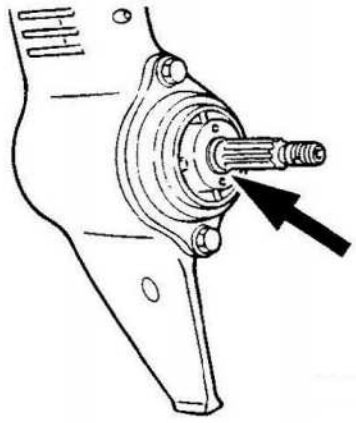
- **Before inspecting, removing, or installing the propeller, remove the spark plug caps from the spark plugs. Also, place the shift control in neutral, turn the main switch to "OFF" (off) and remove the key, and remove the cord from the engine shut-off switch. Turn off the battery cut-off switch if 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.**





Checkpoints

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

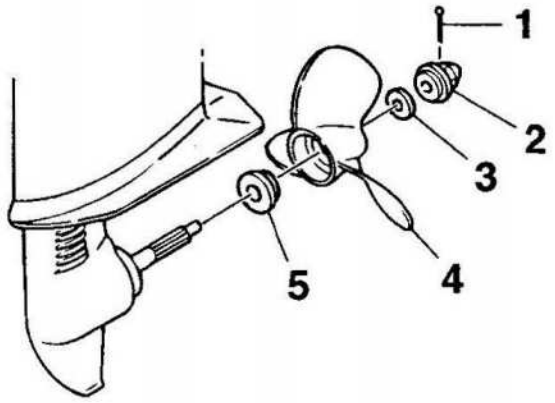


- Check the propeller shaft oil seal for damage.

Removing propeller

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).



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

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

Installing propeller

Spline models

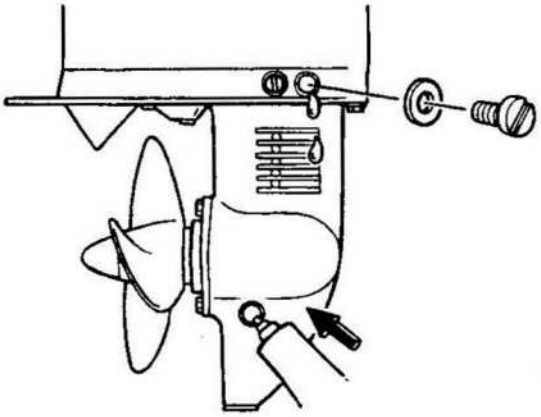
CAUTION:

- **Be sure to install the thrust washer before installing the propeller, otherwise the lower case and propeller boss could be damaged.**
- **Be sure to use a new cotter pin and bend the ends over securely. Otherwise the propeller could come off during operation and be lost.**

1. Apply marine grease or a corrosion resistant grease to the propeller the gear

oil drain screw hole.

Recommended gear oil: Hypoid gear oil SAE#90 Gear oil quantity: 100.0 cm^3 (3.38 US oz) (3.53 Imp.oz)



6. Put a new gasket on the oil level plug. When the oil begins to flow out of the oil level plug hole, insert and tighten the oil level plug.
7. Put a new gasket on the gear oil drain screw. Insert and tighten the gear oil drain screw.

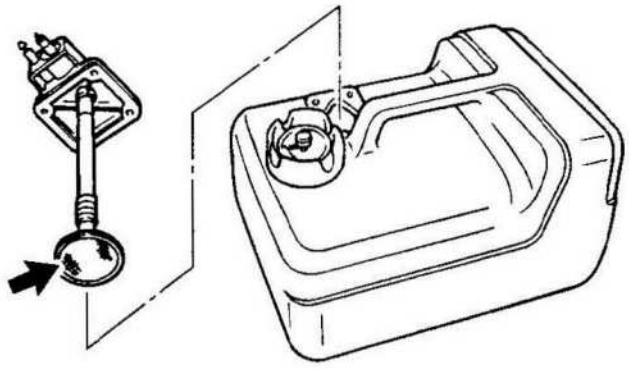
Cleaning fuel tank

⚠ WARNING

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

- **If you have any question about properly doing this procedure, consult your dealer.**
- **Keep away from sparks, cigarettes, flames, or other sources of ignition when cleaning the fuel tank.**
- **Remove the fuel tank from the boat before cleaning it. Work only outdoors in an area with good ventilation.**
- **Wipe up any spilled fuel immediately.**
- **Reassemble the fuel tank carefully. Improper assembly can result in a fuel leak, which could result in a fire or explosion hazard.**
- **Dispose of old gasoline according to local regulations.**

1. Empty the fuel tank into an approved container.
2. Pour a small amount of suitable solvent into the tank. Install the cap and shake the tank. Drain the solvent completely.
3. Remove the screws holding the fuel joint assembly. Pull the assembly out of the tank.



4. Clean the filter (located on the end of the suction pipe) in a suitable cleaning solvent. Allow the filter to dry.
5. Replace the gasket with a new one. Reinstall the fuel joint assembly and tighten the screws firmly.

Inspecting and replacing anode(s)

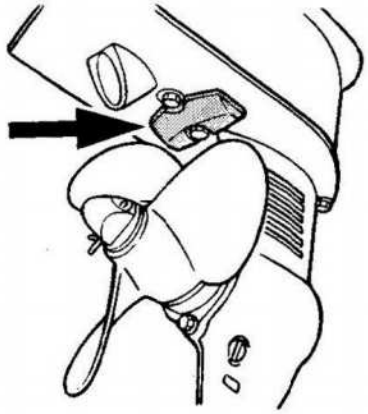
Outboard motors are protected from corrosion by sacrificial anodes. Inspect the external anodes periodically. Remove scales from the surfaces of the anodes. Consult dealer for replacement of external anodes.

CAUTION:

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

NOTE:

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

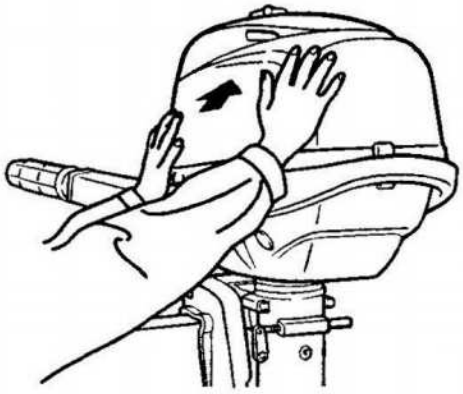


Checking top cowling

CAUTION:

Be sure the cowling is closed securely and that there are no gaps. A loose or improperly fitting cover could allow water into the engine.

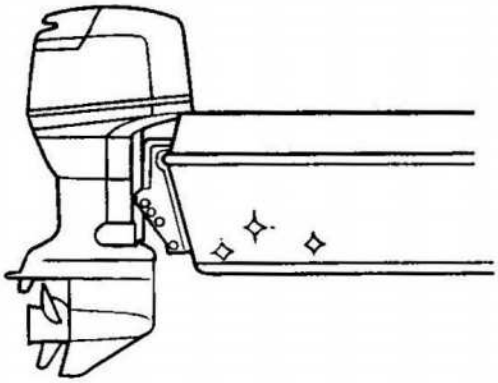
Check the fitting of the top cowling by pushing it with both hands. If it is loose have it repaired by your dealer.



Coating the boat bottom

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.



Trouble Recovery

Troubleshooting

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

Starter will not operate.

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

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

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

Q. Are starter components faulty?
A. Have serviced by dealer.

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

Engine will not start (starter operates).

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

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

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

Q. Is starting procedure incorrect?
A. See page 24.

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

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

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

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

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

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

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

Engine idles irregularly or stalls.

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

Q. Is fuel system obstructed?

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

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

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

Q. Have ignition parts failed?
A. Have serviced by dealer.

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

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

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

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

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

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

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

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

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

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

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

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

Q. Is throttle valve adjustment incorrect?
A. Have serviced by dealer.

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

Warning buzzer sounds or indicator lights.

Q. Is cooling system clogged?
A. Check water intake for restriction.

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

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

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

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

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

Q. Has oil feed/injection pump malfunctioned?
A. Have serviced by dealer.

Trouble Recovery

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

Q. Is water pump or thermostat faulty?
A. Have serviced by dealer.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Q. Have electrical parts failed?
A. Have serviced by dealer.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Temporary action in emergency

Impact damage

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

Starter will not operate

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

⚠ WARNING

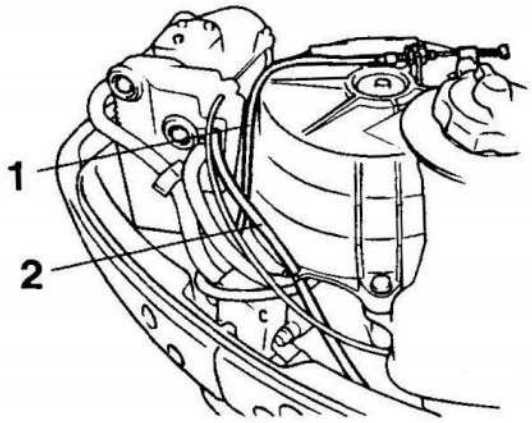
- **Use this procedure only in an emergency to return to the nearest port for repairs.**
- **When the emergency starter rope is used to start the engine, the start-in-gear protection device does not operate. Make sure the remote control lever is in neutral. Otherwise the boat could unexpectedly start to move, which**

could result in an accident.

- **Attach the engine shut-off cord to a secure place on your clothing, or your arm or leg while operating the boat.**
- **Do not attach the cord to clothing that could tear loose. Do not route the cord where it could become entangled, preventing it from functioning.**
- **Avoid accidentally pulling the cord during normal operation. Loss of engine power means the loss of most steering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.**
- **Make sure no one is standing behind you when pulling the starter rope. It could whip behind you and injure someone.**
- **An unguarded, rotating flywheel is very dangerous. Keep loose clothing and other objects away when starting the engine. Use the emergency starter rope only as instructed. Do not touch the flywheel or other moving parts when the engine is running. Do not install the starter mechanism or top cowling after the engine is running.**
- **Do not touch the ignition coil, spark plug wire, spark plug cap, or other electrical components when starting or operating the motor. You could get an electrical shock.**

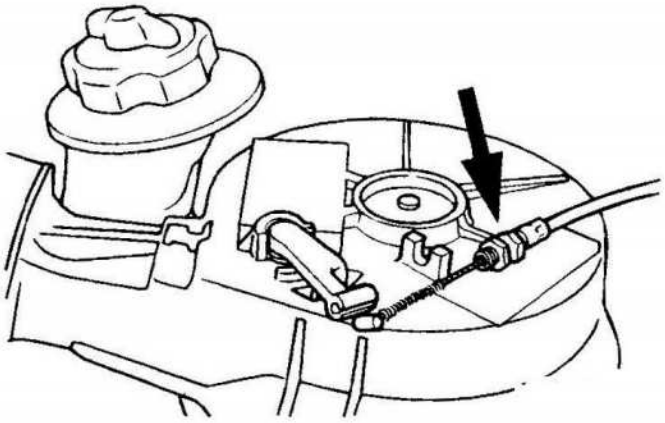
Emergency starting engine

1. Remove the top cowling.
2. Remove the start-in-gear protection cable and the choke cable from the holder on the starter. After removing the choke cable, confirm that the cable end is contacted with the silencer by pushing it inside.

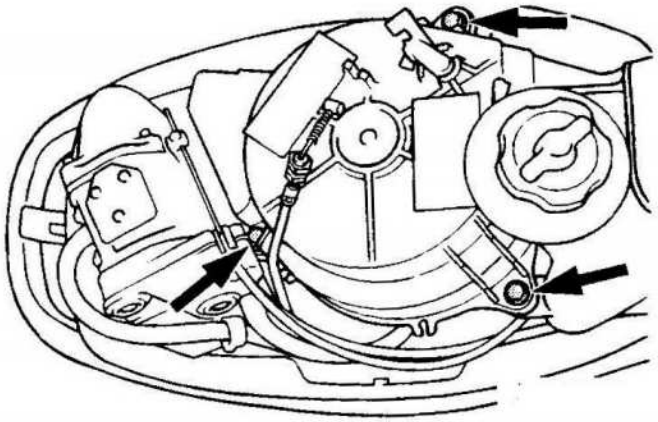


1. Start-in-gear protection cable
2. Choke cable

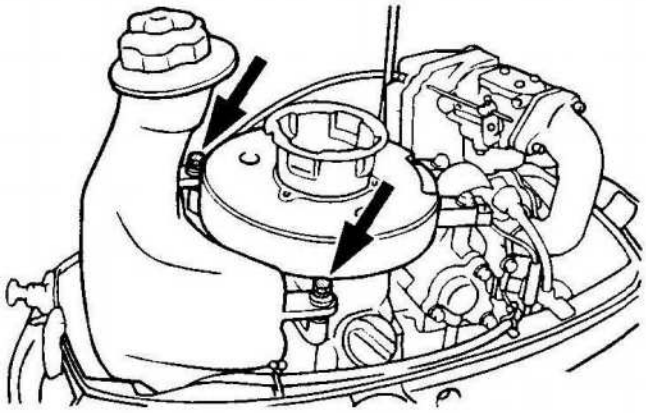
3. Remove the start-in-gear protection cable end by pulling it out from the lever of the starter after loosening the nut.



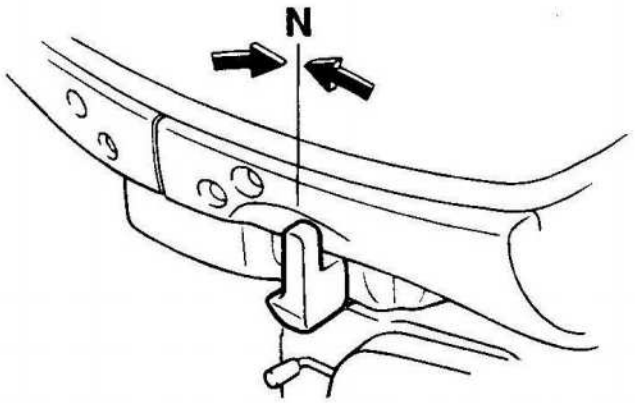
4. Remove the starter after removing the three bolts.

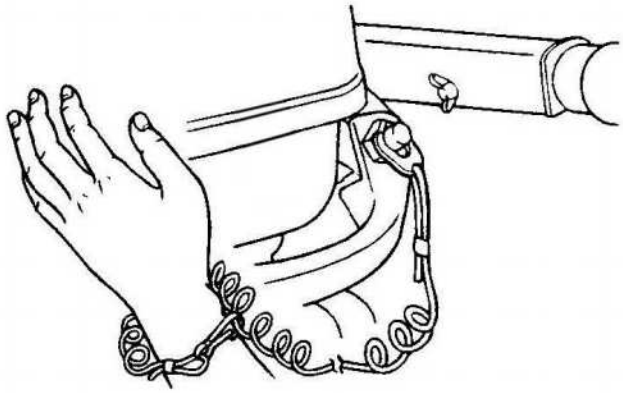


5. Reinstall two bolts to secure the fuel tank.

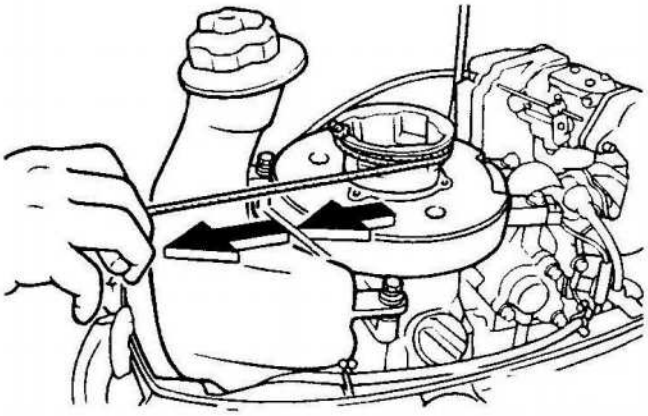


6. Prepare the engine for starting. For further information, see page 24. Be sure the engine is in neutral and that the clip is attached to the engine shut-off switch.





7. Insert the knotted end of the emergency starter rope into the notch in the flywheel rotor and wind the rope several turns around the flywheel clockwise.
8. Pull the rope slowly until resistance is felt.
9. Give a strong pull straight out to crank and start the engine. Repeat if necessary.



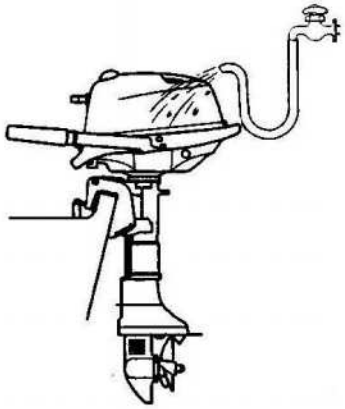
Treatment of submerged motor

If the outboard motor is submerged, immediately take it to dealer. Otherwise some corrosion may begin almost immediately.

If you cannot immediately take the outboard motor to dealer, follow the proce dure below in order to minimize engine damage.

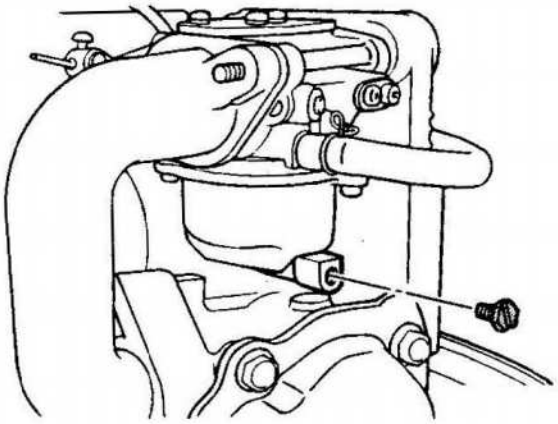
Procedure

1. Thoroughly wash away mud, salt, seaweed, and so on, with fresh water.



2. Remove the spark plug(s), then face the spark plug holes downward to allow any water, mud, or contaminants to drain.
3. Drain the fuel from the carburetor, fuel filter, and fuel line. Drain the engine oil

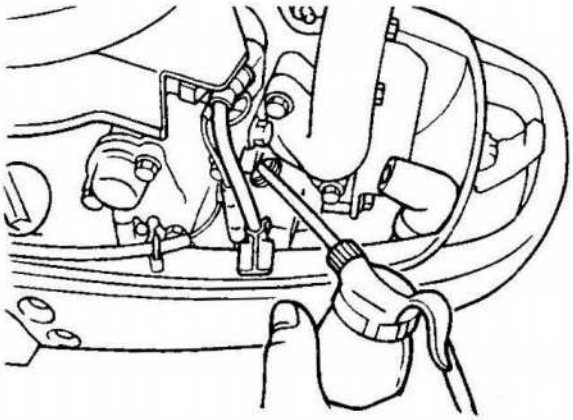
completely.



4. Fill the sump with the fresh engine oil.

Engine oil capacity:
0.5 L (0.53 US qt) (0.44 Imp.qt)

5. Feed engine fogging oil or engine oil through the carburetor(s) and spark plug holes while cranking the engine with the manual starter or emergency starter rope.



6. Take the outboard motor to dealer as soon as possible.

CAUTION:

Do not attempt to run the outboard motor until it has been completely inspected.