



4- Stroke  
**Outboard Motor**

● F 4  
**OWNER'S MANUAL**



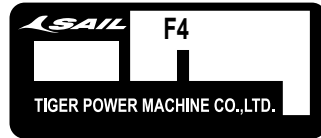
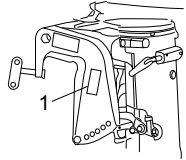
# GENERAL INFORMATION

## Identification numbers record

### Outboard motor serial number

The outboard motor serial number is stamped the port side of the clamp bracket or the upper part of the swivel 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 is stolen.



### 1.Outboard motor serial number location

#### Safety information

- Before mounting or operating the outboard motor, read this entire manual.
- Reading it should give you an understanding of the motor and its operation.
- Before operating the boat, read any owner's or operator's manuals
- supplied with it and all labels. Be sure you understand each item before
- operating.
- Do not overpower the boat with this outboard motor. Overpowering the
- boat could result in loss of control. The rated power of the outboard should
- be equal to or less than the rated horsepower capacity of the boat , if the
- rated horsepower capacity of the boat is unknown, consult the dealer or boat
- manufacturer.
- Do not modify the outboard. Modifications could make the motor unfit or
- unsafe to use.
- Never operate after drinking alcohol or taking drugs. About 50% of all
- boating fatalities involve intoxication.
- Have an approved personal flotation device (PFD) on board for every
- occupant. It is a good idea to 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.
- Gasoline is highly flammable, and its vapors are flammable and
- explosive. Handle and store gasoline carefully. Make sure there are no
- gas fumes or leaking fuel before starting the engine.
- This product emits exhaust gases which contain carbon monoxide, a
- colorless, odorless gas which may cause brain damage or death when

- cockpit and cabin areas well ventilated. Avoid blocking exhaust outlets.
- Check throttle, shift, and steering for proper operation before starting the engine.
- Attach the engine stop switch lanyard to a secure place on your clothing, or your arm or leg while operating. If you accidentally leave the helm, the lanyard will pull from the switch, stopping the engine.
- Know the marine laws and regulations where you will be boating-and obey them.
- Stay informed about the weather. Check weather forecasts before boating. Avoid boating in hazardous weather.
- Tell someone where you are going: leave a Float Plan with a responsible person. Be sure to cancel the Float Plan when you return.
- Use common sense and good judgment when boating. Know your abilities, and be sure you understand how your boat handles under the different boating conditions you may encounter. Operate within your limits, and the limits of your boat. Always operate at safe speeds, and keep a careful watch for obstacles and other traffic.
- Always watch carefully for swimmers during the engine operation.
- Stay away from swimming areas.
- When a swimmer is in the water near you shift into neutral and shut off the engine.

### Important labels

#### Warning labels



Label

#### **▲ WARNING**

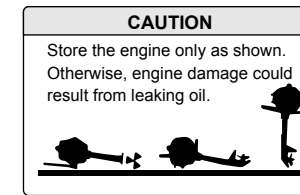
Be sure shift control is in neutral before starting engine. (except 2HP)  
Do not touch or remove electrical parts when starting or during operation.  
Keep hands, hair, and other rotating parts while engine is running.

Label

#### **▲ WARNING**

**LEAKING FUEL COULD CAUSE A FIRE.**  
Before tilting up the engine or laying it on its side:  
Turn the fuel cock to the "closed" position.  
Tighten the air-vent screw on the fuel tank cap.

#### Caution labels



Label

**CAUTION:** \_\_\_\_\_  
Store the engine only as shown. Otherwise, engine damage could result from Leaking oil.

### 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
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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 300 hours of operation.

## Engine oil

Recommended engine oil:  
4-stroke motor oil with a combination of corresponding SAE and API as shown in the chart  
Engine oil quantity (excluding oil filter):  
0.6L

SAE				API
-4	32	68	104°C	SE
-20	0	20	40°C	SF
				SG
				SH
				SJ

## CAUTION:

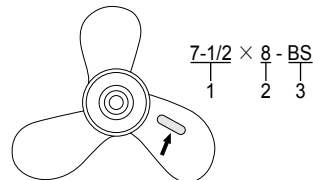
All 4-stroke engine are shipped from the factory without engine oil.



## Propeller selection

The performance of your outboard motor will be critically affected by your choice of propeller, as an incorrect choice could adversely affect performance and could also seriously damage the motor. Engine speed depends on the propeller size and boat. If engine speed is too high or too low for good engine performance, this will have an adverse effect on the engine.

Outboard motors are fitted with propellers chosen to perform well over a range of applications, but there may be uses where a propeller with a different pitch would be more appropriate. For a greater operating load, a smaller-pitch propeller is more suitable as it enables the correct engine speed to be maintained. Conversely, a larger-pitch propeller is more suitable for a smaller operating load. The dealers stock a range of propellers, and can advise you and install a propeller on your outboard that is best suited to your application.



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

## NOTE:

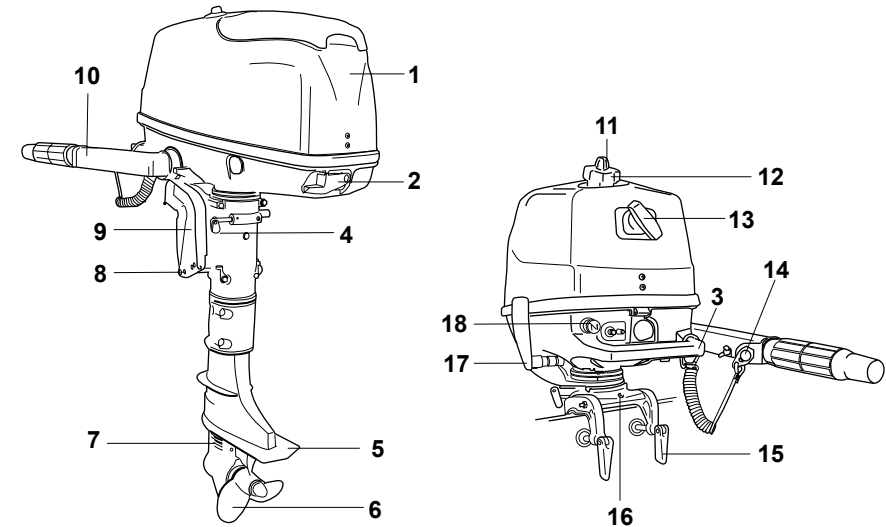
Select a propeller which will allow the engine to reach the middle or upper half of the operating range at full throttle with the maximum boat load. If operating conditions such as light boat loads then allow the engine r/min to rise above the maximum recommended range, reduce the throttle setting to maintain the engine in the proper operating range.

# BASIC COMPONENTS

## Main components

### NOTE:

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



1. Top cowling
2. Top cowling lock lever(s)
3. Carrying handle
4. Steering friction screw
5. Anti-cavitation
6. Propeller
7. Cooling water inlet
8. Trim handle
9. Clamp bracket
10. Tiller handle

11. Air vent screw
12. Fuel tank cap
13. Manual starter handle
14. Engine stop button/Engine stop lanyard switch
15. Clamp screw
16. Rope attachment
17. Gear shift lever
18. Choke knob

## Fuel tank

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

1. Fuel tank cap
2. Air vent screw

### Fuel tank cap

This cap seals the fuel tank. When removed, the tank can be filled with fuel. To remove the cap, turn it counterclockwise.

### Air vent screw

This screw is on the fuel tank cap. To loosen the screw, turn it counterclockwise.

### Fuel cock

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

1. Fuel cock

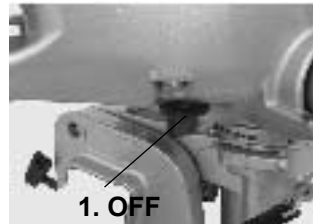


### Close

To stop fuel flow to the engine or to be using outer fuel tank, 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

With the lever/knob in this position, fuel flows to the carburetor.

Normal running is done with the lever/knob in this position.

1. Open position



### Tiller handle

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



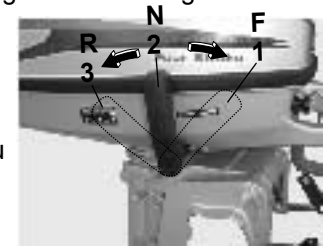
### Gear shift lever

Pulling the gear shift lever towards you puts the engine in forward gear so that the boat moves ahead.

Pulling the gear shift lever back forwards you puts the engine in reverse gear so that the boat moves counter-march.

Note: You should turn down the speed before you swift the forward and reverse gear.

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



### Throttle grip

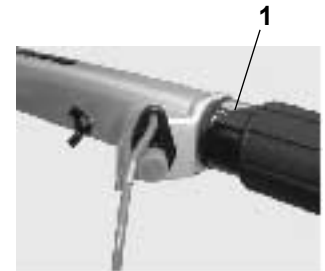
The throttle grip is on the tillerhandle. Turn the grip counterclockwise to increase speed and clockwise to decrease speed.



### 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 throttle lever or grip, which could result in an accident.**

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



### Engine stop lanyard switch

The lock plate must be attached to the engine stop switch for the engine to run. The lanyard 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 lanyard will pull out the lock plate, stopping ignition to the engine. This will prevent the boat from running away under power.

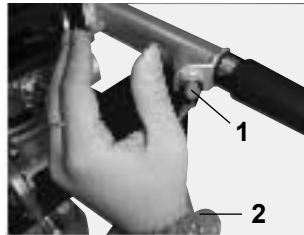
#### **⚠ WARNING**

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

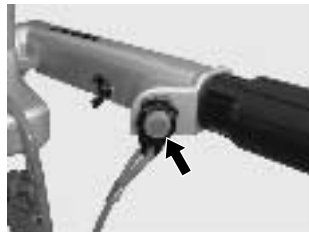
The engine cannot be started with the lock plate removed.

1. Lock plate
2. Lanyard



### 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 support lever for manual tilt model

To keep the outboard motor in the tilted up position, lock the tilt support lever to the clamp bracket.



### 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.



### 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.



## OPERATION

### Installation

#### CAUTION:

Incorrect engine height or obstructions to smooth water flow (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. Severe engine damage may result if the motor is operated continuously in the presence of airborne water spray.

#### NOTE:

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 powerhead, when water rises due to waves when the outboard is not running.

### Mounting the outboard motor

#### ⚠ WARNING

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

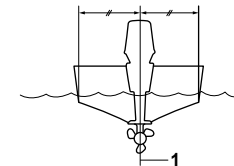
#### ⚠ WARNING

Improper mounting of the outboard motor could result in hazardous conditions such as poor handling, loss of control, or fire hazards. Observe the following:

- For permanently mounted models, your dealer or other person experienced in proper rigging should mount the motor. If you are mounting the motor yourself, you should be trained by an experienced person.
- For portable models, your dealer or other person experienced in proper outboard motor mounting should show you how to mount your motor.

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

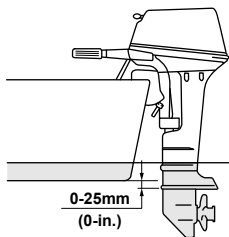
1.Center line (keel line)



### 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 25mm (1 in.) below it.



**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 manufacturer for further information on determining the proper mounting height.

For instructions on setting the trim angle of the outboard motor, see page 18.

**Clamping the outboard motor**

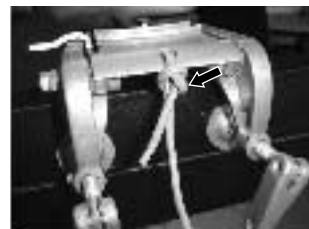
1. Place the outboard motor on the transom so that it is positioned as close to the center as possible. Tighten the transom clamp screws evenly and securely. Occasionally check the clamp screws for tightness during operation of the outboard motor because they could become loose due to engine vibration.

**⚠ 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.

**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**

Run the engine under load (in gear with a propeller installed) as follows.

1. For the first hour of operation:  
Run the engine at 2000 r/min or at approximately half throttle.
2. For the second hour of operation:  
Run the engine at 3000 r/min or at approximately three-quarter throttle.
3. For the next eight hours of operation:  
Avoid continuous operation at full throttle for more than five minutes at a time.
4. After the first 10 hours:  
Operate the engine normally.

**Preoperation checks**

**⚠ WARNING**

If any item in preoperation 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 (if equipped fuel tank or boat tank).
- Be sure the fuel tank is positioned on a secure, flat surface, and that the fuel lines are not twisted or flattened, or likely to contact sharp objects (if equipped fuel tank or boat tank).



## Controls

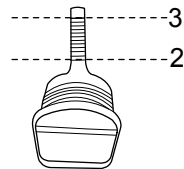
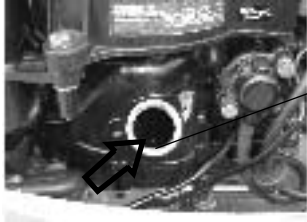
- Check throttle, shift, and steering for proper operation before starting the engine.
- The controls should work smoothly, without binding or unusual free play.
- Look for loose or damaged connections.
- Check operation of the starter and stop switches when the outboard motor is in the water.

## 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. Pull out the oil dipstick and wipe it clean.
3. Completely reinsert the dipstick and pull it out 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 specific level if it is above the upper mark.



1. Oil dipstick

2. Lower level mark

3. Upper level mark

## 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:  
1.3 L (0.344 US gal)(0.286 Imp.gal)

## Operating engine

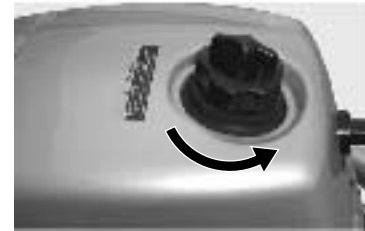
### Feeding fuel

### **⚠ 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. Squeeze the primer pump with the outlet end up until you feel it become firm (if equipped the fuel joint).

### Starting engine

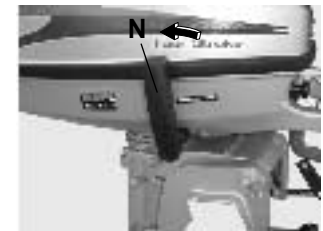
#### Manual start models

1. Place the gear shift lever in neutral

### **⚠ WARNING**

**Always start the engine in neutral to avoid accidentally moving the boat.**

2. If the engine stop switch lanyard is equipped, attach it to a secure place on your clothing, or your arm or leg. Then install the lock plate on the other end of the lanyard into the engine stop switch.



### **⚠ WARNING**

- Attach the engine stop switch lanyard to a secure place on your clothing, or your arm or leg while operating.
- Do not attach the lanyard to clothing that could tear loose. Do not route the lanyard where it could become entangled, preventing it from functioning.

- Avoid accidentally pulling the lanyard 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. Place the choke knob in the "START" (start) position. After the engine starts, return the knob to the "RUN" (run) position.



**NOTE:**

- When restarting a warm engine, place the choke knob in the "RUN" (run) position.
- 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 start the engine. Repeat if necessary.  
6. After the engine starts, slowly return the manual starter handle to the 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.
- If the engine does not start on the first try, repeat the procedure. If the engine fails to start after 4 or 5 tries, open the throttle a small amount (between 1/8 and 1/4) and try again. Also if the engine is warm and fails to start, open the throttle a same amount and try to start the engine again.

## Warming up engine

### 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.

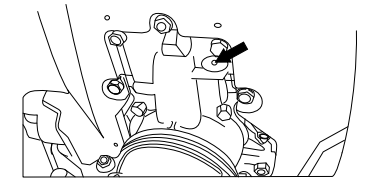
**NOTE:**

- 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 flow of water from the hole on the exhaust cover 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.

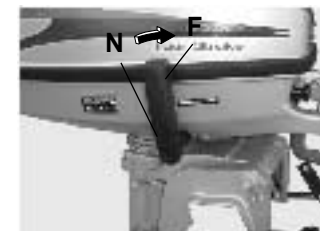
**CAUTION:**

To change the boat direction or shifting position from forward to reverse or viceversa, first close the throttle so that the engine idles (or runs at low speeds.)

### Forward (tiller handle and remote control models)

Tiller control models

1. Place the throttle grip in the fully closed position.
2. Move the gear shift lever quickly and firmly from neutral to forward.



Remote control models

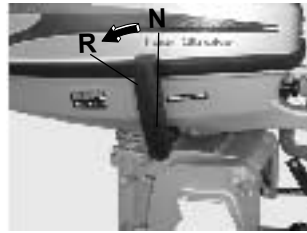
Pull up the neutral interlock trigger (if equipped) and move the remote control lever quickly and firmly from neutral to forward.

### Reverse

#### **⚠ WARNING**

When operating in reverse, go slowly. Do not open the throttle more than half. Otherwise the boat could become unstable, which could result in loss of control and an accident.

1. Place the throttle grip in the fully closed position.
2. Move the gear shift lever quickly and firmly from neutral to reverse.



### 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 stop switch lanyard, the engine can also be stopped by pulling the lanyard and removing the lock plate from the engine stop switch.



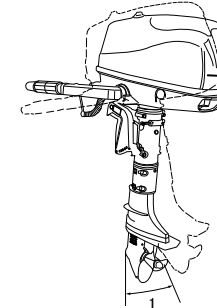
### Trimming outboard motor

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. The trim angle adjusting rod

### ADJUSTING TRIM ANGLE

#### Manual tilt model

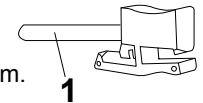
There are 4 or 5 holes provided in the clamp bracket to adjust the outboard motor trim angle.

- 1) Stop the engine.
- 2) Remove the trim angle adjusting rod ① from the clamp bracket while tilting the motor up slightly.
- 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.

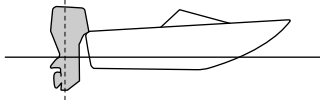
Use caution when trying a trim position for the first time. Increase speed gradually and watch for any signs of instability or control problems. Improper trim angle can cause loss of control.

#### NOTE:

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

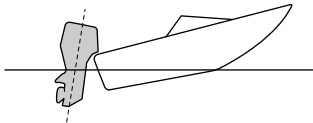
## Adjusting boat trim

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.



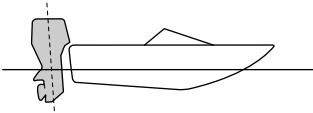
### Bow Up

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.

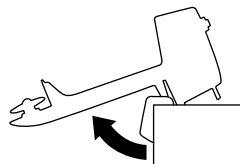


### NOTE:

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



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### ⚠ WARNING

Be sure all people are clear of the outboard motor when tilting up and down, also be careful not to pinch any body parts between the drive unit and engine bracket.

### ⚠ 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. Sever 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°C (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. On full-pivot system models, tighten the steering friction adjuster by turning it clockwise to prevent the motor from turning freely.
3. Tighten the air vent screw. On models equipped with a fuel joint, disconnect the fuel line from the outboard motor.
4. Close the fuel cock.



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5. Tilt support bar equipped models: Hold the rear of the top cowling or the rear rhandle (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 rear handle and tilt 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 the tilt support bar equipped: Slowly tilt the outboard motor down while pulling the tilt support bar lever up.



3. If the tilt support knob equipped: pull out it, then slowly tilt the engine down.
4. 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.**

## Specifications

item	model	Unit	F4-L	F4-S
Dimension				
Overall length		mm	680	680
Overall Width		mm	400	400
Overall height		mm	1200	1080
Weight(AL)S		kg	23.8	23.8
Performance				
Full throttle Operating range		r/min	5250~5750	
Maximum Output		kW(HP)@r/min	3(4)@5500	
Idle speed(in neutral)		r/min	1600±100	
Engine				
Type			4—stroke S	
Displacement		cm <sup>3</sup>	112	
Bore×stroke		mm	59x41	
Ignition System			TCI	
Spark plug		(NGK)	BPR7HS	
Spark plug gap		mm	0.6-0.7	
CORtrol system			Tiller	
Starting carburetion system			Choke valve	
Valve clearance(COId engine) IN		mm	0.08-0.12	
Valve clearance(COId engine) EX		mm	0.08-0.12	
Drive unit				
Gear positions			Forward-neutral-reverse	
Gear ratio			2.08(27 / 13)	
Trim and tilt system			Manual tilt	
Propeller mark			BS	
Fuel and oil				
Recomended fuel			Unleaded regular gasoline	
Fuel tank capacity (inner/outer)		L	1.3/18	
Recommended engine oil			4-stroke outboard motor oil	
Engine oil grade		API	SE, SF, SG, SH, SJ	
Engine oil type		SAE	10W30 or 10W40	
Lubrication			Wet sump	
Engine oil quantity(excluding oil filter)		L	0.60~0.65	
Gear oil quantity		cm <sup>3</sup>	120	
Tightening torque for engine				
Spark plug		N. m	25.0	
Engine oil drain bolt		N. m	18.0	

# PERIODIC MAINTENANCE

## **⚠ WARNING**

Be sure to turn off the engine when you perform maintenance unless otherwise specified. If you or owner is not familiar with machine servicing, this work should be done by your "SAIL" dealer or other qualified mechanic.

### **Replacement parts**

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

### **Maintenance chart**

Frequency of maintenance operations may be adjusted according to the operating conditions, but the following table gives general guidelines. Refer to the sections in this chapter for explanations of each owner-specific action. The "●" symbol indicates the check-ups which you may carry out yourself. The "○" symbol indicates work to be carried out by your "SAIL" dealer.

Item	Actions	Initial		Every	
		10 hours (1 month)	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)
Anode(s) (external)	Inspection/ replacement		●/○	●/○	
Anode(s) (internal)	Inspection/ replacement				○
Cooling water passages	Cleaning		●	●	
Cowling clamp	Inspection/cleaning				●
Fuel filter (inside built-in fuel tank)	Inspection / cleaning				○
Fuel system	Inspection	●	●	●	
Fuel tank (built-in tank)	Inspection / cleaning				○
Gear oil	Change	●		●	
Greasing points	Greasing			●	
Idling speed (carburetor models)	Inspection / cleaning	●/○		●/○	
Propeller and cotter pin	Inspection / replacement		●	●	
Shift link / shift cable	Inspection / adjustment				○
Thermostat	Inspection				○
Throttle link / throttle cable / throttle pick-up timing	Inspection / adjustment				○
Water pump	Inspection				○
Engine oil	Inspection / change	●		●	
Spark plug(s)	Cleaning / adjustment / replacement	●			●
Valve clearance (OHC, OHV)	Cleaning / adjustment	○		○	

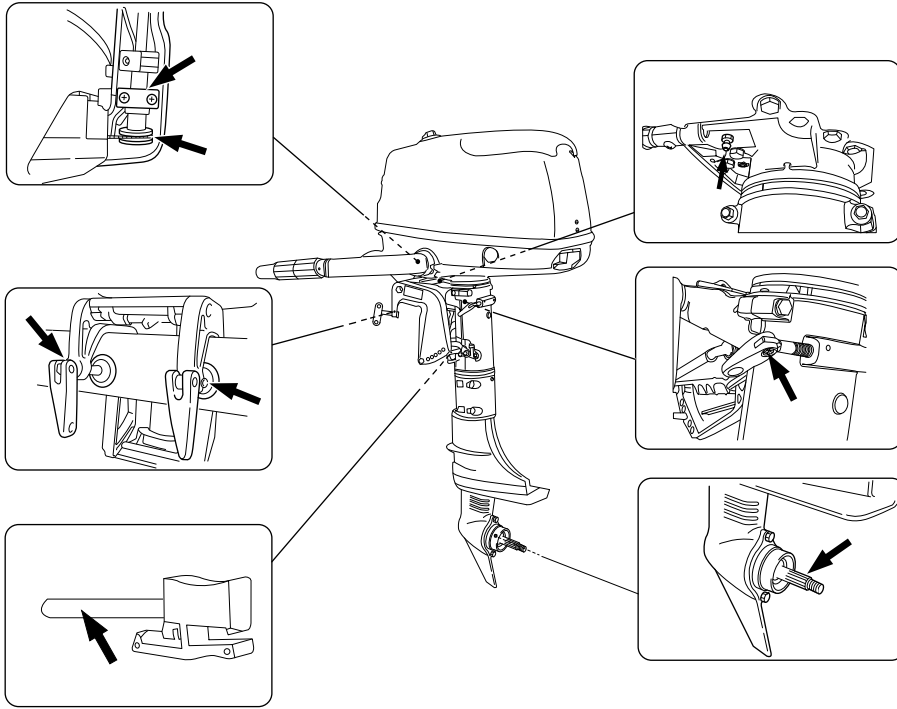
### **NOTE:**

When operating in salt water, turbid or muddy water, the engine should be flushed with clean water after each use.

## Greasing

Grease A (water resistant grease)

Grease D (corrosion resistant grease; for propeller shaft)



## Cleaning and adjusting spark plug

### **⚠ WARNING**

When removing or installing a spark plug, be careful not to damaged insulator could allow external sparks, which could lead to explosion or fire.

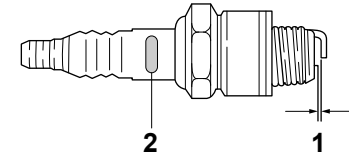
The spark plug is an important engine component and is easy to inspect. The condition of the spark plug can indicate something about the condition of the engine. For example, if the center electrode porcelain is very white, this could indicate an intake air leak or carburetion problem in that cylinder. 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:

□ BPR7HS

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)



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-ib)(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 fingertight. 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



## 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.
- 2-hp models: The propeller rotates whenever the engine is running. Do not move the throttle control lever from the start position during warm-up. The boat could unexpectedly start to move, which could result in an accident.

### **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. 2-hp model: Warm the engine with the throttle in the start position or less. If the outboard is mounted on a boat is tightly moored.

### **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 a dealer or other qualified mechanic.

2. Verify whether the idle speed is set to specification. For idle speed specifications, see page 23.

## Changing engine oil

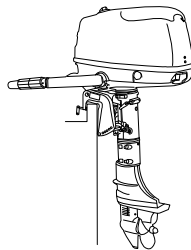
- Avoid draining the engine oil immediately after stopping the engine. The oil is hot and should be handled with care to avoid burns.
- Be sure the outboard motor is securely fastened to the transom or a stable stand.

### **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.

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.



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

Drain screw tightening torque:

□ 18.0 Nm (13.3 ft-ib)(1.84 kgf-m)

### **NOTE:**

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

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

Recommended engine oil:

□ 4-stroke outboard motor oil

Engine oil quantity (excluding oil filter):

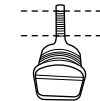
□ 0.4 L(0.42 US qt)(0.35 Imp.qt)

5. Start the engine and watch to make sure the low oil pressure warning indicator (if equipped) turns off. Make sure that there are no oil leaks.

### **CAUTION:**

If the low oil pressure warning indicator does not turn off or if there are oil leaks, stop the engine and find the cause. Continued operation with a problem could cause severe engine damage. Consult your dealer if the problem cannot be located and corrected.

6. Turn off the engine and wait 3 minute. Pull out the oil dipstick and wipe it clean. Completely reinsert the dipstick and pullout it again. 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 specific level if it is above the upper mark.



7. Dispose of used oil according to local regulations.



**NOTE:** \_\_\_\_\_

- For more information on the disposal of used oil, consult your dealer.
- Change the oil more often when operating the engine 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 so water leaks from the joints between the exhaust cover, cylinder head, and body cylinder.

#### Engine oil leakage

Check for oil leads on the around the engine.

**NOTE:** \_\_\_\_\_

If any leaks are found, consult your dealer.

#### Checking propeller

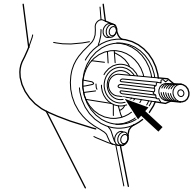
### **⚠ WARNING**

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 lanyard from the engine stop 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 / shear pin for wear or damage.
- Check for fish line tangled around the propeller shaft.
- Check the propeller shaft oil seal for damage.



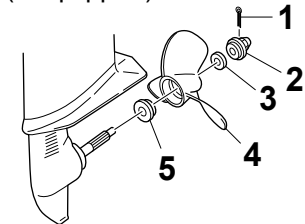
**NOTE:** \_\_\_\_\_

If the shear pin equipped: it is designed to break if the propeller hits a hard underwater obstacle to help protect the propeller and drive mechanism. The propeller will then spin freely on the shaft. If this happens, the shear pin must be replaced.

#### Removing the propeller

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



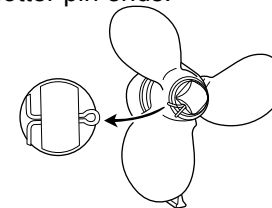
3. Remove the propeller and thrust washer.

#### Installing the propeller

**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 shaft.
2. Install the spacer (if equipped), thrust washer, and propeller on the propeller shaft.
3. Install the spacer (if equipped) and the washer. Tighten the propeller nut until there is no forward-backward movement.
4. Align the propeller nut with the propeller shaft hole. Insert a new cotter pin in the hole and bend the cotter pin ends.



**NOTE:** \_\_\_\_\_

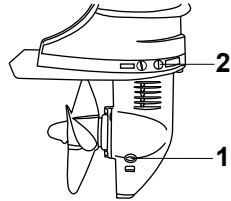
If the propeller nut does not align with the propeller shaft hole after tightening it, loosen the nut until it aligns with the hole.

## Changing gear oil

### **⚠ WARNING**

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

1. Tilt the outboard motor so that the gear oil drain screw is at the lowest point possible.
2. Place a suitable container under the gear case.
3. Remove the gear oil drain screw.



1. Gear oil drain screw
2. Oil level plug

### **NOTE:**

If the magnetic gear oil drain screw equipped: remove all metal particles from the screw before installing it.

4. Remove the oil level plug to allow the oil to drain completely.

### **CAUTION:**

Inspect the used oil after it has been drained. If the oil is milky, water is getting into the gear case which can cause gear damage. Consult a dealer for repair of the lower unit seals.

### **NOTE:**

**For disposal of used oil consult your dealer.**

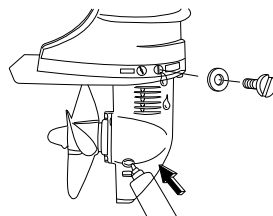
5. With the outboard motor in a vertical position, and using a flexible or pressurized filling device, inject the gear oil into the gear oil drain screw hole.

#### Recommended gear oil:

Hypoid gear oil SAE#90

#### Gear oil quantity:

120 cm<sup>3</sup> (4.064 US oz)(4.24 Imp.oz)



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

### **Inspecting and replacing anode(s)**

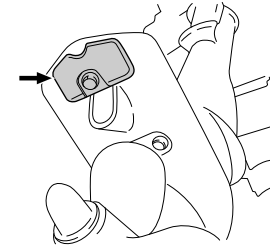
Outboard motors are protected from corrosion by sacrificial anodes. Inspect the external anodes periodically. Remove scales from the surfaces of the anodes. Consult a dealer for replacement of external anodes.

### **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 replacement of internal anodes attached to the power unit.



### **Checking top cowling**

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 antifouling paint approved for your area to inhibit marine growth. Do not use anti-fouling which includes copper or graphite. These paints can cause more rapid engine corrosion.

