



OUTBOARD MOTOR

NSF15C/20C

OWNER'S OPERATING MANUAL

ENOM00001-0



READ THIS MANUAL BEFORE USING THE OUTBOARD MOTOR. FAILURE TO FOLLOW THE INSTRUCTIONS AND SAFETY PRECAUTIONS IN THIS MANUAL CAN RESULT IN SERIOUS INJURY OR DEATH. KEEP THIS MANUAL IN A SAFE LOCATION FOR FUTURE REFERENCE.

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YOUR NISSAN MARINE OUTBOARD MOTOR

ENOM00002-0

OWNER REGISTRATION AND IDENTIFICATION

Upon purchasing this product, be sure that the WARRANTY CARD is correctly and completely filled out and mailed to the addressee noted there on. This WARRANTY CARD identifies you as the legal owner of the product and serves as your warranty registration.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, YOUR OUTBOARD MOTOR WILL NOT BE COVERED BY THE APPLICABLE LIMITED WARRANTY, IF THIS PROCEDURE IS NOT FOLLOWED.

ENOM00003-0

PRE-DELIVERY CHECK

Be sure that the product has been checked by an authorized NISSAN MARINE dealer before you take delivery.

ENOM00004-0

Limited Warranty

Please refer to the NISSAN MARINE outboard motor Limited warranty provided to you with this product, the terms and conditions of which, as amended from time to time, are incorporated by reference into the manual.

ENOM00005-0

Serial Number

In the space below, please record the outboard motor's serial number (indicated both on the lower motor cover and on the cylinder block). The serial number will be needed in the event of theft or to quickly identifying the outboard motor type.

Serial Number:

ENOM00006-0

To You, Our Customer

Thank you for selecting a NISSAN MARINE outboard motor. You are now the proud owner of an excellent outboard motor that will service you for many years to come.

This manual should be read in its entirety and the inspection and maintenance procedures described later in this manual should be followed carefully. Should a problem arise with the outboard motor, please follow the troubleshooting procedures listed at the end of this manual. If the problem persists, contact an authorized NISSAN MARINE service shop or dealer.

We hope you will enjoy your outboard motor and wish you good luck in your boating adventures.

NISSAN MARINE

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11. TROUBLESHOOTING

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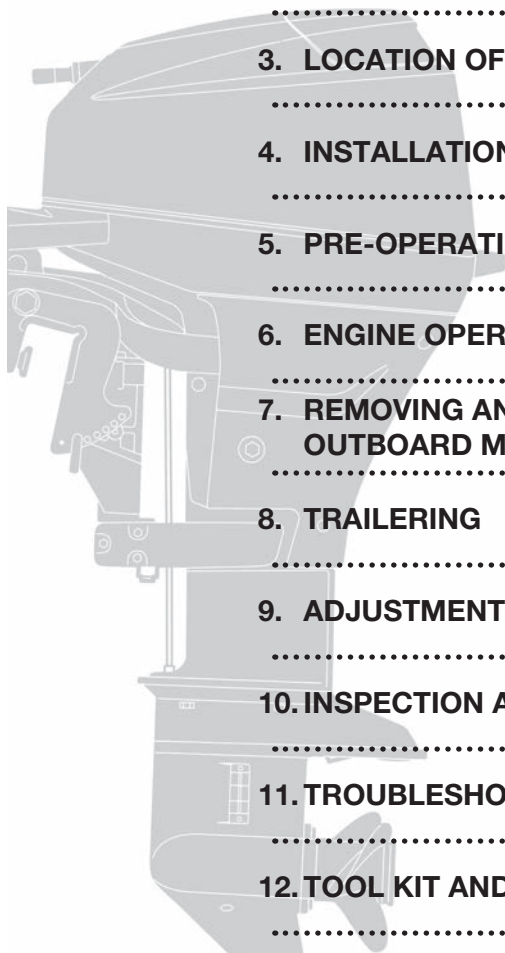
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GENERAL SAFETY INFORMATION

ENOM00007-0

NOTICE: DANGER/WARNING/CAUTION/Note

Before installing, operating or otherwise handling your outboard motor, be sure to thoroughly read and understand this Owner's Manual and carefully follow all of the instructions. Of particular importance is information preceded by the words "DANGER," "WARNING," "CAUTION," and "Note." Always pay special attention to such information to ensure safe operation of the outboard motor at all times.

ENOW00001-0

DANGER

Failure to observe will result in severe personal injury or death, and possibly property damage.

ENOW00002-0

WARNING

Failure to observe could result in severe personal injury or death, or property damage.

ENOW00003-0

CAUTION

Failure to observe could result in personal injury or property damage.

ENON00001-0

Note

This instruction provides special information to facilitate the use or maintenance of the outboard motor or to clarify important points.

ENOM00008-0

EMERGENCY STOP SWITCH

The Emergency Stop Switch will stall the outboard motor when the stop switch tether is pulled off. This stop switch tether can be attached to the operator of the outboard motor to minimize or prevent injuries from the propeller in case the operator falls overboard. We highly recommend use of the Emergency Stop Switch tether.

ENOW00004-0

WARNING

Accidental activation of the Emergency Stop Switch (such as the tether being pulled out in heavy seas) could cause passengers to lose their balance and even fall overboard, or it could result in loss of power in heavy seas, strong currents, or high winds. Loss of control while mooring is another potential hazard.

To minimize accidental activation of the Emergency Stop Switch, the 500 mm (20 inch.) stop switch tether is coiled and can extended to a full 1300 mm (51 inch.).

ENOM00009-0

SAFE OPERATION OF BOAT

As the operator/driver of the boat, you are responsible for the safety of those aboard and those in other boat around yours, and for following local boating regulations. You should be thoroughly knowledgeable on how to correctly operate the boat, outboard motor, and accessories. To learn about the correct operation and maintenance of the outboard motor, please read through this manual carefully.

It is very difficult for a person standing or floating in the water to take evasive action should he or she see a power boat heading in his/her direction, even at a slow speed. Therefore, when your boat is in the immediate vicinity of people in the water, the outboard motor should be shifted to neutral and shut off.

ENOW00005-0



WARNING

SERIOUS INJURY IS LIKELY IF A PERSON IN THE WATER MAKES CONTACT WITH A MOVING BOAT, GEAR HOUSING, PROPELLER, OR ANY SOLID DEVICE RIGIDLY ATTACHED TO A BOAT OR GEAR HOUSING.

ENOM00010-0

SERVICING, REPLACEMENT PARTS & LUBRICANTS

We recommend that only an authorized service shop perform service or maintenance on this outboard motor. Be sure to use genuine parts, genuine lubricants, or recommended lubricants.

ENOM00011-0

MAINTENANCE

As the owner of this outboard motor, you should be acquainted with correct maintenance procedures. It is the operator's responsibility to perform all safety checks and to ensure that all lubrication and maintenance instructions are complied with for safe operation. Please comply with all instructions concerning lubrication and maintenance. You should take the engine to an authorized dealer or service shop for periodic inspection at the prescribed intervals.

Correct periodic maintenance and proper care of this outboard motor will reduce the chance of problems and limit overall operating expenses.

ENOM00012-0

MOUNTING

Outboard motor mounting must be performed by trained service person(s) using lift or hoist with sufficient capacity.

SPECIFICATIONS

ENOM00301-0

MF, EF, EFT

Item		MODEL	15C MF 20C MF	15C EF 20C EF	15C EFT 20C EFT
Overall Length		mm (in)	980 (38.6)		
Overall Width		mm (in)	365 (14.4)		
Overall Height S-L-UL		mm (in)	1065 (41.9)	1215 (47.8)	1342 (52.8)
Transom Height S-L-UL		mm (in)	413 (16.3)	562 (22.1)	689 (27.1)
Weight	S kg (lb)		51.5 (114)	55.0 (121)	62.0 (136)
	L kg (lb)		53.0 (117)	56.5 (125)	63.5 (139)
	UL kg (lb)		54.5 (120)	58.0 (128)	65.0 (142)
Output		kW (ps)	15C : 11.0 (15) 20C : 14.7 (20)		
Max. Operating Range		rpm	15C: 5000-6000 20C: 5400-6100		
Idle Speed in Forward Gear		rpm	900		
Idle Speed in Neutral Gear		rpm	950		
Engine Type			4-Stroke		
Number of Cylinder			2		
Bore × Stroke		mm (in)	61 × 60 (2.40 × 2.36)		
Piston Displacement		mL (Cu in)	351 (21.42)		
Exhaust System			Through hub exhaust		
Cooling System			Water cooling		
Engine Lubrication			Trochoid pump		
Starting System			Manual	Electric starter motor*	
Ignition System			Flywheel Magneto C.D. ignition		
Spark Plug			NGK DCPR6E		
Trim Position			6		
Engine Oil		mL (fl.oz.)	API SF, SG, SH, SJ, SL or SM FCW 10W-30, Approx. 1000 (33.8)		
Gear Oil		mL (fl.oz.)	Genuine Gear Oil or API GL5, SAE #80-90, Approx. 370 (12.5)		
Fuel			Unleaded regular gasoline : Pump posted 87 Octane (research octane rating of 91)		
Fuel Tank Capacity		L (US gal)	12 (3.17)		
Gear Reduction Ratio			2.15 (13 : 28)		
Emission Control System			EM (Engine modification)		
Operator Sound Pressure (ICOMIA 39/94) dB (A)			83.9		
Hand Vibration Level (ICOMIA 38/94) m/sec2			2.5		

*: with manual

Remark: Specifications subject to change without notice.

ENOM00302-0

EP, EPT

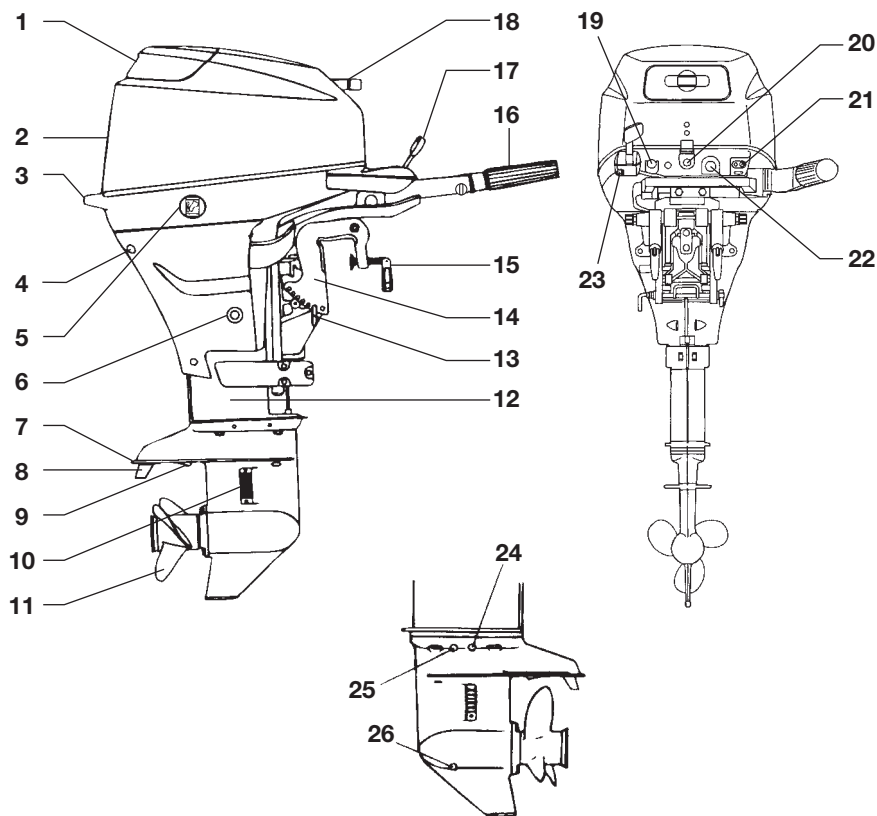
Item		MODEL	15C EP 20C EP	15C EPT 20C EPT
Overall Length		mm (in)	640 (25.2)	
Overall Width		mm (in)	345 (13.6)	
Overall Height S-L-UL		mm (in)	1065 (41.9)	1215 (47.8) 1342 (52.8)
Transom Height S-L-UL		mm (in)	413 (16.3)	562 (22.1) 689 (27.1)
Weight	S kg (lb)		54.0 (119)	61.0 (134)
	L kg (lb)		55.5 (122)	62.5 (138)
	UL kg (lb)		57.0 (126)	—
Output		kW (ps)	15C: 11.0 (15) 20C: 14.7 (20)	
Max. Operating Range		rpm	15C: 5000-6000 20C: 5400-6100	
Idle Speed in Forward Gear		rpm	900	
Idle Speed in Neutral Gear		rpm	950	
Engine Type			4-Stroke	
Number of Cylinder			2	
Bore × Stroke		mm (in)	61 × 60 (2.40 × 2.36)	
Piston Displacement		mL (Cu in)	351 (21.42)	
Exhaust System			Through hub exhaust	
Cooling System			Water cooling	
Engine Lubrication			Trochoid pump	
Starting System			Electric starter motor*	
Ignition System			Flywheel Magneto C.D. ignition	
Spark Plug			NGK DCPR6E	
Trim Position			6	5
Engine Oil		mL (fl.oz.)	API SF, SG, SH, SJ, SL or SM FCW 10W-30/40, Approx. 1000 (33.8)	
Gear Oil		mL (fl.oz.)	Genuine Gear Oil or API GL5, SAE #80-90, Approx. 370 (12.5)	
Fuel			Unleaded regular gasoline: Pump posted 87 Octane (research octane rating of 91)	
Fuel Tank Capacity		L (US gal)	12 (3.17)	
Gear Reduction Ratio			2.15 (13 : 28)	
Emission Control System			EM (Engine modification)	
Operator Sound Pressure (ICOMIA 39/94) dB (A)			83.9	
Hand Vibration Level (ICOMIA 38/94) m/sec ²			—	

*: with manual

Remark: Specifications subject to change without notice.

NAMES OF PARTS

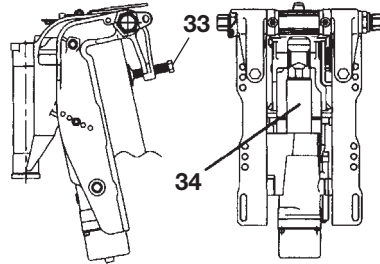
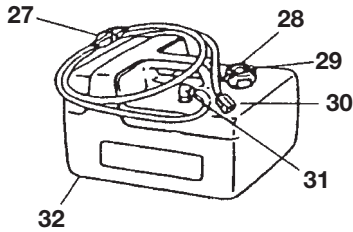
ENOM00303-0

MF, EF, EP, EFT, EPT


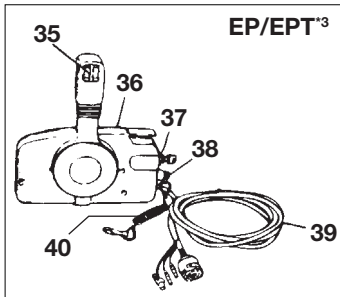
ENOF00301-0

- | | | |
|--|---------------------------------|-------------------------------|
| 1 Tilt Handle | 12 Drive Shaft Housing | 24 Water Plug |
| 2 Top Cowl | 13 Thrust Rod | 25 Oil Plug (Upper) (Level) |
| 3 Bottom Cowl | 14 Clamp Bracket | 26 Oil Plug (Lower) (Fill) |
| 4 Cooling Water Check Port | 15 Clamp Screw | *1: MF, EF and EFT type only. |
| 5 Power Tilt Switch
(EPT and EFT type only) | 16 Throttle Grip* ¹ | *2: EF and EFT type only. |
| 6 Oil Drain Bolt | 17 Shift Lever* ¹ | |
| 7 Anti Ventilation Plate | 18 Starter Handle | |
| 8 Anode/Trim Tab | 19 Stop Switch | |
| 9 Sub Water Inlet | 20 Warning Lamp | |
| 10 Water Inlet | 21 Fuel Connector | |
| 11 Propeller | 22 Starter Switch* ² | |
| | 23 Choke Knob* ¹ | |

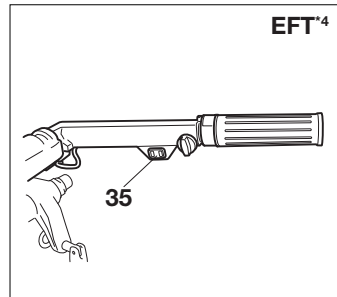
MF, EF, EP, EFT, EPT



Power Tilt Type



EP/EPT^{*3}



EFT^{*4}

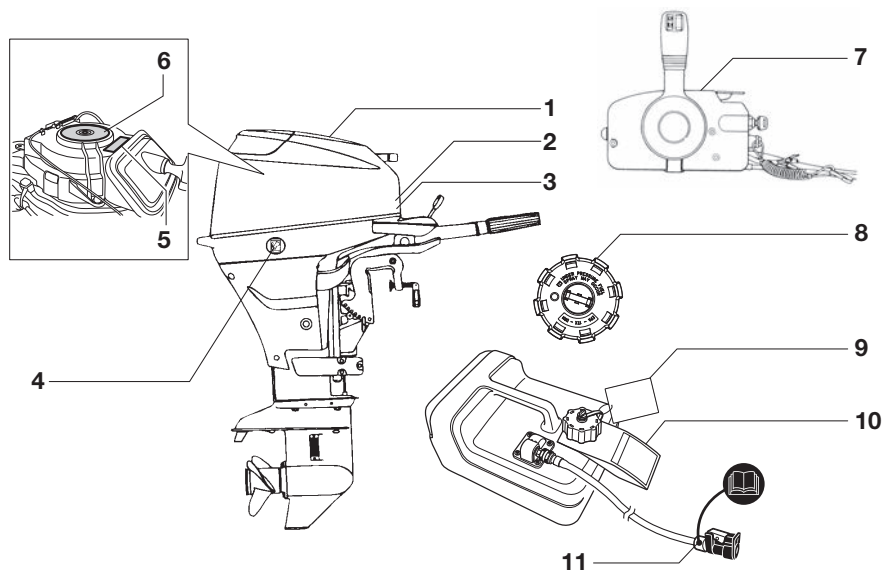
- 27 Primer Bulb
- 28 Fuel Tank Cap
- 29 Air Vent Screw
- 30 Fuel Connector
- 31 Fuel Pick up Elbow
- 32 Fuel Tank
- 33 Clamp Screw
(EFT type only)
- 34 Power Tilt
- 35 Power Tilt Switch
(EPT type only)
- 36 Remote Control Box

- 37 Main Switch
- 38 Stop Switch
- 39 Cord Assembly
- 40 Engine Stop Switch Cord
- ^{*3}: EP and EPT type only.
- ^{*4}: EFT type only.

LOCATION OF WARNING LABELS

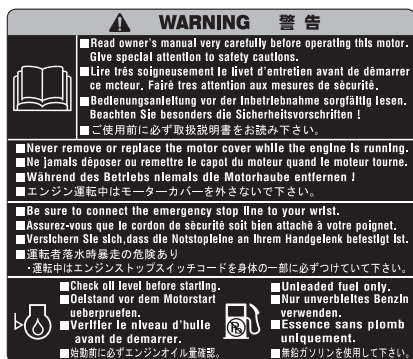
ENOM00305-0

Locations of warning labels



ENOF00303-0

1. Warning label regarding owner's manual, top cowl, engine stop switch, engine oil level and unleaded gasoline.
2. Only for EU remote control model
Warning label regarding installation of remote control system (See page 20).



ENOF00005-0



ENOF00120-0

3. Warning label regarding oil pressure (See page 28).



ENOF00131-0

4. Warning label on position of outboard motor when setting down.



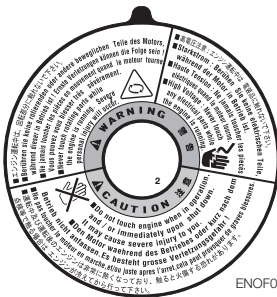
ENOF00006-0

5. Only for EU model
Warning label regarding emergency starting (See page 34).



ENOF00128-0

6. Warning label regarding rotating parts, electrical shock and high temperature.



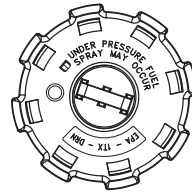
ENOF00129-0

7. Warning label on engine stop switch.



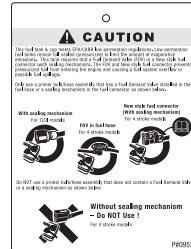
ENOF00008-0

8. Only for USA and CANADA models
Warning regarding fuel tank cap
(See pages 25, 29–32).



ENOF00012-0

9. Only for USA and CANADA models
Warning regarding combination of fuel tank and primer bulb ass'y.



ENOF00010-0

10. Only for USA and CANADA models
When opening or closing fuel tank cap, be sure to observe warning note on fuelling.



ENOF00011-0

11. Only for USA and CANADA models
Warning regarding fuel connector
(See pages 25, 29–32).

ENOM00023-0

Symbols

Individual symbol marks means as described below.

Warning/Caution



ENOF00114-0

Read manual thoroughly



ENOF00115-0

Check oil level



ENOF00116-0

Use unleaded gasoline only



ENOF00117-0

Lay as indicated



ENOF00118-0

Flammable - Keep Fire Away



ENOF00119-0

Gear shift lever operation direction, dual direction



ENOF00122-0

Engine start/Engine cranking



ENOF00123-0

Warning, rotating object



ENOF00249-0

Warning, high voltage



ENOF00204-0

Warning, high temperature

ENOF00205-0

INSTALLATION

ENOM00024-0

1. Mounting the outboard motor on boat

ENOW00006-0

WARNING

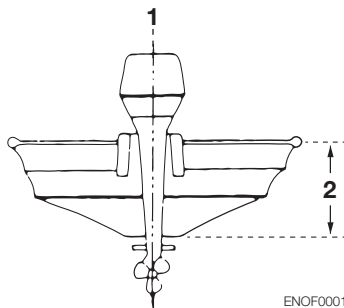
Most boats are rated and certified in terms of their maximum allowable horsepower, as shown on the boat's certification plate. Do not equip your boat with an outboard motor that exceeds this limit. If in doubt, contact your dealer.

Do not operate the outboard motor until it has been securely mounted on the boat in accordance with the instructions below.

ENOM00025-0

Position ... Above keel line

Set engine at center of boat.



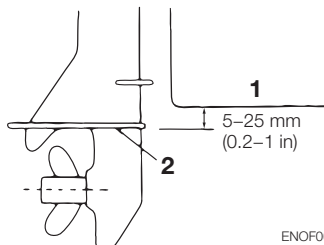
ENOF00014-0

1. Center of boat
2. Boat transom

ENOM00509-0

Transom matching

Be sure that the anti ventilation plate of the outboard motor is below the water surface when running with the throttle wide open. If the above condition cannot be met due to the shape of the bottom of your boat, please consult your authorized dealer.



ENOF00015-0

1. Bottom of hull
2. Anti ventilation plate

ENOM00306-0

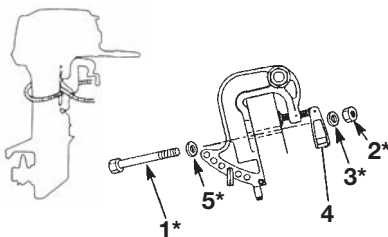
MF, EF, EP type

1. To attach the outboard motor to the boat, tighten the clamp screws by turning their handles. Also, tighten the bolts. Secure the outboard motor with a rope to prevent loss overboard.

ENON00002-0

Note

A rope is not included in the standard accessories.



ENOF000304-0

1. Bolt (8 × 85)*
2. Nut*
3. Washer*
4. Clamp screw
5. Washer*

*: Option

ENOW00007-0

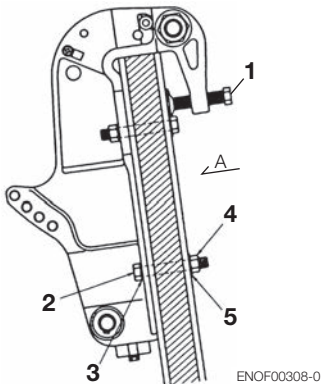
⚠ CAUTION

- Before beginning the running test, check that the boat with maximum capacity loading floats on the water in a proper attitude. Check the position of water surface on the driveshaft housing. If the water surface is near the bottom cowl- ing, in high waves, water may enter the engine cylinders.
- Incorrect outboard motor mounting height or existence of underwater object(s), such as hull bottom design, bottom surface conditions or underwa- ter accessories, can cause water spray possibly reaching the engine through an opening of the bottom cowling during cruising. Exposing the engine to such conditions for extended periods can lead to severe engine damage.

ENOM00309-0

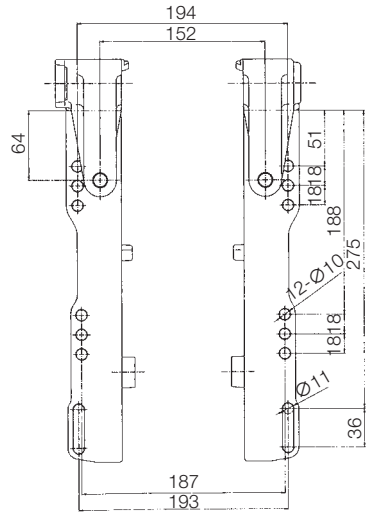
EFT, EPT type

2. Power Tilt and Gas Assist type



ENOF00308-0

1. Clamp screw (EFT type only)
2. Bolt (8 × 85)
3. Washer
4. Nut
5. Washer



ENOF00305-0

View A

ENON00401-0

Note

It is recommended to install upper mounting bolts with bolt head at inside surface of transom. Bolts with threaded end at inside surface of transom can cause personal injury.

ENON00003-0

Notes

1. Apply sealing agent, such as silicone sealed between the bolts and the transom board holes before tightening the bolts.
2. Be sure to tighten the mounting bolt nuts to the specified torque.
(30 Nm (3.0 kgf) 13 ft-lb)

ENOW00009-0

⚠ WARNING

- Mounting the outboard motor without following this manual can lead to unsafe conditions such as poor maneuverability, lack of control or fire.

- Loose clamp screws and/or mounting bolts can lead to the release or displacement of the outboard motor, possibly resulting in lost of control and/or serious personal injury. Be sure that fasteners are tightened to the specified torque (30 Nm (3.0 kgf) 13 ft-lb). Check the fasteners for tightness from time to time.
- Be sure to use outboard mounting fasteners included in the outboard motor package or their equivalents in terms of size, material, quality and strength. Tighten fasteners to the specified torque (30 Nm (3.0 kgf) 13 ft-lb). Test cruise to check if fasteners are tightened securely.
- Outboard motor mounting must be performed by trained service person(s) using lift or hoist with sufficient capacity.

ENOM00028-0

2. Installing the remote control devices

ENOW00010-0



WARNING

When using other than Nissan Marine's genuine remote control box, **DO NOT** select the one without neutral safety switch that prevents in-gear start.

Use of remote control box without neutral safety switch can allow start of engine with gear at other than neutral shift, potentially leading passengers to falling or causing passenger to be thrown overboard.

It is recommended that you consult with your authorized dealer for installation and adjustment of the remote control device.

- Installation of the Remote Control Cables (Box side):

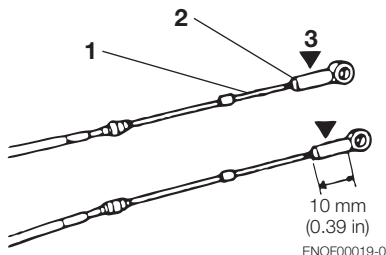
Follow the instruction manual provided with the remote control.

- Installation of the Remote Control on your boat:

Follow the instruction manual provided with the remote control.

- Installation of the Remote Control Cable (engine side) and the Cord Assembly (Wiring Harness):

1. Fitting of connecting parts to cables
Screw the tip of the remote control cable into the cable joint up to approx. 10 mm (0.39 inch), then lock them with a lock nut. Apply grease to the hole of the cable joint.



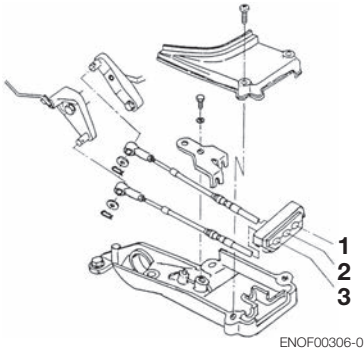
1. Remote control cable
2. Lock nut
3. Cable joint

2. Fitting of Remote Control Cable to Engine.

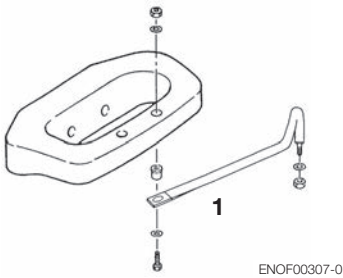
ENON00004-0

Note

Put the control lever in the Neutral position and the Free Accel lever in the fully closed position.



1. Cable harness B
2. Shift cable
3. Throttle cable



1. Drag link
- ENOW00100-0

⚠ CAUTION

Be careful not to loop the remote control cables to a diameter of 406 mm (16 inches) or less.

ENON00301-0

Note

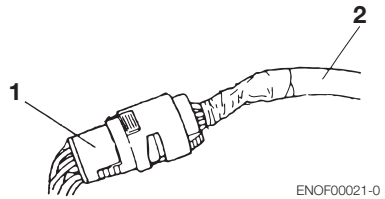
Confirm whether the shift of engine is in gear when shifting the control lever of the Remote Control to its first position in Forward or Reverse (about 32°) and whether the throttle valve is fully open when shifting the lever further.

Confirm whether the throttle valve is fully closed when the control lever is shifted to the Neutral position.

3. Connecting the Cord assembly (Wiring Harness).

Connect cable harness B to cable harness A.

Location of the connectors is near the recoil starter of starboard side in the cowl.



1. Cable Harness A (Outboard motor side)
2. Cable Harness B (From remote control)

ENOW00011-0

⚠ WARNING

Do not disconnect the cord assembly when the outboard motor is in operation or you will lose control of the outboard motor.

ENOM00029-0

3. Installing the battery

1. Place the battery box in a convenient position away from possible water spray. Securely fasten both the box and the battery so they do not shake loose.

ENOW00012-0

⚠ WARNING

Battery electrolyte contains sulfuric acid and thus is hazardous, causing a burn if it comes in contact with your skin, or poisonous if swallowed.

Keep battery and electrolyte away from reach of children.

When handling the battery, be sure to:

- Read all warnings shown on the battery case
- Prevent electrolyte from coming in contact with any part of your body. Contact can cause serious burn or, if it comes in contact with your eye, loss of sight. Use safety glasses and rubber gloves.

In case battery electrolyte comes in contact with:

- Skin, flush thoroughly with water.
- Eye, flush thoroughly with water, and then seek immediate medical treatment.

In case battery electrolyte is swallowed:

- Seek immediate medical treatment.

ENON00302-0

Note

Minimum recommended battery: 12V, 70AH (800 Marine Cranking Amps (MCA) or 650 Cold Cranking Amps (CCA))
Specifications and features of batteries vary among the manufacturers. Consult the manufacturer for details.

ENOW00013-0

! WARNING

Battery generates explosive hydrogen gas. Be sure to:

- Charge the battery in a well-ventilated place.
- Place the battery away from any source of fire, sparks and open flames such as burners or welding equipment.
- Do not smoke when handling the battery.
- Do not smoke near the battery when the battery is charging.

ENOW00014-0

! CAUTION

- Make sure that the battery leads do not get stuck between the outboard motor and boat when turning, etc.

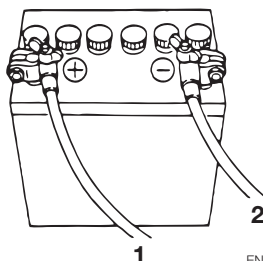
- The starter motor may fail to operate if the leads are incorrectly connected.
- Be sure to correctly connect the (+) and (–) leads. If not, the charging system will be damaged.
- Do not disconnect the battery leads from battery while the engine is operating, the electrical parts could be damaged.
- Always use a fully charged battery.

ENOW00015-0

! CAUTION

Do not use a battery that is not recommended. Use of a battery not recommended can lead to poor performance of, and/or damage to, the electrical system.

2. Connect the positive lead (+) to the positive terminal (+) of the battery, and then connect the negative lead (–). When disconnecting the battery always remove the negative lead (–) first. After connecting the positive terminal (+), securely place a cap on it to prevent short circuits.



ENOF00022-0

1. Battery cord (red)
2. Battery cord (black)

PRE-OPERATING PREPARATIONS

ENOM00016-0

DANGER

Consult an authorized dealer for details on handling gasoline, if necessary.

Gasoline and its vapors are very flammable and can be explosive.

When carrying a fuel tank containing gasoline:

- Close the air vent screw of fuel tank cap, or gasoline vapor will be emitted through the air vent screw, creating a fire hazard.
- Do not smoke.

When or before refueling:

- Stop the engine, and do not start the engine during refueling.
- Do not smoke.
- Be careful not to overfill fuel tank. Wipe up any spilled gasoline immediately.

When or before cleaning the gasoline tank:

- Dismount fuel tank from the boat.
- Place the fuel tank away from every source of ignition, such as sparks or open flames.
- Do the work outdoors or in a well ventilated area.
- Wipe off gasoline well immediately if spilt.

After cleaning gasoline tank:

- Wipe off gasoline well immediately if spilt.
- If the fuel tank is disassembled for cleaning, reassemble carefully. Imperfect assembly may cause a fuel leak, possibly leading to fire or explosion.
- Dispose aged or contaminated gasoline in accordance with local regulations.

ENOM00030-0

1. Recommended gasoline types

ENOM00017-0

CAUTION

Use of improper gasoline can damage your engine. Engine damage resulting from the use of improper gasoline is considered misuse of the engine, and damage caused thereby will not be covered under the limited warranty.

ENOM00031-0

FUEL RATING

NISSAN MARINE engines will operate satisfactorily when using a major brand of unleaded gasoline meeting the following specifications:

USA and Canada — having a posted pump Octane Rating of 87 (R+M)/2 minimum. Premium gasoline (92 [R+M]/2 Octane) is also acceptable. Do not use leaded gasoline.

Outside USA and Canada — Use unleaded gasoline with declared octane rating of 90 RON or over. Use of premium gasoline of 98 RON is also allowed. Use of name-brand leaded gasoline may be allowed only if unleaded gasoline is not available.

ENOM000514-0

GASOLINES CONTAINING ALCOHOL

The fuel system components on your NISSAN MARINE engine will withstand up to 10% alcohol content in the gasoline. But if the gasoline in your area contains either methanol (methyl alcohol) or ethanol (ethyl alcohol), you should be aware of certain

adverse effects that can occur. These adverse effects are more severe with methanol. Increasing the percentage of alcohol in the fuel can also worsen these adverse effects. Some of these adverse effects are caused because the alcohol in the gasoline can absorb moisture from the air, resulting in a separation of the water/alcohol from the gasoline in the fuel tank.

These may cause increased:

- Corrosion of metal parts
- Deterioration of rubber or plastic parts
- Fuel permeation through rubber fuel lines
- Starting and operating difficulties

ENOW00018-0

WARNING

Fuel leakage can cause fire or explosion, potentially leading to severe injury or loss of life. Every fuel system part should be checked periodically, and especially after long term storage, for fuel leak, change of hardness of rubber, expansion and/or corrosion of metals. In case any indication of fuel leakage or degradation of fuel part is found, replace relevant part immediately before continuing operation.

If the use of gasoline containing alcohol is inevitable, or presence of alcohol is suspected in the gasoline, it is recommended to add a filter that has water separating capability, and check the fuel system for leaks and mechanical parts for corrosion and abnormal wear more frequently.

And, in case any of such abnormality is found, discontinue the use of such gasoline and contact our dealer immediately.

Damages resulting from the use of gasolines that contain alcohol are not covered under the limited warranty.

Fuel tank capacity:

12 liters (3.17 U.S. gal)

Fuel Tank: When using a fixed fuel tank in place of genuine fuel tank, it is recommended to select a one with a structure facilitating interior cleaning.

ENOW00019-0

WARNING

Do not fill the fuel tank over capacity. The rise of gasoline temperature may cause gasoline to expand which, if overfilled, may leak through air vent screw when it is open. Leaking gasoline is a dangerous fire hazard.

ENOW00020-0

CAUTION

When operating a NISSAN MARINE engine on gasoline containing alcohol, storage of gasoline in the fuel tank for long periods should be avoided. Long periods of storage, common to boats, create unique problems. In cars, alcohol blend fuels normally are consumed before they can absorb enough moisture to cause trouble, but boats often sit idle long enough for phase separation to take place. In addition, internal corrosion may take place during storage if alcohol has washed protective oil films from internal components.

ENOM00033-0

2. Low permeation fuel hose requirement

EQUIPPED FOR UNITED STATES AND CANADA MODEL

Required for outboards manufactured for sale, sold, or offered for sale in the United States

- NISSAN MARINE engine has used fuel hoses for The Environmental Protection Agency (EPA) requires from January 1, 2011.

ENOM00034-0

3. EPA pressurized portable fuel tank requirements

EQUIPPED FOR UNITED STATES AND CANADA MODEL

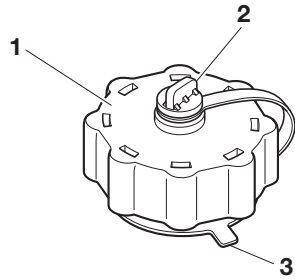
The Environmental Protection Agency (EPA) required portable fuel systems that are produced after January 1, 2011 for use with outboard engines to remain fully sealed (pressurized) up to 34.4 kPa (5.0 psi). These tanks may contain the following:

- An air inlet that opens to allow air to enter as the fuel is drawn out of the tank.
- An air outlet that opens (vents) to the atmosphere if pressure exceeds 34.4 kPa (5.0 psi). A hissing noise may be heard as the tank vents to the atmosphere. This is normal.
- When installing the fuel tank cap, turn the cap to the right until you hear two clicks. This signals that the fuel cap is fully seated. A built-in device prevents overtightening.
- The fuel tank has a manual vent screw which should be closed for transportation and full open for operation and cap removal.

Since sealed fuel tanks are not openly vented, they will expand and contract as the fuel expands and contracts during heating and cooling cycles of the outside air. This is normal.

ENOM00035-0

REMOVING THE FUEL CAP



ENOF00023-0

1. Fuel cap
2. Manual vent screw
3. Tab lock

IMPORTANT: Contents may be under pressure. Rotate the fuel cap 1/4 turn to relieve pressure before opening.

1. Open the manual vent screw on top of the fuel cap completely.
2. Turn the fuel cap until it contacts the tab lock.
3. Press the tab lock and turn to remove cap.

ENOM00036-0

4. EPA approval Primer valve/hose assembly

EQUIPPED FOR UNITED STATES AND CANADA MODEL

NISSAN MARINE adopts Primer bulb/hose assembly approved by the Environment Protection Agency (EPA).

Please use the EPA approved primer bulb/hose assembly with the identification mark on the fuel connector.

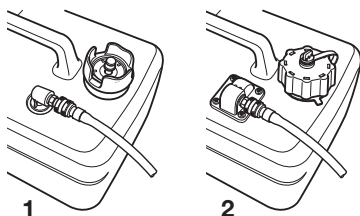


ENOF00111-0

ENOW00021-0

CAUTION

Be sure to use EPA approved tank and EPA approved primer bulb/hose assembly as a set. Confirm shapes of EPA approved tank and regular tank.



1. Except for U.S. model (regular tank)
2. For U.S. and Canada model (EPA approved tank)

ENOF00414-0

ENOM00037-0

5. Recommended engine oil

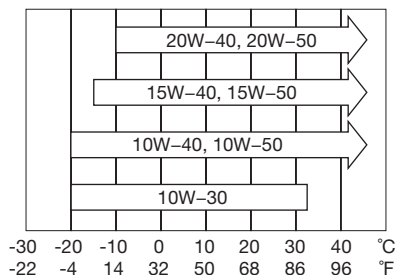
Use only high quality 4-stroke engine oil to insure performance and prolonged engine life.

Use NMMA FC-W certified 4-stroke engine oil below.

10W-30: is recommended for use in all temperature.

25W-40: may be used at temperatures above 4°C (40°F).

You can also use oils that carry the API rating of SF, SG, SH, SJ, SL, or SM. Select the appropriate viscosity, based on atmospheric temperature, from the chart below.



ENOF00025-0

ENOW00022-0

CAUTION

The engine oil is drained for shipping from the factory. Be sure to fill the engine to the proper level before starting engine. (To properly fill the engine with oil follow the instructions in section 10 of this manual)

ENON00007-0

Note

Use of engine oils that do not meet these requirements will result in reduced engine life, and other engine problems.

ENOM000331-0

6. Altitude adjustment kit requirement

For U.S.A. market only High altitude:

When engine operates at high altitude engine may need to have a high altitude kit installed. Otherwise, operating the engine at high altitude may increase its emissions and decrease fuel efficiency and performance. Please see "LIMITED WARRANTY INFORMATION" for more detail.

ENOM00038-0

7. Break-In

Your new outboard motor and lower unit require break-in for the moving components according to the conditions described in the following time table.

ENOW00023-0

 CAUTION

Operating the outboard motor without break-in can shorten service life of the product.
If any abnormality is experienced during the break-in:

- **Discontinue the operation immediately.**
- **Have the dealer check the product and take proper action(s) if necessary.**

	1–10 min	10 min – 2 hrs	2–3 hrs	3–10 hrs	After 10 hrs
Throttle Position	Idle	Less than 1/2 throttle	Less than 3/4 throttle	3/4 throttle	Full throttle available
Speed		Approx. 3000 rpm max	Full throttle run allowed for 1 min every 10 min	Approx. 4000 rpm. Full throttle run allowed for 2 min every 10 min	

ENON00008-0

Note

Proper break-in allows outboard motor to deliver it full performance for longer service life.

ENOW00024-0

 DANGER

Do not operate the outboard motor in closed area or area with no forced ventilation.

Exhaust gas emitted by this outboard motor contains carbon monoxide that will cause death if inhaled continuously. Inhaling the gas initially causes symptoms such as feeling of sickness, drowsiness and headache.

During operation of the outboard motor:

- **Keep peripheral area well ventilated.**
- **Always attempt to stay on the windward side of emission.**

ENOM00315-0

8. Engine oil warning lamp

Oil pressure is required to lubricate internal engine parts.

When the warning lamp (Red) is off, indicates that oil pressure is present.

Remark: When engine is first started, the red light will turn on for several seconds to confirm that it is working and then turn off.

ENOW00402-0



CAUTION

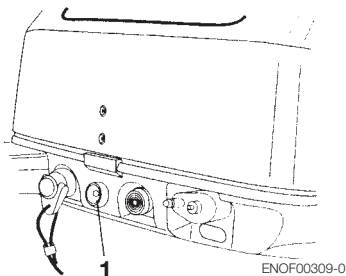
Never run the engine if the warning lamp is on or blinking on and off.

When the warning lamp is on or blinking on and off, as an additional alert of the low oil pressure condition, the engine will run rough and not exceed 2000 rpm;

* Stop the engine immediately and check the engine oil level.

If the oil level is lower than the appropriate level: Replenish engine oil.

If the oil level is within the appropriate level: Consult with your dealer.



ENOF00309-0

1. Warning lamp

ENOM00330-0

9. ESG (A device preventing over revolution)

ESG is a device to prevent over revolution of the engine (more than approximately 6400 rpm).

If you sense that the ESG is activated return to shore at a reduced speed (rpm). Possible causes of ESG activation are: Worn, broken, bent propeller. Slipping propeller rubber, Making sharp turns at high speeds.

ENON00202-0

Note

If the engine speed drops frequently after restarting the engine, please contact your dealer.

ENGINE OPERATION

ENOM00042-0

Before starting

ENOW00026-0

CAUTION

The engine oil is drained for shipping from the factory. Be sure to fill the engine to the proper level before starting engine. (To properly fill the engine with oil follow the instructions in section 10 of this manual)

ENOW00027-0

CAUTION

Before starting engine for the first time after reassembling engine or off-season storage, disconnect stop switch lock and pull the starter handle completely out approximately 10 times in order to prime the oil pump.

ENOM00043-0

1. Filling the fuel

ENOW00028-0

DANGER

Consult an authorized dealer for details on handling gasoline, if necessary.

Gasoline and its vapors are very flammable and can be explosive.

When carrying a fuel tank containing gasoline:

- Close the fuel tank cap and air vent screw of fuel tank cap, or gasoline vapor will be emitted through the air vent screw, creating a fire hazard.
- Do not smoke.

When or before refueling:

- Stop the engine, and do not start the engine during refueling.

- Do not smoke.
- Be careful not to overfill fuel tank. Wipe up any spilled gasoline immediately.

When or before cleaning the gasoline tank:

- Dismount fuel tank from the boat.
- Place the fuel tank away from every source of ignition, such as sparks or open flames.
- Do the work outdoors or in a well ventilated area.
- Wipe off gasoline well immediately if spilt.

After cleaning gasoline tank:

- Wipe off gasoline well immediately if spilt.
- If the fuel tank is disassembled for cleaning, reassemble carefully. Imperfect assembly may cause a fuel leak, possibly leading to fire or explosion.
- Dispose aged or contaminated gasoline in accordance with local regulations.

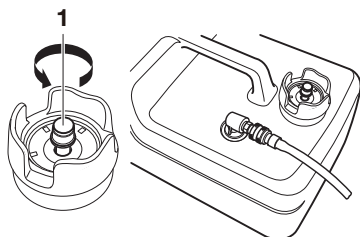
ENOW00029-0

WARNING

When opening fuel tank cap, be sure to follow the procedure described below. Fuel could blast out through the fuel tank cap in case the cap is loosened by using another procedure when internal pressure of fuel tank is raised by heat from sources such as engine or sun light.

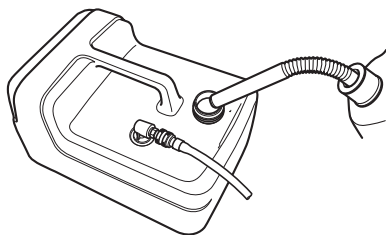
Except for USA and Canada model

1. Full open the air vent screw on the tank cap and release internal pressure.



ENOF00417-0

1. Full open the Air vent screw
2. Open the fuel tank cap slowly.
3. Fill the fuel carefully not to over flow.

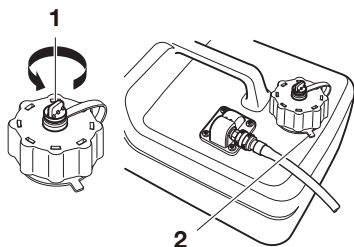


ENOF00419-0

4. After filling the tank, close the tank cap.

For USA and Canada model

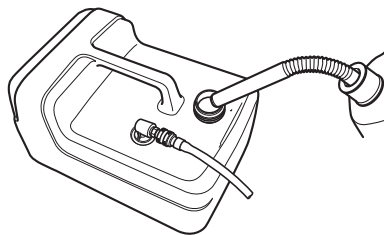
1. Full open the air vent screw on the tank cap and release internal pressure.



ENOF00421-0

1. Full open the air vent Screw
2. Tab lock

2. Loosen the tank cap until it contacts the tab lock and release internal pressure completely. After that, press down the tab lock and open the tank cap.
3. Fill the fuel carefully not to over flow.



ENOF00419-0

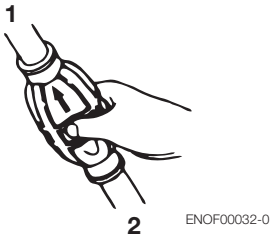
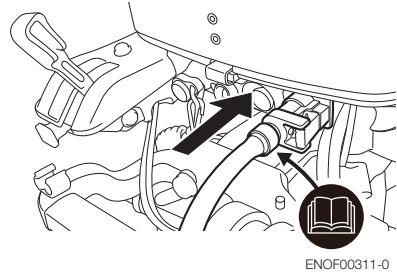
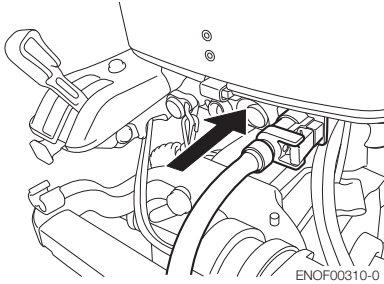
4. After filling the tank, close the tank cap until two clicks sound is heard.

ENOM00044-0

2. Feeding the fuel

Except for USA and Canada model

1. Full open the air vent screw on the tank cap.
2. Open the fuel tank cap slowly and release internal pressure completely. After that, close the fuel tank cap.
3. Connect the fuel connector to the engine and squeeze primer bulb until it becomes stiff to feed fuel to carburetor. Direct arrow mark upward when priming.

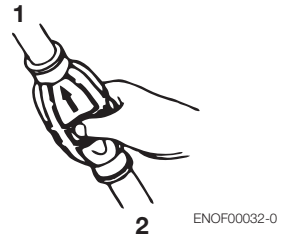


1. Engine side
2. Fuel tank side

Do not squeeze primer bulb while engine running or when the outboard motor is tilted up. Otherwise, fuel could overflow.

For USA and Canada model

1. Full open the air vent screw on the tank cap.
2. Loosen the tank cap until contacts the tab lock and release internal pressure completely. After that, close the tank cap until two clicks sound is heard.
3. Connect the fuel connector to the engine and squeeze primer bulb until it becomes stiff to feed fuel to carburetor. Direct arrow mark upward when priming.



1. Engine side
2. Fuel tank side

Do not squeeze primer bulb while engine running or when the outboard motor is tilted up. Otherwise, fuel could overflow.

ENOW00030-0

CAUTION

When using EPA approval fuel tank, only use a primer bulb/hose assembly that has a Fuel Demand Valve installed in the fuel hose or a sealing mechanism in the fuel connector as shown below.

(FDV and fuel connector that has an sealing mechanism prevent pressurized fuel from entering the engine and causing a fuel system overflow or possible fuel spillage.)



ENOF00035-0

1. FDV in fuel hose
2. Sealing mechanism in fuel connector
3. Identification

Do NOT use a primer bulb/hose assembly that does not contain a Fuel Demand Valve or a sealing mechanism as shown below: otherwise overflow the fuel system or fuel spillage may occur.

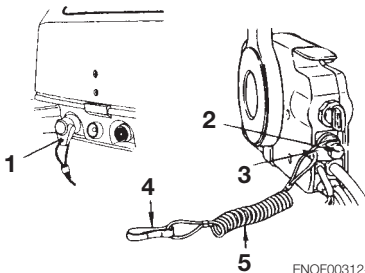


ENOF00036-0

ENOM00311-0

3. Starting

1. After making sure the stop switch lock has been installed, connect the hook to a part of the operator's body.



ENOF00312-0

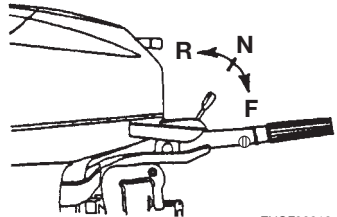
1. Stop switch lock
2. Stop switch
3. Lock
4. Hook
5. Emergency stop line

MF, EF, EFT type

2. Place the shift lever in the Neutral position.

Be sure that the shift is in Neutral when starting the engine.

This model is provided with start in gear protection.



ENOF00313-0

ENOW00031-0

CAUTION

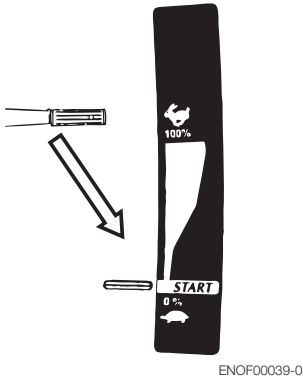
If the engine starts in gear, do not use it. Contact an authorized dealer.

ENON00010-0

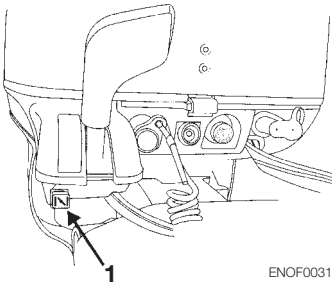
Note

Start-in-gear protection prevents engine from starting at other than neutral shift. In-gear starting of engine will move the boat immediately, potentially leading to falling down or causing passenger(s) to be thrown overboard.

3. Set the throttle grip to "START" position.



4. Pull the choke knob fully.



1. Choke knob

ENON00501-0

Note

Choke is not necessary when the engine is warm. Set the throttle grip to "RE-START" position.

ENON00502-0

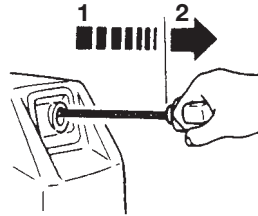
Note

If engine does not start with 4 or 5 times starting operation, push the knob back and restart.

MF type

Engine is equipped with a compression release mechanism.

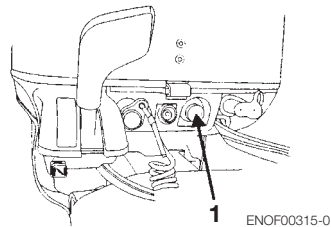
5. Pull the starter handle slowly until you feel engagement, keep pulling till you feel less resistance. Then pull it quickly. Repeat if necessary until started.
6. When starting the engine, push the choke knob back.



1. Slowly
2. Quickly

EF, EFT type

5. Push the starter switch button.



1. Starter switch button

6. Release the button when the engine has started.
7. When starting the engine, push the choke knob back.

EP, EPT type

2. Insert the main switch key.
3. Set the control lever in the Neutral position.

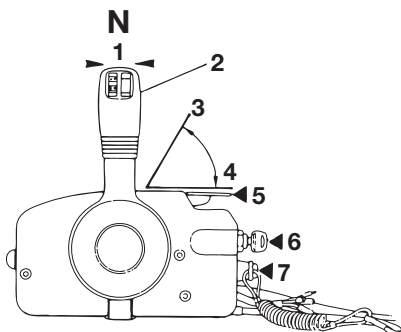
4. Raise the free accel lever a little (both of cold engine and warm engine).
5. Turn the main switch key to START position. Then, continuously push the key to operate the choke.

ENON00503-0

Note

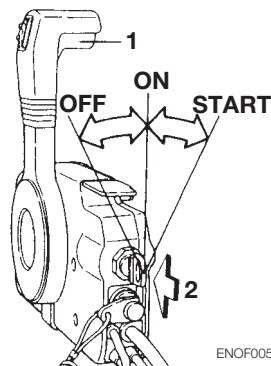
Choke operation is not necessary if the engine is warm.

6. Stop pushing the key when the engine has started.
The key returns to the original position, automatically.
7. Returns the Free accel lever to close position.



ENOF00042-0

1. Neutral (N)
2. Control lever
3. Fully open
4. Fully closed
5. Free accel lever
6. Main switch key
7. Stop switch



ENOF00570-0

1. Lock button
2. Push to operate choke

ENON00504-0

Note

The free accel lever can not be raised when the control lever shift is in Forward or Reverse.

ENOW00032-0

CAUTION

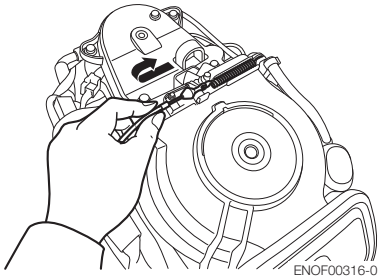
Do not keep turning starter motor for over 5 seconds, or the battery may be consumed, potentially making the engine starting impossible and/or damaging the starter.

If cranking over 5 seconds fails to start engine, return main switch to "ON", and crank engine again after 10 seconds or more.

ENOM00312-0

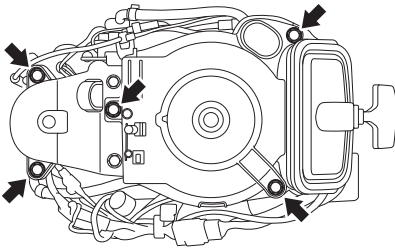
If the recoil starter fails to operate

1. Remove the top cowl.
2. Remove starter lock cable from recoil starter by pulling the starter lock cable.



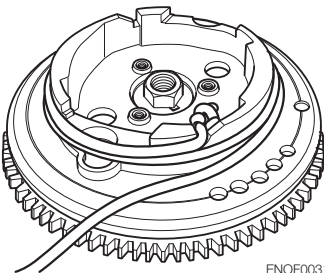
ENOF00316-0

3. Remove the bolts (5pcs) and remove the recoil starter.



ENOF00317-0

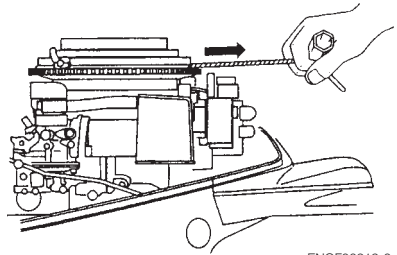
4. Insert the knotted end of the starter rope into the notch in the flywheel and wind the rope around the flywheel several turns clockwise.



ENOF00318-0

5. Tie a loop in the another end of the emergency starter rope and attach socket wrench that is included in the tool kit.

6. Confirm that the shift lever is at neutral position and turn on the main switch key.
7. Pull the choke knob out when the engine is cold (For EP and EPT type, refer to page 36 "If the choke solenoid fails to operate".)
- Pull the starter handle slowly until you feel engagement, keep pulling till you feel less resistance. Then pull it quickly.



ENOF00319-0

ENOW00099-0

⚠ WARNING

When the emergency starter rope is used for starting engine;

- **Start in gear protection does not work.**
Be sure to shift is at neutral position. Otherwise the engine will move the boat immediately and cause personal injury.
- **Be careful that your clothes or other items do not get caught in the rotating engine parts.**
- **To prevent accident and injury by rotating parts, do not re-attach the recoil starter after the engine has been started.**
- **Do not pull starter rope if any bystander is behind. The action can injure the bystander.**
- **Attach engine stop switch lanyard to clothing or any part of body like arm before starting engine.**
- **Be careful not to remove engine stop switch lanyard from engine accidentally**

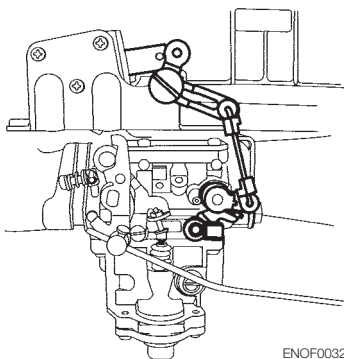
while boat is running. Sudden stop of engine can cause loss of steering control. It can also cause loss of boat speed, possibly leading the crew(s) and or objects on the boat to be thrown forward due to inertial force.

- Do not touch electrical components such as ignition coils, spark plug cables or spark plug caps when starting engine or while engine is in operation. Touching any of these parts can cause electrical shock.

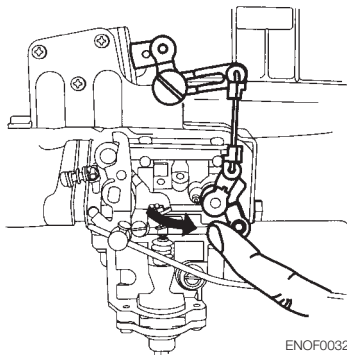
ENOM00518-0

If the choke solenoid fails to operate (EP and EPT type only)

1. Remove the top cowl.
2. Close the choke plate by finger.
3. Raise the Free accel lever a little.
4. Turn the main switch key to start position.
5. Stop pushing the key when the engine has started.
6. Return the choke plate to open position.



ENOF00320-0



ENOF00321-0

ENOM00043-0

4. Warming up the engine

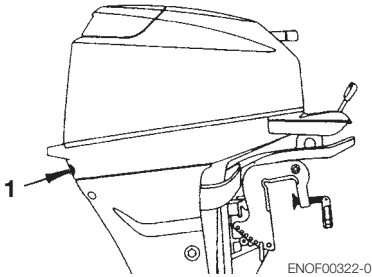
Warm the engine at low engine speeds for about three minutes. This allows the lubricating oil to circulate to all parts of the engine. Operating the engine without warm up shortens the engine's life.

Be sure to check that cooling water is coming out of the cooling water check port during warm up.

ENOW00035-0

CAUTION

If the engine is operated without water discharging from the check port, the engine may over heat.



1. Cooling water check port

ENOW00036-0

CAUTION

Be sure to stop engine immediately if cooling water check port is not discharging water, and check if cooling water intake is blocked. Operating engine could lead to overheating potentially leading to engine damage. Consult an authorized dealer if the cause cannot be found.

ENOM00313-0

Engine speeds

Idling speed after warming up.

Remark: In case of cold engine starting, idling speed is increased about 300 rpm for several minutes.

Clutch in (In gear)	Clutch off (Out of gear)
900 rpm	950 rpm

ENOM00314-0

Propeller selection

Propeller must be selected that will allow the engine to reach recommended rpm when cruising at wide-open throttle.

Wide-open throttle rpm range	
15	20
5000—6000 rpm	5400—6100 rpm

Genuine propellers are listed on PROPELLER TABLE of this manual.

ENOM00046-0

5. Forward and reverse

ENOW00037-0

WARNING

Before shifting into forward or reverse, make sure that boat is properly moored and outboard motor can be steered fully to the right and left. Make sure that no swimmer(s) is ahead or astern of the boat.

ENOW00038-0

WARNING

- Attach other end of emergency stop switch tether to the operator's clothing or arm and keep it attached during cruising.
- Do not attach the tether to a part of clothing that can be torn easily when pulled.
- Arrange the tether so that will not be caught by any object when pulled.
- Be careful not to pull the tether accidentally during cruising. Unintentional stop of engine can cause loss of control of outboard motor. Rapid loss of engine power can lead to falling down or causing passenger(s) to be thrown overboard.

ENOW00301-0

WARNING

Be sure to connect the emergency tethered stop hook to your waist or clothing. The engine will shut down when the switch lock becomes disconnected from the engine.

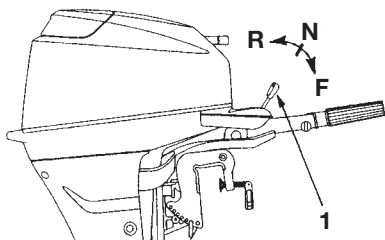
ENON00012-0

Note

Do not increase engine speed unnecessarily in reverse.

ENOM00315-0

MF/EF and EFT type



ENOF00323-0

1. Shift lever

ENOW00039-0

WARNING

Severe damage, and personal injury, may occur if shifting at high engine speed. Engine must be in the slow idle position before shifting is attempted.

Forward

Turn the throttle grip to reduce engine speed. When the engine reaches trolling (or idling) speed, quickly pull the shift lever to the Forward position.

Reverse

Reduce engine speed, when the engine reaches trolling (or idling) speed, quickly push the shift lever to the Reverse position.

ENOW00040-0

WARNING

Before shifting, make sure that no swimmer(s) or obstacle(s) is ahead or astern of the boat.

ENOW00041-0

CAUTION

Be sure to warm up engine well before starting cruise. Operating cold engine may cause damage to your motor.

ENON00013-0

Note

Idle speed may be higher during warming up of engine. If shifted to Forward or Reverse during warming up, it may be difficult to shift back to neutral. In such case, stop engine, shift to neutral, and restart engine to warm up.

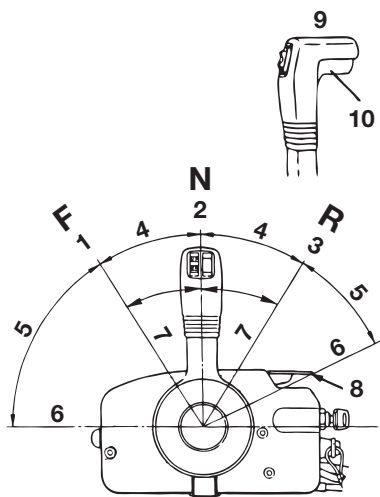
ENON00014-0

Note

Frequent shifting to forward or reverse can accelerate wear or degradation of parts. In such case, replace gear oil earlier than the period specified.

ENOM00316-0

EP, EPT type



ENOF00048-0

1. Forward (F)

2. Neutral (N)
3. Reverse (R)
4. Shift
5. Throttle
6. Fully open
7. Fully close
8. Free accel lever
9. Control lever
10. Lock button

Forward

Quickly push the control lever to the Forward (F) position 32°, where the gear is connected, while lifting up on the lock button located at the bottom of the control lever grip. Further shifting will open the throttle.

Reverse

Quickly pull the control lever to the Reverse (R) position at 32°, where the gear is connected, while lifting up on the lock button located at the bottom of the control lever grip. Further shifting will open the throttle.

ENON00015-0

Note

The control lever is inoperative unless the free accel lever is in the fully closed position.

ENON00016-0

Note

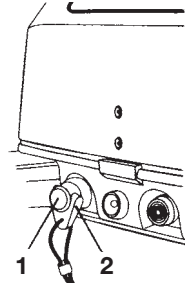
Reduce the engine speed when the control lever is in Neutral and do not increase the engine speed unnecessarily.

ENOM00317-0

6. Stopping

ENOM00318-0

MF, EF, EFT type



ENOF00344-0

1. Stop switch
2. Stop switch lock

1. Turn the throttle grip to the slow position.
2. Put the shift lever in the Neutral position.
Run the engine for 2-3 minutes at idling speed if it has been running at full speed.
3. Push the stop switch to stop the engine or release the stop switch lock.

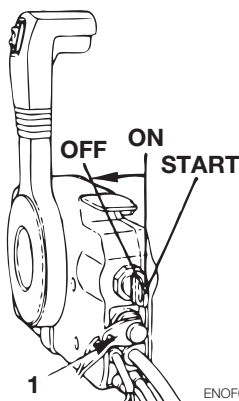
ENOW00042-0

WARNING

- Do not shift into Reverse during planing, or control will be lost leading to serious personal injury, boat may swamp, and/or hull may be damaged.
- Do not shift into Reverse during cruising, or control may be lost, falling down or causing passenger(s) to be thrown overboard. Leading to serious personal injury, and steering system and/or shifting mechanism may be damaged.

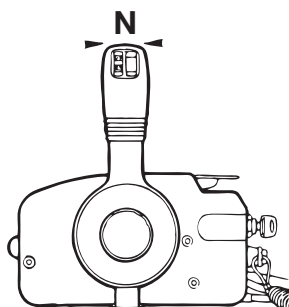
ENOM00319-0

EP, EPT type



ENOF00112-0

1. Stop switch lock



ENOF00050-0

1. Put the shift lever in the Neutral position and run the engine for 2-3 minutes at idling speed if it has been running at full speed.
2. Turn the main switch key to the OFF position.

ENON00017-0

Notes

- After stopping the engine, close the air vent screw on the tank cap.
- Disconnect the fuel connector of the engine or the fuel tank.

- Disconnect the battery cord of the EF or EP type engine, if the engine will not be used for more than 3 days.

ENOM00050-0

7. Trim angle

The trim angle of the outboard motor can be adjusted to suit the transom angle of the hull, and load conditions. Choose an appropriate trim angle that will allow the anti-ventilation plate to run parallel to the water surface during operation.

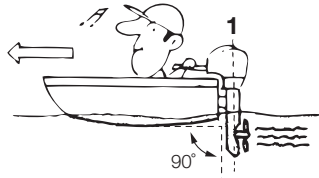
ENOM00320-0

MF, EF, EP type

ENOM00052-0

Proper trim angle

The position of the thrust rod is correct if the hull is horizontal during operation.



ENOF00051-0

1. Perpendicular to the water surface

ENOM00053-0

Improper trim angle (bow rises too high)

Set the thrust rod lower if the bow of the boat rises above horizontal.



ENOF00052-0

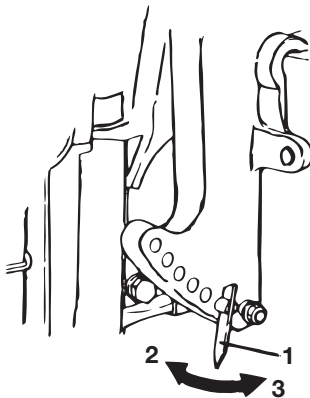
ENOM00054-0

Improper trim angle (bow dips into the water)

Set the thrust rod higher if the bow of the boat is below horizontal.



ENOF00053-0



ENOF00054-0

1. Thrust rod
2. Higher
3. Lower

ENOW00043-0

! WARNING

- Do not put hand or finger in between outboard motor body and clamp bracket when adjusting trim angle to prevent injury in case the outboard motor body falls.
- Unsuitable trim position can cause loss of control of boat.
When testing a trim position, run boat slow initially to see if it can be controlled safely.

ENOW00044-0

! WARNING

Excessive trim up or down may lead to unstable boat operation, potentially causing the steering difficulty that leads to accident during cruising.

- Do not cruise at high speed if improper trim position is suspected. Stop the boat and readjust trim angle before continuing cruise.
- For outboard motor model with PTT switch on the bottom cowl, do not operate the switch during cruising, or control of boat may be lost.

ENOM00320-0

EFT, EPT type

ENOM00057-0

Improper Trim Angle (bow rises too high)

If the trim angle is excessive, the bow will rise out of the water and the speed will decrease.

Furthermore, the bow may sway or the bottom may slam the water while cruising. In this case, decrease the trim angle by pressing the switch on the remote control level to "DN".



ENOM00058-0

Improper Trim Angle (bow dips into the water)

If the trim angle is too small, the bow will dip into the water, the speed will decrease, and water may enter the boat. In this case, the trim angle should be increased by pressing the switch on the remote control lever to "UP".

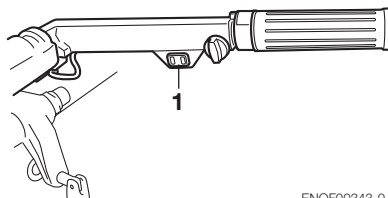


ENOM00059-0

Proper Trim Angle

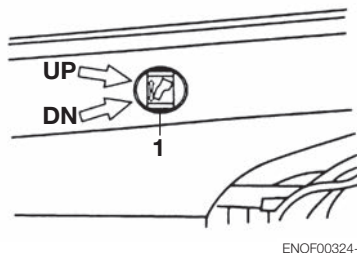
The trim angle is optimum when the boat is parallel to the water surface while running.

EFT type



1. Power tilt switch

EPT type



1. Power tilt switch

ENOW00043-0

! WARNING

- Do not put hand or finger in between outboard motor body and clamp bracket when adjusting trim angle to prevent injury in case the outboard motor body falls.
- Unsuitable trim position can cause loss of control of boat. When testing a trim position, run boat slow initially to see if it can be controlled safely.

ENOW00044-0

! WARNING

Excessive trim up or down may lead to unstable boat operation, potentially caus-

ing the steering difficulty that leads to accident during cruising.

- Do not cruise at high speed if improper trim position is suspected. Stop the boat and readjust trim angle before continuing cruise.
- For outboard motor model with PTT switch on the bottom cowl, do not operate the switch during cruising, or control of boat may be lost.

ENOM00060-0

8. Tilt up, tilt down and shallow water operation

ENOM00061-0

MF, EF, EP type

ENOW00048-0

WARNING

When tilting up or down, be careful not to place your hand between the swivel bracket and the stern bracket.

Be sure to tilt the outboard motor down slowly.

ENON00018-0

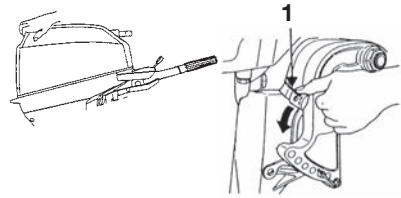
Note

Stop the engine before tilting up.

ENOM00062-0

Tilt up

Push the reverse lock lever down until it stops. (This is the tilt up position.) Now, tilt the outboard motor all the way up until it is locked in place.



ENOF000325-0

1. Reverse lock lever

ENOW00049-0

WARNING

- Do not put hand or finger in between outboard motor body and clamp bracket when adjusting trim angle to prevent injury in case the outboard motor body falls.
- When tilting up outboard motor with fuel joint for over a few minutes, be sure to disconnect fuel hose or close fuel cock, or fuel may leak, potentially catching fire.

ENOW00050-0

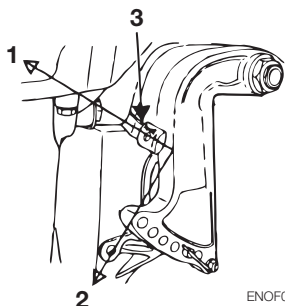
CAUTION

Do not tilt up outboard motor during operation, or engine may be damaged from overheating due to lack of sufficient cooling water.

ENOM00063-0

Tilt down

Pull the reverse lock lever upward until it stops. (This is the tilt down position.) Now, lift up the outboard motor slightly, and then allow gravity to lower it for you.



ENOF00060-0

1. Tilt down position
2. Tilt up position
3. Reverse lock lever

ENOM00064-0

Shallow water operation

ENOW00051-0

WARNING

During shallow water operation, be careful not to place your hand between the swivel bracket and the stern bracket. Be sure to tilt the outboard motor down slowly.

ENON00019-0

Note

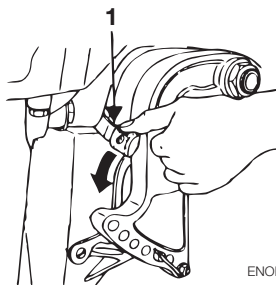
Slow down to trolling speed, and shift into neutral before setting outboard motor to shallow water drive position.

ENOW00052-0

WARNING

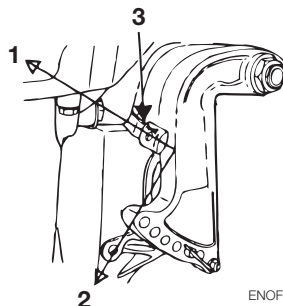
- Run at lowest possible speed when using shallow water drive.
- Tilt lock is disabled when in shallow water drive position.
- When driving shallow water, be careful not to strike outboard motor against sea bottom, or propeller may be pushed out of water, resulting in loss of control.

1. Shallow water running position:
Put the reverse lock lever in the tilt up position, and tilt up the outboard motor to put the outboard motor in the shallow water running position.



ENOF00061-0

1. Reverse lock lever
2. Return to normal running position:
Put the reverse lock lever in the tilt down position, slightly lift up the outboard motor, and then put it down.



ENOF00062-0

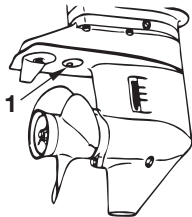
1. Tilt down position
2. Tilt up position
3. Reverse lock lever

ENOW00053-0

CAUTION

While in shallow water drive position, do not operate the outboard motor in reverse. Operate the outboard motor at slow speed

and keep the cooling water intake submerged.



ENOF00063-0

1. Sub water inlet

ENOW00054-0

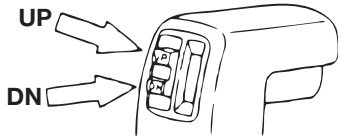
CAUTION

Do not overtilt outboard motor when driving shallow water, or air may be sucked through subwater inlet, potentially leading to engine overheating.

ENOM00069-0

EFT, EPT type

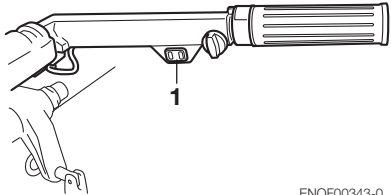
1. Operate the Power Trim & Tilt switch and tilt the outboard motor up.



ENOF00067-0

The outboard motor can also be tilted up using the switch provided under the bottom cowl.

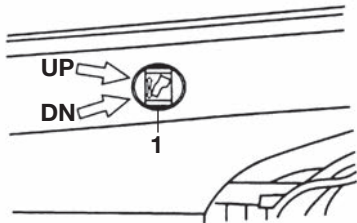
EFT type



ENOF00343-0

1. Power tilt switch

EPT type



ENOF00324-0

1. Power tilt switch

It is possible to tilt up or down in spite of main switch "ON" or "OFF".

ENOW00055-0

WARNING

Do not tilt up or down outboard motor when swimmer(s) or passenger is near to prevent them from being caught between outboard motor body and clamp bracket in case the outboard motor body falls.

ENOW00056-0

WARNING

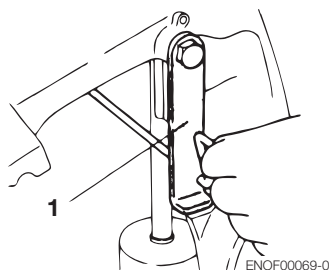
When tilting up outboard motor with fuel joint for over a few minutes, be sure to disconnect fuel hose or close fuel cock, or fuel may leak, potentially catching fire.

ENOW00057-0

CAUTION

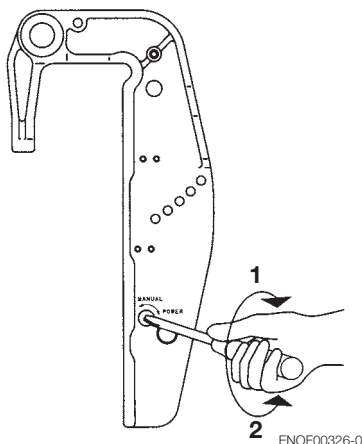
Do not tilt up outboard motor while engine operates, or no cooling water may be fed, leading to engine seizure due to overheating.

- Lock the tilt with the Tilt stopper after the outboard motor has been tilted up.



- Tilt stopper

- If the battery is dead, and the power trim & tilt switch thus inoperative, turn the manual valve a few turns in the Manual direction. This will allow manual tilting of the outboard motor.



- POWER
- MANUAL

ENOM00055-0

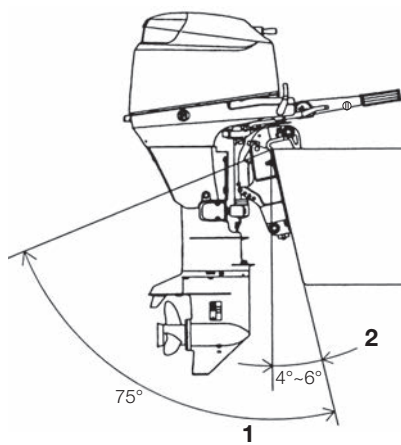
EFT, EPT type

The provided Power tilt makes tilt-up/down electrically. It may be used as a power trim and tilt when the outboard motor is used with the light load condition. In this case, it can be adjusted to set the desired trim angle of the outboard motor in relation to the transom shape, planning speeds and load. It is imperative that the trim angle is adjusted correctly. Incorrect adjustment will cause the boat to sway, deteriorate engine performance and may cause unsafe steering conditions.

ENOW00045-0

CAUTION

The Power Trim & Tilt can be set to any trim angle, however, avoid cruising with the outboard motor tilted in the tilt range. Operating the boat in this manner, the outboard motor may ingest air into the water cooling system, resulting in engine overheating.



REMOVING AND CARRYING THE OUTBOARD MOTOR

ENOM00070-0

1. Removing the outboard motor

1. Stop the engine.
2. Disconnect the fuel connector, the remote control cables and the battery cords from the outboard motor.
3. Remove the outboard motor from boat and completely drain the water from the gear case.

ENOM00064-0

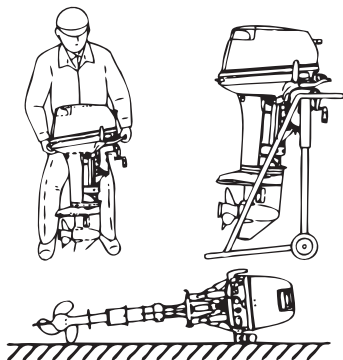
CAUTION

Engine may be hot immediately after operating and could cause burns if touched. Allow engine to cool down before attempting to carry the outboard.

ENOM00071-0

2. Carrying the outboard motor

Keep the outboard motor in a vertical position when carrying.



ENOF00071-0

ENOW00065-0

WARNING

- **Close air vent screw of fuel tank and fuel cock before carrying or storing outboard motor and fuel tank, or fuel may leak, potentially catching fire.**
- **Do not give a shock to an outboard motor during transportation. It becomes a cause of breakage.**

ENOM00072-0

3. Storing the outboard motor

Outboard motor should be stored in a vertical position.

ENON00021-0

Note

If the outboard motor must be laid down be sure the tiller handle faces down as shown in the drawing above.

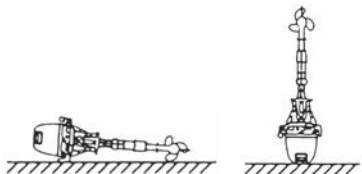
Elevate power unit 2 inches to 4 inches if traveling to avoid oil spillage.

ENOW00066-0

CAUTION

Do not carry or store outboard motor in any of positions described below.

Otherwise, engine damage or property damage could result from leaking oil.



ENOF00328-0

TRAILERING

ENOW00067-0

⚠ WARNING

Do not go under outboard motor tilted up even if it is supported by support bar, or accidental fall of outboard motor could lead to severe personal injury.

ENOW00068-0

⚠ WARNING

Close air vent screw of fuel tank and fuel cock before carrying or storing outboard motor and fuel tank, or fuel may leak, potentially catching fire.

ENOW00069-0

⚠ WARNING

When taking outboard motor from package or removing outboard motor from the boat, never release the lock lever. If the lock lever is released, it will very easy for the clamp bracket to spring up to the tilting direction because it is not fixed.

ENOW00070-0

⚠ WARNING

Never attempt to disassemble shock absorber of gas assist tilt system. It is dangerous because high pressure gas is included in the shock absorber.

*Care must be taken so as not to release lock lever by accident.

*For more safety, tie the clamp bracket to the outboard motor with a rope.

*Pay attention to the tilting direction so as not to be injured by the springing stern bracket.

ENOW00071-0

⚠ CAUTION

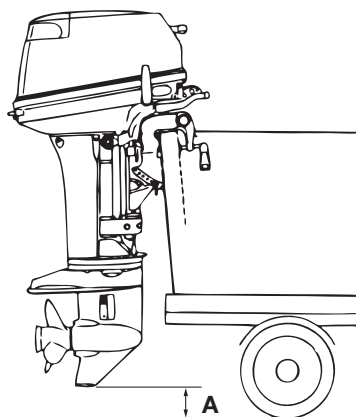
The tilt support device supplied on your outboard motor is not intended for towing. It is intended to support the outboard motor while the boat is docked, beached, etc.

ENOW00072-0

⚠ CAUTION

When trailering the outboard motor should be in a vertical (normal running) position, fully down. Trailering in the tilted position may cause damage to the outboard motor, boat, etc.

If trailering with outboard motor fully down is not available (the gear case skeg is too close to the road in a vertical position), fix the outboard motor securely using a device (like a transom saver bar) in the tilted position.



ENOF00074-0

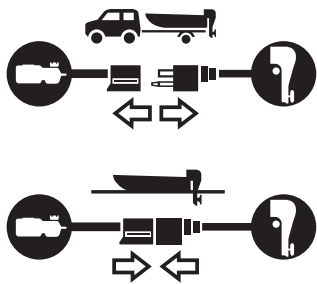
A. Ground clearance should be provided sufficiently.

ENOW00073-0

⚠ WARNING

Please disconnect fuel connector except when operating engine.

Fuel leakage is a fire or explosion hazard, which can cause serious injury or death.



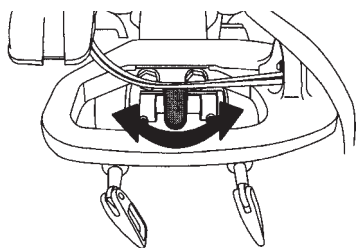
ENOF00075-0

ADJUSTMENT

ENOM00073-0

1. Steering friction

Adjust this lever to achieve the desired steering friction (drag) on the tiller handle. Move lever towards (A) to tighten friction and move lever towards (B) to loosen friction.



A ←→ B

ENOF00329-0

- A. Heavier
B. Lighter

ENOW00074-0



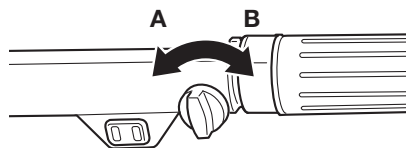
WARNING

Do not overtighten the throttle grip or remote control tensioner or it could result in difficulty of movement resulting in the loss of control causing an accident and could lead to severe injury.

ENOM00074-0

2. Throttle grip

Friction adjustment of the throttle grip can be made with the throttle adjustment screw.



ENOF00330-0

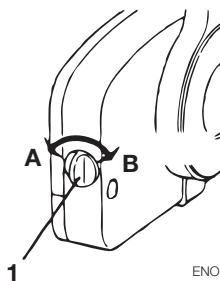
- A. Lighter
B. Heavier

ENOM00075-0

3. Remote Control Lever Load

(Throttle friction adjustment screw)

To adjust the load of the remote control lever, turn the throttle friction adjustment screw on the front of the remote control. Turn clockwise to increase the load and counter-clockwise to decrease it.



ENOF00078-0

1. Throttle friction adjustment screw
A. Lighter
B. Heavier

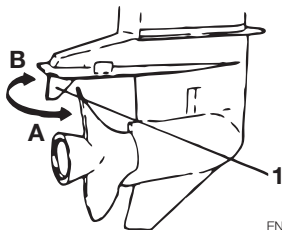
ENOM00076-0

4. Trim Tab Adjustment

If straight-line cruising can not be achieved, adjust the trim tab located under the anti-ventilation plate.

- If the boat veers toward the right, direct the trim tab towards A.

- If the boat veers toward the left, direct the trim tab towards B.



ENOF00079-0

1. Trim tab

ENON00022-0

Notes

- The trim tab also acts as an anode to prevent electrolytic corrosion. Therefore do not paint or grease this part.
- After adjustment securely tighten the trim tab fixing bolt.
- Check for looseness of the bolt and the trim tab at regular intervals.

ENOW00075-0



WARNING

- **Inappropriate adjustment of trim tab could cause steering difficulty. After installing or readjusting trim tab, check if steering load is even.**
- **Tighten trim tab bolt to specified torque.**

ENOW00076-0



WARNING

- **Be sure that outboard motor is secured to transom or service stand, or accidental drop or fall of outboard motor could lead to severe personal injury.**
- **Be sure to lock outboard motor if it is tilted up, or accidental fall of outboard motor could lead to severe personal injury.**
- **Do not go under outboard motor tilted up and locked, or accidental fall of out-**

board motor could lead to severe personal injury.

INSPECTION AND MAINTENANCE

ENOM00077-0

Care of your outboard motor

To keep your outboard motor in the best operating condition, it is very important that you perform daily and periodic maintenance as suggested in the maintenance schedules that follow.

ENOW00077-0



CAUTION

- **Your personal safety and that of your passengers depends on how well you maintain your outboard motor. Carefully observe all of the inspection and maintenance procedures described in this section.**
- **The maintenance intervals shown in the checklist apply to an outboard motor in normal use. If you use your outboard motor under severe conditions such as frequent full-throttle operation, frequent operation in brackish water, or for commercial use, maintenance should be performed at shorter intervals. If in doubt, consult your dealer for advice.**
- **We strongly recommend that you use only genuine replacement parts on your outboard motor. Damage to your outboard motor arising from the use of other than genuine parts is not covered under the warranty.**

adjustments. **Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine SI (Spark Ignition) engine repair establishment or individual.**

ENOM00078-0

EPA Emissions Regulations

EPA (United States Environmental Protection Agency) has emission regulations regulating air pollution from new outboard motors. All new outboard motor manufactured by us are certified to EPA as conforming to the requirements of the regulations. This certification depends upon factory standards. Therefore, factory specifications must be followed when servicing emission related controls, or making

ENOM00322-0

1. Daily Inspection

Perform the following checks before and after use.

ENOW00078-0

 WARNING

Do not use outboard motor if any abnormality is found during pre-operation check or it could result in severe damage to the motor or severe personal injury.

Item	Points to Check	Remedy
Fuel System	• Check the amount of fuel in the tank. • Check for debris or water in the fuel filters. • Check the rubber hoses for fuel leakage.	Replenish Clean or replace Replace
Fuel Tank Cap	• Check for crack, leakage, damage in the fuel tank cap. • Check for crack, damage in the gasket and tether. • Check for leakage at full close. • Check for ratchet performance.	Replace Replace Replace Replace
Engine Oil	• Check the oil level.	Fill oil
Electrical Equipment	• Check that the main switch functions normally. • Check that the battery electrolyte level and specific gravity are normal. • Check for loose connections on the battery terminal. • Check that the stop switch functions normally and make sure the lock plate is there. • Check cords for loose connections and damage. • Check the spark plugs for dirt, wear and carbon build-up.	Replace Replenish or recharge Retighten Remedy or replace Correct or replace Clean or replace
Throttle System	• Check carburetor linkage is working normally when turning the throttle grip.	Correct
Recoil Starter	• Check the rope for wear and chafing. • Check the ratchet engagement.	Replace Correct or replace
Clutch and Propeller System	• Check that the clutch engages correctly when operating the shift lever. • Visually Check propeller for bent or damaged blades. • Check the propeller nut is tightened.	Adjust Replace
Installation of Motor	• Check all the bolts attaching the motor to the boat. • Check the thrust rod installation.	Tighten
Power Tilt	• Check working of the tilt up and down of the motor.	
Cooling Water	• Check that cooling water is discharged from the cooling water check port after the engine has started.	Repair
Tools and Spares	• Check that there are tools and spare parts for replacing spark plugs, the propeller, etc. • Check that you have the spare rope.	
Steering Devices	• Check the operation of the steering handle.	Repair
Other parts	• Check if the anode is securely installed. • Check the anode for corrosion and deformation.	Repair if necessary Replace

ENOM00080-0

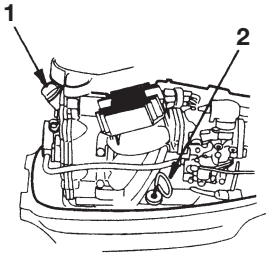
Maintaining engine oil

If the engine oil is low, the life of the engine will be shortened significantly.

ENOM00081-0

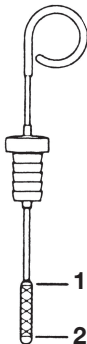
Checking oil level

1. Stop the engine and set it in a vertical position.
2. Remove the top cowl.
3. Remove the dipstick.
4. Wipe oil off the oil dipstick with a clean rag.
5. Put in the dipstick.
6. Take out the dipstick and check the oil level.
7. Replace the dipstick.



ENOF00331-0

1. Oil filler cap
2. Dipstick



ENOF00332-0

1. Upper Level 1000 mL (33.8 fl.oz.)
2. Lower Level 750 mL (25.4 fl.oz.)

ENON00024-0

Note

The oil level should be checked when the engine is cold.

ENON00025-0

Note

Consult with an authorized dealer if the engine oil is milky color, or appears contaminated.

ENOM00082-0

Replenishing engine oil

If the oil level is low, or at lowest mark, add recommended oil to the upper dipstick mark.

ENOW00079-0



CAUTION

- Do not add engine oil of brand and grade other than existing one. In case engine oil of other brand or grade is added, drain all oil and ask dealer for treatment.
- In case other than engine oil such as gasoline is put in the oil chamber, empty the chamber and ask dealer for treatment.
- When replenishing engine oil, be careful not to allow entry of foreign matters such as dust and water into oil chamber.
- Wipe off engine oil well immediately if spilled.
- Do not replenish engine oil over upper limit. If overfilled, remove oil to upper limit. If engine oil is over the upper limit, it can leak potentially leading to engine damage.

ENOM00083-0

Washing outboard motor

If outboard motor is used in salt water, brackish water or water with a high acidic level, use fresh water to remove salt, chemicals or mud from exterior and cool-

ing water passage after every cruising or before storing outboard motor for long time. Before flushing, remove the propeller and the forward thrust holder.

ENOW00080-0

CAUTION

Keep cooling water passage free of clogs, or lack of cooling water flow could lead to engine overheating, potentially resulting in engine trouble.

ENON00026-0

Note

It is recommended to check chemical properties of water on which your outboard motor is regularly used.

ENOW00081-0

WARNING

Do not start engine without removing propeller, or accidentally turning propeller could cause personal injury.

ENOW00082-0

WARNING

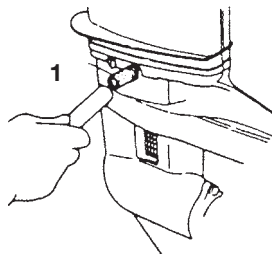
Never start or operate the engine indoors or in any space which is not well ventilated. Exhaust gas contains carbon monoxide, a colorless and odorless gas which can be fatal if inhaled for any length of time.

ENOM00323-0

Use flushing attachment.

1. Remove propeller (refer to Propeller Replacement). Remove the water plug from the outboard motor, and screw in the flushing attachment.

2. Attach a water hose to the flushing attachment. Turn on the water and adjust the flow. (Be sure to seal the water inlet and sub water inlet, located in the gear case, with tape.)
3. Insert a hose connected to a water tap into the flushing attachment and let the water running.
4. Put the shift lever in the neutral position and start the engine.
5. Make sure of cooling water flowing out of water pump indicator hole and continue engine running for 3 to 5 minutes.
6. Stop the engine and water supply. Remove the flushing attachment and tape, and then reinstall the water plug and the propeller.



ENOF00333-0

1. Flushing attachment (option)

ENOW00083-0

CAUTION

Keep engine at idle speed during flushing.

ENOM00086-0

Replacing the propeller

A worn-out or bent propeller will lower the motor's performance, and cause engine trouble.

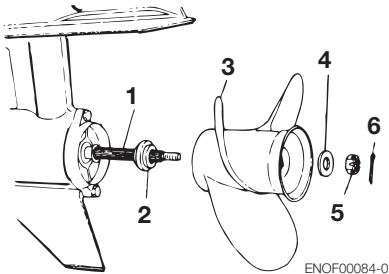
Before removing the propeller, remove the spark plug caps from the spark plugs to protect against personal injury.

ENOW00084-0

! WARNING

Do not begin propeller removal and installation procedure with spark plug caps attached, shift in forward or reverse, main switch at other than "OFF", engine stop cord attached to the switch, and starter key attached, or engine could accidentally start leading to serious personal injury. Disconnect battery cable if possible.

1. Remove the split pin, propeller nut and washer.
2. Remove the propeller and thrust holder.
3. Apply genuine grease to the propeller shaft before installing a new propeller.
4. Install the thrust holder, propeller, washer and propeller nut onto the shaft.
5. Install a new split pin into the nut hole and bend it.



ENOF00084-0

1. Propeller shaft
2. Thrust holder
3. Propeller
4. Washer
5. Nut
6. Split pin

ENOW00085-0

! WARNING

Do not hold propeller with hand(s) when loosening or tightening propeller nut. Put a piece of wood block between propeller

blade and anti-ventilation plate to hold propeller.

ENOW00086-0

! CAUTION

- Do not install propeller without thrust holder, or propeller boss could be damaged.
- Do not reuse split pin.
- After installing split pin, spread the pin apart to prevent it from falling out which could lead to the propeller coming off during operation.

ENOM00087-0

Replacing the spark plugs

ENOW00087-0

! WARNING

- Do not reuse spark plug with damaged insulation, or sparks can leak through crack, potentially leading to electric shock, explosion and/or fire.
- Do not touch spark plugs immediately after stopping engine as they will be hot and could cause severe burns if touched. Allow motor to cool down first.

If the spark plug(s) is fouled, has carbon build up, or is worn, it should be replaced. When reusing spark plugs, remove dirt from the electrodes and adjust spark gap to specification.

ENON00027-0

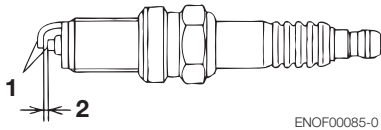
Note

When inspecting 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.

1. Stop the engine.
2. Remove the top cowl.
3. Remove the spark plug caps.

4. Remove the spark plugs by turning it counter-clockwise, using a 5/8" socket wrench and handle.
5. Attach spark plug and tighten to specified torque.

Use spark plug NGK DCPR-6E.



ENOF00085-0

1. Electrode
2. Spark gap (0.8–0.9 mm, 0.031–0.035 in)

ENON00028-0

Note

- **Spark plug torque:**
18.0 Nm (13.3 ft-lb) [1.84 kgf-m]

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.

ENOM00088-0

Replacing the anode

The anode protects the outboard motor from galvanic corrosion (metal corrosion caused by feeble electricity).

Anodes are installed under the anti-ventilation of the gear case, the left cramp bracket (port side) and the left mount bracket (port side).

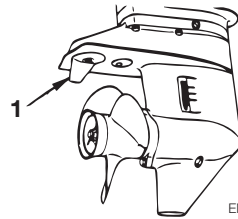
When an anode is worn down under 2/3 of its original size (of new port), replace it.

ENON00029-0

Notes

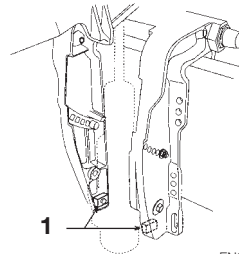
- Never grease or paint the anode.

- At each inspection re-tighten the anode attaching bolt. As it is likely to be subjected to electrolytic corrosion.



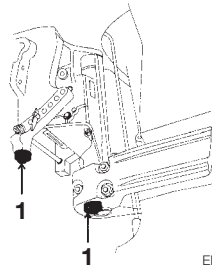
ENOF00086-0

1. Anode (Trim tab)



ENOF00334-0

1. Anode



ENOF00335-0

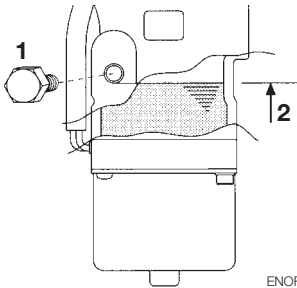
1. Anode

ENOM00089-0

Checking and Refilling Oil in the Power Trim & Tilt.

1. Check the oil level of the reservoir tank as shown on the right while the tank is kept in a vertical position. Tilt the outboard motor up to check the oil level in the tank.

Remove the oil cap by turning counter-clockwise, then check if the oil level reaches the bottom line of the plug hole.



ENOF00558-0

1. Oil cap
2. Oil level

ENOW00088-0

⚠ WARNING

- Be sure that outboard motor is secured to transom or service stand, or accidental drop or fall of outboard motor could lead to severe personal injury.
- Be sure to lock outboard motor if it is tilted up, or accidental fall of outboard motor could lead to severe personal injury.
- Do not go under outboard motor tilted up and locked, or accidental fall of outboard motor could lead to severe personal injury.

ENOW00089-0

⚠ CAUTION

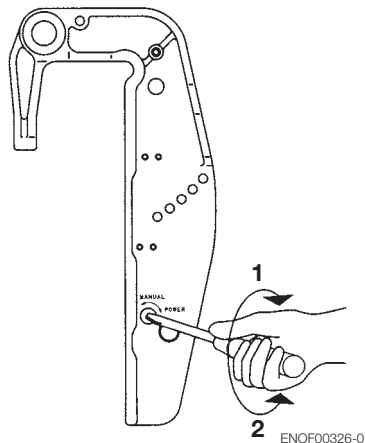
Do not unscrew the oil plug with the outboard motor tilted down. Pressurized oil in the oil tank may spurt out.

2. Recommended oil
Use an automatic transmission fluid or equivalent.
Recommended oils are as shown below.

ATF Dexron III

3. Air purging from the Power Trim and Tilt unit.

Entrapped air in the Power Trim & Tilt unit will cause poor tilting movement and increased noise. With the outboard motor mounted on the boat, set the manual release valve to the Manual side, and tilt the outboard motor manually up/down 5-6 times while checking the oil level. When done, close the valve by turning it clockwise towards the Power side.



ENOF00326-0

1. POWER
2. MANUAL

ENOM00324-0

2. Periodic Inspection

It is important to inspect and maintain your outboard motor regularly. At each interval on the chart below, be sure to perform the indicated servicing.

Maintenance intervals should be determined according to the number of hours or number of months, whichever comes first.

Description		Inspection intervals				Inspection procedure	Remarks
		First 20 hours of 1 month	Every 50 hours of 3 months	Every 100 hours of 6 months	Every 200 hours of 1 year		
Fuel System	Carburetor ^{*1}			●	●	Strip clean, and adjust.	
	Fuel filter	●	●	●	●	Check and clean or Replace if necessary.	Entire cartridge
	Piping/Hoses ^{*2}	●	●	●	●	Check and clean or Replace if necessary.	
	Fuel tank ^{*2}	●		●	●	Clean	
	Fuel tank cap ^{*2}	●	●	●	●	Check and clean or Replace if necessary.	
	Fuel pump ^{*1}	●	●	●	●	Check and clean or Replace if necessary.	
Ignition	Spark plug	●		●	●	Check gaps. Remove carbon deposits or Replace if necessary.	0.8–0.9 mm (0.031–0.035 in)
	Ignition timing ^{*1}	●		●	●	Check timing.	
Starting System	Starter rope ^{*1}	●	●	●	●	Check for wear or chafing.	
	Starter motor ^{*1}			●	●	Check for salt deposits and the battery cable condition.	
	Battery	●	●	●	●	Check installation, fluid quantity, gravity.	
Engine	Engine oil	Replace ●		Replace ●	Replace ●	Replace if necessary.	
	Oil filter ^{*1}					Replace every 200 hrs or 2 years	Entire cartridge
	Valve Clearance ^{*1}	●		●	●	Check & adjust	IN: 0.13–0.17 mm (0.0051–0.0067 in) EX: 0.18–0.22 mm (0.0071–0.0087 in)
	Timing belt ^{*1}			●	●	Check and Replace if necessary.	
	Thermostat ^{*1}			●	●	Check and Replace if necessary.	
Lower Unit	Propeller	●	●	●	●	Check for bent blades, damage, wear.	
	Gear oil	Replace ●		Replace ●	Replace ●	Change or replenish-oil and check for water leaks.	370 mL (12.5 fl.oz.)
	Water pump ^{*1}		●	●	●	Check for wear or damage.	Replace impeller every 12 months.
Power trim & tilt ^{*1}		●		●	●	Check & replenish oil, manually operate	
Warning system ^{*1}			●	●	●	Check function	
Bolts and Nuts		●	●	●	●	Retighten	
Sliding and Rotating Parts. Grease Nipples		●	●	●	●	Apply and pump in grease.	
Outer Equipment		●	●	●	●	Check for corrosion.	
Anode			●	●	●	Check for corrosion and deformation.	Replace if necessary.

*1: Have this handled by your dealer.

*2: In USA, you have to use EPA approved part (See pages 24–26).

ENON00030-0

Note

Your outboard motor should receive careful, and complete inspection at 300 hours. This is the best time for major maintenance procedures to be carried out.

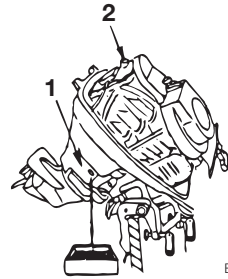
ENOM00091-0

Replacing engine oil

Engine oil mixed with dust or water will dramatically shorten the life of the engine.

To change engine oil:

1. Stop the engine and set it in a tilted position.
2. Remove the top cowl and oil filler cap. Allow it to cool.
3. Turn the steering on the outboard motor so that the drain hole is facing downward.
4. Put a oil drain pan under the oil drain screw.
5. Remove the oil drain screw and completely drain oil from the engine.
6. Tighten the oil drain screw.
7. Reset the engine in a vertical position.
8. Repeat 3 to 7 procedures two or three times to drain the oil completely.
9. Fill the engine through filler port with recommended oil (see chart below) to the upper dipstick mark.
10. Tighten the oil filler cap.



ENOF00092-0

1. Drain hole
2. Filler port

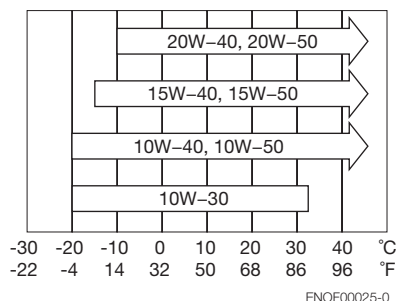
Use only high quality 4-stroke engine oil to insure performance and prolonged engine life.

Use oils that carry the API rating of SF, SG, SH, SJ, SL, or SM. Select the appropriate viscosity, based on atmospheric temperature, from the chart below.

You can also use NMMA FC-W certified 4-stroke outboard oil below.

10W-30: is recommended for use in all temperature.

25W-40: may be used at temperatures above 4°C (40°F).



ENOW00090-0

**CAUTION**

Use of engine oils that do not meet these requirements will result in reduced engine life, and other engine problems.

ENOW00091-0

**CAUTION**

You may be injured due to high engine temperatures if you fill engine oil just after stopping. Changing engine oil should be done after the engine has been cooled.

ENOW00092-0

**CAUTION**

- **Do not overfill engine oil, or engine oil could leak and/or engine could be damaged. If engine oil level is over upper limit marks of oil gauge, drain oil to level lower than upper limit.**
- **Be sure that outboard motor is in upright and level position when checking or changing oil.**
- **Stop engine immediately if low oil pressure warning lamp is lit or oil leak is found, or engine could be severely damaged. Consult dealer.**

ENON00031-0

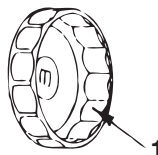
Notes

- If any amount of water is found in engine oil, making it milky white, consult dealer.
- If engine oil is contaminated with fuel, emitting strong fuel smell, consult dealer.
- Some oil dilution is normal if engine is idled or trolled for long periods, especially in cooler water temperatures.

ENOM00092-0

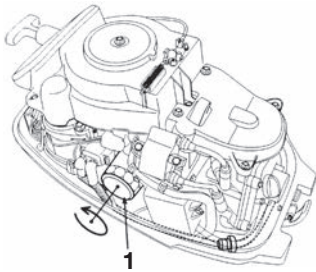
Replacing oil filter

1. Drain oil from the engine.
2. Place a rag or towel below the oil filter to absorb any spilled oil.
3. Unscrew old filter by turning the filter to the left.
4. Clean the mounting base. Apply film of clean oil to filter gasket.
Do not use grease. Screw new filter on until gasket contacts base, then tighten 3/4 to 1 turn.



ENOF00094-0

1. Oil filter wrench
P/N 3AC-99090-0
P/N 3AC99090M
(US. CANADA Only)



ENOF00337-0

1. Oil filter

ENOM00093-0

Cleaning the fuel filters and the fuel tank

Fuel filters are provided inside the fuel tank and engine.

ENOW00093-0

WARNING

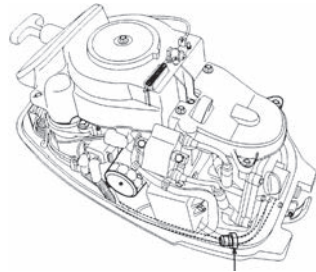
Gasoline and its vapors are very flammable and can be explosive.

- Do not start this procedure while engine is operating or hot even after stopping it.
- Place fuel filter away from every source of ignition such as sparks or open flames.
- Wipe off gasoline well immediately if spilled.
- Install fuel filter with all related parts in place, or fuel leak could occur, leading to catching fire or explosion.
- Check fuel system regularly for leakage.
- Contact authorized dealer for fuel system services. Services by unqualified person could lead to engine damage.

ENOM00556-0

Fuel filter (for engine)

1. Replace the fuel filter provided inside of engine cover if there is water or dirt inside.



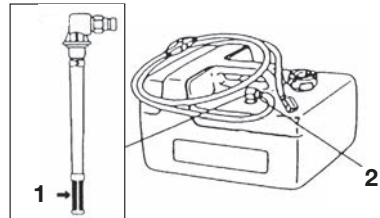
1 ENOF00338-0

1. Fuel filter

ENOM00557-0

Fuel filter (for fuel tank)

Loosen the fuel pickup elbow shown at left, remove it and clean the fuel filter.



ENOF00456-0

1. Filter
2. Fuel pick up elbow

ENOM00097-0

Fuel tank

Water or dirt in the fuel tank will cause engine performance problems.

Check and clean the tank at specified times or after the outboard motor has been stored for a long period of time (over three months).

ENOM00098-0

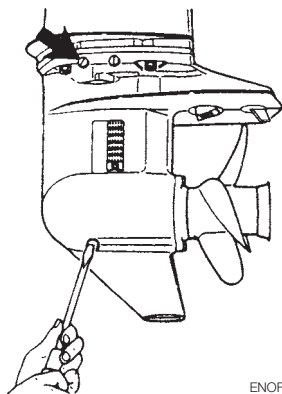
Replacing gear oil

ENOW00094-0

WARNING

- Be sure that outboard motor is secured to transom or service stand, or accidental drop or fall of outboard motor could lead to severe personal injury.
- Be sure to lock outboard motor if it is tilted up, or accidental fall of outboard motor could lead to severe personal injury.
- Do not go under outboard motor tilted up and locked, or accidental fall of outboard motor could lead to severe personal injury.

1. Remove the oil plugs (upper and lower), and completely drain the gear oil into a pan.



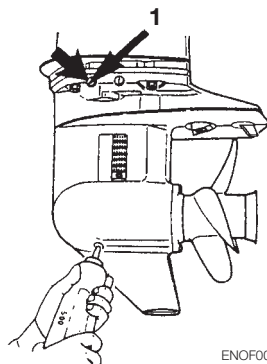
ENOF00339-0

2. Insert the oil tube nozzle into the lower oil plug hole, and fill with gear oil by squeezing the oil tube until oil flows out of the upper plug hole.

ENOW00095-0

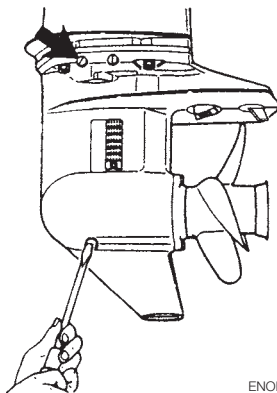
CAUTION

Do not reuse oil plug gasket. Always use new gasket and tighten oil plug properly to prevent entry of water into lower unit.



ENOF00340-0

1. Oil plug (Upper)
3. Install the upper oil plug, and then remove oil tube nozzle and install the lower oil plug.



ENOF00341-0

ENON00032-0

Note

If water in the oil, giving it a milky colored appearance. Contact your dealer.

ENOM00303-0

Note

Use genuine gear oil or the recommended one (API GL-5: SAE #80 to #90).
Required volume: approx. 370 mL.

ENOM00100-0

3. Off-season storage

Before you put your outboard motor in storage, it is a good opportunity to have it serviced and prepared by your dealer.

ENOW00096-0

**CAUTION**

Before servicing the motor for storage:

- Remove the battery cables.
- Remove the spark plug caps from the spark plugs.
- Do not run the motor out of the water.

ENOM00101-0

Engine

1. Wash the engine exterior and flush the cooling water system thoroughly with fresh water. Drain the water completely.
Wipe off any surface water with an oily rag.
2. Use a dry cloth to completely wipe off water and salt from the electrical components.
3. Drain all fuel from the fuel hoses, fuel pump, and carburetor, and clean these parts.
Keep in mind that if gasoline is kept in the carburetor for a long time, gum and varnish will develop, causing the float valve to stick, restricting the fuel flow.

4. Remove the spark plugs and spray storage oil (available from an authorized dealer) into the combustion chamber through the spark plug holes while slowly turning the motor over using the recoil starter.
5. Change the engine oil.
6. Change the gear oil in the gear case.
7. Apply grease to the propeller shaft.
8. Apply grease to all sliding parts, joints, nuts, and bolts.
9. Stand the outboard motor up vertically in a dry place.

ENOW00097-0

**WARNING**

Be sure to use cloth to remove fuel remaining in the cowl and dispose of it in accordance with local fire prevention and environment protection regulations.

ENOM00102-0

Battery

1. Disconnect the battery cables.
2. Wipe off any chemical deposits, dirt, or grease.
3. Apply grease to the battery terminals.
4. Charge the battery completely before storing it for the winter.
5. Recharge the battery once a month to prevent it from discharging and the electrolyte from deteriorating.
6. Store the battery in a dry place.

ENOM00103-0

Electric Starter Motor

Coat the internal pinion gears and the shaft of the electric starter motor with grease.

Do not put grease on the teeth of the

starter pinion or flywheel or increased wear or damage will occur.

ENOM00325-0

4. Pre-season check

- 1. Check that the shift and throttle function properly.
(Be sure to turn the propeller shaft when checking the shift function or else the shift linkage may be damaged.)

ENON00034-0

Notes

The following steps must be taken when first using the engine after winter storage.

- 1. Fill the fuel tank completely.
- 2. Warm up the engine for 3 minutes in the "NEUTRAL" position.
- 3. Run the engine for 5 minutes at the slowest speed.
- 4. Run the engine for 10 minutes at half speed.

In steps 2 and 3 above, the oil used for storage inside the engine will be flushed out to assure optimum performance.

- 2. Check the electrolyte level, and measure the voltage and specific gravity of the battery.

Specific Gravity at 20°C	Terminal Voltage (V)	Charge Condition
1.120	10.5	Fully discharged
1.160	11.1	1/4 charged
1.210	11.7	1/2 charged
1.250	12.0	3/4 charged
1.280	13.2	Fully charged

- 3. Check that the battery is secure and the battery cables are properly installed.

ENOM00105-0

5. Motor submerged in water

After taking your outboard motor out of the water, immediately take it to your dealer.

The following are the emergency measures to be taken for a submerged outboard motor, if you can not take it your dealer right away.

- 1. Wash the outboard motor with fresh water to remove salt or dirt.
- 2. Remove the engine oil drain screw and completely drain water and oil from the engine.
- 3. Remove the spark plugs, and completely drain the water from the engine by pulling the recoil starter several times.

Replace oil filter and oil to the correct level.

The oil and filter may need to be changed again after running a short period to get all moisture completely out of the crankcase.

- 4. Inject a sufficient amount of engine oil through the spark plug holes.

Pull the recoil starter several times to circulate the oil throughout the outboard motor.

ENOW00098-0

 **CAUTION**

Do not attempt to start submerged outboard motor immediately after it is recovered, or engine could be severely damaged.

ENOM00106-0

6. Cold weather precautions

If you moor your boat in cold weather at temperatures below 0°C (32°F), there is the danger of water freezing in the cooling water pump, which may damage the pump, impeller, etc. To avoid this problem, submerge the lower half of the outboard motor into the water.

ENOM00107-0

7. Checking after striking underwater object

Striking the sea bottom or an underwater object may severely damage the outboard motor. Immediately bring the outboard motor to the dealer and ask for the following checks.

1. Looseness or damage of power unit installation bolts, gear case and extension case bolts, propeller shaft housing bolts, propeller or propeller shaft upper and lower mount rubber bolts, and/or mount bracket bolts.

Ask an authorized dealer to tighten any loose bolts and nuts, and to replace damaged parts.

2. Damage to mount rubber, the tilt stopper, thrust rod, gears and clutch, and/or propeller.

Ask an authorized dealer to replace damaged or defective parts.

TROUBLESHOOTING

ENOM00326-0

If you encounter a problem, consult the check list below to determine the cause and to take the proper action.

An authorized dealer will always be happy to provide any assistance and information.

	Engine failing to start	Engine starting but stopping soon	Poor idling	Poor acceleration	Engine speed abnormally high	Engine speed abnormally low	Overheating of engine	Power tilt inoperative	Possible cause
FUEL SYSTEM	●	●							Empty fuel tank
	●	●	●	●		●	●		Incorrect connection of fuel system
	●	●	●	●		●	●		Air entering fuel line
	●	●	●	●		●	●		Deformed or damaged fuel hose
	●	●	●	●		●	●		Closed air vent on fuel tank
	●	●	●	●		●	●		Clogged fuel filter, fuel pump, or carburetor
			●	●		●	●		Use of improper engine oil
	●	●	●	●			●		Use of improper gasoline
	●	●		●					Excessive supply of fuel
	●	●	●	●		●	●		Poor carburetor adjustment
ELECTRICAL SYSTEM	●	●	●	●		●	●		Spark plug other than specified
	●	●	●	●		●			Dirt, soot, etc. on spark plug
	●	●	●	●		●			No Spark or weak spark
	●								Short circuit of engine stop switch
	●		●	●		●			Ignition timing incorrect
	●								Lock plate not fitted
	●						●		Disconnection of wire or loose ground connection
	●						●		Blown 20 Amp fuse in the starting circuit
	●								Not shifted into neutral position
	●						●		Weak battery or battery connections are loose or corroded
	●						●		Ignition key switch failure
	●								Wiring or electrical connection faulty
	●								Starter motor or starter solenoid failure
								●	Power trim & tilt switch defective, Solenoid is defective

TOOL KIT AND SPARE PARTS

ENOM00327-0

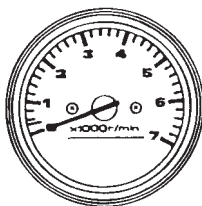
The following a list of the tools and spare parts provided with the motor.

Items		Quantity	Remark
Service tools	Tool bag	1	10 × 13 mm 16 mm Cross-and straight-point
	Pliers	1	
	Socket wrench	1	
	Socket wrench	1	
	Socket wrench handle	1	
	Screwdrivers	1	
	Screwdriver handle	1	
Spare parts	Emergency starter rope	1	1600 mm
	Spark plug	2	NGK DCPR6E
	Split pin	1	
Parts Packaged with Engine	Fuel tank	1	12 L
	Primer bulb	1 set	
	Remote control box	1 set	for EP and EPT
	Remote control attachment	1 set	for EP and EPT
	Drag link	1	for EP and EPT
	Bracket fixing		EPT/EFT only
	Bolt	4	
	Nut	4	
	Washer	8	

OPTIONAL ACCESSORIES

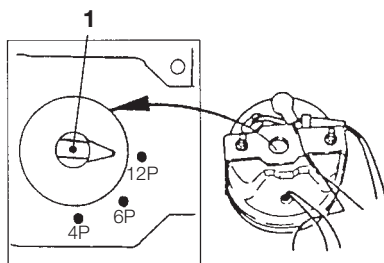
ENOM00328-0

Tachometer



ENOF00564-0

Selector



ENOF00342-0

1. Selector

Propeller



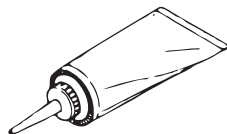
ENOF00459-0

Flushing attachment



ENOF00102-0

Genuine gear oil (500 mL)



ENOF00104-0

Touch-up paint (300 mL)



ENOF00105-0

Genuine engine oil (450 mL, 1 L)



ENOF00106-0

PROPELLER TABLE

ENOM00329-0

Use a genuine propeller.

A propeller must be selected so that the engine rpm measured at wide open throttle while cruising is within the recommended range.

15: 5000–6000 rpm

20: 5400–6100 rpm

	Propeller Mark	Propeller Size (Blades × diameter × pitch)	
		inch	mm
Light boats	11.5	3 × 9.25 × 11.5	3 × 235 × 292
	10	3 × 9.25 × 10	3 × 235 × 254
	9	3 × 9.25 × 9	3 × 235 × 229
	8	3 × 9.25 × 8	3 × 235 × 203
	7	3 × 9.2 × 6.9	3 × 234 × 174
	6	3 × 9.2 × 6.1	3 × 234 × 155
Heavy boats	7	4 × 10 × 4	4 × 254 × 178

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