OWNER'S MANUAL

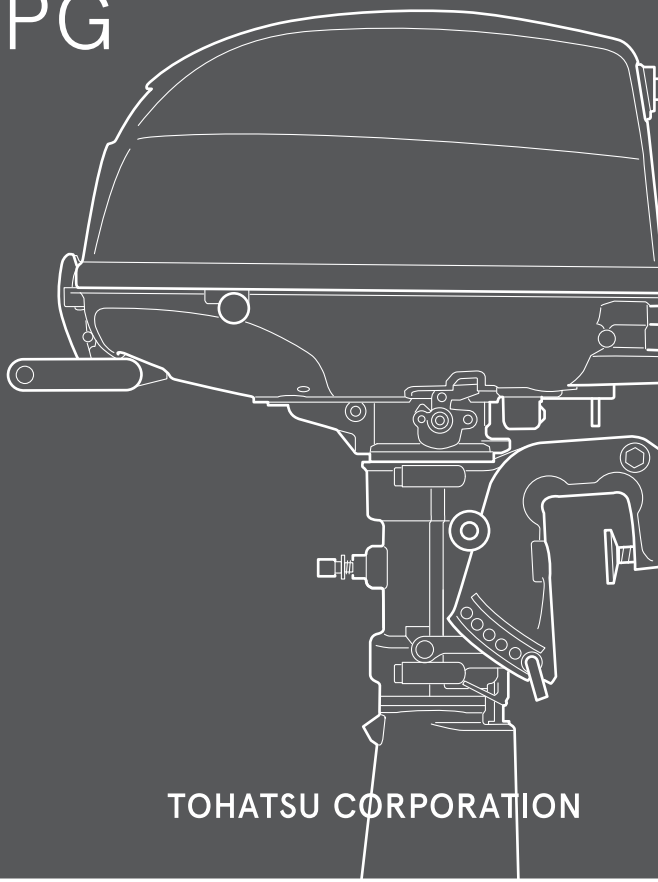
TOHATSU
Feel the Wind™

Original instructions

EN

MFS 5D LPG

OB No.003-11157-4BC1



BACKS YOU UP™

TOHATSU CORPORATION

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.**

YOUR TOHATSU OUTBOARD MOTOR

ENOM00006-2

To You, Our Customer

Congratulations on your purchase of the TOHATSU outboard motor. You are now the proud owner of an excellent outboard motor that will serve you for many years to come. This owner's manual contains important safety, operational and maintenance information.

The efficiency and longevity of your outboard motor will depend heavily on your operating methods and periodic maintenance. Failure to operate and maintain your outboard motor according to the instruction in this owner's manual may void the limited warranty, as well as reduce the efficiency and reliability of the outboard motor.

Any person operating TOHATSU outboard motor must carefully read and fully understand the entire contents of this manual prior to operation. For safety, follow all safety warnings contained within the owner's manual and the labels applied to your outboard motor. You should keep this owner's manual where accessible while operating your outboard motor. If the outboard motor is resold, make sure the manual is passed on to the next owner. In case you encounter any problems, please contact an authorized TOHATSU service shop or dealer for assistance.

Tohatsu Corporation reserves the right to change, modify, add, or remove a part or whole of the owner’s manual without prior notice and incurring any obligations.

We are excited to take a part in your boating adventures and wish for your great and safe boating experience.

TOHATSU CORPORATION

ENOM00113-1

DECLARATION OF CONFORMITY (DoC)

This product conforms to certain portion of the European Parliament directive and UK Regulations. DoC contains the following information;

- Name and Address of the manufacturer, EU - notified body, EU - authorized representative, and UK - approved body.
- Applied community directives and regulations
- Reference standard
- Description of the product. (model name and serial number)
- Signature of the responsible person (name / title / date and place of issue).

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.

ENOM00003-1

PRE-DELIVERY CHECK

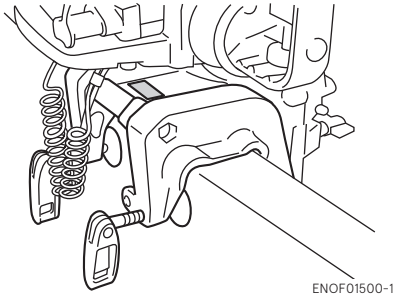
Make sure Pre-delivery inspection has been properly done by authorized TOHATSU dealer before operating your outboard motor.

ENOM00005-1

Serial Number

Your outboard motor has a unique serial number. The serial number is identification of outboard motor and is located on the outboard motor as shown in the figures below. The serial number is required for warranty registration, filing a warranty claim as well as making technical inquiries and may be required for other occasions.Therefore, please write down the serial number and date of purchase in the space below.

Serial Number:



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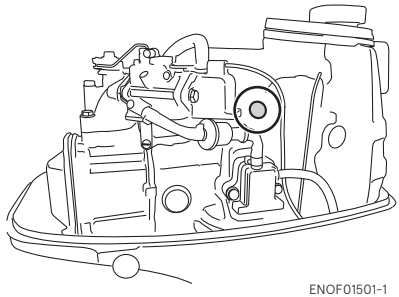

ENOF01501-1

Serial Number: Date of purchase:

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.

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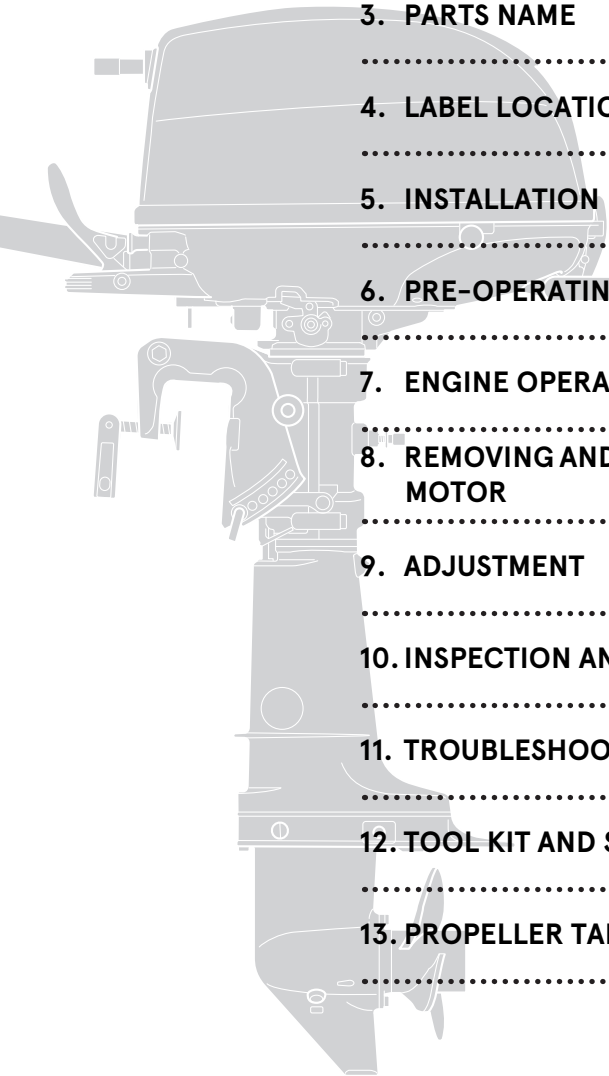


GENERAL SAFETY INFORMATION

ENOM00009-1

SAFE OPERATION OF BOAT

As the operator/driver of a 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 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 must 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.

ENOM00247-1

STOP SWITCH LANYARD

The engine can be stopped by pulling out the stop switch lock from the stop switch. The stop switch lanyard is the coiled red cord with the stop switch lock on one end and a metal clip on the other end. With attaching the stop switch lanyard to the operator's body part or operator’s personal flotation device (PFD), the engine will stop when the stop switch lanyard is being stretched and pulled out the lock from the switch if the operator accidentally falls overboard or leaves from operator’s position. This function may prevent losing control of the boat and minimize or prevent risk of collision with other boats, people and other objects. It is operator’s responsibility to use the stop switch lanyard.

ENOW00004-1

⚠ WARNING

Accidental activation of the 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 Stop Switch, the 500 mm (20 inch.) stop switch lanyard is coiled and can extended to a full 1300 mm (51 inch.).

ENOM00800-A

PERSONAL FLOTATION DEVICE

As the operator/driver and passenger a boat, you are responsible to wear a PFD (Personal Flotation Device) while on the boat.

ENOM00010-1

SERVICING, REPLACEMENT PARTS & LUBRICANTS

We recommend that only an authorized service shop perform service or maintenance on your outboard motor. Be sure to use genuine parts, genuine lubricants, or recommended lubricants. Be aware that the installation and use of parts not approved by Tohatsu Corporation will void warranty and may lead to unsafe operating conditions.

ENOM00011-1

MAINTENANCE

As the owner of the outboard motor, you should be acquainted with correct maintenance procedures following by maintenance section of this manual (See page 45). It is the operator's responsibility to perform all safety inspections, proper lubrication and to follow all maintenance instructions for safe operation. 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 outboard motor will reduce the chance of problems, limit overall operating expenses and contribute to longevity of your outboard motor.ss

Carbon Monoxide Poisoning Hazard

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

Propane

Propane (Liquefied petroleum gas / LPG) is extremely flammable and can be explosive. Use extreme care when handling propane. You should be thoroughly knowledgeable on how to correctly handle propane by reading this manual.

SPECIFICATIONS

ENOM00810-D

MODEL FEATURE

F5D LPG Model		F5D LPG	F5D LPG SP*2
Type		MF	MF
Transom heights	S	●	
	L	●	●
	UL		●
Tiller Handle		●	●
Remote Control *1		(●)	(●)
Manual tilt		●	●

*1: Option

*2: SP model equip with charging coil as a standard.

ENOM00811-D

MODEL NAME EXAMPLE

F 5 DLPGL

F	5	D	LPG	L
Model description	Horse power	Product generation	Fuel	Shaft length
F= Four stroke	-	A and up	LPG=Propane	S= Short 15 in L= Long 20 in UL= Ultra long 25 in

ENOM00401-0

MF

Item		Model	MFS 5DS	MFS 5DS SP
			Separate Tank	
Overall Length		mm (in)	823 (32.4)	
Overall Width		mm (in)	345 (13.6)	
Overall Height		mm (in)	S : 1030 (40.6) L : 1157 (45.6) UL : 1284 (50.6)	
Transom Height		mm (in)	S : 436 (17.2) L : 563 (22.2) UL : 690 (27.2)	
Weight*1		S kg (lb)	27.0 (60.0)	
		L kg (lb)	27.5 (61.1)	
		UL kg (lb)	-	28.0 (62.2)
Engine Type			4 stroke	
Number of Cylinder			1	
Piston Displacement		cm^3 (cu.in.)	123 (7.5)	
Bore x Stroke		mm (in)	59 x 45 (2.30 x 1.75)	
Max. Output		kW (PS)	3.7 (5)	
Max. Operating Range		min^{-1} (rpm)	5000 - 6000	
Idle Speed in Forward Gear		min^{-1} (rpm)	1100	
Idle Speed in Neutral Gear		min^{-1} (rpm)	1300	
Exhaust System			Through-hub exhaust	
Lubrication System			Wet sump (Trochoid pump)	
Cooling System			Water cooling (with thermostat)	
Starting System			Manual starter	
Ignition System			Flywheel Magneto CD Ignition	
Alternator			12V - 5A*2	
Steering Angle		Degree	150	
Trim Angle*3		Degree	-8 - 12	
Trim Position			6	
Tilt Up Angle*3		Degree	63	
Gear Shift			Dog clutch (F-N-R)	
Gear Reduction Ratio			2.15 (28:13)	
Emisson Controul System			EM (Engine modification)	
Operator Sound Pressure (ICOMIA 39/94 Rev.1) dB (A)			81.0	
Hand Vibration Level (ICOMIA 38/94 Rev.1) m/s^2			5.9	

Remark: Specifications subject to change without notice.
*1: With propeller, with battery cable.
*2: Equippted only for SP model, the other models OPTION.
*3: Transom angle is at -12°
Tohatsu outboard is power rated in accordance with ISO8665 (propeller shaft output).

2

Service data

Item		Model	MFS 5DS	MFS 5DS SP
			Separate Tank	
Fuel			Propane	
Fuel Connector			CGA 600	
Engine Oil		Grade	API: SH, SJ, SL SAE: 10W-30, 10W-40	
		mL (US/Imp.oz)	450 (15/16)	
Gear Oil		Grade	API:GL-5, SAE:80-90	
		mL (US/Imp.oz)	195 (6.6/6.9)	
Battery (minimum requirements)			-	40Ah/20HR, 330CCA
Spark Plug			NGK DCPR6E	
Spark Plug Gap		mm (in)	0.8-0.9 (0.031-0.035)	
Intake Valve Clearance		mm (in)	0.06-0.14 (0.0024-0.0055)	
Exhaust Valve Clearance		mm (in)	0.11-0.19 (0.0043-0.0075)	

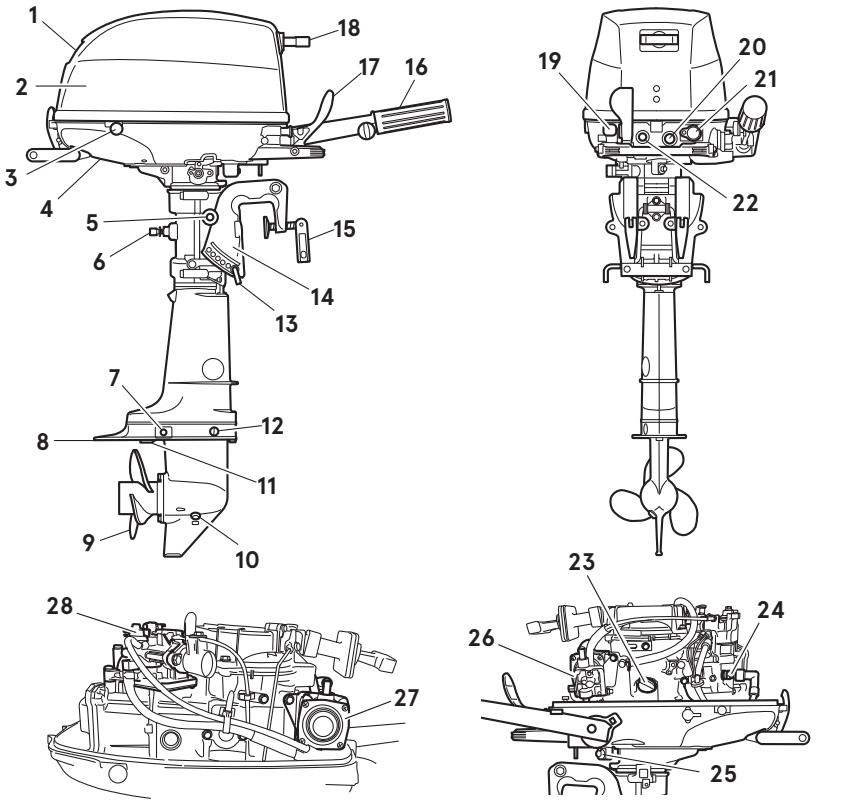
Tightening torque

Engine Oil Drain Bolt	18N · m (13 ft · lb, 1.8 kgf · m)
Gear Oil Plug	4N · m (3 ft · lb, 0.4 kgf · m)
Propeller Nut	12N · m (9 ft · lb, 1.2 kgf · m)
Spark Plug	18N · m (13 ft · lb, 1.8 kgf · m)

PARTS NAME

ENOM00402-A

5D



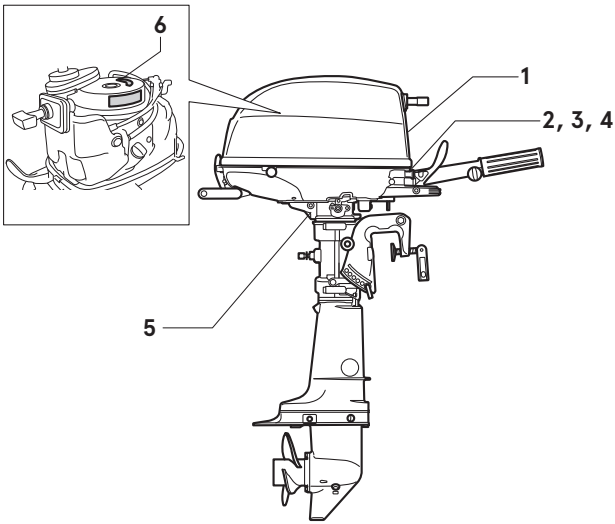
ENOF01502-B1

1 Tilt Handle
2 Top Cowl
3 Bottom Cowl
4 Cooling Water Check Port
5 Tilt Lever
6 Steering Adjustment Screw
7 Anode
8 Anti Ventilation Plate
9 Propeller
10 Oil Plug (Lower) (Fill)
11 Water Inlet
12 Oil Plug (Upper) (Level)
13 Thrust Rod
14 Clamp Bracket
15 Clamp Screw
16 Throttle Grip
17 Shift Lever
18 Starter Handle
19 Choke Knob
20 Stop Switch
21 Fuel Connector
22 Warning Lamp
23 Engine Oil Filler Cap
24 Spark Plug
25 Engine Oil Drain Screw
26 Shut Off Valve
27 Regulator
28 Mixer

LABEL LOCATIONS

ENOM00019-A

Warning label locations



ENOF01503-B3

1. Read owner's manual.

ENOF00120-0

2. Oil pressure lamp (See page 27).

ENOF00131-0

3. Engine stop switch (See page 36).

ENOF00131-B

4. Warning regarding fuel (See page 23).

3PG-72185-0

5, 6-2. HOT SURFACE

Can cause burns.

Do not touch when operating or immediately after the engine has stopped.

3GR-76191-0

6-1. Warning regarding starting the engine (See page 30).

6-3. HAZARD CAUSED BY ROTATING PARTS

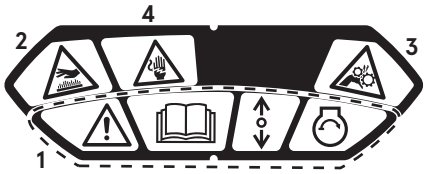
Rotating parts can cause severe injury.

Keep hands, feet, hair, and clothing away from all rotating parts to prevent injury.

6-4. ELECTRICAL SHOCK HAZARD

High voltage can cause severe electrical shock.

Do not touch electrical components such as ignition coil or spark plug cord when starting or while the engine is in operation.

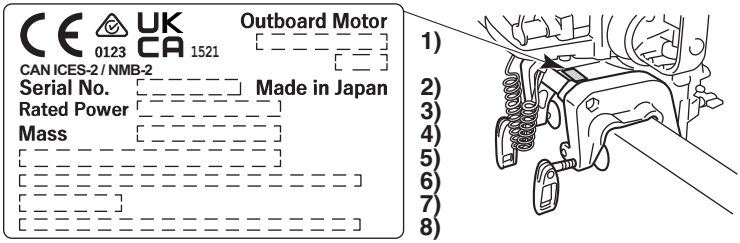


3PA-72181-1

4

ENOM00019-B

CE label locations



ENOF01504-3

1. Model code(Model name)
2. Serial No.
3. Rated power
4. Dry mass weight(Without propeller, with battery cable)
5. Manufacturer name
6. Manufacturer address
7. Authorised representative
8. Authorised representative address

Description of serial number year code

Last two digits of alphabet represent production year as below.

Year Code	BC	BD	BE	BF	BG
Year of manufacture	2023	2024	2025	2026	2027

INSTALLATION

ENOM00024-B

1. Mounting the outboard motor on boat

ENOW00006-1

⚠ WARNING

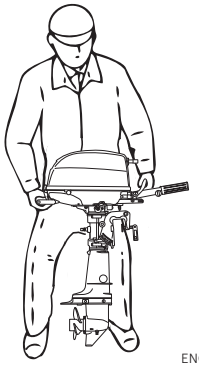
Most boats are rated and certified for their maximum allowable horsepower, as shown on the boat's certification plate. Do not equip your boat with an outboard motor that exceeds this limit. If in doubt, contact your dealer.
Do not operate the outboard motor until it has been securely mounted on the boat in accordance with the instructions below.

ENOW00009-2C

⚠ 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 can lead to the release or displacement of the outboard motor, possibly resulting in loss of control and/or serious personal injury. Check the clamp screws for tightness before operating your outboard.**

Keep the outboard motor in a vertical position when mounting.

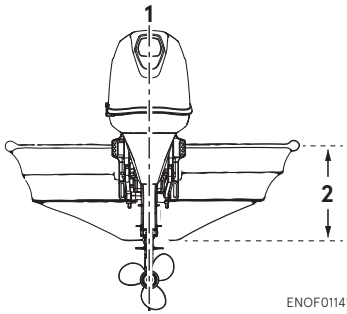


ENOF01505-1

ENOM00025-0

Position ... Above keel line

Place the outboard motor in the center of the boat's transom.



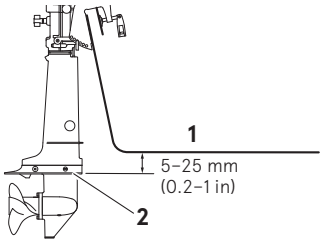
ENOF01141-0

1. Center of boat
2. Boat transom

ENOM00026-0

Transom matching

Be sure that the anti ventilation plate of the outboard motor is 5–25 mm (0.2–1 in) below the bottom of hull.
If the above condition cannot be met due to the shape of the bottom of your boat, please consult your authorized dealer.



ENOF01506-0

1. Bottom of hull
2. Anti ventilation plate

ENOW00007-1A

⚠ CAUTION

- **Before running test, check the boat with maximum loading capacity. Overloading or incorrect weight distribution of the weight may result in boat to lose control, even swamping or capsizing. Make sure that there is enough distance between bottom cowl and water surface to prevent water from entering the engine.**
- **Make sure to mount the engine in correct position. If outboard motor is mounted incorrectly, water may intrude the engine from openings of the bottom cowl while cruising. Exposing the engine to such condition may result in severe damage to the engine.**
- **Tighten the clamp screws sufficiency, otherwise falling down of outboard could be happened.**

5

ENOM00831-0

Mounting the outboard motor

1. Set the outboard motor to appropriate position.
2. Tighten the clamp screws by turning their handles.
3. Secure the outboard motor to the boat with a rope to prevent accidental loss of the outboard motor overboard.

ENON00930-0

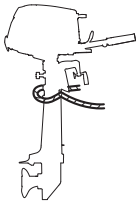
Note

Do not use tools to tighten clamp screws. Over tightening could result in damage to the clamp screws and clamp brackets.

ENON00002-0

Note

A rope is not included in the standard accessories.



ENOF01507-A

ENOM00029-A

2. Battery installation (For SP model)

ENOW00012-1

⚠ WARNING

Battery electrolyte contains sulfuric acid and is hazardous, causes a burn if come in contact with your skin, and 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 come in contact with your eye, loss of sight. Use safety glasses and rubber gloves.**

In case you came in contact with battery electrolyte:
- **For skin, flush thoroughly with water.**
- **For eye, flush thoroughly with water, and then seek immediate medical treatment.**

In case battery electrolyte is swallowed:
- **Seek immediate medical treatment.**

ENOW00013-B

⚠ 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 charge the battery when the electrolyte level is low. Otherwise, the battery will be damaged and may cause malfunction.**

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.**

ENOW00015-1

⚠ 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.

ENON00006-1C

Note

Minimum battery requirements: 12V 40Ah/20HR, 330 Cold Cranking Amps (CCA).
Larger capacity battery is required when it is used under a freezing condition.
Recommend connecting only the engine battery cables to the starting battery.
Specifications and features of battery vary by manufacturers.
Consult the manufacturer for details.
* The battery should be purchased separately and is not supplied with the outboard motor.

1. Connect the battery cable to the leads that come from the bottom cowl.

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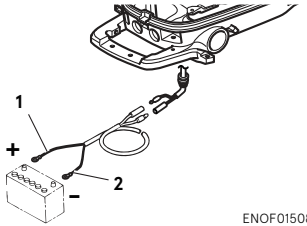
2. Place the battery box in a convenient position and away from possible water spray. Securely fasten both the box and the battery so they do not shake loose.
3. Connect the positive lead (+) to the positive terminal (+) of the battery, and then connect the negative lead (—). When disconnecting the battery, always remove the negative lead (—) first. After connecting the positive terminal (+), securely place a cap on it to prevent short circuits.



ENOF01508-0

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

PRE-OPERATING PREPARATIONS

ENOM00030-A

1. Fuel handling

ENOW00948-0

⚠ WARNING

- **Only LP gas can be used to fuel the outboard motor. Do not use any fuel other than LP gas. Failure to observe this may result in the outbreak of fire or damage to the engine.**
- **Leaking LP gas may cause a fire or explosion if ignited causing serious bodily injury or death.**
- **Turn off the engine when handling LP gas and when connecting or splitting hoses, and perform these tasks in a well-ventilated area.**
- **Do not smoke or allow flames, sparks, etc., in the vicinity of the gas when handling LP gas and when connecting or splitting hoses. Also, make sure that static electricity that has built up within the body is discharged prior to performing these tasks.**
- **Check to make sure that the gas is not leaking when starting up the engine.**
- **Turn off the engine immediately if LP gas leaks are detected (smell of gas or other indications of a leak), and then perform the following measures:**
- **Close the valve when not used.**
- **Remove the gas hose from the outboard motor during except for operation.**
- **Contact your LP gas dealer.**
- **LP gas is heavier than air and may settle in low places while dissipating.**
- **Contact with the liquid contents of the cylinder will cause freeze burns to the skin.**
- **Do not allow children to tamper or play with LPG tank.**

ENOW000017-0

⚠ CAUTION

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

ENOM00031-1B

FUEL RATING

Use only major brand propane gas.

Propane fuel only.

ENON00396-0

Note

The fuel that highly containing butane may cause hard starting of the engine.

ENOM00125-1

FUEL TANK

The fuel tank without regulator is recommended. If it's avoidable to use a tank with regulator,

pressure must exceed 100 kPa (14.5 psi) [1kgf/cm^2] at least.

ENOM00043-B

2. Fuel filling

ENOW00949-0

⚠ WARNING

- **Be certain LPG tank is purged of trapped air prior to first filling.**
- **Before filling any LPG tank there must be a visual inspection of the tank. Check for any damages such as deep dents or areas of heavy rust if the tank is metal.**
- **Never fill an LPG tank beyond 80% full: a fire causing death or serious injury may occur.**
- **Do not use a LPG tank expired life span. Re qualification will be required after**

specific years from the date of manufacture. Please follow to the LPG tank manufactures' instruction.
- **When filling fuel, keep LPG tank in an upright position.**
- **When transporting, keep LPG secured in an upright position with the tank valve turned off.**
- **Do not use, store or transport tank where it would be exposed to high temperatures.**

ENOM00037-C

3. Engine oil filling

ENOW00022-2

⚠ CAUTION

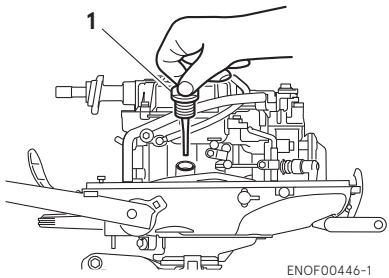
The engine oil is drained for shipping at the factory. Be sure to fill the engine oil to the proper level before starting the engine.

ENOW00092-1

⚠ CAUTION

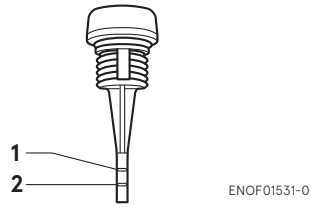
- **Do not overfill engine oil, or engine oil could leak and/or engine could be damaged. If engine oil level is over upper limit marks of dip stick, drain oil to level lower than upper limit.**
- **Be sure that outboard motor is upright when checking or changing oil.**
- **Stop the engine immediately if low oil pressure warning lamp or oil leak is found, or engine could be severely damaged. Consult your dealer.**
- **Wipe off engine oil well immediately if spilled and dispose of it in accordance with local fire prevention and environment protection regulations.**

1. Place the engine in a vertical position.
2. Remove the top cowl and the oil filler cap (dipstick).
3. Fill the engine through filler port with recommended oil to the middle of dipstick mark.
4. Tighten the oil filler cap (dipstick).



ENOF00446-1

1. Oil filler cap (Dipstick)



ENOF01531-0

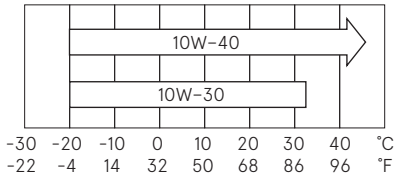
1. Upper limit
2. Lower limit

Engine oil recommendation

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

SAE: 10W-30 or 10W-40
API: SF,SG,SH or SJ

Engine oil viscosity must be selected from the following chart according to the average temperatures in your area.



ENOF00208-0

Engine oil volume
Approximately 450 mL (0.48 US qt.)

ENOW0002A-A

⚠ CAUTION

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

ENOM00033-A

4. Break-In

Your new outboard motor and lower unit require break-in for the moving components according to the conditions described in the following timetable.
Please refer to ENGINE OPERATION section (See page 29) to learn how to correctly start and operate the outboard motor.

ENOW00024-A

⚠ DANGER

Do not operate the outboard motor in closed area or area with not enough ventilation.
Exhaust gas emitted by the outboard motor contains carbon monoxide that may cause dizziness, nausea, other health problem or even death if inhaled continuously.
During operation of the outboard motor:
- **Keep peripheral area well ventilated.**
- **Always stay on the windward side of emission.**

ENOW00023-1

⚠ CAUTION

Operating the outboard motor without break-in can shorten life.
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.**

ENON00008-2

Note

- During Break-in, run the outboard motor at varied RPM less than specified engine speed. Not following the procedure may result in problems and may shorten the product life.
- Break-in must be conducted under load in the water in-gear with propeller installed.

	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 min^{-1} (rpm) max	Full throttle run allowed for 1 min every 10 min	Approx. 4000 min^{-1} (rpm). Full throttle run allowed for 2 min every 10 min	

ENOM00039-A

5. Warning system

If outboard motor encounters an abnormal condition of fault, the warning lamp (LED) will be ON.

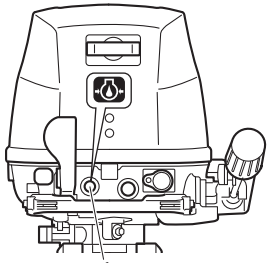
See next page for conditions which will lead to an abnormal condition or fault.

ENOM00040-D

Location of warning lamp

■ **Warning lamp (LED)**

Tiller handle models: Located on the bottom cowl.



ENOF00415-1

1. Warning lamp

ENOM00041-E

Warning indicators, faults and remedy

Warning indicators		Description of faults	Remedy
Lamp (LED)	ESG		
On for several sec.		Normal system test when start up	
-	ON	Engine speed exceeds maximum allowable RPM	**1**
ON	-	Low oil pressure*1	**2**

Remarks

*1: In this case, oil pressure switch is "ON".

High speed ESG (Electronic Safety Governor)

High speed ESG is a device to prevent over revolution of the engine. If the load to the engine becomes light for some reason, it runs at a higher speed than the usual. In such the case, the buzzer sounds and the ESG is activated not to ignite the spark plug. Therefore, the engine speed varies and is controlled under 6300min^{-1} (rpm).

ENOM00126-A

Remedy

1. Reduce the speed to less than half open throttle, and move to safe place quickly, and stop the engine.
   Check the propeller for bent or damage on blades.
   Consult an authorized dealer if engine shows the same result even after replacing propeller with a new one.
2. Move to safe place quickly, and stop the engine until it cools down.
   Check the engine oil level, and add engine oil if necessary.
   Consult your dealer if the engine oil level is too low or too high.

ENOW00025-B

⚠ CAUTION

High speed ESG ON: Engine speed will be limited to 6300 min^{-1} (rpm) and engine will run rough until throttle is reduced.

ENGINE OPERATION

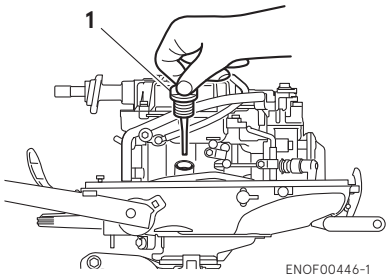
ENOM00042-0

Before starting

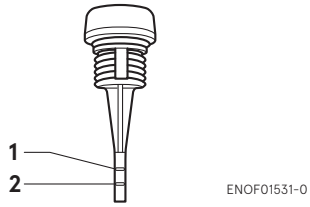
ENOM00246-0

Oil Level checking

Check the engine oil level before each use. If the oil level is low or too high, the life of the engine will be shortened significantly. (To properly check the engine oil level, follow the instructions, see page 48)



1. Oil filler cap (Dipstick)



1. Upper limit
2. Lower limit

ENOW00027-D

⚠ CAUTION

Before starting engine for the first time after reassembling engine or off-season storage, disconnect stop switch lock and crank approximately 10 times in order to circulate oil through the engine.

ENOW00950-0

⚠ WARNING

Before starting engine, secure the tank in an upright position.

ENOM00044-E

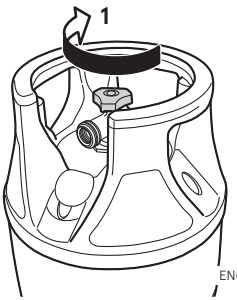
1. Fuel feeding

ENOW00951-0

⚠ WARNING

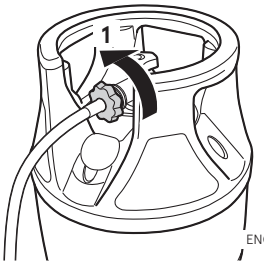
- **Check the special gas hose connector and connection points on the engine to make sure that they are not contaminated with dirt, mud, moisture or any other foreign matter, or otherwise damaged, and then make sure that the connection is firm.**
- **Failure to achieve a firm connection may result in gas leaks, which could lead to explosions or the outbreak of fire.**
- **If dirt, mud, sand, moisture or any other foreign matter is discovered, clean it off in a well-ventilated area.**
- **Do not use the engine if damage is discovered on the special gas hose connector or connection points on the engine.**
- **Do not use a tool to tighten connector. Over tighten may cause breakage of the connector.**

1. Make sure the valve of the LPG tank is closed.



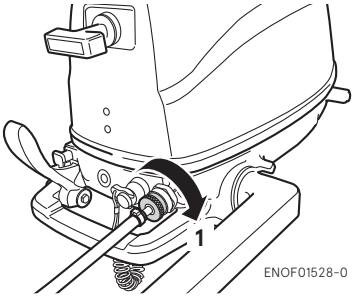
1. Close

2. Connect the hose to the LPG tank by turning connector counter-clockwise.



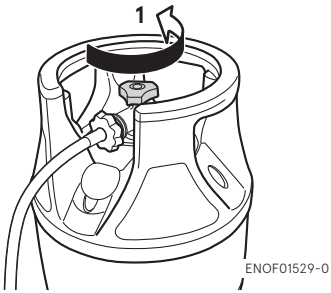
1. Connect

3. Connect the hose connector to the engine side by turning connector clockwise.



1. Connect

4. Fully open the valve of the LPG tank slowly.



1. Open

ENOM00045-C

2. Starting the engine

ENOW00958-1

⚠ WARNING

- **Do not remove or install the top cowl after the engine has started.**
- **The exposed rotating engine parts cause serious injury.**

ENOW00959-0

⚠ CAUTION

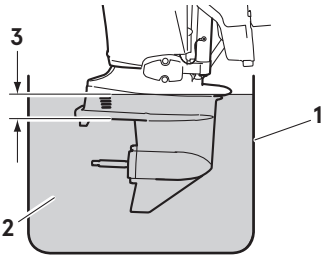
The top cowl must be installed while the engine running except in an emergency. If the top cowl is not installed correctly, water splash can damage the engine.

ENOW00036-1A

⚠ CAUTION

When starting the outboard motor in the test tank, make sure that:

1. Water level is at least 10 cm (4 in.) above the anti-ventilation plate to avoid overheating of the engine.
2. Run at idling only
3. Remove the propeller
(See page 56)



ENOF00863-0

1. Test tank
2. Water
3. Over 10 cm (4 in.)

ENOW00036-1

⚠ CAUTION

Operating outboard motor without cooling water will lead to overheating and damage on the outboard motor severely. In case the cooling water check port is not discharging water, stop the outboard motor immediately, check for any object, debris which may be blocking the cooling water check port. If you are unable to locate the cause, consult an authorized dealer immediately.

ENOW00032-B

⚠ CAUTION

Do not try to crank after engine has started.

This model is provided with start in gear protection.

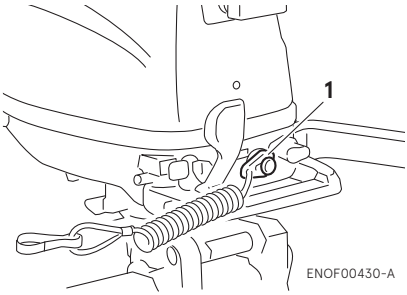
ENON00010-1

Note

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

Tiller handle type

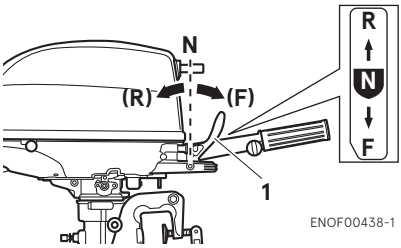
1. Be sure to install the stop switch lock to the stop switch, and attach the stop switch lanyard securely to the operator or to the operator's PFD (Personal Flotation Device.)



ENOF00430-A

1. Stop switch lock

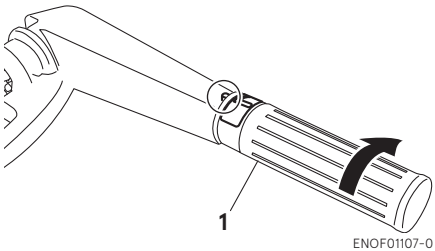
2. Set the shift lever in the Neutral position.



ENOF00438-1

1. Shift lever

3. Set the throttle grip to CLOSED position.



ENOF01107-0

1. Throttle grip

7

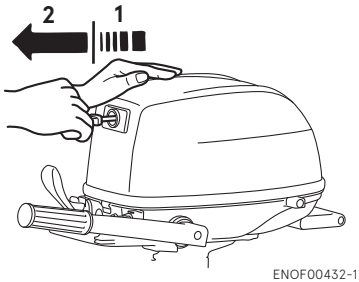
4. Pull the choke knob fully.

ENON00501-0

Note

Choke is not necessary when the engine is warm. Set the throttle grip to CLOSED position.

5. Pull the starter handle slowly until you feel engagement, keep pulling till you feel less resistance. Then pull it quickly. Repeat the procedure until the outboard motor is started.



ENOF00432-1

1. Slowly
2. Quickly

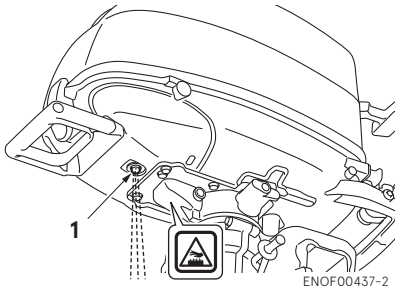
ENOW00064-0

⚠ 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.

6. Check the after engine starting, return the choke knob while check the engine speeds. if the engine speeds unstable, pull the choke knob to operated.

7. Cooling water from cooling water check port.



ENOF00437-2

1. Cooling water check port

ENOM00042-F

Emergency starting

ENOW00099-1

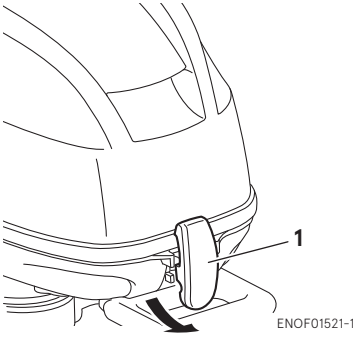
⚠ WARNING

When the emergency starter rope is used for starting engine;

- **Start in gear protection does not work. Make sure that shift is in neutral position. If the gear is in Forward or Reverse, the boat can start moving immediately and may lead to accident and personal injury.**
- **Be careful that of your clothes or other items do not to get caught in the rotating parts.**
- **To prevent accident and injury by rotating parts, do not re-attach flywheel cover or recoil starter and the top cowl after the engine has been started.**
- **Do not pull starter rope if any bystander is around.**
- **Attach engine stop switch lanyard to clothing or any part of body such as wrist, arm before starting engine the outboard motor.**

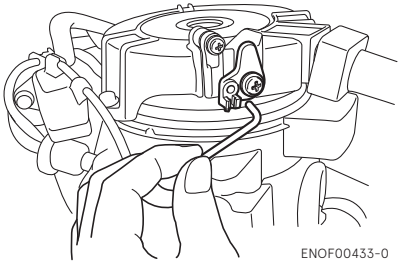
1. Remove the top cowl.

7

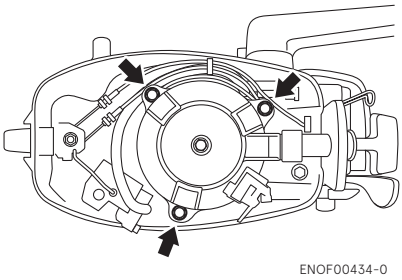


1. Cowl latch

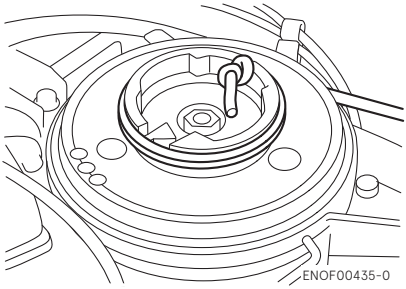
2. Disconnect the rink of the starter lock rod.



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



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



5. Tie a loop in the another end of the emergency starter rope and attach socket wrench, both the loop and the wrench are provided in outboard motor box.

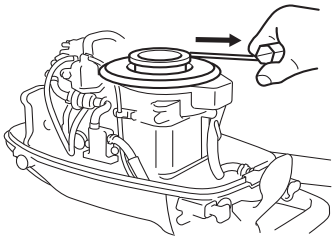
ENOW00860-0

⚠ CAUTION

Be sure to keep the harness away from the rotation parts.

6. Be sure to install the stop switch lock to the stop switch, and attach the stop switch lanyard securely to the operator or to the operator's PFD (Personal Flotation Device.)
7. Set the shift lever in the Neutral position.

8. Pull the starter handle slowly until you feel engagement, keep pulling till you feel less resistance. Then pull it quickly.



ENOF00436-0

9. Once the outboard motor is started, do not reinstall the recoil starter and top cowl.

ENOM00043-A

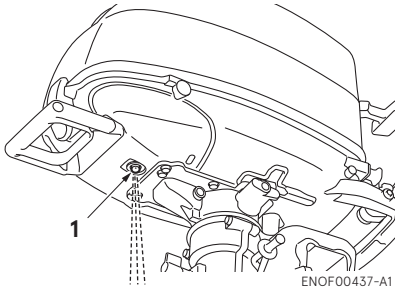
3. Warming up the engine

ENOW00932-1

⚠ CAUTION

Be sure to check that cooling water is discharged from the cooling water check port during warm up.

Warm the engine at low engine speeds for about
3 minutes : above 5°C (41°F)
5 minutes at 2000 min^{-1} (rpm) : below 5°C (41°F)
This allows the lubricating oil to circulate to all parts of the engine. Operating the engine without warm up shortens the engine's life.



ENOF00437-A1

1. Cooling water check port

ENOM00044-A

Engine speeds

Idling speed after warming up.

Clutch in (In gear)	Clutch off (Out of gear)
1150 min^{-1} (rpm)	1300 min^{-1} (rpm)

ENOM00046-A

4. Forward, reverse, and acceleration

ENOW00037-1

⚠ 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 around of the boat.

ENOW00967-0

⚠ WARNING

- **Attach the other end of emergency stop switch lanyard to the operator's PFD (Personal Flotation device) or arm and keep it attached during cruising.**
- **Do not attach the lanyard to a part of clothing that can be torn easily when pulled.**

- **Arrange the lanyard so that will not be caught by any object when pulled.**
- **Be careful not to pull the lanyard accidentally during cruising. Unintentional stop of engine can cause loss of control of outboard motor. Rapid loss of engine power can lead to fall down or causing passenger(s) to be thrown overboard.**

ENOW00042-1

⚠ 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, fall down or causing passenger(s) to be thrown overboard. Leading to serious personal injury, and steering system and/or shifting mechanism may be damaged.**

ENOW00861-1

⚠ WARNING

Do not shift at high boat speed, or control may be lost, fall down or causing passenger(s) to be thrown overboard. Leading to serious personal injury.

ENOW00867-1

⚠ WARNING

Sudden acceleration and deceleration may cause passenger(s) to be thrown overboard or fall down.

ENOW00862-1

⚠ CAUTION

Gear and clutch damage may occur if shifting at high engine speed.
Engine must be in the slow idle position before shifting.

ENOW00863-0

⚠ CAUTION

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.

ENOW00864-0

⚠ CAUTION

Do not increase engine speed unnecessarily when the shift is in neutral and reverse, or engine damage may occur.

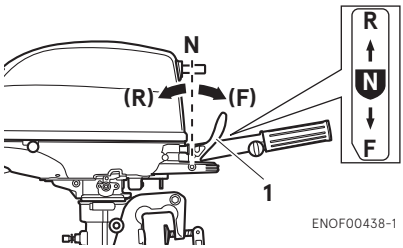
ENOM00890-A

Tiller handle type

ENOW00865-A

⚠ CAUTION

Do not force to shift when the throttle grip is not in the fully closed position, otherwise, steering system and/or shifting mechanism may be damaged.



1. Shift lever

7

Forward

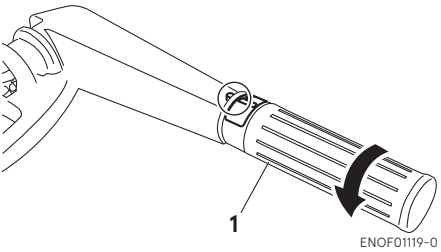
1. Turn the throttle grip to reduce engine speed.
2. When the engine reaches trolling (or idling) speed, quickly pull the shift lever to the Forward position.

Reverse

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

Acceleration

Open throttle grip gradually.



1. Throttle grip

ENOM00049-A

5. Stopping the engine

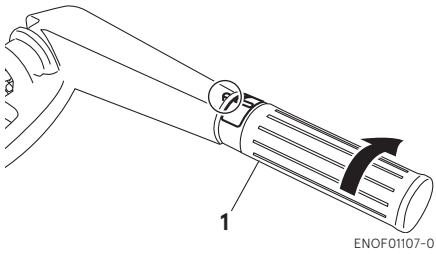
ENOW00868-1

⚠ WARNING

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, speed, possibly leading the crew(s) and or objects on the boat to be thrown forward due to inertial force.

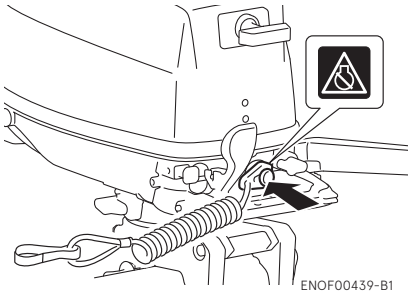
Tiller handle type

1. Turn the throttle grip to the slow position.

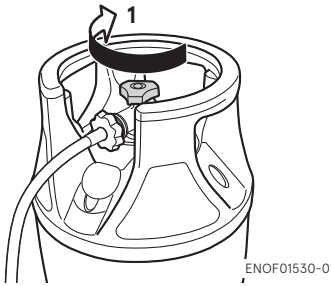


1. Throttle grip

2. Put the shift lever in the Neutral position.
   Run the engine for 2-3 minutes at idling speed for cooling down if it has been running at full speed.
3. Push the stop switch.



4. Close the valve of the LPG tank.



1. Close

ENOW00984-0

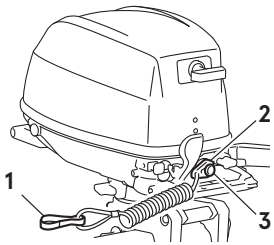
⚠ WARNING

After stopping the engine:

- **After close the valve of the fuel tank, consume remained fuel by running the engine if the motor will be stored.**
- **Disconnect the fuel connector from the engine and the fuel tank.**
- **Disconnect the battery cable, after each use.**

Emergency engine stopping

Remove stop switch lock to stop the engine.



ENOF00439-1

1. Hock
2. Stop switch lock
3. Stop switch

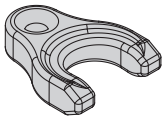
ENOM00910-1

Spare emergency stop switch lock (For CE marking model)

A spare emergency stop switch lock is provided in the accessories bag.

Make sure that spare stop switch lock is available before operating outboard motor.

When used as described, the emergency stop switch clip and emergency stop switch lanyard system stops the engine if the operator is thrown overboard. When an operator falls into water, be sure to use spare emergency stop switch lock.



ENOF00891-0

ENOM00920-A

6. Steering

ENOW00870-1

⚠ WARNING

Sudden steering may cause passenger(s) to be thrown overboard or fall.

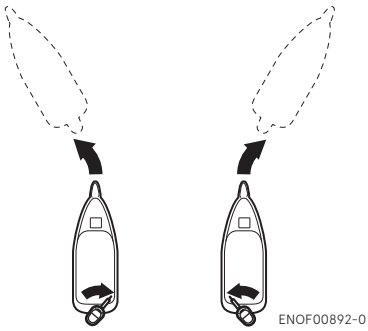
Tiller handle type

Right turn

Move the tiller handle to the left

Left turn

Move the tiller handle to the right.



ENOF00892-0

ENOM00050-0

7. Trim angle

ENOW00043-1

⚠ WARNING

- **Adjust the trim angle when the engine is stopped.**

7

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

ENOW00044-1A

⚠ WARNING

Excessive trim up or down may cause unstable boat operation, loss of control that may leads to accident during cruising.

- **For manual tilt model, If you feel the trim is improperly positioned, stop the boat and readjust trim angle before continuing to cruise.**

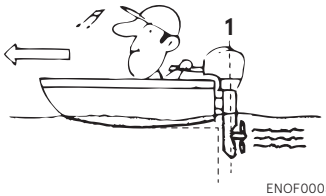
The trim angle of the outboard motor can be adjusted to suit the transom angle of the hull, and load conditions. Choose an appropriate trim angle that will allow the anti-ventilation plate to run parallel to the water surface during operation.

7

ENOM00052-0

Proper trim angle

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



ENOF00051-1

1. Perpendicular to the water surface

ENOM00053-A

Improper trim angle (bow rises too high)

Set the thrust rod (or preset knob) lower if the bow of the boat rises above horizontal.

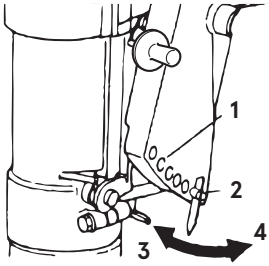
ENOF00052-0

ENOM00054-0

Improper trim angle (bow dips into the water)

Set the thrust rod (or preset knob) higher if the bow of the boat is below horizontal.

ENOF00053-0



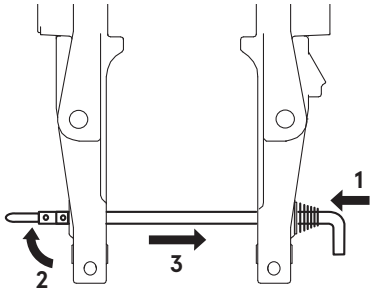
ENOF00440-0

1. Trim angle adjustment hole
2. Thrust rod
3. Higher
4. Lower

Trim angle adjustment

The transom angle adjustment

1. Stop the engine.
2. Shift into neutral position.
3. Tilt up the outboard motor.
4. Remove the thrust rod as shown picture.



ENOF01238-1

1. Push in
2. Rise the stopper
3. Pull out

5. Reinstall the thrust rod in the desired position securely.
6. Gentry tilt down the outboard motor.

ENOM00060-A

8. Tilt up and down

ENOW00055-1

⚠ WARNING

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

ENOW00048-1

⚠ WARNING

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

ENOW00056-A

⚠ WARNING

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

ENOW00057-1

⚠ CAUTION

Do not tilt up the outboard motor while engine is operating, or no cooling water may be discharged, leading to engine seizure due to overheating.

ENON00921-1

Note

After use, leave the outboard motor upright for a minute to drain the water from inside the engine.

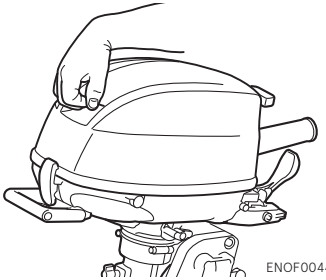
ENOM00423-0

Tilt up

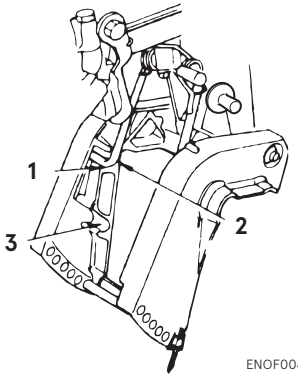
With the shift lever in Forward, fully tilt the motor up toward you by holding the tilt handle provided at the rear of the top

7

cowl. Then slightly lower the motor for locking in the up position.



ENOF00441-1



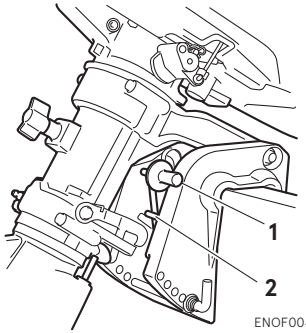
ENOF00442-0

1. Tilt up position
2. Tilt stopper
3. Shallow water running position

ENOM00424-0

Tilt down

Slightly tilt the motor up, and pull the tilt lever toward you to release the tilt-lock. Then lower the motor slowly.



ENOF00443-0

1. Tilt lever
2. Tilt stopper

ENOM00068-A

9. Shallow water operation

ENOW00051-0

⚠ WARNING

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

ENOW00053-0

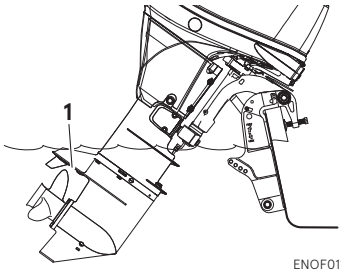
⚠ CAUTION

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.

ENOW00054-1A

⚠ CAUTION

Do not over tilt the outboard motor when driving in shallow water, or air may be sucked through water inlet, potentially leading to engine overheating.



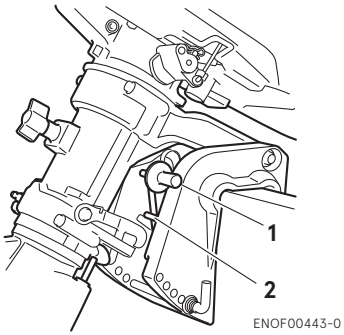
1. Water inlet

Shallow water running position:

1. With the shift lever in Forward, tilt the motor up slowly by about 40° and then lower the tilt lever for setting at the shallow water running position.

Return to normal running position:

2. Tilt the motor up fully and then return the motor down slowly to the normal running position.



1. Tilt lever
2. Tilt stopper

REMOVING AND CARRYING THE OUTBOARD MOTOR

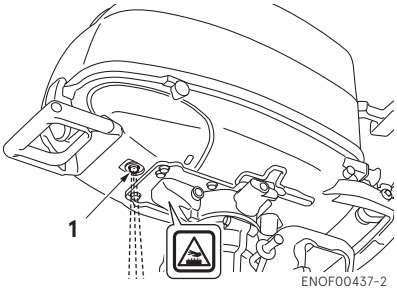
ENOM00070-D

1. Removing the outboard motor

ENOW00064-1

⚠ CAUTION

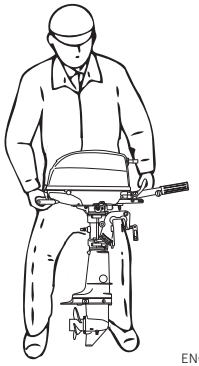
Engine may be hot immediately after operation and could cause burns if came in contact. Allow engine to cool down before attempting to carry the outboard.



ENOF00437-2

1. Cooling water check port

1. Before stopping the engine, close the valve of the propane tank to consume remained fuel in the fuel line. And wait until engine is stopped.
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 in a vertical position.



ENOF01505-1

ENOM00071-A

2. Carrying the outboard motor

ENOW00933-0

⚠ WARNING

Be sure to disconnect fuel connector except when operating engine.
Fuel leakage is a fire or explosion hazard, which can cause serious injury or death.

ENOW00952-0

⚠ WARNING

- **When transporting, keep tank secured in an upright position with the tank valve turned off.**
- **Do not use, store or transport tank where it would be exposed to high temperatures.**

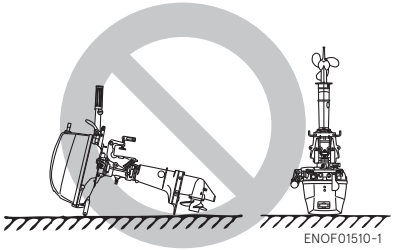
ENOW00066-1

⚠ CAUTION

- **Do not give a shock to an outboard motor during transportation.**
- **Do not carry or store outboard motor in any of positions described below.**

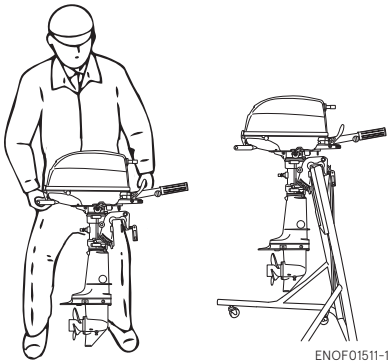
Otherwise, engine's exterior may be damaged or water may enter the cylinder

through the exhaust port and cause engine problems.



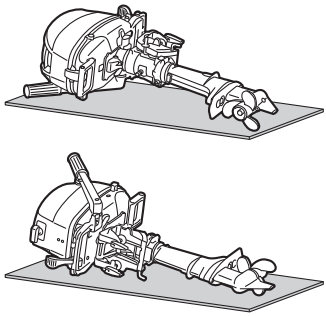
ENOF01510-1

Keep the outboard motor in a vertical position when carrying.
The optional outboard motor stand is recommended for keeping the outboard motor vertical both during transport and storage.

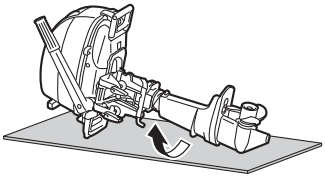


ENOF01511-1

ENOM00442-0
If the outboard motor must be laid down, be sure to close the valve of the LPG tank and disconnect fuel line, and then turn the engine until engine stop so that consume the remaining fuel in the fuel system completely. When laying down the outboard motor, place front-side, starboard-side, or port-side down on a cushion or any softer surface shown below.



ENOF01532-0



ENOF01533-0

ENON00941-0
Note

When laying the outboard front-side down, turn the clamp bracket 90° clockwise or anti-clockwise so that it does not interfere with the ground. Then tighten up the steering adjustment screw to maintain its position (see page 45).

ENOM00072-1A

3. Trailering

ENOW00072-0

⚠ CAUTION

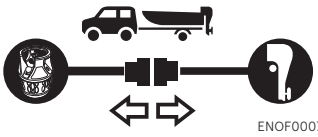
Trailering in the tilted position may cause damage to the outboard motor, boat, etc.

8

ENOW00073-A

⚠ WARNING

Be sure to disconnect fuel connector except when operating engine.
Fuel leakage is a fire or explosion hazard, which can cause serious injury or death.



ENOF00075-A

ENOW00952-0

⚠ WARNING

- **When transporting, keep tank secured in an upright position with the tank valve turned off.**
- **Do not use, store or transport tank where it would be exposed to high temperatures.**

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-A

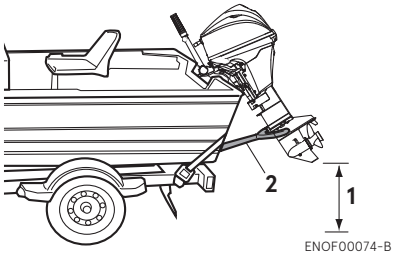
⚠ CAUTION

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.

When transporting a boat on a trailer with the outboard motor still attached, disconnect the fuel line from the outboard motor beforehand and keep the outboard motor in the normal running position or on a transom saver bar.

Tiller handle type

While transporting outboard motor attached to the boat on a trailer, properly tighten the steering friction bolt to prevent the outboard motor from moving (page 45).



ENOF00074-B

1. Ground clearance should be provided sufficiently.
2. Transom saver bar

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.

ADJUSTMENT

ENOM00073-0

1. Steering friction

Tiller handle type

ENOW00074-1E

⚠ WARNING

Do not overtighten the steering friction adjustment screw or it could result in difficult handling of the outboard motor, resulting in the loss of control causing an accident and could lead to severe injury.

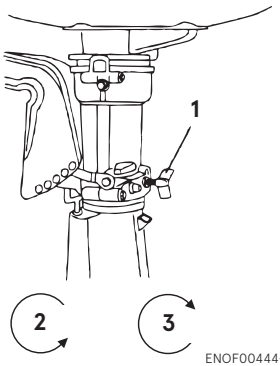
ENON0506-0

Note

The steering friction adjustment screw is used to adjust the friction load of the steering, but not to fix the steering. Excess tightening of the adjustment screw may cause damage to the swivel bracket.

ENOM00544-0

Steering friction can be adjusted in accordance with your preference by turning the steering friction adjustment screw.



ENOF00444-0

1. Steering friction adjustment screw
2. Lighter
3. Heavier

EENOM00074-A

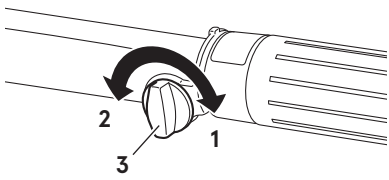
2. Throttle grip friction

ENOW00074-1B

⚠ WARNING

Do not overtighten the throttle adjustment screw or it could result in difficult handling of the outboard motor, resulting in the loss of control causing an accident and could lead to severe injury.

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



ENOF00445-A

1. Heavier
2. Lighter
3. Throttle friction adjustment screw

INSPECTION AND MAINTENANCE

ENOM00077-1

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 as follows.

ENOW00077-1

⚠ CAUTION

- **Your personal safety and that of your passengers depends on how well you maintain your outboard motor. Carefully read 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.**

ENOM00428-0

1. Daily Inspection

Perform the following checks before and after use.

ENOW00078-1

⚠ WARNING

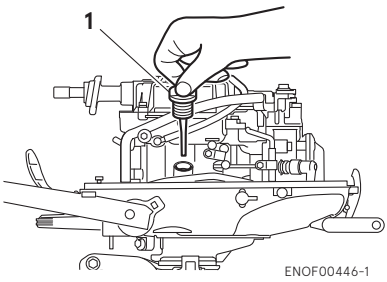
Do not use outboard motor if any abnormality is found during pre-operation check otherwise it could result in severe damage to the motor or severe personal injury.

Item	Points to Check	Remedy
Fuel System	· Check the amount of fuel in the tank. · Check the rubber hoses for fuel leakage.	Replenish Replace if necessary
Fuel Tank	· Check for crack, leakage, damage in the fuel tank. · Check for leakage at full close.	Replace Replace
Engine Oil	· Check the oil level.	Fill to the upper level mark on dipstick
Electrical Equipment	· 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 secured. · Check cords for loose connections and damage. · Check the spark plug(s) for dirt, wear and carbon build-up.	Replenish or recharge Retighten Remedy or replace Correct or replace Clean or replace
Throttle System	· Check mixer 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 clutch engages correctly when operating the shift lever. · Visually Check propeller for bent or damaged blades. · Check the propeller nut is tightened and the split pin is in correct position.	Adjust Replace
Installation of Motor	· Check all the bolts attaching the motor to the boat. · Check the thrust rod installation.	Tighten
Cooling Water	· After starting the outboard motor, make sure that water is being discharged from the cooling water check port.	Repair
Tools and Spares	· Check that there are tools and spare parts for replacing spark plug(s), the propeller, etc. · Check that you have the spare rope.	
Steering Devices	· Make sure that steering handle and remote control is functioning normally.	Repair
Other parts	· Check if the anode is securely installed. · Check the anode for corrosion and deformation.	Repair if necessary Replace

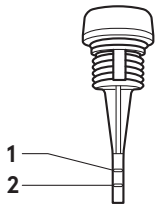
ENOM00081-B

Oil level checking

1. Place the engine in a vertical position.
2. Remove the top cowl and the oil filler cap (dipstick).
3. Wipe oil off the dipstick with a clean-cloth and screw the dipstic back completely.
4. Remove the dipstick again . Check the oil level on the dipstick. Oil level must be between the upper limit and lower limit shown on the dipstick.
5. Return the dipstick.



1. Oil filler cap (Dipstick)



1. Upper limit
2. Lower limit

ENON00024-0

Note

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

ENON00025-0

Note

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

ENOM00082-A

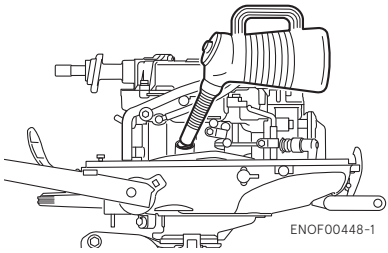
Engine oil replenishing

ENOW00983-1

⚠ CAUTION

- **Do not add engine oil of brand and gradeother than existing one. In case engine oilof other brand or grade is added, drain all oil 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 and dispose of it in accordance with local fire prevention and environment protection regulations.**
- **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.**

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



ENOM00083-B
Washing outboard motor

ENOW00920-0

⚠ CAUTION

When washing the outboard motor, be careful not to spray the water inside of the top cowl, especially electrical components.

ENON00026-0
Note

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

If outboard motor is used in salt water, brackish water or water with high acidic level, use fresh water to remove salt, chemicals or mud. And flush cooling water passage after every use or before storing outboard motor for long time. Before flushing, remove the propeller and the forward thrust holder.

ENOM00085-A
Flushing attachment

ENOW00921-0

⚠ CAUTION

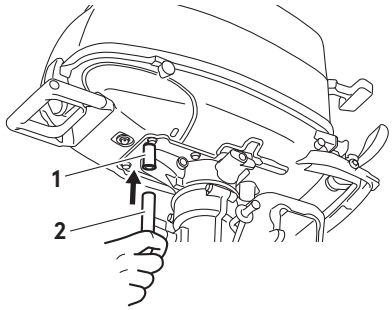
Do not operate the engine when flushing the outboard motor with a hose joint as this can cause damage to the outboard motor.

ENOW00922-0

⚠ CAUTION

To prevent the engine from starting when you are near the propeller, remove the stop switch lock.

1. Tilt down the outboard motor.
2. Remove the water plug from the bottom cowl, and screw in the flushing plug as below picture.
3. Connect a water hose. Turn on the water and adjust the flow.
   Continue flushing the outboard motor for 3 to 5 minutes.
4. After the flushing, be sure to reattach the water plug.
5. Tilt up the outboard motor.



ENOF00449-A

1. Flushing plug (option)
2. Hose (commercially available)

ENOM00085-A
Flushing by test tank

ENOW00081-1

⚠ WARNING

Do not start engine without removing propeller, turning propeller out in the open may lead to personal injury.

ENOW00082-0

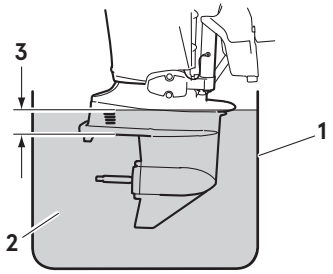
⚠ WARNING

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.

ENOW00036-1A

⚠ CAUTION

When starting the outboard motor in the test tank, make sure that:
1. Water level is at least 10 cm (4 in.) above the anti-ventilation plate to avoid overheating of the engine.
2. Run at idling only
3. Remove the propeller
(See page 56)



ENOF00863-0

1. Test tank
2. Water
3. Over 10 cm (4 in.)

ENOM00950-1

Fuse replacement (for SP type)

ENOW00923-1

⚠ CAUTION

Before replacing a fuse, disconnect the battery cable from the battery negative (-) terminal first. Failure to properly remove battery cables may cause a short-circuit.

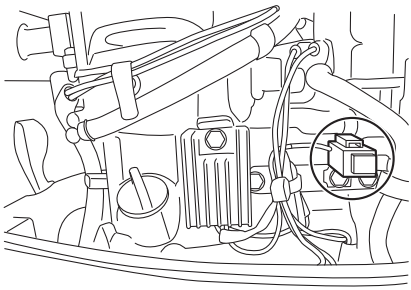
ENOW00924-0

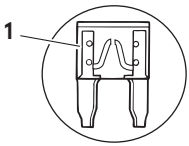
⚠ CAUTION

Never use a fuse with a rating that exceeds the specified rating as this could cause serious damage to the electrical system.

If the fuse is blown, try to determine the cause and respond to the problem as simply replacing the fuse will likely be blown again. If you are unable to respond to the cause or the fuse continues to blow, request an authorized Tohatsu dealer for inspection.

1. Stop the engine and disconnect the battery cable from the battery negative (-) terminal.
2. Remove the engine cover.
3. Remove the fuse box lid.
4. Remove the fuse and check it. If the fuse is blown, replace it with a fuse of the same specified rating. The outboard motor is supplied with spare fuses in the spare fuse holder.





ENOF01524-0

1. Blown fuse

ENOM00431-1

2. Periodic Inspection

It is important to inspect and maintain your outboard motor regularly. Make sure to perform each service at interval specified in the chart below. Maintenance intervals are determined by the number of hours outboard motor has been used or number of months, whichever comes first.
Recode inspection performed in the INSPECTION & MAINTENANCE LOG at the back of this manual.

Description		Inspection intervals					Inspection procedure	Remarks
		First 20 hours or 1 month	Every 50 hours or 3 months	Every 100 hours or 6 months	Every 200 hours or 1 year	Every 400 hours or 2 year		
Fuel System	Hose	●/❍	●/❍				Check /Replace if necessary	
	Mixer				❍		Check /Replace if necessary	
	Regulator				❍		Check /Replace if necessary	
	Shut off valve				❍		Check /Replace if necessary	
Ignition System	Spark plug				●		Check and clean	Gap 0.8–0.9 mm (0.031–0.035 in)
	Spark plug cap/ High tension cord	❍		❍			Check /Replace if necessary	
Starting System	Starter rope	●/❍	●/❍				Check /Replace if necessary	
Engine	Engine oil	● Replace		● Replace			Replace	Approx.450 mL (15.2 fl.oz) Refer to P50
	Valve clearance				❍		Check and adjustment	IN: 0.06–0.14 mm (0.0024–0.0055 in) EX: 0.11–0.19 mm (0.0043–0.0075 in)
	Idling speed	●/❍	●/❍				Check /Adjust	
	Compression pressure				❍		Check	
	Combustion chamber					❍	Clean	
	Thermostat				❍		Check	
Lower Unit	Propeller	●	●				Check and replace if necessary	Refer to P56
	Split pin	●	●				Check and replace if necessary	Refer to P56
	Gear oil	● Replace	●	● Replace			Check and replace	195 mL (6.6 fl.oz) Refer to P55
	Water strainer	●	●				Check	
	Water pump impeller		●/❍		❍ Replace		Check/Replace if necessary	
	Water pump housing					❍	Check and replace if necessary	
Shift/ Throttle	Throttle cable			❍			Check and replace if necessary	
	Shift link	❍	❍				Check and adjustment	

Description	Inspection intervals					Inspection procedure	Remarks
	First 20 hours or 1 month	Every 50 hours or 3 months	Every 100 hours or 6 months	Every 200 hours or 1 year	Every 400 hours or 2 year		
Warning system		❍				Check	
Stop switch	●	●				Check	Refer to P36
Bolt, nut	❍	❍				Retighten	
Sliding part / rotating part	●	●	●	●		Apply grease	Refer to P60
Grease nipples	●	●				Pump in grease	Refer to P60
Outer equipment	●	●	●	●		Check	
Anode		●/❍				Check /Replace if necessary	Refer to P59
Top cowl / Latch				●/❍		Check /Adjustment	

*"●" This procedure can be performed by end user (or dealer)
*"❍" This procedure shall be carried out by the dealer.

Outboards used in rental, commercial, or other under severe condition as described below in detail require more frequent inspections and maintenance than shown in this manual.

- Continuous operation at maximum engine speed
- Continuous operation at idling or trolling speed
- Operation without appropriate warm up
- Stopping without sufficient time for the engine to cool down
- Frequent sudden acceleration and sudden deceleration
- Frequent stop start operation
- Frequent shifting operation
- Frequent operation in acidic, polluted, muddy, sandy, or shallow water

10

Appropriate maintenance can prolong your engine life.
Consult your Tohatsu authorized dealer for suitable maintenance interval depending on operating and environmental conditions.

ENOM00091-B

Engine oil replacement

ENOW00091-1

⚠ CAUTION

You may be injured due to high engine temperatures if you fill engine oil just after operation. Engine oil should be changed after the engine has been cooled.

ENOW00092-1

⚠ 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 dip stick, drain oil to level lower than upper limit.**
- **Be sure that outboard motor is upright when checking or changing oil.**
- **Stop the engine immediately if low oil pressure warning lamp or oil leak is found, or engine could be severely damaged. Consult your dealer.**
- **Wipe off engine oil well immediately if spilled and dispose of it in accordance with local fire prevention and environment protection regulations.**

ENOW00090-0

⚠ CAUTION

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

ENOW00933-0

⚠ CAUTION

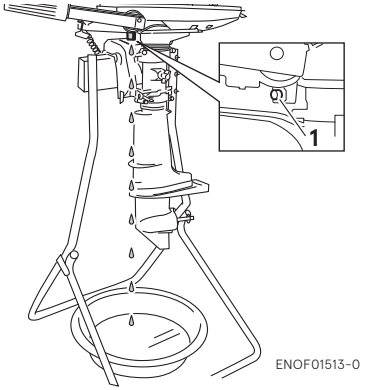
Engine oil mixed with dust or water will dramatically shorten the life of the engine.

ENOM00443-0

To change engine oil:

Be sure to use recommended engine oil.

1. Stop the engine and leave it in a vertical position over 5 minutes.
2. Turn the steering on the outboard motor left.
3. Put an oil drain pan under the oil drain bolt.
4. Remove the oil drain bolt and completely drain oil from the engine.



1. Drain hole

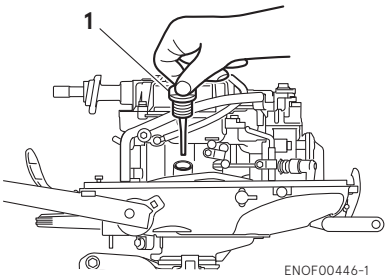
5. Apply oil on the sealing surface of the drain bolt. Tighten the bolt with a new gasket.

Oil drain bolt specified torque

18N·m (13 ft·lb, 1.8 kgf·m)

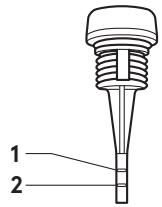
6. Pull the bottom of cowl latch to unlock, lift and remove the top cowl.
7. Fill the engine through the filler port with the recommended oil to between the upper and lower limit mark on the dipstick.
8. Tighten the oil filler cap (dipstick).
9. Leave the outboard motor for 5 minutes and check oil level on the dipstick. Add oil if necessary.
10. Insert the dipstick to the hole completely and install the top cowl.

11. Start the engine and idling for 5 minuets, then check for no oil leaks and no warning indicate.



ENOF00446-1

1. Oil filler cap (Dipstick)



ENOF01531-0

1. Upper limit
2. Lower limit

ENON00920-0

Note

Use only recommended engine oil (See page 24)

10

Oil volume needed for complete oil replacement
Approximately 450 mL (0.48 US qt.)

ENOW00925-0

⚠ CAUTION

Wipe off engine oil well immediately if spilled and dispose of it in accordance with local fire prevention and environment protection regulations.

ENON00031-0

Note

- 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.

ENOM00122-0

LPG tank, gas hose and connector inspection

ENOW00953-0

⚠ WARNING

Be sure to select LPG tank, gas hose and connector in accordance with recommended specification.

ENOW00954-1

⚠ WARNING

- **Do not use a LPG tank expired life span. Re qualification will be required after specific years from the date of manufacture. Please follow to the fuel tank manufacture's instruction.**
- **Be sure to follow your fuel tank, hose and connector manufacture's inspection instruction.**

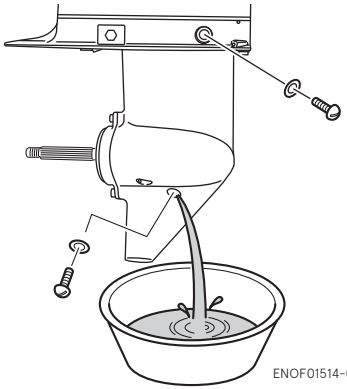
ENOM00098-A
Gear oil replacement

ENOW00076-1

⚠ WARNING

- **Be sure that the 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 the outboard motor in the tilt up position, or accidental fall of outboard motor could lead to severe personal injury.**
- **Do not go under outboard motor in the tilt up position and locked, or accidental fall of outboard motor could lead to severe personal injury.**

1. Tilt down the outboard motor.
2. Remove the oil plugs (lower and upper), and completely drain the gear oil into a pan.



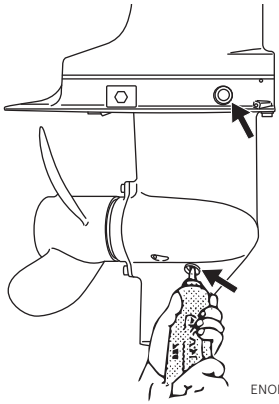
ENOF01514-0

3. 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 and bubbles is disappeared to remove the air.

ENON00033-1
Note

Use genuine gear oil or the ones recommended (API GL-5: SAE #80 to #90).

Required volume: approx. 195 mL (6.6 fl.Oz).



ENOF01515-0

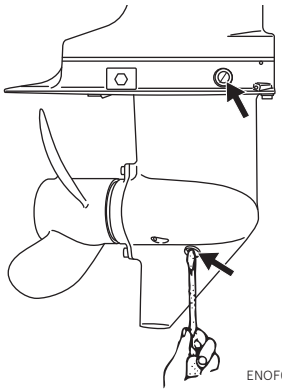
4. Install the upper oil plug, and then remove oil tube nozzle and install the lower oil plug.

Oil plug specified tightening torque
4Nm (3 ft-lb, 0.4 kgf-m)

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.



ENOF01516-0

ENOW00928-1

⚠ CAUTION

If gear oil is spilled, wipe off immediately and dispose according to the local regulations.

ENON00032-1

Note

If the gear oil color appears to be milky color, contact your dealer.

ENOM00086-A

Propeller replacement

ENOW00084-1

⚠ WARNING

- **Do not install or remove propeller on the outboard motor with spark plug caps attached, shift in forward or reverse, main switch at other than "OFF", engine stop switch lock attached to the switch, and starter key attached, or engine could accidentally start leading to serious personal injury. Disconnecting battery cable is recommended (if equipped).**
- **The propeller edge is thin and sharp. Wear the gloves while installing or removing to protect your hands.**

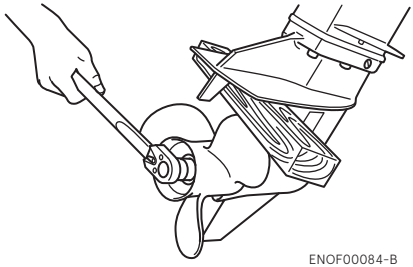
ENOW00086-1

⚠ CAUTION

- **Do not install propeller without thrust holder, or propeller boss could be damaged.**
- **Do not reuse split pin.**
- **After installing split pin, spread bend both end of the pin apart to lock propeller in place.**

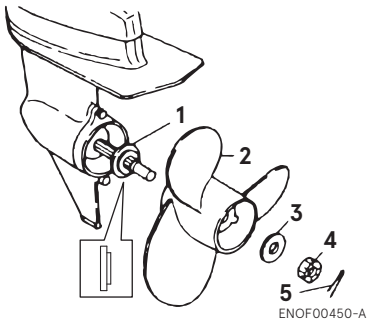
A worn-out or bent propeller will lower the motor's performance, and cause engine trouble.

1. Put a piece of wood block between propeller blade and anti-ventilation plate to hold propeller.



ENOF00084-B

2. Remove the split pin, propeller nut and washer.
3. Remove the propeller and thrust holder.
4. Apply waterproof grease to the propeller shaft before installing a new propeller.
5. Install the thrust holder, propeller, stopper, washer and propeller nut onto the shaft.



ENOF00450-A

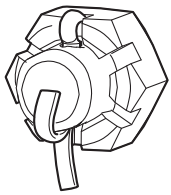
1. Thrust rod
2. Propeller
3. Washer
4. Propeller nut
5. Split pin

6. Tighten the propeller nut to specified torque and align one of the grooves with propeller shaft hole.

Propeller nut torque:

12 Nm (9 ft-lb, 1.2 kgf-m)

7. Install a new split pin into the nut hole and bend both ends of pin apart to lock propeller in place.



ENOF00084-E

ENOM00087-A

Spark plugs replacement

ENOW00087-1

⚠ WARNING

- **Do not reuse spark plug, if the insulation is damaged or sparks can leak through crack, potentially leading to electric shock, explosion and/or fire.**
- **Do not touch spark plug(s) immediately after stopping engine as they will be hot and could cause severe burns if touched.**

ENOW00929-0

⚠ CAUTION

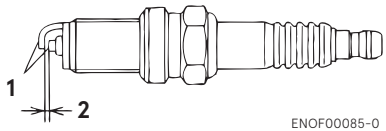
Use only the recommended spark plugs. Spark plugs which have an different heat range may cause engine damage.

If the spark plug(s) is fouled, has carbon build up, or is worn, it should be replaced.

When reusing spark plug, remove dirt from the electrodes and check the spark plug gap.

1. Stop the engine.
2. Remove the top cowl.
3. Remove the spark plug cap.
4. Remove the spark plug by turning it counter-clockwise, using a 5/8" (16 mm) socket wrench and handle that are provided in the tool bag.
5. Inspect the spark plug. Replace the spark plug if with wear on electrodes and if the insulators are cracked or chipped.
6. Measure the spark plug gap with a wire type feeler gauge. The gap should be 0.8-0.9 mm (0.031-0.035 inches). If the gap is out of specification, replace the spark plug with a new one

Use spark plug NGK DCPR-6E.



ENOF00085-0

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

7. Install the spark plug by hand and turn it carefully to avoid cross-threading.

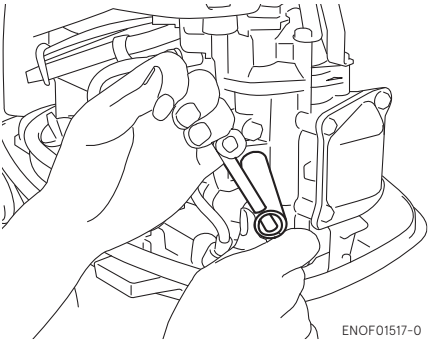
8. Tighten the spark plug to the specified torque.

ENON00028-2A

Note

- **Spark plug tightening torque: 18 N·m (13 ft·lb) [1.8 kgf·m]**

If a torque-wrench is not available when you are installing a new spark plug, tighten it 1/4 to 1/2 a turn past finger-tight. If reusing a spark plug, tighten 1/12 a turn past finger tight. Have the spark plug adjustment to the correct torque as soon as possible with a torque-wrench.



ENOF01517-0

ENOM00088-1A

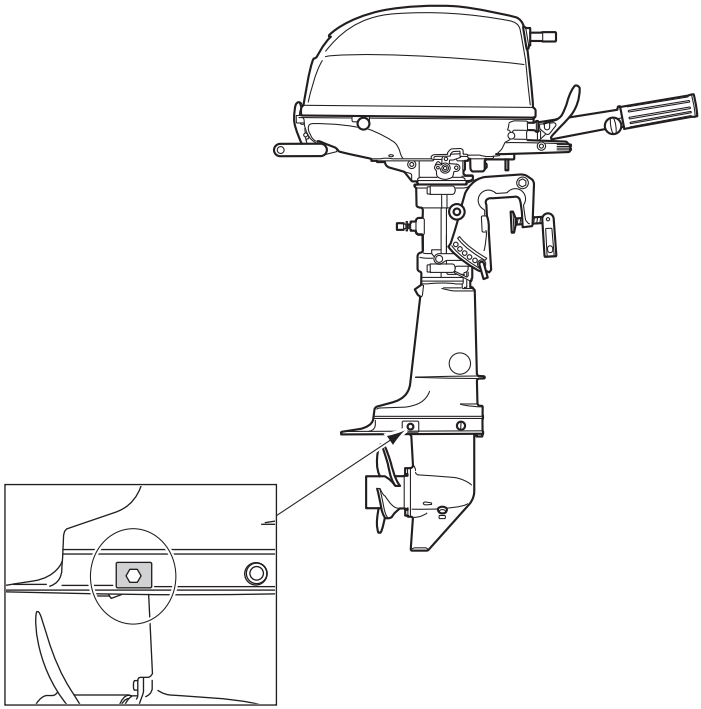
Anode replacement

A sacrificial anode protects the outboard motor from galvanic corrosion. Anode is located on the gear case, cylinder etc.. When the anode is eroded more than 1/3 of original size, replace it.

ENON00029-1

Notes

- Never grease or paint the anode.
- At each inspection, re-tighten all the anode attaching bolts. Those bolts may loosen if the anodes are corroded.

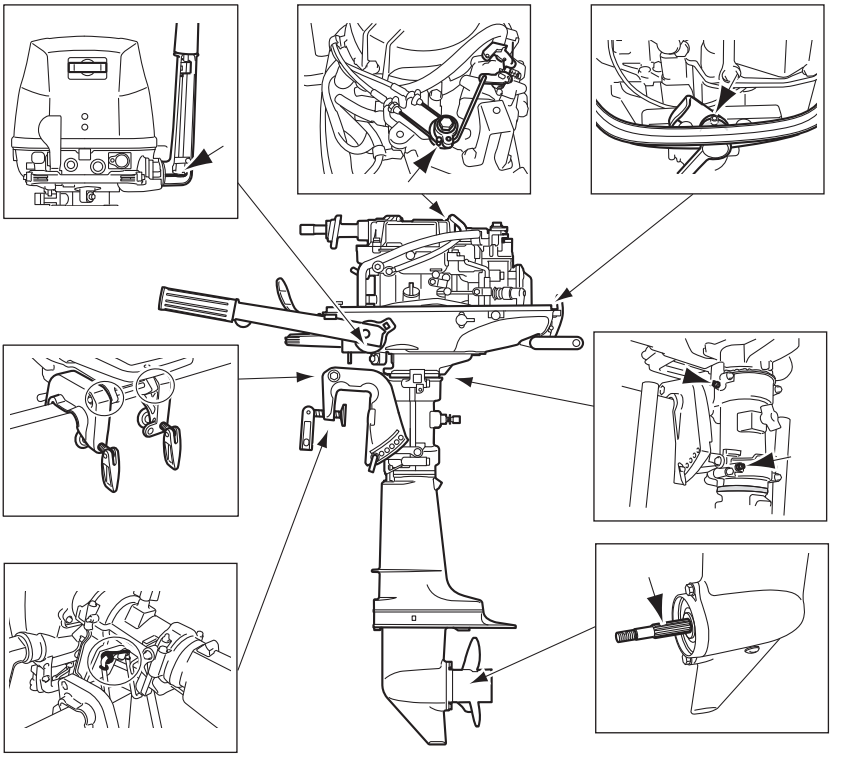


ENOF01518-1

ENOM00960-0

Grease point

Apply waterproof grease to the parts shown below.



ENOF01519-1

ENOM00100-A

3. Off-season storage

ENOW00955-0

⚠ WARNING

- **Close the valve of the LPG tank.**
- **After close the valve of the tank, consume remained fuel by running the engine if the motor is stored.**

ENOW00934-0

⚠ WARNING

- **Be sure to disconnect fuel connector except when operating engine.**
- **Fuel leakage is a fire or explosion hazard, which can cause serious injury or death.**

Before you put your outboard motor in storage, it is a good opportunity to have it serviced by your dealer.
Be sure to use fuel stabilizer while running the motor before storage. (See page 68)

ENOM00101-E

Engine

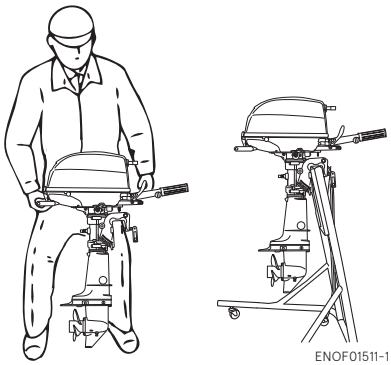
1. Wash the engine exterior and flush the cooling water system thoroughly with fresh water. Drain the water completely.
   Wipe off any surface water with an oily rag.
2. Remove the fuel hose from the outboard motor.
3. Consume remained fuel by turning the engine if the motor is stored.
4. Remove the spark plug and put a teaspoon of engine oil or spray storage oil into the combustion chamber through the spark plug holes.
5. Pull the recoil starter several turns to lubricate inside the cylinder.

ENOW00930-1

⚠ WARNING

- **Be sure to remove stop switch lock to prevent the spark plug(s) from igniting.**
- **Put a cloth to spark plug hole and wipe up any spilled engine oil, when cranking the outboard motor.**

6. Change the engine oil (See page 53).
7. Change the gear oil in the gear case (See page 55).
8. Apply grease to grease point (See page 60).
9. Place the outboard motor in the vertical position under a dry condition.



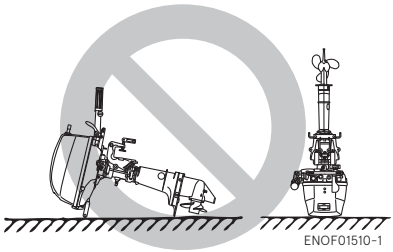
ENOF01511-1

ENOW00066-1

⚠ CAUTION

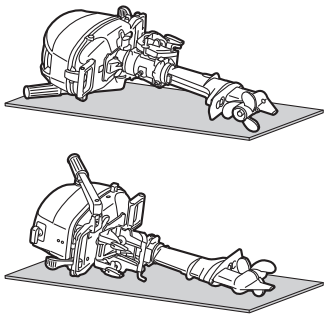
- **Do not give a shock to an outboard motor during transportation.**
- **Do not carry or store outboard motor in any of positions described below.**

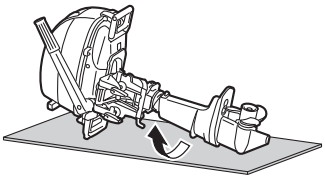
Otherwise, engine's exterior may be damaged or water may enter the cylinder through the exhaust port and cause engine problems.


ENOF01510-1

ENOM00442-0

If the outboard motor must be laid down, be sure to close the valve of the LPG tank and disconnect fuel line, and then turn the engine until engine stop so that consume the remaining fuel in the fuel system completely. When laying down the outboard motor, place front-side, starboard-side, or port-side down on a cushion or any softer surface shown below.


ENOF01532-0


ENOF01533-0

ENON00941-0

Note

When laying the outboard front-side down, turn the clamp bracket 90° clockwise or anti-clockwise so that it does not interfere with the ground. Then tighten up the steering adjustment screw to maintain its position (see page 45).

ENOM00102-0

Battery

ENOW00931-A

⚠ WARNING

- **Place the battery away from any source of fire, sparks and open flames such as burners or welding equipment.**
- **Place the battery away from fuel tank. Accidental sparks of battery may cause explosion of fuel.**

1. Disconnect the battery cables and be sure to remove the negative terminal first.
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.

ENOM00104-A

4. Pre-season check

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

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

Specific Gravity at 20°	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	3/4 charged
1.280	13.2	Fully charged

3. Check that the battery is secure and the battery cables are properly installed.
4. Change the engine oil (See page 53).
5. Before starting the engine, disconnect stop switch lock and crank approximately 10 times in order to prime the oil pump.
6. Fill fuel tank completely.
7. Start the engine and warm up the engine for 3 minutes in the "NEUTRAL" position.
8. Run the engine for 5 minutes at the slowest speed.
9. Run the engine for 10 minutes at half throttle. The oil used for storage inside the engine will be circulated out to assure optimum performance.

ENOM00105-C

5. Submerged outboard motor

ENOW00098-0

⚠ CAUTION

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

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.

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 plug, and completely drain the water from the engine by pulling recoil starter several times.
   Replace 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 rope several times to circulate the oil throughout the outboard motor.

ENOM00106-1A

6. Cold weather precautions

If you moor your boat in cold weather at temperatures below 0°C (32°F), water residue in water pump may freeze and may damage the pump, impeller, etc. To avoid, submerge the lower half of the outboard motor into the water.

■ **Antifreeze Measures**

1. Make sure the LPG tank and pipes are protected against freezing if there is a risk of the outdoor temperature falling to -5 degrees Centigrade or lower.
2. The amount of gas ejected from LPG tank differs in accordance with the outdoor temperature, so consult with your LPG dealer with regard to methods of increasing tank capacity and other measures if necessary.

ENOM00107-A

7. Striking underwater object

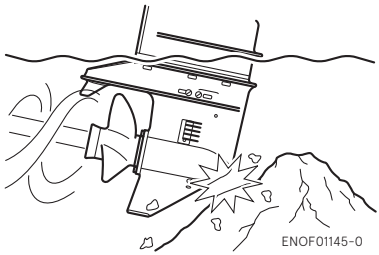
ENOW00935-0

⚠ CAUTION

Striking the sea bottom or an underwater object may severely damage the outboard motor.

Follow the procedure below and consult a dealer as soon as possible.

1. Stop the engine immediately.
2. Check the control system, gear case, boat transom etc.
3. Return to the nearest harbor slowly and carefully.
4. Consult a dealer check the outboard motor before operation again.



ENOM00120-2

8. Auxiliary outboard motor operation

When the auxiliary outboard motor is not in operation, be sure to remove the stop switch lock, shift into forward, and then tilt the outboard motor up. Otherwise, over-rotation of the propeller due to water spray and water ingestion that could cause damage to the outboard motor.

TROUBLESHOOTING

ENOM00109-0

If you encounter a problem, check the 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	Boat speed low	Overheating of engine	Warning lamp ON	Possible cause
FUEL SYSTEM	●	●								Empty fuel tank
	●	●	●	●		●	●	●		Incorrect connection of fuel system
	●	●	●	●		●	●	●		Air entering fuel line
	●	●	●	●		●	●	●		Deformed or damaged fuel hose
	●	●	●	●		●	●	●		Leaking of fuel system
	●									Closed LPG tank valve
	●	●	●	●		●	●	●		Clogged regulator or mixer
			●	●		●	●	●		Use of improper engine oil
	●	●	●	●			●	●		Use of improper LPG
			●	●		●	●			High oil level
						●		●		Low oil level
	●	●	●	●		●	●	●		Poor mixer adjustment
						●		●		Faulty oil pump
	●	●	●	●		●	●	●		Faulty regulator
	●									Clogged or damaged negative pressure hose for shut off valve
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 (Ignitor, valve timing)
	●									Lock plate not fitted
	●									Disconnection of wire or loose ground connection

	Engine failing to start	Engine starting but stopping soon	Poor idling	Poor acceleration	Engine speed abnormally high	Engine speed abnormally low	Boat speed low	Overheating of engine	Warning lamp ON	Possible cause
COMPRESSION & OIL SYSTEM	●	●	●	●		●	●			Incorrect valve clearance
		●	●	●			●			Poor sealing of cylinder head
	●	●	●	●		●	●			Poor sealing of intake or exhaust valve seat
	●	●	●	●		●	●			Wear of piston, piston ring and cylinder
			●					●		Carbon deposits in the combustion chamber
			●	●			●	●		Poor tightening of spark plug
OTHERS							●	●		Insufficient cooling water flow, clogged or defective pump
			●				●	●		Faulty thermostat
				●	●		●	●		Damage of anti-ventilation plate
				●	●	●	●	●		Incorrect propeller selection
			●	●	●	●	●	●		Damaged or bent propeller
				●	●		●	●		Improper thrust rod position
				●	●	●	●	●		Unbalanced load on boat
				●	●	●	●	●		Transom too high or too low
	●	●	●	●		●	●			Transom too high or too low

TOOL KIT AND SPARE PARTS

ENOM00562-1

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

Items		Quantity	Remark
Service tools	Tool bag	1	
	Pliers	1	
	Socket wrench	1	10 × 13 mm
	Socket wrench	1	16 mm
	Socket wrench handle	1	
	Screwdrivers	1	Cross-and straight-point
	Screwdriver handle	1	
Spare parts	Emergency starter rope	1	
	Spark plug	1	NGK: DCPR6E
	Split pin	1	
	Stop switch lock	1	

PROPELLER TABLE

ENOM00438-0

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.

5: 5000–6000 min^{-1} (rpm)

	Propeller Mark	Propeller Size (Diameter × pitch)		Standard propeller on the model
		inch	mm	5
Light boats	9	7.9 × 9.0	200 × 229	
	8	7.8 × 8.0	198 × 203	S, L, UL
	7	7.8 × 7.0	198 × 178	
Heavy boats	6	7.9 × 6.0	200 × 152	*

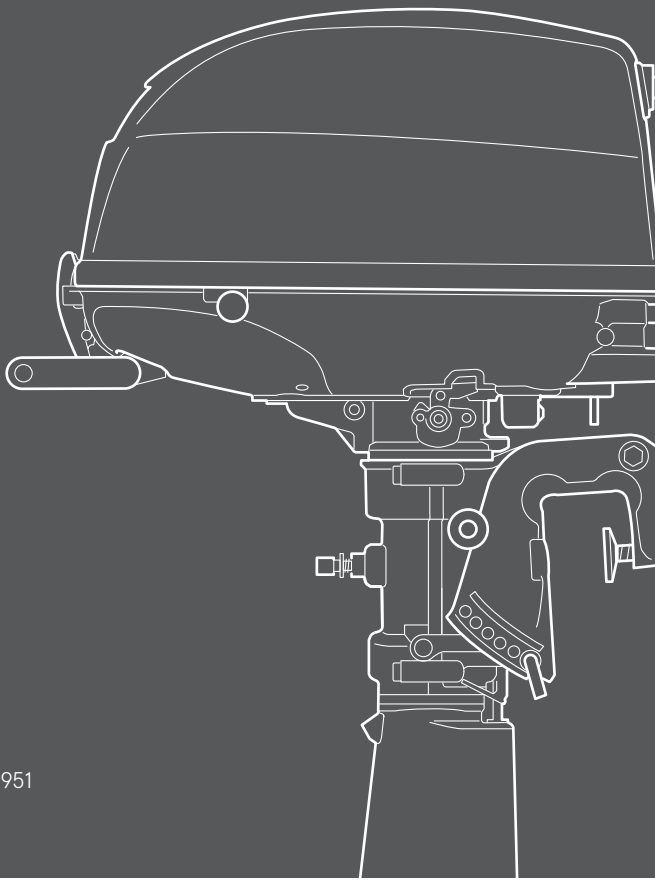
S:Short shaft
L:Long shaft
UL:Extra long shaft
*:SP model

INSPECTION & MAINTENANCE LOG

Date	Engine Hour	Inspection/Maintenance Performed	Performed by

OWNER'S MANUAL

MFS 5D LPG



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