# NURSIA Outboard Motors

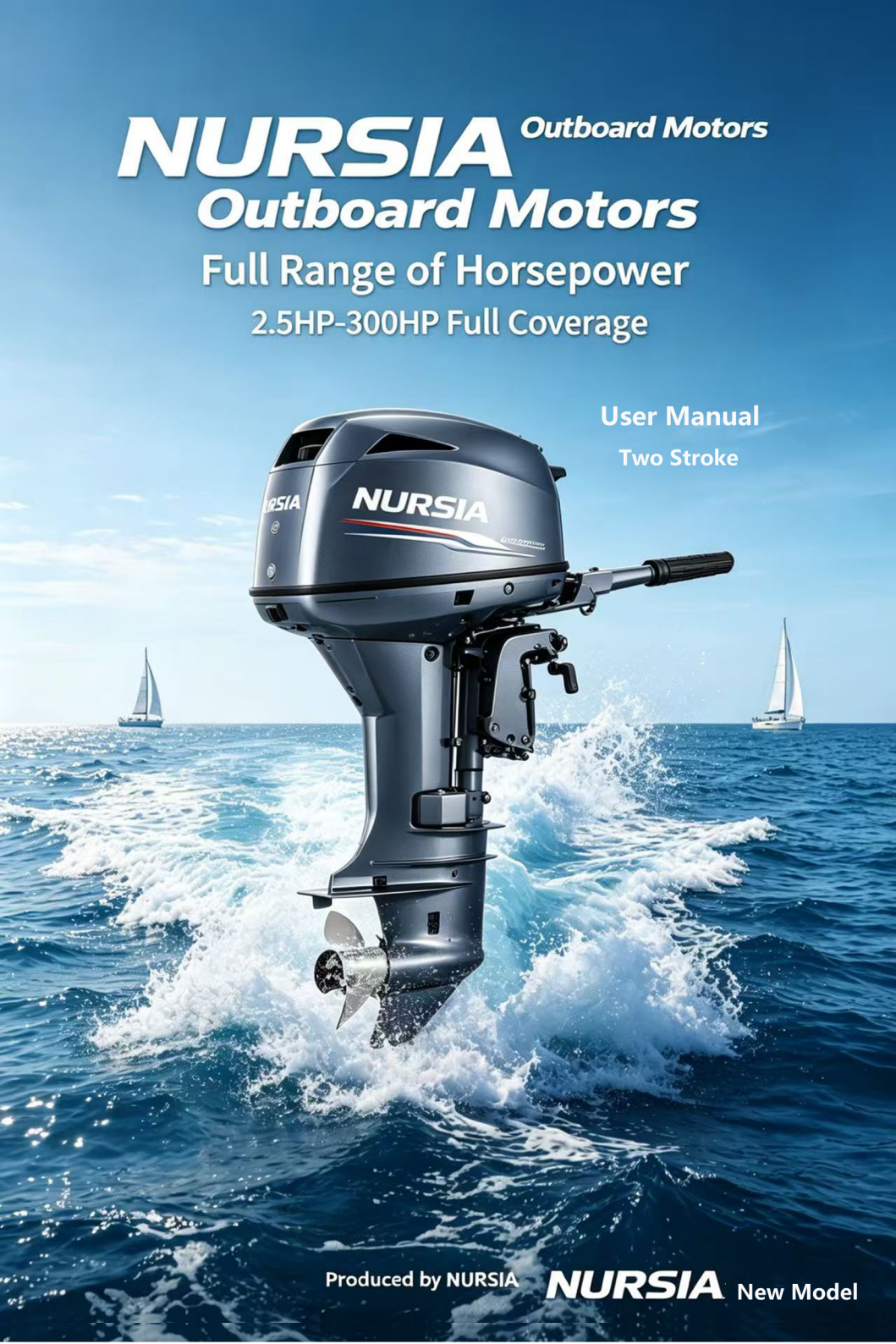
NURSIA Outboard Motors

## Full Range of Horsepower

2.5HP-300HP Full Coverage

**User Manual**

**Two Stroke**




Produced by NURSIA

NURSIA New Model

# User's Instruction Manual

2-Stroke Outboard Engine (T Series)

NURSIA Two-Stroke Outboard

Quick Start & Safety Notes

1.Always use pre-mixed fuel with two-stroke oil at the correct ratio.
2.Start and run the motor only in water. Never dry-run on land.
3.Confirm cooling water is flowing normally after launching.
4.10-hour break-in period: Do NOT use full throttle during break-in.

# NURSIA

## OUTBOARD MOTOR

### 二冲程水冷船外机/TWO STROKE WATER COOLED OUTBOARD



### 二冲程水冷船外机数据/DATA FOR TWO STROKE WATER COOLED OUTBOARD

注释： 二冲程最大马力为 60 马力， 船外机区分为长轴和短轴， 长轴比短轴长 10 公分

| 产品项目 PRODUCT ITEMS | T4.0 马力 | T6.0 马力 | T9.8 马力 | T9.9 马力 | T12 马力 | T15 马力 | T18 马力 | T20 马力 | T30 马力 | T40 马力 | T60 马力 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 最大功率 MAXIMUM POWER | 2.9(4) | 4.4(6) | 7.2(9.8) | 11(15) | 8.8(12) | 11(15) | 12.5(18) | 14.7(20) | 22(30) | 29.4(40) | 44.1(60) |
| 外型尺寸 DIMENSIONS | 450X300X960 | 490X320X1060 | 842X336X992 | 873X332X1053 | 873X332X1040 | 675X332X1070 | 873X332X953 | 870X328X1039 | 849X339X1034 | 1106X408X1213 | 713X364X1479 |
| 艉板高度 STERN HEIGHT | 420 | 420 | 420 | 420 | 420 | 420 | 420 | 420 | 420 | 420 | 420 |
| 油门全开运行范围 FULL THROTTLE OPERATING RANGE | 4200-5300 | 4500-5500 | 4500-5500 | 4500-5500 | 4500-5500 | 4500-5500 | 4500-5500 | 4500-5500 | 4500-5500 | 4500-5500 | 4500-5500 |
| 发动机活塞冲程 PISTON STROKE | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| 气缸数 NUMBER OF CYLINDERS | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 排量 DISPLACEMENT | 74.6 | 102 | 169 | 246 | 169 | 246 | 246 | 276 | 496 | 703 | 846 |
| 净重 NET WEIGHT | 15 | 20 | 37 | 40 | 37 | 40 | 40 | 36.5 | 55 | 82 | 102 |
| 传动比 RATIO | 2.08(27:13) | 2.08(27:13) | 2.08(27:13) | 2.08(27:13) | 2.08(27:13) | 2.08(27:13) | 2.08(27:13) | 2.08(27:13) | 2.08(27:13) | 2.08(27:13) | 2.08(27:13) |
| 换挡方式 GEAR CHANGEOVER | F-N | F-N-R | F-N-R | F-N-R | F-N-R | F-N-R | F-N-R | F-N-R | F-N-R | F-N-R | F-N-R |
| 倾角倾斜系统 INCLINATION SYSTEM | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY | 手动倾斜 TILT MANUALLY |
| 点火系统 IGNITION SYSTEM | CDI | CDI | CDI | CDI | CDI | CDI | CDI | CDI | CDI | CDI | CDI |
| 标准油箱容积 FUEL TANK VOLUME | 1.4L | 2.5L | 12L | 24L | 24L | 24L | 24L | 24L | 24L | 24L | 24L |
| 螺旋桨规格 PROPELLER | 3-7. 1/4 "X6" | 3-7. 8" X8" | 3-8. 1/9" X8.5" | 3-9. 1/4" X11" | 3-8. 1/9" X8.5" | 3-9. 1/4" X11" | 3-9. 1/4" X11" | 3-9. 7/8" X12" F | 3-9. 7/8" X12" F | 3-11. 1/2" X13" G | 3-13, 1/4" X17" |
| 启动方式 STARTUP MODE | 手动启动 MANUAL START | 手动启动 MANUAL START | 手动启动 MANUAL START | 手动启动 MANUAL START | 手动启动 MANUAL START | 手动启动 MANUAL START | 手动启动 MANUAL START | 手动启动 MANUAL START | 手动启动 MANUAL START | 手动启动 MANUAL START | 手动启动 MANUAL START |
| 控制系统 CONTROL SYSTEM | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL | 舵柄控制 TILLER CONTROL |
| 混合比 MIXING RATIO | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 | 汽油： 机油 50： 1 |
| 冷却系统 COOLING SYSTEM | 水冷却 WATER COOLING | 水冷却 WATER COOLING | 水冷却 WATER COOLING | 水冷却 WATER COOLING | 水冷却 WATER COOLING | 水冷却 WATER COOLING | 水冷却 WATER COOLING | 水冷却 WATER COOLING | 水冷却 WATER COOLING | 水冷却 WATER COOLING | 水冷却 WATER COOLING |
| 汽油型号 GASOLINE MODEL | 92 以上 92 OR MORE | 92 以上 92 OR MORE | 92 以上 92 OR MORE | 92 以上 92 OR MORE | 92 以上 92 OR MORE | 92 以上 92 OR MORE | 92 以上 92 OR MORE | 92 以上 92 OR MORE | 92 以上 92 OR MORE | 92 以上 92 OR MORE | 92 以上 92 OR MORE |

NOTE:The maximum horsepower of the two-stroke is 60 horsepower,and the off-board aircraft is divided into long axis and short axis.The longer than axis is 10cm longer than the short axis

## Notes to users

Before operating the outboard engine, please read this manual carefully. This manual shall be wrapped with waterproof bag and placed on the vessel when departing from port. This manual shall be supplied and sold with the outboard engine.

## Notes to information contained in this manual

Various information to be noticed contained in this manual shall be identified due to different emphasis. This is required for users.

Warning

Relate to safety requirements and pay attention to it.

Advice

Remind users to operate carefully in accordance with requirements and avoid damage to the machine.

“Concern”

With continuous improvement of quality and product design, partial information contained in this manual may deviated from the engine you have. In case of any doubt, please consult the distributor.

Any damage arising from negligence is excluded from warranty.

When some dealers are unable to offer effective warranty services, the consumers may require the distributor to offer information related to maintenance in the consumption area at purchasing to make consumers not worry about after-sales services.

Notes:

This manual involves interpretation and explanation of engines with model of 2-stroke 15HP and standard accessories. Therefore, not all these articles are applicable to all models.

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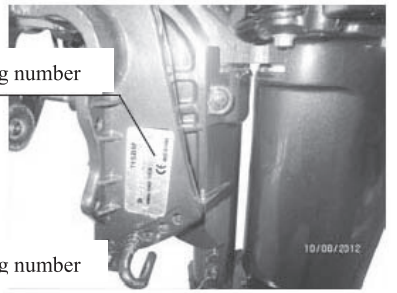
I Comprehensive information

1.1 Identification number record

The outboard engine serial number is printed on the label attached to the tightened support port (T2.5 number printed on the rotating racket).






ALT 1001 ALT 1002

2, 2.5, 2.6HP manufacturing number

Product manufacturing number

The outboard engine number is recorded in the space supplied.

1.2 Important warning

Warning

Before starting the engine, ensure that the handle is at the neutral gear. (Exclude models without gear)

During the starting or operating period, do not touch or disassemble the electric parts.

During operating of the engine, keep your hands, hair and clothes away from the flywheel and other parts.

Warning

When the engine is installed with idle gear starter, the engine cannot be started at the non-idle gear position, or forced starting may damage the outboard engine.

## 2. Safety

Safety instructions:

2.1 Rotating component

After the engine is started, the hands, feet, hair, life jacket, belt etc. are not allowed to touch the rotating components in the engine to prevent winding and cause severe injury.

Do not remove or replace the top cover.

2.2 Hot component

The components are hot during operating or stop of the engine. Before the engine is cooled, do not touch any components inside the top cover.

2.3 Electric shock

During starting or running the engine, do not touch any electric components. Otherwise, it may cause electric shock and death.

2.4 Stop cable for engine

During running, fasten the stop cable for engine to a safe place of your clothes, arms or legs. During the vessel running, if the operator fall away from the vessel or the cable falls down when someone is injured, the engine stops automatically to prevent accident of the vessel and personnel.

During running the vessel, do not remove the vessel or leave the steering handle. Do not fasten the cable to any places probably slacked on the clothes and avoid fastening the cable at the wound area, to prevent steering handle out of control in case of fault to injure the personnel.

Example of the stop cable fastened reliably




2.5 Gasoline

Gasoline and gasoline steam are highly flammable and explosive. Fuel is supplemented referring to the flow.

Do not spray out the gasoline. If the gasoline is sprayed out, wipe off the gasoline with dry mop immediately and dispose of the clothes immediately. If the gasoline is sprayed onto the clothes, the clothes shall be changed immediately.

Fuel is not taken out by siphon.

2.6 Operating attention

Even the engine is at idling gear, the propeller may keep running. Therefore, keep persons in water from approaching the vessel.

Brake is not applied to vessels. Be careful in operating. Keep a safe speed and a safe distance with other persons, objects and other vessels.

Avoid sharp turn and excessive operating to lower risks of being out of control, thrown out and collision.

Avoid the vessel shipping into area with obstacles underground or the shallow water area.

Ensure that at least 1 person onboard ever receiving training on engine operation to avoid emergency accident.

3. Basic requirements

3.1 Notes to fueling

Warning

Fuel and its steam are highly flammable and explosive!

Do not smoke in course of filing fuel, and keep away from spark, fire and flake.

Stop the engine before filling fuel.

Fill the fuel in a well-ventilated area. Portable fuel tank is used when outboard.

Do not spray out gasoline. If the gasoline is sprayed out, wipe off with dry cloth immediately.

The fuel tank cannot be full in filling the fuel. The fuel gas is heated or vibrated to expand, which results in leakage and danger.

After filling fuel, firmly tighten the fuel filling orifice.

If the gasoline is sprayed into the eyes, ask for a doctor immediately.

If the gasoline is sprayed onto the skin, rinse with soap and water immediately. If the gasoline is sprayed onto clothes, change it.

The fuel outlet and the hopper are contacted to flow the fuel to avoid static spark.

Advice

Only new cleaning gasoline stored in cleaning container or not polluted by foreign objects can be used.

3.1.1 Gasoline

Recommended gasoline

93# standard lead-free gasoline

3.1.2 Engine oil

Recommended engine oil

Exclusive/2-stroke engine oil

3.2 Installation requirements

Before installing the outboard engine, ensure that total horsepower of the engine is no more than the maximum horsepower of the vessel.

Warning

Excessive horsepower of the vessel may result in severely unstable vessel.

Install the engine

Only the distributors or other personnel with rich and correct assembling experience can use the correct equipment and install the engine referring to the safety instructions.

Warning

Improper installation of the outboard engine may lead to improper disposal, out of control, fire and other dangerous situations.

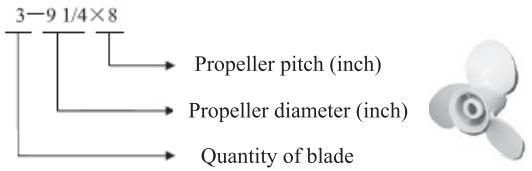
For the engine is heavy, for safety assembling, learn the knowledge of installation, special equipment and training recommended.

3.3 Propeller selection

Selection of the correction propeller is one of the most crucial decisions made by the Owner. Type and size of the propeller affect acceleration, maximum speed and fuel efficiency, even service life of the engine.

Your propeller configured by the outboard engine is selected and can be well operated under various applications, and may be not ideal under some application. Therefore, other more proper propellers may be used, and the propeller shall make the engine reach the average or middle-grade operation under maximum load and full throttle conditions. Generally, propeller with small pitch is selected for relatively low operation load. If the load you run varies a lot, you can select the propeller based on the maximum load operated. You can make the engine running in the proper range. Do remember, while operating the relatively low load, you should lower the accelerator setting value to keep the engine speed within the recommended speed range.

| HP range | Propeller | HP range | Propeller |
|---|---|---|---|
| 2-3.5 | 3-7 1/4*6 | 9.9-15 | 3-9 1/4*8 |
| 4-5 | 3-7 1/7*7 | 25-30 | 3-11 1/8*12 |
| 8-10 | 3-8 3/4*8 | 40-50 | 3-11 1/8*13 |

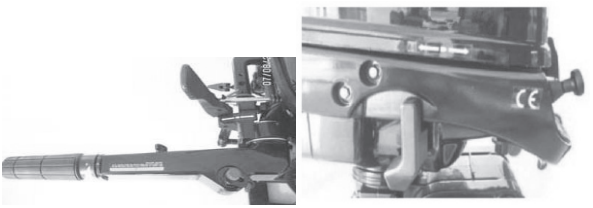



3.4 Anti-engagement starting protector

Warning

The outboard engine must be provided with anti-engagement starter. This safety features makes the engine started at idle gear, which must be selected before starting the engine. (Refer to 6.6)

Advice

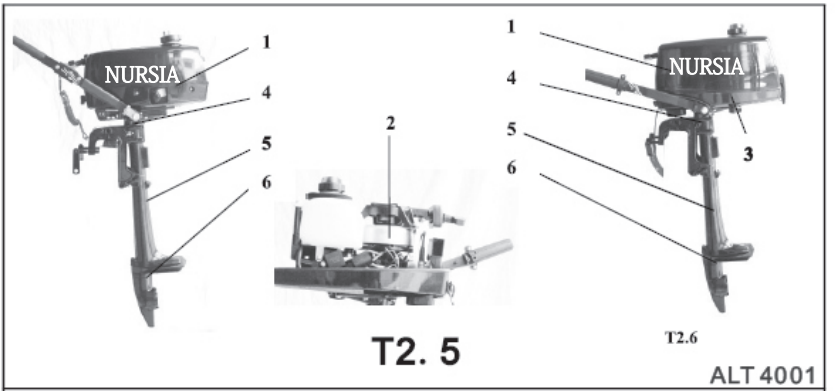


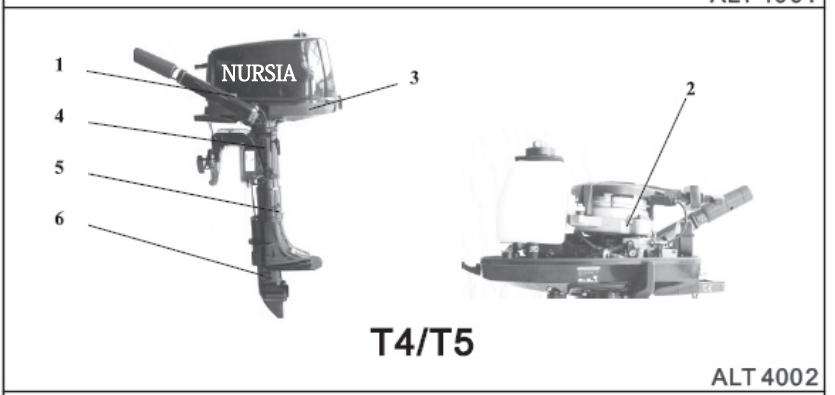
Engagement hand lever

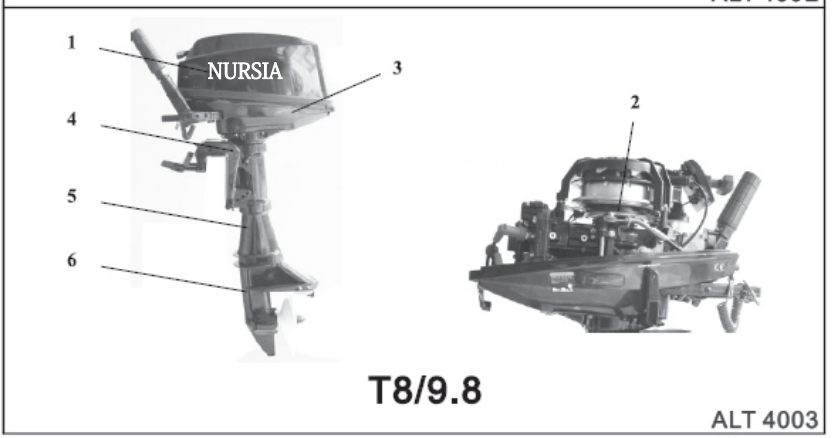
In general, delivery status of the products (as shown above) is at the neutral gear

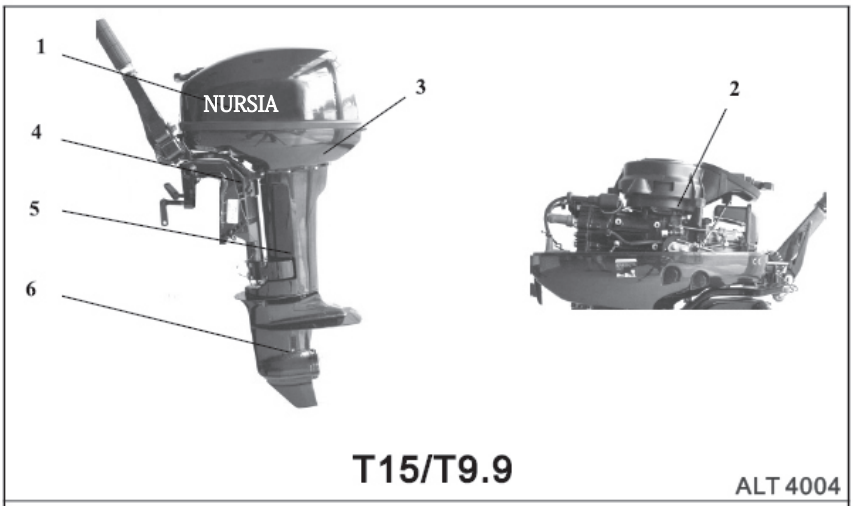
Basic components and functions

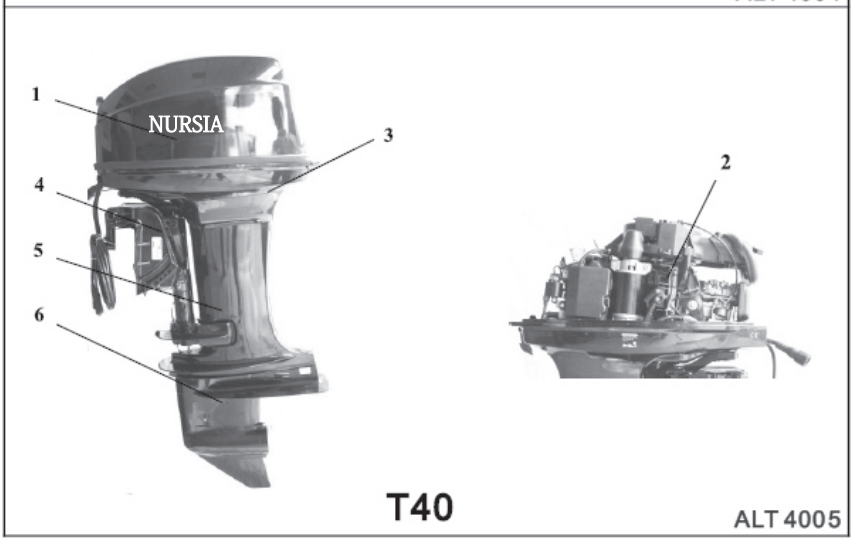
4.1 Introduction to main basic components



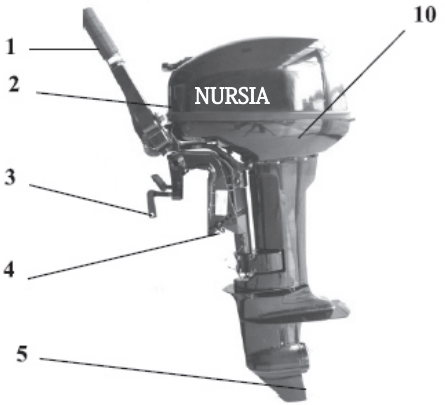






1) Top cover assembly
2) Engine assembly
3) Bottom cover assembly
4) Rotating rack assembly
5) Waterborne shell assembly
6) Gear box assembly

Introductions of functional components



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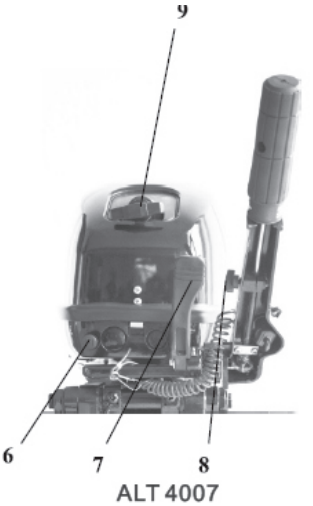
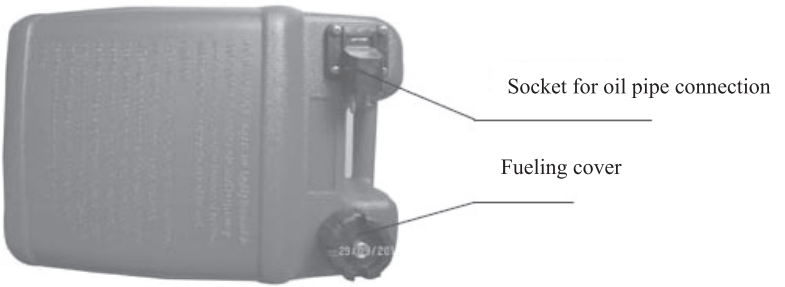


ALT 4007

1) Steering handle 2) Flameout switch 3) Install clamping handle 4) Tilting limit lever 5) Propeller 6) Choke valve handle 7) Transmission handle 8) Accelerator damping knob 10) Top cover opening handle

4.1.1 Fuel tank

If the model is configured with the portable fuel tank, the functions are described as follows:

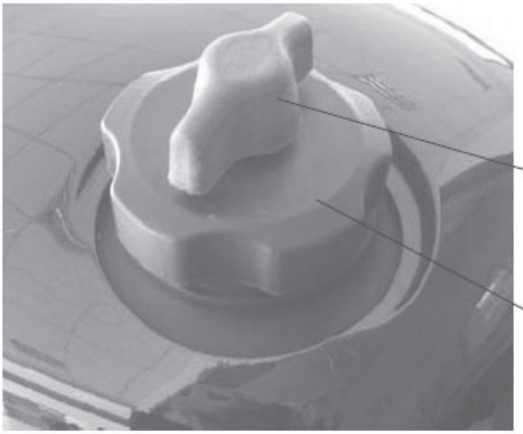


ALT 4008

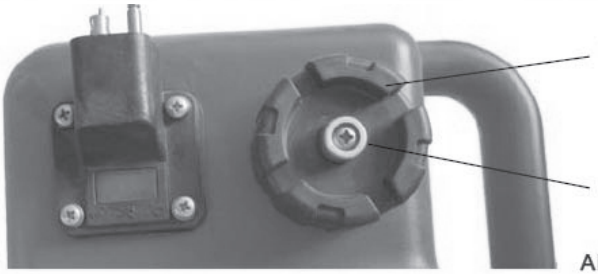
Warning

The fuel tank supplied with the engine is exclusive fuel tank and cannot be used as the fuel container. The commercial users shall observe relevant safety rules to ensure that the sold fuel tank is exclusive for the outboard engine.

1. Fuel tank cover and exhausting bolt knob




ALT 4009




ALT 4010

4.1.1.1 Fuel tank cover

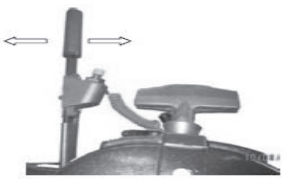
This fuel tank cover is used to seal the fuel tank. After disassembling, the fuel tank is filled with fuel. To remove the fuel tank cover, rotate counterclockwise.

4.1.1.2 Exhausting screws

The exhausting screws are located above the fuel tank cover. To screw off the screws, rotate counterclockwise.

4.1.2 Steering hand grip

The steering hand grip moves leftwards, the vessel navigates to the right side; if the steering hand grip moves rightwards, the vessel navigates to the left side.



ALT 4011

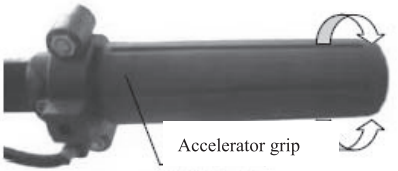


ALT 4012

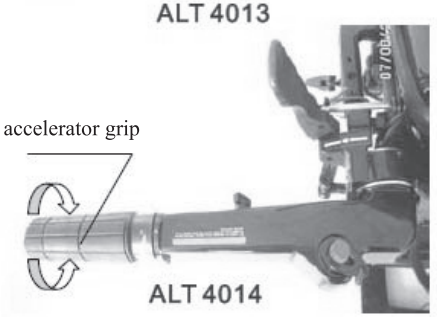
8

4.1.3 Accelerator grip

The accelerator grip is located at the steering hand grip. Rotate the grip counterclockwise to accelerate, and rotate clockwise to decelerate.




ALT 4013



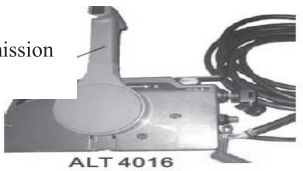

ALT 4014

2.5HP accelerator grip



4.1.4 Transmission lever (remote control)

Push the transmission lever upwards to accelerate.




ALT 4016

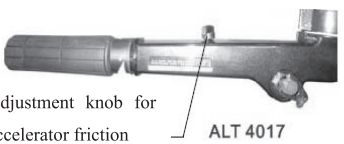
Transmission lever

4.1.5 Adjustment knob for accelerator friction

The friction device delivers adjustable resistance for movement of the accelerator grip or remote control lever and is set in accordance with the operator's favorites. To increase resistance, rotate the adjuster clockwise. Contrarily, decrease the resistance.

To keep the constant speed, tighten the adjuster to keep the required accelerator setting.

Loosen the adjuster in advance to change the speed.



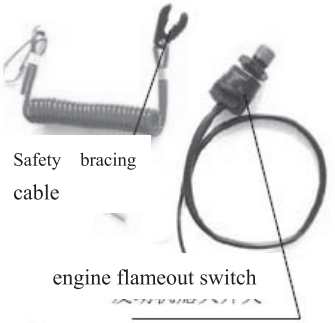

ALT 4017

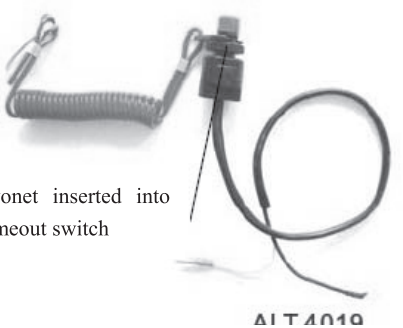
Warning:

The adjustment knob for friction adjustment during normal operation cannot be tightened excessively. Excessive resistance affects the ideally rotated adjustment knob or results in accident.

4.1.6 Stop switch for engine

The engine can be started and operation when the stop switch for the engine is inserted with the bracing cable clamp. If the bracing cable is separated from the clamp, the engine is flameout.




Warning

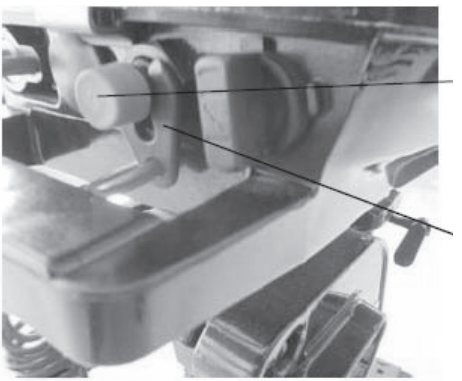
In course of running and operating, the stop cable for engine must be fastened to a safety place of your clothes, arms or legs.

The bracing cable is not allowed to be fastened to the place which may be loosened to prevent the danger of not flameout when the driver leaves the machine. Do not wind the bracing cable to make the safety function unavailable.

During running of the vessel, do not remove the bracing cable and leave the rudder to avoid fault of the engine and the rudder out of control.

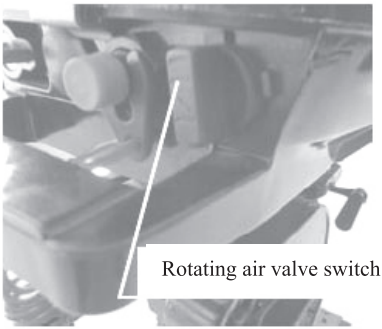
4.1.7 Stop button for engine (flameout switch)

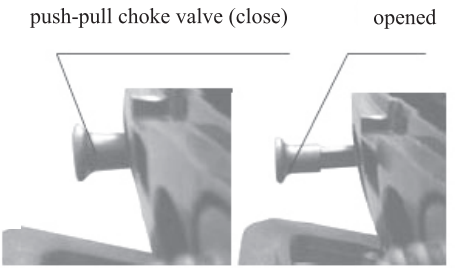
To stop running the engine, press this button.



4.1.8 Choke valve button

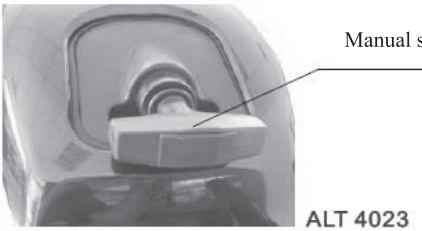
1. To deliver the required thickened fuel mixing gas for starting the engine, pull out or rotate this knob (T2.6, T2 air valve switch leftward rotation to close and the air valve is opened. Air valve switches of T2.5 and other rotating forms are rotated rightwards).




4.1.9 Manual starter handle

To start the engine, slight pull out the handle until resistance is felt. Pull out quickly to start the engine. If failed, repeat the operation.

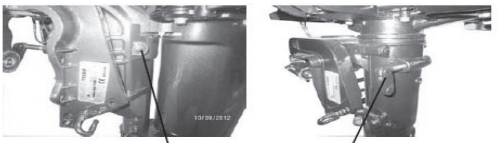



4.1.10 Steering friction adjuster

The friction device can be deployed to adjust resistance of the rudder and can be set in accordance with operator's setting. The adjustment screws or bolts are located at the rotating racket.

To increase resistance, rotate the adjuster clockwise.

To decrease resistance, rotate the adjuster counterclockwise.



Two forms of the steering friction adjustment

The friction adjustment cannot be excessively tightened. If the resistance is too large, steering is difficult which may result in accident.

4.1.11 longitudinal tilting adjustment lever (tilting limit lever)

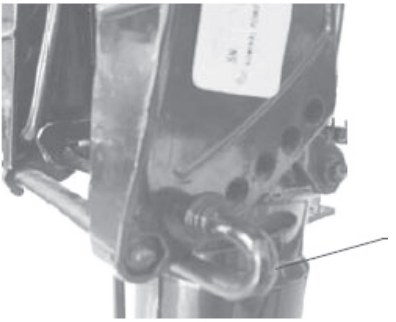
Location of the longitudinal tilting adjustment lever determines the minimum longitudinal tiling angle of the outboard engine to the stern trimming flag.

4.1.12 Tilting locking unit

The tilting locking unit is used to prevent the propeller out of the water due to high revolution when the outboard engine is at reverse gear.

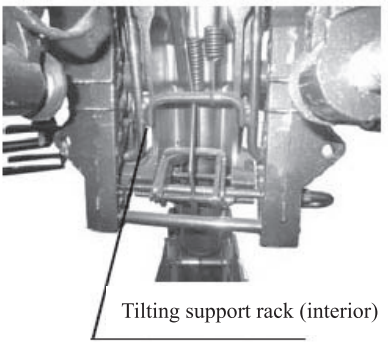
1. Tilting limit lever

To tilt the outboard engine upwards, the tilting limit lever is located at the opening position upwards. To tilt the outboard engine downwards, the tilting limit lever is located at the opening position downwards.




2. Tilting support rack

The tilting support rack is deployed to fix the outboard engine at the proper location which is inclined upwards.







Advice

The tilting support lever cannot be used if a town is used to carry the vessel. Vibration by impact may loosen the engine which falls down. If the engine cannot be transported at an usual position, fix it at the tilting position with other supporting units.

Installation

The information supplied in this sector is only for reference. The information is not the complete description of all combinations of vessels and engines. The correct installation depends on experience and the specified combination of vessels and engines.

Warning

Improper installation of the outboard engine may trigger accident, out of control or fire and other hazardous status. In terms of permanent installation mode, the dealer or other staff with rich experience is invited to install the engine.

5.1 Install the outboard engine

Warning

Your dealer shall demonstrate how to install the outboard engine correctly.

Installation of the outboard engine may keep balance of the vessel. Otherwise, steering may be affected. As for single-engine vessels, the outboard engine shall be installed at the central line (vessel keel) of the vessel.

Installation height

Irrational installation height of the vessel engine affects optimization of drawing. If the installation is too high, vortex may be triggered to lower the impetus; if the top of the propeller exposes air, temperature of the engine will be increased unusually which results in engine overheating and reducing the engine efficiency. The correct installation of the outboard engine makes the anti-vortex board 25mm below the bottom of the vessel.



Anti-vortex board

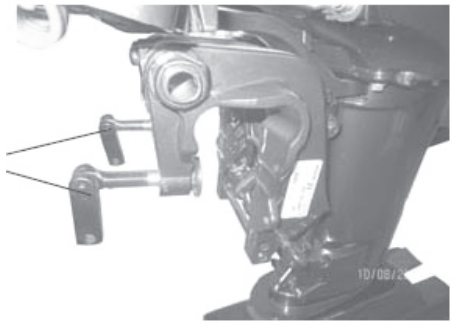
Concern:

Optimum installation height of the outboard engine is subject to combination of vessel and engine and the expected application. Testing on different height is advantageous to determination of the optimum installation height. Refer to 6.9 on more information of the longitudinal tilting angle of the outboard engine.

5.2 Tighten the outboard engine

1. The outboard engine is installed on the stern trimming flag which shall be close to the center of the vessel (keel position) as much as possible. The two stern trimming flag tightening screws are tightened equally and reliably. For the tightening screws may be slackened due to the engine vibration, so check the tightening screws are loosened or not during operation of the outboard engine.

Two tightening bolts for stern trimming flag installation



Warning

Loosening of the tightening screws makes the outboard engine loosened or moving on the stern trimming flag, which results in out of control and severe accident.

1. If the engine is supplied with the steel rope ringer for fixing the engine, the fixing steel rope or chain shall be used. One end is connected with the steel rope ringer for fixing the engine, and the other end is connected with the fixing point for installation of the vessel. Otherwise, when the engine falls down from the stern trimming flag by accident, the engine will fall into the river.
2. The bolts supplied with the outboard engine (if supplied) are deployed to fix the tightening racket onto the stern trimming plate.

Warning

Bolts, nuts or washers not from the package of the engine are not allowed to use. To use, they must be of the same material and strength and are completely tightened. After tightening, run the engine as trial and check whether they are tightened or not.

Operating

6.1 New machine operating

6.1.1 Engine break-in

A break-in period is needed for the new engine to make the meshing surface of the movement components worn equally. Correct break-in running is advantageous to ensuring sound performance and long service life.

Advice

Failure to observe the break-in operating procedure affects service life of the engine and damages the engine severely.

Gasoline and engine oil mixing proportion of the break-in period is 25:1.

| Suggested time range | Operating speed range | Remarks |
|---|---|---|
| The first 10 minutes and the last 50 minutes | Refer to 1 and 2 below | |
| Running at the 2nd hour | Refer to 3 below | |
| Running after 5 hours | Avoid full throttle running in continuous 4 minutes | Overtime high-speed running damages the engine |
| Running after 8 hours | Run the engine as usual | Gasoline mixing ratio 50:1 |

Advice

Ensure that the gasoline and the engine oil are sufficiently mixed; otherwise, the engine may be damaged.

Operating procedures for break-in period of new machine of the 2-stroke pre-mixing model (repeated procedure applied for use of new engine)

Run the engine with load (gear with propeller) for 8 hours.

1. The first 10 minutes

Run the engine at the speed as low as possible. Idling speed at the neutral gear is proper.

2. In the following 50 minutes

Do not exceed the half accelerator speed (about 2200RPM). Change the engine speed constantly. If your vessel coasts, accelerate until coasts at full accelerator, and lower the accelerator speed to 2200RPM or lower.

3. In the following 2 hours

Increase the accelerator speed to full speed for coasting. Then lower the engine speed to 3/4 accelerator (3100RPM). Change the engine speed constantly. Run for 1 minute at the full accelerator speed, and run the engine with 3/4 accelerator or lower speed for 10 minutes to cool the engine.

4. Keep for 5 hours

Run the engine at any speed. Avoid running at the full accelerator for over 4 minutes.

5. After the first 8 hours

Run the engine as usual. Mix the gasoline and the machine oil in accordance with the standard pre-mixing ratio.

6.2 Pre-operation check

Warning

Before operating, if abnormal operation of any components is found, remove the abnormality. Otherwise, accident may occur.

Advice

The engine is of water-cooling engine, so it cannot be started out of water. Otherwise, the engine may be damaged due to overheating.

6.2.1 Fuel

Check and ensure that the fuel is free of leakage and sufficient for navigation.

Check the fuel pipeline connection, and ensure that it is connected reliably and is free of leakage.

Ensure that the fuel tank is located at safe and flat surface, and the fuel pipeline is free of twisting, extrusion and probable damage by friction.

6.2.2 Control

Before starting the engine, check that change of accelerator, shifting and rudder control is stable and resetting is accurate without jamming. Input and output connection is reliable.

When the outboard engine is in water, operating of the starter and stop switch shall be checked.

6.2.3 Engine

Check the engine involves slackened or damaged fasteners.

Check the propeller is damaged or not.

6.3 Fill fuel and engine oil

Warning:

The gasoline and its team are highly flammable and explosive. Keep away from various fires.

1. Remove the fuel tank cover.
2. Fill fuel into the fuel tank carefully.
3. After filling, re-tighten the fuel tank cover. Wipe off all the sprayed fuel.

6.3.1 Mixing of gasoline and lubricant (50:1)

| | Proportion of gasoline to engine oil |
|---|---|
| Break-in period | 25:1 |
| After the break-in period | 50:1 |

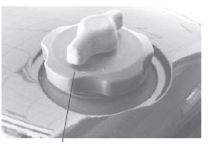
6.3.2 Flow

If the portable fuel tank is configured:

1. Screw off the fuel tank cover counterclockwise, remove the screen and replace in the fuel tank opening after cleaning.
2. Pour the lubricant into the fuel tank with measuring cup in accordance with the proportion, and fill gasoline.
3. Tighten the fuel tank cover and shake the fuel tank to mix the fuel thoroughly.

If the built-in fuel tank is configured, take additional fuel tank, measure and mix in accordance with the measurement procedures of the portable fuel tank, and pour the mixed fuel into the built-in fuel tank with funnel.

4. The built-in fuel tank is configured with fuel switch (most arranged at the lower portion of the bottom cover). Before starting, the switch is closed. Before starting the engine, check the label and open the fuel switch.

Fuel switch of built-in fuel tank, form of built-in fuel tank cover

Advice

Avoid use of any lubricant other than the one exclusive for the two-stroke engine.

Concern:

If the mixing liquid is not mixed thoroughly or the mixing proportion is incorrect, the problems below may occur.

Too low lubricant proportion: lack of lubrication results in engine fault, such as stuck of the piston.

Too high lubricant proportion: result in the spark plug short circuited, smoke exhausting and massive carbon depositing.

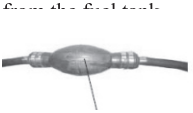
Warning

Before starting the engine and at the time of screwing off the exhausting screws, keep away from fire and spark.

1. The exhausting screws on the fuel tank cover shall be screwed off for 2 or 3 turns (refer to Figure in 4.1.1).
2. If the engine is installed with fuel connector, the fuel pipeline is firmly connected with the connector. The other end of the fuel pipeline is firmly connected with the fuel pipeline socket on the fuel tank.

Concern:

During running of the engine, place the fuel tank horizontally; otherwise, fuel cannot be taken from the fuel tank.





supply, keep the arrow horizontal and upwards until

Arrow mark of manual extrusion pump, oil pipe connector on both ends of the manual pump

Warning

Before starting the engine, anchor the vessel and avoid obstacles. Ensure that swimmers are not around the water area.

Manual starting

1. Set the shifting handle at the neutral gear.
2. The other end of the bracing cable is inserted into the flameout switch (refer to 4.1.6 below).
3. Set the accelerator hold at the START position (increase the accelerator to the 1/5 full accelerator position).
4. Pull out or rotate the choke valve switch (refer to Figure in 4.1.8). After the engine has been started, return the choke valve switch or back to the position before starting. Repeat the procedure in case of difficult.

Concerns:

The choke valve switch is unnecessary for starting the switch under hot status.

5. Pull the manual starting handle slowly until resistance is felt. Then pull outwards to start the engine. Repeat the engine when necessary.
6. After the engine is started, recover the manual starter to the original position.

Concerns:

If the engine is started under cold status, pre-heat the engine under idling gear running.

If the engine starting fails in the first time, repeat the operating. If the engine is not started for 4 or 5 times, slightly open the accelerator (1/8 to 1/4) and try again.

6.5 Pre-heat the engine

1. After the engine is started, run the engine for 3 minutes to preheat. Otherwise, service life of the engine may be shortened. At the time of preheating the engine, the choke valve button is returned to the initial position.
2. Observe the water flow is stable and water yield is normal through the cooling water observation hole.

Advice

Continuous water observed through the cooling water observation hole shows that the water pump delivers cooling water through the cooling passage. If the cooling water observed is interrupted during the engine running or the water yield is reduced, the engine may be overheated and severely damaged. Stop the engine and check the cooling water observation hole or the water channel in the engine is jammed or not. If it is difficult to diagnose and solve the problem, please consult your supplier.

6.6 Shifting

Warning:

Before shifting, ensure that there is no swimmer or obstacle in the water area nearby.

Advice

Preheat the engine before shifting. If the engine pre-heating is not completed, the idling speed may be higher than the normal speed. The relatively higher idling speed affects shifting. In case of such circumstances, stop shifting and continue preheating.

Shifted from neutral gear

Before entering the gear (forward or backward) operating, check the tilting limiting lever is at the locking position or not.

Shift from the normal gear (forward/backward) to the neutral gear (neutral gear unavailable for outboard engine with models of T2, T2.5 and T2.6).

1. Reduce the accelerator and lower the engine to the idling speed.
2. When the engine is at the idling speed, the remote control lever is moved to the neutral gear position stably and quickly. (Remote control)




Forward gear, backward gear; backward gear, forward gear

6.7 Stop vessel

Warning:

The reverse gear is not permitted to decelerate or stop running; otherwise, the vessel may be out of control, person or object is thrown out or related components are damaged or the risk of human injury is increased and the vessel sinks or is damaged.

After the accelerator is returned to the idling speed, the resistance of water stops the vessel quickly. Difference of the brake distance depends on load, water flowing direction, and wind direction and operation experience.

6.8 Stop the engine

Before stopping the engine, lower the running speed to the idling speed or run at low speed for several minutes. Do not stop the engine after running at high speed.

Flow

1. Press the engine stop button continuously until the engine stops completely. After stopping, close the exhausting hole on the fuel tank cover (refer to Figure 4.1.1).
2. Remove the fuel socket when the external fuel tank is used.
3. The fuel switch shall be closed if the built-in fuel tank.

Concerns:

If the outboard engine is installed with safety bracing cable, the bracing cable is pulled to remove the clamp and stop the engine.

6.9 Longitudinal trimming outboard engine

Warning:

If the running is unstable or difficult to control, reduce the speed or readjust the longitudinal trimming angle; otherwise, the probability of accident may be increased.

6.9.1 Adjustment of the longitudinal trimming operating angle

Four or five holes are arranged on the tightening bracket to adjust the longitudinal trimming angle of the outboard engine.




Selection hole with adjustable longitudinal trimming angle

1. Stop the engine.
2. The outboard engine is tilted upwards, the longitudinal trimming limiting lever is taken out from the tightening bracket hole and re-inserted into a proper hole.

Trial running can be carried out with different angles of the longitudinal trimming limiting lever to find out the conditions suitable for vessel navigation.

Warning:

Excessive outward tiling of the outboard engine raises the fore significantly and results in high air resistance. The crew may be thrown out under severe conditions. The propeller exposes waterborne, which lowers the use performance, leads to water inlet absorbing air discontinuously and reduces cooling water volume.

Notes:

After the longitudinal trimming limiting lever is moved for one hole, the longitudinal trimming angle of the outboard engine is changed for about 4 degrees.

6.9.2 Adjust longitudinal tilting of the vessel

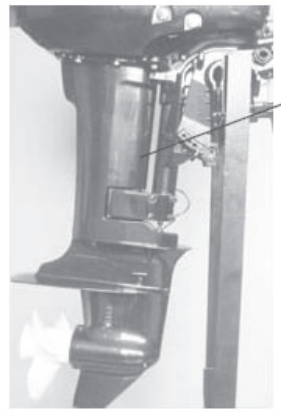
When the vessel is coasting, the fore can be raised by 3 to 5 degrees, improving stability and increasing efficiency. When the fore is raised, the vessel turns at one side or the other side, which is compensated with rudder control. Also the navigation adjustment piece is adjusted to offset such influences.

Concerns:

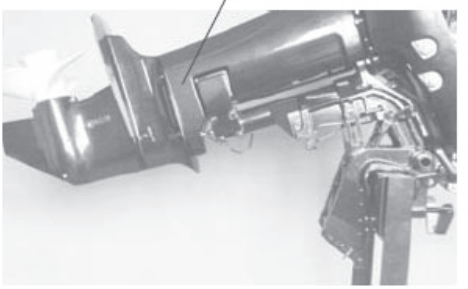
Excessive inward longitudinal tilting makes the vessel “difficult running in water”, increased fuel consumption and difficult to accelerate, and high-speed running makes the vessel unstable, difficult and risky running.

6.10 Up and down tilting

If the engine stops running or the vessel anchored at shallow water area, tilt the outboard engine upwards to the top position to protect the propeller and underground devices from being hit by obstacles and cause damage to the machines.



ALT 6008




ALT 6009

Warning:

Ensure that all the staff is far away from the machines in case that the outboard engine inclines ups and downs. When the operator is adjust the longitudinal trimming or tiling of the engine, any other persons are not permitted to participate in or give assistance to prevent injury by non-coordination.

Warning:

If the outboard engine will not run for a long time and tiling is not needed, disconnect the fuel pipeline or close the fuel faucet. Otherwise, the fuel leaks.

Advice

If the outboard engine is tilted, the engine cannot be tilted up by raising the rudder, for the rudder handle may be broken.

6.10.1 Upward tilting flow (manual tilting)

1. Set the gear transmission lever at the neutral gear.
2. Set the tilting positioning pin (if supplied) at the release/upward tilting position.
3. Hold the rear end of the top cover, and tilt the engine at the upward direction.
4. Push the tilting support handle into the clamping support; otherwise, the tilted support bracket is automatically rotated to the locking position.

6.10.2 Downward tilting flow (manual tilting)

1. Set the tiling positioning pin on the installation bracket at the release position.
2. Tilt up the engine until the tilting positioning pin is inserted below the tilted engine.
3. Slowly place down the tilted engine to make it set at the tilting positioning pin.

6.11 Patrol in shallow water

The outboard engine is properly tilted up for patrolling in shallow water.

Warning:

Before use of the shallow water patrolling, set the shifting lever at the neutral gear.

During use of the shallow water patrolling, the vessel shall run at the speed as low as much possible. When the shallow water patrolling is deployed, the tiling locking device does not work. In case of underground obstacles met, the outboard engine exposes water. Therefore, relatively high speed leads to being out of control.

To reverse the vessel, set the shifting lever at the reverse position to fall back the vessel (engaged in neutral gear 180° rotation if the reverse gear is unavailable).

Be careful in running the reverse gear, and do not run at the accelerator of no more than 25%. Excessive reverse gear thrust tilts the outboard engine to increase the probability of accident and human injury and death.

Once the vessel returns to the deep water area, the outboard engine is restored to the normal position.

Advice

In process of setting and patrolling in shallow water area, the outboard engine is not tilted up until the cooling water inlet underground exposes water surface. The engine may be damaged due to overheating.

6.12 Navigating in the following environment

Used in salt water

After operating in salt water, flush the cooling water channel with fresh water to avoid jamming. The fresh water is also used to clean the exterior of the outboard engine. If possible, clean the dynamics head at the lower portion of the top cover with wet cloth several times.

Used in acid water

Some areas may carry acid water. After operating in such water, flush the cooling channel with fresh water to avoid corrosion. The fresh water is also used to clean the exterior of the outboard engine.

Maintenance

7.1 Specifications and related parameters

Stern trimming flag height: (mm)

| Spec. | T2-T2.6 | T3.5 | T4-T5 | T8-T10 | T15 | T25-30 | T40 |
|---|---|---|---|---|---|---|---|
| Short leg(S) | 417mm | 444mm | 444mm | 450mm | 440mm | 423mm | 423mm |
| Long leg (L) | | 571mm | 571mm | 577mm | 567mm | 550mm | 550mm |

Net weight: (Kg)

| Spec. | T2-T2.6 | T3.5 | T4-T5 | T8-T10 | T15 | T25-30 | T40 |
|---|---|---|---|---|---|---|---|
| Short leg(S) | 9.8KG | 15KG | 21KG | 27.8KG | 37KG | 53.5KG | 77KG |
| Long leg (L) | | | 22KG | 28.5KG | 38.5KG | 55.5KG | 80.3KG |

Revolution distribution: (RPM)

| Specifications | T2-T3.5 | T4-T5 | T8-T10 | T15 | T25-T30 | T40 |
|---|---|---|---|---|---|---|
| Full accelerator RPM | 4000-5000 | | | | | |
| Idling | 1200-1500 | 900-1050 | 900-1050 | 900-1959 | 850-1000 | 850-1000 |

Engine:

Type: two-stroke

Ignition system: CDI

Spark plug (NGK): BPR7HS

Spark plug clearance: 0.6-0.7mm (0.024-0.028 inch) for engine of 6HP or below; 0.7-0.9mm (0.028-0.035 inch) for engine of 8HP or above.

Control system: rudder. Reconfiguration or mote accepted.

Fuel supply system: carburetor

Starting system: manual type with power of less than 15HP, and manual and electric types with power of more than 20HP

Starting the carburetor system: choke valve

Fuel and engine oil:

Recommended fuel: ordinary 93# lead-free gasoline

Fuel tank volume: (L)

| Specifications | T2-T2.6 | T3.5 | T4-T5 | Portable 12L | Portable 24L |
|---|---|---|---|---|---|
| Volume (L) | 1.1L | 1.4L | 2.8L | 12L | 24L |

Recommended gear oil: hypoid gear oil SAE#90

Volume of the gear oil poured shall be subject to overflow of the gear oil from the exhausting hole.

Tightening torque

Refer to Table 2 in 7.4.1.

7.2 Transportation and storage of the outboard engine

Warning:

Fuel leakage involves the danger of fire. In course of transportation and storage of the outboard engine, close the exhausting screw of the fuel tank and the fuel faucet and the fuel switch to prevent fuel leakage.

Do not fill the fuel container to the maximum volume. After being heated, the gasoline expands rapidly and accumulates pressure in the fuel container.

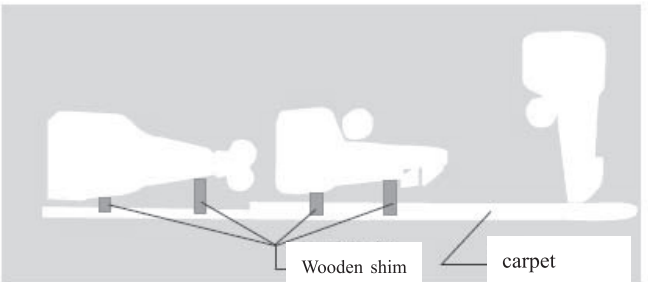
It involves fuel leakage and potential fire risks.

Advice

When the vessel is hauled, the outboard engine is hauled at the tilting position, without use of the tilting supporting bar or support racket; otherwise, the outboard engine may be loosened and falls from the tilting support device. Other supporting devices shall be used to fix at the tilting position.

7.2.1 Storage status of the outboard engine

The outboard engine removed from transportation or storage shall keep the status as show in the Figure below.




Notes:

Towel or similar objects are placed below the outboard engine to avoid damage.

7.2.2 Storage of the outboard engine

When the outboard engine shall be stored for a long time(2 months or longer), several key procedures shall be applied to avoid excessive damage.

Advice

Before complete drainage of the cooling water, the outboard engine cannot be stored laterally. Otherwise, the cooling water may enter the cylinder through the drainage hole and cause the engine fault.

The outboard engine is stored in a dry and well-ventilated place avoiding sunshine.

7.2.3 Procedure

Flush in the testing box, and clean before storage.

Advice

Do not run the engine without supply of cooling water, which may result in damage to the engine water pump or the engine due to overheating.

1. Clean the main body of the outboard engine with fresh water. Refer to 6.12 for further information.
2. Remove the fuel pipeline on the engine or close the fuel faucet (if any).
3. Remove the engine top cover and the muffler cover. Remove the propeller.
4. Install the outboard engine on the testing water tank. Fill fresh water into the water tank until the position higher than the anti-vortex board.

Advice

If the fresh water level is not lower than the anti-vortex board or the water supply is insufficient, scuffing of cylinder bore may occur.

5. Flushing of the cooling system is crucial for preventing jamming of the cooling system by salt, sand or dust etc. Besides, the engine must be atomized/ lubricated to prevent excessive corrosion of the engine. Flushing and atomization must be carried out simultaneously.

Warning:

In process of starting or operating, do not contact or disassemble the electric parts.

6. The engine runs for several minutes when it is at the neutral gear.
7. Immediately before turning off the engine, spray the “atomization oil” into each carburetor or atomization hole of the muffler cover (if any) alternatively. After correct execution, the engine generates smoke and involves stall-out.
8. Remove the outboard engine from the testing water tank cover.
9. Install the muffler cover/atomization hole cover and top cover.
10. If the “atomization oil” is unavailable, the engine runs at average speed and idling speed alternatively until the fuel is exhausted and the engine stops.
11. Evacuate cooling water in the engine. Clean the engine body thoroughly.
12. If the “atomization oil” is unavailable, remove the spark plug. Fill a spool of clean engine oil into each cylinder. Start the engine manually for many times. Replace the spark plug.
13. Drain clean fuel from the fuel tank.

Concerns: the fuel tank is stored in a dry and well-ventilated place, avoiding sunshine.

7.2.4 Lubricant and lubrication grease

1. Check whether the lubricant carries moisture or not.
2. Fill lubricant into all oil nozzles.

Notes: for long-term storage, oil is recommended to atomize the engine. Consult the atomization oil dealer on information related to use of the atomization oil and the atomization process.

7.2.5 Clean the outboard engine

After use, clean water is used to clean the exterior of the outboard engine. Fresh water is deployed to flush the cooling system.

7.2.6 Check coating surface of the engine

Check the engine suffers from scratch, concavity or paint film scaling etc. The damaged area may be corroded. When necessary, clean and apply paint to the area.

Warning:

Turn off the engine in the process of maintaining. If you are not familiar with maintenance, the work shall be forwarded to the dealer or the professional technician.

7.3 Routine maintenance

Warning

Turn off the engine in process of maintenance. If you are not familiar with the maintenance, forward the work to dealer or professional technician.

7.3.1 Maintenance schedule

Frequency of the maintenance shall be subject to operating conditions, and the general principles are set out below.

Concerns:

After operating in seawater, dirty water or muddy water, flush the engine with clean water after each use.

Table 1: the mark ○ refers to work carried out by professional maintenance supplier, and the mark●carried out on our own.

Table 1

| Description | Requirements | Initial stage | | Regular use | |
|---|---|---|---|---|---|
| | | 10 hours (1 months) | 50 hours (3 months) | 100 hours (6 months) | 200 hours (1 year) |
| Anode (ex.) | Check/replace | | ●/○ | ●/○ | |
| Anode (in.) | Check/replace | | | | ○ |
| Cooling water channel | Clean | | ● | ● | |
| Cover clamp | Check | | | ● | |
| Fuel filter (disassembling) | Check/clean | | ● | ● | |
| Fuel system | Check | ● | ● | ● | |
| Fuel tank (portable) | Check/clean | | | | ● |
| Gear oil | Replace | ● | | ● | |
| Lubricant filling point | Fill lubricant | | | ● | |
| Idling speed (carburetor) | Check | ●/○ | | ●/○ | |
| Propeller and cotter pin | Check/replace | | ● | ● | |
| Shifting connecting bar/shifting steel rope | Check/adjust | | | ○ | |
| Thermostat | Check/replace | | | ○ | ○ |
| Accelerator connecting bar/accelerator steel rope/accelerator starting timing | Check/adjust | | | | |
| Water pump | Check/replace | | | ○ | |
| Spark plug | Clean/adjust/ replace | ● | ● | ● | |

Reference Table for reference torque of fasteners Table 2

| Tightened parts | Screw specifications | Tightened torque | |
|---|---|---|---|
| | | n. M | Kgf. M |
| Temperature saver | M6 | $1^{st}$: 6 $2^{nd}$: 12 | $1^{st}$: 0.6 $2^{nd}$: 1.2 |
| Anode | M5/M6 | 5/8 | 0.5/0.8 |
| Spark plug | M12/M14 | 18/25 | 1.8/2.5 |
| Cooling water inlet cover bolt | M8 | 5 | 0.5 |
| Drainage bolt | M5-M6 | 9 | 0.9 |
| Check bolt | M8 | 9 | 0.9 |
| Butter nozzle | M6 | 3 | 0.3 |
| Propeller tightening nuts | M10/M14/M16 | 17/28/35 | 1.7/2.8/3.5 |

7.3.2 Clean and adjust the spark plug

Warning:

In course of disassembling or installing the spark plug, do not damage the insulation body. The external spark enters if the insulation body is damaged, which results in explosion or fire.

Warning:

The engine is very hot after the engine has been turned off. Do not touch and avoid scaling.

The spark plug is an important engine component and is easily checked. Status of the spark plug reflects the status of the engine. For instance, if the central electrode ceramics is extra-white, there may be air leakage or the cylinder involves atomization fault. Such fault must be checked at professional maintenance station. The spark plug shall be removed periodically and checked, for the heat and deposit may corrode the spark plug. The spark plug shall be replaced with the same in case of excessive electrode corrosion.

| Spark plug: identification mark NGK BR7HS/BPR7HS | | | |
|---|---|---|---|
| Inter-electrode distance of spark plug | | | |
| 2HP-8HP | 0.6-0.7mm | Over 9.8HP | 0.8-0.9mm |

At the time of installing the spark plug, clean the liner surface and use the new liner. Wipe off the dust in the screw, and tighten the spark plug to the correct torque.

Torque of the spark plug: refer to the tightening table

Concerns:

At the time of installing the spark plug, if the torque wrench is unavailable, the torque estimate is: feel tightened plus 1/4 to 1/2 turn.

7.3.3 Check fuel system

Warning:

Fuel leakage may result in fire or explosion.

Regularly check if there is any fuel leakage.

Check if there is any leakage, crack or fault of the fuel pipeline. If any problems discovered, ask the professional mechanic engineers to repair.

Check points:

1. Leakage of the carburetor or fuel system
2. Leakage of the fuel pipeline connector
3. Aging, crack or other damage of the fuel pipeline
4. Leakage of the fuel connector

7.3.4 Check fuel filter

Warning:

The gasoline is highly flammable, and its steam is flammable and causes explosion.

Do not execute the procedure on hot or running engine. Cool down the engine.

The fuel filter consists of fuel. Keep away from fire. In case of damage, replace immediately.

The procedure may spray out some fuel. Receive the fuel with cloth and wipe off the fuel immediately.

Clean the fuel filter (assembling form)

1. Disassemble the nuts for fixing the fuel filter assembly (if configured).
2. Disassemble the filter cup and wipe off the overflow fuel.
3. Remove the filter element and clean in the solvent. Wait until it is dry. Check the filter element and O seal ring. Ensure that they are at sound conditions. If required, replacement is carried out. If water in the fuel is discovered, check and clean the portable fuel tank or other fuel tanks.
4. The filter element is reinstalled in the filtration cup. Ensure that the O seal ring is ready in the filter cup. The filter cup is installed on the filter shell.
5. The filter assembly is installed on the bracket to make the flexible fuel pipeline connected to the filter assembly.
6. Run the engine. Check the filter and pipeline involve leakage or not.

7.3.5 Check idling speed

Warning

In the process of starting or running, do not touch or disassemble the electric parts. Do not rotate the parts.

Advice

When the outboard engine is in the water, the following procedures must be executed. The flushing device accessories or testing water tank can be used.

Notes:

The diagnosis revolution meter is used for the procedure. The results may vary.

1. Start the engine and preheat at the neutral gear until it operates stably.

Notes:

2. After the engine is completely preheated, perform the correct the idling speed check. Otherwise, the measured idling speed is higher than the normal value. If it is difficult to confirm the idling speed value or the idling speed value is to be adjusted, consult the professional technical staff.
3. Confirm that the idling speed is set at the proper value. Consider that the idling speed can be low, which cannot affect the normal engagement, reverse gear and acceleration, and can be high, which is free of abnormal sound in engagement without shock.

7.3.6 Check wiring and connecting

Check each grounding wire is fastened firmly or not.

Check the component of each connecting wire is connected firmly or not.

7.3.7 Exhausting leakage and cooling water leakage

Start the engine, and check the exhausting or cooling water leaks from the exhausting cover or the combination surface between the cylinder cover and the cylinder body. The check method is that applying soap water with concentration of 40% (cleanser solution) to the surrounding of the combination surface and confirming if there are any air bubbles.

7.3.8 Check propeller

Warning:

Before checking, removing or installing the propeller, remove the spark plug cap from the spark plug. Set the gear into the neutral gear, rotate the main switch to the OFF and remove the key, and remove the wire clamp from the stop switch for the engine. Turn off the disconnection switch of the accumulator (if configured onboard).

At the time of loosening or screwing the propeller nuts, do not hold the propeller. A wooden block is arranged between the anti-vortex board and the propeller to prevent rotating of the propeller.

Check the propeller blade involves any wear, corrosion (caused by vortex or ventilation) or other damages.

Check the propeller shaft is damaged or not.

Check the spline is worn or damaged or not.

Remove the winding on the propeller or shaft or not.

7.3.9 Remove the propeller

1. Remove the cotter pin directly with vice.
2. Remove the propeller nut, washer and shim (if configured).
3. Remove the propeller and thrust washer.

7.3.10 Install the propeller

Advice

Before installing the propeller, ensure that the thrust washer is installed; otherwise, the underwater device shell and propeller wheel hub may be damaged.

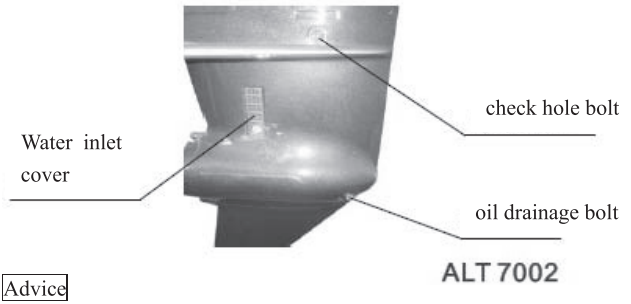
Ensure that the new copper pin is used and the end is firmly bent. Otherwise, the propeller falls down and becomes missing during operating.

1. Apply lubrication grease or anti-corrosion oil grease on the propeller shaft.
2. Install shim on the propeller shaft (if any), thrust washer and propeller.
3. Install the shim (if configured) and washer. Tighten the propeller nut to the specified torque.

Align the propeller nut and the propeller shaft hole. If the holes are not aligned, further tighten the nut it aligns with the hole. Insert a new cotter pin into the hole and bend the two ends of the cotter pin.

7.3.11 Replace the gear oil

1. Tilt the outboard engine, and make the gear oil drainage screws at the lowest position.
2. Place a proper container below the gear box.
3. Remove the gear oil drainage screws and sealing pad.
4. Remove the check hole screws and sealing pad to drain the machine oil completely.




Advice

Check the drained gear oil. If the gear oil is in the milky form, water enters the gear box. Ask professional staff to repair the underwater devices. Otherwise, the gear may be damaged.

Concerns:

Dispose of the used machine oil in accordance with environmental protection requirements.

5. Make the outboard engine at the vertical position, use the flexible oil filling equipment and pour the gear oil into the drainage screw holes.

| Information of filled oil volume of the outboard engines of various specifications | | | | | | |
|---|---|---|---|---|---|---|
| Specifications | 2-2.6 | 4-5 | 8-10 | 15 | 25-30 | 40 |
| Filled volume | 45mL | 100mL | 160mL | 250mL | 300mL | 430mL |

Recommended gear oil: hypoid gear oil SAE#90

6. New sealing pad is placed on the exhausting hole of the gear box. When the machine oil starts to flow from the exhausting hole, insert and fasten the exhausting hole.

7. Place new sealing pad on the drainage screws of the gear box. Insert and fasten the gear oil drainage screws.

7.3.12 Clean the gear box

Warning

Before cleaning the fuel tank, remove from the vessel. Clean at a well-ventilated place. Keep away from fire in the progress. Incorrect assembling results in fuel leakages, which causes fire or explosion.

Dispose of the used gasoline in accordance with the local laws and regulations.

1. Drain the fuel in the fuel tank to the permitted container.
2. Inject a proper amount of solvent into the fuel tank. Cover and shake the fuel tank. Drain the solvent completely.
3. Remove the screws for fixing the fuel connector assembly, and draw the assembly from the fuel tank.
4. Clean the fuel filter with proper solvent (at the end of the absorbing pipe) and dry off.
5. Replace with new liner. Reassemble the fuel connector assembly and firmly fasten the screws.
6. Check the fuel tank and fuel joint assembly. The oil pipeline does not involve leakage.

7.3.13 Check and replace the anode

The outboard engine is prevented from corrosion by consuming the anode. Periodically check the external anode. Remove water scale from the surface of the scale. Consult the dealer on replacement of the internal anode.

Please check the grounding wire on the external anode (for models installed with anode). Consult the professional technical staff on checking and replacement of the internal anode on the dynamics unit.

Advice

Do not apply coat to the anode; otherwise, the anode is invalid.

7.3.14 Check the top cover

Advice

Ensure that the top cover is tightly closed after installation, free of any clearance, looseness or improper connection. Otherwise, the engine may suffers from water and the top cover falls down.

Push the top cover to check reliability of the connection. If the connector is removed, ask professional staff to repair.

Troubleshooting

8.1 Faults met in the initial use

1. Fault caused by failure to read the instruction manual carefully, error operation or improper operation

Solution: read the instruction manual again to know about information in related sectors and help readers start and use the outboard engine.

2. The fuel is not mixed in accordance with the proportion or not mixed as the 2-stroke machine oil, and speed lowered even flameout 30 minutes after starting.

Solution: stop the engine immediately. After cooling, remove the spark plug and add a small amount of 2-stroke engine oil into the hole. Pull the starting handle for 3-5 times and install the spark plug. Restart. If the starter cannot be started, deliver to the dealer for handling.

3. Flameout about 10 minutes after starting, flameout 3-6 minutes after restarting and the failure repeats many times.

Solution: check the oil switch and the fuel tank air inlet are closed or not.

4. With the air completely opened, start 6-10 times or more and fail to start the engine.

Solution: after the air valve is completely with starting failed, open the drainage bolt of the carburetor and drain the full fuel in the carburetor. Under the situation of existing spark, adjust the air valve volume and restart.

Many problems will be encounters in the initial use. Operators are required to read the instruction manual carefully to know the use of the outboard engine.

8.2 introduction of the troubleshooting

Any problems of the fuel system, engine body, cooling system or ignition system may result in starting fault or other problems. The fundamental check and other probable problems described in this part may be inapplicable to your models.

When the engine fault lamp twinkles, please consult the professional repair maintenance.

Starting fault of the starter

Q: the accumulator capacitor is too weak or too low? (Electric starting)

A: check the accumulator. Use the accumulator with the recommended capacitor.

Q: the accumulator connection is loosened or corroded?

A: fasten the accumulator cable and clean the accumulator terminal.

Q: fuse or circuit of the electronic starting relay is burnt down or not?

A: check the cause for the electronic relay overloaded. Install the fuse of the rated ampere capacity and replace the former fuse.

Q: any fault of the starter component?

A: ask the professional maintenance engineer to repair.

Q: not at the neutral gear?

A: switch to the neutral gear.

The engine fails to start

Q: no fuel in the fuel tank?

A: pour the clean and fresh fuel into the fuel tank.

Q: is the fuel polluted or stale?

A: pour the clean and fresh fuel into the fuel tank.

Q: check the filter is jammed or not?

A: clean or replace the filter.

Q: is the starting procedure incorrect?

A: refer to 6.4.

Q: is the fuel pump faulty?

A: ask the professional maintenance staff to repair.

Q: any dirt or abnormality on the spark plug?

A: check the spark plug. Use the recommended types for cleaning or replacement.

Q: non-conformed ignition. Check the wiring damaged or connection unaccepted, and the cable clamp falls down or not.

A: check the wire is worn or not. Fasten all the loosened connection. Replace the worn wiring, including the bracing cable.
Q: is the ignition normal?
A: pull the starting handle to check the electrode spark of the plug.
Q: is the internal component of the engine damaged?
A: ask the professional engineers to repair.
Engine idling speed unstable or easy flameout
Q: any dirt or abnormality on the spark plug?
A: check the spark plug. Use the recommended types for cleaning or replacement.
Q: dirt on the carburetor?
A: ask the professional engineers to repair.
Q: is the fuel system jammed or not?
A: check unsmooth fuel supply in the shrunk or bent fuel pipeline or other fuel system.
Q: is fuel polluted or stale?
A: pour the clean and fresh fuel into the fuel tank.
Q: is the fuel filter jammed?
A: clean or replace the filter.
Q: is the alarm system activated?
A: ask the professional engineers to find out and correct the cause for alarm.
Q: the spark plug clearance incorrect?
A: check and adjust in accordance with specifications.
Q: the ignition wire damaged or weak connection?
A: check the wire is worn or not. Fasten the loosened connection. Replace the worn wiring.
Q: not use the specified engine oil?
A: check and replace oil in accordance with specifications.
Q: the temperature adjuster is faulty or the water course is jammed?
A: ask the professional engineers to repair.
Q: carburetor adjustment incorrect?
A: ask the professional engineers to repair
Q: the fuel pump working is abnormal or damaged?
A: ask professional engineers to repair.
Q: the exhausting screws on the fuel tank is closed or not?
A: open the exhausting screws.
Q: the choke valve button is pulled out?
A: back to the original position.
Q: the carburetor is jammed?
A: ask the professional engineers to repair.
Q: the fuel pipeline connection is correct?
A: reconnect.
Q: the starting motor does not work
A: check the starting motor is normal (professional maintenance staff checks and repairs)
Relay function normal (professional maintenance staff checks and repairs)
Connecting leading wire correct, free of looseness
The accumulator capacitor satisfies requirements.
The beeper makes sound or the indicator light twinkles.

Q: the cooling system is jammed or not?
A: check if there is any restriction on the water inlet.
Q: the temperature control switch is normal or not? (Remote control)
A: check the temperature control switch wiring, the mounted switch is reliable and the switch operating is normal or not?
Q: is the water pump or temperature adjuster faulty?
A: ask the professional engineers to repair.
Operation fault of the outboard engine
Q: the propeller damaged?
A: repair or replace the propeller.
Q: the propeller pitch or diameter incorrect?
A: install the correct propeller, operating in the recommended range (RPM).
Q: the tilting angle incorrect?
A: adjust the longitudinal tilting angle to perform optimum operation.
Q: installation height of the engine on the stern trimming flag incorrect?
A: adjust the engine to the proper stern trimming flag height.
Q: the alarm system is activated or not?
A: find out and correct the cause for alarm.
Q: the vessel bottom dirty due to underground living creatures?
A: clean the vessel bottom.
Q: any weed or other foreign objects wound in the gear chamber?
A: clear the foreign objects and clean the underground devices.
Q: the fuel system jammed or not?
A: check unsmooth fuel supply in the shrunk or bent fuel pipeline or other fuel system.
Q: is the fuel filter jammed?
A: clean or replace the filter?
Q: is the fuel polluted or stale?
A: pour the clean and fresh fuel into the fuel tank.
Q: the spark plug clearance incorrect?
A: check and adjust in accordance with specifications.
Q: ignition wire damaged or weak contact?
A: check the wire worn or not. Fasten all the loosened connection. Replace the worn wire.
Q: is the electronic component faulty?
A: ask the professional engineers to repair.
Q: the temperature adjuster is faulty or jammed?
A: as the professional engineers to repair.
Q: the exhausting screws are closed or not?
A: open the exhausting screws.
Q: the fuel pump damaged or not?
A: ask the professional engineers to repair.
Q: the fuel connection normal?
A: connect correctly.
Q: heating range of the spark plug incorrect?
A: check the spark plug and use the recommended spark plug to replace the former one.

Q: incorrect response to shifting lever position of the engine?
A: ask the professional engineers to repair.
Excessive vibration of the engine
Q: the propeller is damaged or not?
A: ask the professional engineers to repair?
Q: any weed or other foreign matters wound on the propeller?
A: remove and clean the propeller.
Q: the engine installation bolts are loosened or not?
A: tighten the bolts.
Q: the rudder shaft is loosened or damaged or not?
A: tighten and ask professional engineers to repair.
Q: the temperature control switch with surface mounted metal surface (remote control)
A: reinstall and contact the metal surface effectively.
8.3 Provisional measures under emergency conditions
8.3.1 Damage by impact
If the outward engine collides with objects in water, the following procedures shall be applied.

1. Immediately stop the engine.
2. Check all the control systems and all components are free of damage. The vessel is free of damage.
3. Regardless of damage discovered not or, slowly drive the vessel to the nearest harbor.
4. The distributor is asked to check the outboard engine before starting navigation again.

8.3.2 The starter does not work
If the engine starter does not work (the engine cannot be started following the tarter), the emergency starting cable can be used to start the engine.

Warning
Such starting is deployed only the vessel needs to drive to the nearest harbor for repair in case of emergency
If the emergency starting cable is used to start the engine, the linkage protector will not work. Please set the remote control bar at the neutral gear. Otherwise, the vessel may start by accident and cause accident.
At the time of navigating the vessel, fasten the flameout cable to a safe place of your clothes, arms or legs.
Please confirm that no person is behind you when you pull the cable. The cable may be thrown to the rear position to injure others.
The rotating flying wheel not protected is dangerous. At the time of starting the engine, placed the removed cover and other objects distant.
Pull the emergency starting cable as instructed. Duringrunningf the engine, do not install the starter or the engine top cover.
During the starting or operating period, do not touch the ignition coil, spark plug wire, spark plug cap or other electronic components. Otherwise, you may be electrically shocked.

8.3 Start the engine urgently
1. Remove the top cover.
2. Remove the anti-engagement gear on the starter to protect the steel rope (if configured).
3. Remove the bolt and the starter/flywheel protection cover.
4. Make preparations for starting. Refer to 6.4 on more information. Ensure that the engine is at the neutral gear and the wire clamp is at the stop switch for the engine.
5. If the choke valve button is provided, it shall be pulled out when the engine is cold. After the engine is started, turn the choke air button to the original position during preheating process of the engine.
6. The urgent starting cable end is inserted into the groove of the flywheel to wind around the flywheel clockwise for many turns.
7. Pull out the urgent starting cable to start the engine with crankshaft. Repeat the operating when necessary.
8.3.4 Dispose of the immersed engines
If the outboard engine is immersed in water, it shall be delivered to the professional maintenance station.
Procedures
1. Clean the slurry, salt, algae etc. thoroughly with fresh water.
2. Remove the spark plug which is downwards to discharge water, slurry and other dirt.
3. Drain fuel thoroughly from carburetor, fuel filter and fuel pipeline.
4. At the time of starting with manual starting or urgent starting cable, pour atomization oil or engine oil into the carburetor and spark plug.
5. If the starting succeeds, keep at the middle and low-speed and navigate to the nearest harbor to ask professional maintenance staff to handle.

Advice
Do not try to start the engine before a thorough check.

# NURSIA Outboard Motor




Two-stroke engine

Two-stroke: 6HP, 9.8HP, 12HP, 15HP

**15HP、20HP、30HP、40HP、60HP**

4 Stroke

Four-stroke: 3HP-60HP

## E-FI Electronic Fuel Injection

4-Cylinder Power

High efficiency and low consumption

Marine-grade corrosion prevention

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