

1

Important information.

The owner needs to know.

Thank you for choosing a HANGKAI outboard motor. This manual contains the necessary information for the correct operation, proper maintenance and storage of your motor. A thorough

understanding of these simple guidelines will help you get the most out of your engine. If you have questions about the operation and maintenance of your outboard motor, please consult

our dealer. This manual highlights particularly important information in the following way.

This safety symbol says **WARNING! ANXIETY! YOUR SAFETY IS REDUCED!**

WARNING

Failure to follow a **WARNING** could result in serious injury or death to the operator, bystanders, or those servicing or repairing the engine.

CAUTION:

A **CAUTION** indicates special precautions to avoid damage to your outboard motor.

NOTE:

A **NOTE** provides key information to make operating the motor easier and clearer.

To ensure long service life of the motor, it is recommended to use materials and carry out diagnostics and maintenance strictly following the instructions in this manual. Please note

that if you do not follow these instructions, not only may the motor break down, but your warranty may also be voided.

2

Contents

The owner needs to know.

.....1

General information4

.....4

Safety 4

..... 4

Important shortcuts. 6

..... 6

Recommendations for refueling. 7

..... 7

Selecting a screw. 8

..... 8

Basic elements. 9

.....9

Main Elements. 9

..... 9

Fuel tank. 10

..... 10

Operation. 15

..... 15

Installation. 15

..... 15

Running in the engine.	18
Pre-launch examination.	18
Refilling the built-in tank.	19
Starting the engine.	20
Warming up the engine.	22
Switching transmission	23
Turning off the engine.	24
Motor tilt.	25

3

Angle adjustment.	25
Raising and lowering the motor.	27
Characteristics.	29
Fuel and oil:	thirty
Service	31
Transportation and outboard motor storage.	31
Frequency service.	34
Maintenance table.	35
Checking the fuel system.	37
Installing the screw.	41
Changing the oil in the gearbox.	41
Troubleshooting.	43
Actions in an emergency.	44
Restoring the functionality of a recessed motor.	47

4

General Information

Safety

- Please read this entire manual before installing and operating your outboard motor. Knowing the manual will give you an understanding of the motor and its operation.

- Before operating the boat, read the manual that comes with it and all markings on it. Before operation, make sure that you clearly understand all symbols and terms.
- Do not install a motor that exceeds the power rating specified on the maximum rating plate or in the boat manual. An engine that is too powerful can cause the boat to behave erratically. If your boat does not have this label, check with your boat manufacturer.
- Do not attempt to modify the motor. This may reduce the safety of its operation.
- The wrong choice of propeller can not only have a negative impact on fuel consumption, but also damage the engine. Consult your dealer.
- Do not start the engine after consuming alcohol or drugs. About 50% of deaths on water occur due to intoxication.
- It is necessary to have as many life jackets (PFD) as there are people in the boat, and it would be better to put them on when approaching the water. At a minimum, children and non-swimmers should wear life jackets at all times near water, and everyone else should immediately put them on if any danger is detected.
- Gasoline is highly flammable and its vapors are also explosive. Handle and store gasoline carefully. Make sure there are no fumes or gasoline leaks before starting the engine.
- Gasoline emits vapors containing carbon monoxide, which is colorless and odorless, which can cause deterioration of brain function or death to those who inhale them. Symptoms include nausea, dizziness and drowsiness. Keep the cockpit and cabin well ventilated. Try to eliminate the possibility of escaping fumes.

5

- Check the throttle, drive mode switch and steering before starting the engine.
- Attach the safety cord to a secure place on your clothing, arm, or leg. Then insert the pin on the other end of the cord into the kill switch on the motor. If you lose it, the pin control will jump out of the switch and the engine will stall.
- Be aware of and follow local boating regulations and laws. You will see basic driving rules on page 5.
- Be aware of weather forecasts before boating. Do not go sailing if the forecast is dangerous.
- Be sure to tell someone where you are going and leave your travel plans with the person in charge. When you return, please inform us that you are canceling this plan.
- Use common sense and good judgment when traveling by boat. Determine your capabilities and make sure you understand how to operate the boat in the conditions you will encounter.
- Operate the boat with awareness of your capabilities and its capabilities. Drive at a safe speed and keep an eye out for obstacles and other road users.
- While driving, be aware of bathers and swimmers.
- Stay away from swimming areas.
- If a swimmer is unexpectedly nearby, put the vehicle in neutral (N) and turn off the

engine.

- Dispose of empty and used oil containers only to designated areas.

Consult your oil retailer about this.

- When changing engine and transmission oil, be sure to wipe off any spilled oil. Only pour oil through a funnel or other device. If necessary, check with our dealer for the correct procedure.

- Dispose of used consumables only in approved locations.

Consult your dealer about this.

6

Important shortcuts.

Hazard warning labels.

WARNING

- Before starting the engine, make sure the drive mode switch is in the neutral (N) position.
- Do not touch or move parts of the electrical system when starting and operating the engine.
- Keep hands, hair, and clothing away from the flywheel and other rotating parts of the engine while it is running.

WARNING

FUEL LEAKS CAN CAUSE A FIRE.

Before lifting the engine or laying it on its side, you must:

1. Close the fuel valve.
2. Close the fuel tank vent.

Caution labels.

CAUTION

Top side

7

Recommendations for refueling.

WARNING!

GASOLINE AND ITS VAPORS ARE VERY FLAMMABLE AND EXPLOSIVE!

- Do not smoke while refueling the engine, and stay away from areas where open flames and sparks may occur.
- Stop the engine before refueling.
- Refuel in a well-ventilated area. Do not fill additional fuel tanks on board.
- Try not to spill gasoline; if gasoline does spill, wipe it up immediately.
- Do not allow fuel to overflow into the tank.
- Close the gas cap securely, but not too tightly.
- If gasoline accidentally gets into your mouth, nose, eyes, or if you inhale a lot of gasoline vapor, seek medical help immediately.
- If gasoline comes into contact with your skin, wipe it off immediately and wash the area with soap and water.

Change clothes if gasoline has soaked into them.

- Touch the tip of the refill bottle to some metal part of the engine to avoid causing static sparks.

ATTENTION! Use only fresh, clean gasoline that is stored in a clean container that is not contaminated with water or other products.

Petrol.

Fuel: - Unleaded gasoline 92, if unleaded, you can use gasoline 95 once.

If a knocking noise occurs when you sharply open the throttle, change the gas station or use gasoline with a higher octane number.

Engine oil.

It is recommended to use semi-synthetic or synthetic motor oil for 2-stroke outboard motors (TCW3).

8

Examples of preparing the engine mixture:

Break-in 25:1

Gasoline 1l 5l 12l 14l 24l

Oil 0.04l 0.2l 0.48l 0.56l 0.96l

After break-in 50:1

Gasoline 1l 5l 12l 14l 24l

Oil 0.02l 0.1l 0.24l 0.28l 0.48l

NOTE : If the recommended grade of motor oil is not available, choose another one that is suitable for your region in terms of temperature conditions.

ATTENTION: All 2-stroke engines are supplied without oil.

Screw selection.

The choice of propeller significantly affects the performance of your motor, since the wrong choice

can not only have a negative impact on the operation, but also seriously damage your motor. Engine speed

depends on the size of the propeller and the load capacity of the boat. If the rpm is too high or too low for

the engine to operate properly, engine life may be adversely affected.

For boats with a large carrying capacity, a low-performance propeller is better suited, as it will allow the engine to develop optimal power speed. Accordingly, a propeller with higher performance is better suited for a smaller boat.

1. Prop diameter in inches

2. Prop pitch (performance) in inches

3. Prop type

NOTE:

Select a prop that will allow the engine to reach at least half of its maximum RPM at full throttle with

the boat fully loaded. If the engine exceeds the maximum RPM limit under these conditions with the boat empty,

close the throttle so that the engine operates within the normal RPM range.

For instructions on how to remove and install the screw, see page 40.

9

Basic Elements.

Main Elements.

NOTE: There may be minor differences.

10

Fuel tank.

Gas tank cap.

She closes the tank. If you need to add fuel, unscrew it counterclockwise.

Breathing (ventilation) of the tank lid.

The breather is located on the tank lid. To open it, turn it counterclockwise.

Throttle grip slide control.

Slip adjusters allow you to change the resistance to rotation of the throttle or steering at the request of the person driving the boat. To increase the resistance, turn the knob clockwise, to decrease it, counterclockwise.

WARNING!

Do not over-tighten the slide adjuster. If the resistance is very strong, it will be difficult to regulate the throttle, which may lead to an accident.

When the desired speed is reached, the regulator will lock the throttle in the desired position.

11

Lever for switching transmission modes.

Your motor has three mode selection positions: Forward (F), Neutral (N) and Reverse (R). Set the gas to idle. Switch modes clearly.

Gas handle.

The gas handle is located on the tiller. Turn the knob counterclockwise to increase speed, and clockwise to decrease speed.

The engine can be turned off with an emergency pin. The pin must be inserted into the emergency switch in order for the engine to run. Attach the safety cord to a secure place on your clothing, arm or leg with a carabiner. If the boat capsizes or loses control, the pin will pop out of the switch and the engine will stall. This will prevent an uncontrollable boat from moving.

12

WARNING!

Attach the cord of the checks with a carabiner to a secure place on your clothing, or to your arm or leg while moving.

Do not attach the safety cord to clothing that could fly off. Do not place the pin cord where it could get tangled, making it difficult to operate.

Avoid accidentally pulling the cord while the engine is running. A sudden loss of engine power causes deterioration in controllability. When the engine is turned off, the boat

slows down quickly. This can cause people and objects in the boat to suddenly move forward.

NOTE:

Without the emergency check, the engine will not start.

Ignition off button.

To turn off the ignition and stop the engine, press this button.

Start-up enrichment of exhaust type.

To enrich the mixture at startup, pull out the button.

13

Starter handle.

Slowly pull out the starter handle until you feel resistance. Then pull it firmly to turn the crankshaft and start the engine. Repeat as necessary.

Steering slip adjuster.

The steering slip adjuster allows you to set its rotation resistance at the operator's discretion. The adjusting screw or bolt is located on the rotating bracket. To reduce resistance, rotate counterclockwise.

WARNING!

Do not over-tighten the slide adjuster. If the resistance is very strong, it will be difficult to control the boat, which may lead to an accident.

Tilt adjustment pin.

The position of the adjustment pin determines the slight angle of inclination of the motor relative to the transom.

14

Lift lever.

To hold the motor in the raised position, move the lever to the closed position towards the bracket.

Upper fairing lock lever.

To remove the upper fairing, pull the lock handle and lift the fairing up. When installing the fairing, check the location of the rubber gasket. Then close the fairing by bending the lever.

Oil Pressure Indicator (if equipped)

Oil pressure is necessary to lubricate the internal parts of the engine. When the red indicator

lamp does not light up, it means there is pressure.

WARNING!

Stop the engine immediately if the light is on or flashing.

15

Operation.

Installation.

WARNING:

Incorrect motor height or obstructions to the water flow (such as the design and condition of the boat, or devices such as the stepped transom or depth gauge) can create a foamy spray while underway. Driving for a long time in such an environment can cause serious damage to the motor.

NOTE:

When testing on the water, check the buoyancy of the boat at rest with maximum load. Check the exhaust window to ensure that the water level does not threaten to enter the engine during rough seas if

the boat is not moving.

Installing an outboard motor.

WARNING!

An engine that is too powerful can cause the boat to behave erratically. Do not install a motor that exceeds the power rating shown in the maximum rating table on the boat nameplate or in the manual. If your boat does not have this label, check with your boat manufacturer.

The information provided in this section may be used as a reference. Proper installation depends partly on experience and partly on how well the boat and engine match.

WARNING!

Improper installation of an outboard motor can result in dangerous conditions such as

poor

handling, complete loss of control and fire hazard. Observe

the following:

It would be better if the motor is installed by our dealer or someone with such experience.

If you

are going to install the motor yourself, consult with specialists.

To learn how to install light motors, contact our dealer or other specialist and

they will show you how to do it correctly.

Mount the outboard motor on the centerline (keel line) of the boat. Make sure the boat itself

is stable. For asymmetrical or keelless boats, consult your dealer.

1 - Center line (keel lines)

Height setting.

To maximize the seaworthiness of your boat,

the water resistance of the engine and boat should be minimal. The water resistance depends on

the correct installation of the outboard motor in height

. If the motor is placed too high, the likelihood

of cavitation increases, when it occurs, the thrust is significantly reduced and therefore, that the propeller is rotating in the air, the engine speed may

increase uncontrollably, which may lead to overheating. If the motor is mounted too low, water resistance increases and the motor loses efficiency.

Install the motor so that the anti-cavitation plate is 30-50mm below the bottom of the boat.

17

NOTE:

The optimal mounting height for your outboard motor depends on the compatibility of your boat and motor and how you want

to use them. Check on the fly how the behavior of the boat and motor changes with different installations and this

will help you choose the optimal height. For more information, please contact our dealer or boat manufacturer.

To adjust the motor angle, see page 25.

Mounting the outboard motor.

1. Place the motor as close to the center of the boat as possible. Tighten the mounting screws securely and evenly
. Constantly check the reliability of the engine mounting because... they may become loose due to engine vibration.

WARNING!

If the mounting screws come loose, the engine may fall off or hang loose on the transom. This may cause you to lose control of the boat. Make sure the mounting screws are securely tightened.
Constantly check their tightness during operation.

2. If the motor is equipped with an emergency lanyard, be sure to use it. Attach it to the boat and it will help avoid complete loss of the motor if the main mount for some reason fails and the motor falls off the transom.

18

Running in the engine.

Your new engine requires a break-in period to better break in the surfaces of the moving parts and ensure uniform wear. Proper running-in will help ensure good performance and long engine life.

ATTENTION:

Failure to perform the break-in procedure may lead to a decrease in engine life or even to its breakdown

. Let the engine run under load (gear engaged, propeller installed) as follows:

1. First 10 minutes: Let it run at idle speed.
2. Next 50 minutes: Run the engine at 3000 rpm or approximately half throttle.
3. Next 2 hours: Run engine at 4000 rpm or approximately $\frac{3}{4}$ throttle.
4. Next 8 hours: Avoid opening the throttle fully for more than 5 minutes continuously.
5. Normal operation of the motor.

Pre-start check.

WARNING!

If any pre-start check item does not work properly, it must be inspected and corrected before starting the engine in order to avoid accidents.

WARNING:

Do not start the engine while not in the water. Overheating can cause serious engine damage.

Fuel.

Make sure you have enough fuel for the entire route.

19

Make sure there are no fuel leaks or gasoline vapors.

Make sure all connections in the fuel system are secure.

Make sure the fuel tank is level and that it is not deformed, chafed, or in contact with sharp objects.

Control.

Check the throttle, switches, and steering gear before starting the engine.

Controls should move smoothly without binding or wobbling.

Check the integrity and reliability of all connections.

Check the functionality of the starting mechanism and transmission mode switch when the motor

is already on the water.

Motor

Check that the motor is securely secured.

Check that the emergency cable is not lost or damaged.

Check if the screw is damaged.

Refilling the built-in tank.

WARNING!

Gasoline and its vapors are highly flammable and explosive. Keep it away from burning cigarettes, sparks,

flames and other sources of fire.

1. Remove the tank cap with the engine lowered (vertical operating position).

2. Use a funnel or pump with a spout of suitable diameter and length for the fuel tank neck.

3. Carefully fill the tank.

4. Close the tank carefully after refueling. Wipe up any spilled fuel.

Fuel tank capacity is 2.5 liters.

20

Starting the engine.

Fuel supply.

WARNING

Before starting the engine, make sure the boat is securely moored and there is nothing obstructing

control. Make sure there are no swimmers nearby.

When the vent is open, gasoline vapors spread. Gasoline is highly flammable, and its vapors are also

explosive. Do not smoke and stay away from open flames and sparks. if

the fuel tank ventilation vent is open.

Gasoline emits vapors containing carbon monoxide, which is colorless and odorless, which can cause

deterioration of brain function or death to those who inhale them. Symptoms include nausea, dizziness and drowsiness. Keep the cockpit and cabin well ventilated. Try

to eliminate the possibility of escaping fumes.

1. On the built-in fuel tank cap, open the vent valve one turn. On an additional tank, 2 or 3 turns.

2. Place the hose connector of the additional tank onto the motor fitting. The arrow on the pump should

point towards the motor.

3. Open the fuel valve on the engine.

21

4. Supply fuel from the auxiliary tank to the carburetor. squeezing the pump until it becomes hard.

5. Place the shift lever in neutral (N).

WARNING

Always start the engine in neutral (N). To avoid spontaneous movement of the boat. If the motor is equipped with a safety pin, attach the safety pin cord to a secure place on your clothing, arm or leg. Then insert the pin on the other end of the cord into the kill switch on the motor.

WARNING

Attach the safety cord to a secure place on your clothing or to your arm or leg. Do not attach the safety cord to clothing that could fly off. Do not place the cord where it could get tangled, which could make it difficult to operate.

Avoid accidentally pulling the cord while the engine is running. A sudden loss of engine power causes deterioration in controllability. When the engine is turned off, the boat slows down quickly. This can cause people and objects in the boat to suddenly move forward.

6. Turn the throttle to the start position.

7. Place the enrichment start button in the start position. After the engine starts, return the key to the run position.

22

NOTE:

When starting a warm engine, place the key in the run position. .

If you put the starter key in the start position while driving, the engine will begin to choke or stall

8. Slowly pull the starter handle until you feel resistance. Then pull it firmly to turn the crankshaft and start the engine. Repeat as necessary.

9. Once the engine has started, slowly return the recoil starter handle to its place and then release.

10. 10. Slowly move the throttle to the closed throttle position

NOTE:

If the engine is cold, you need to warm it up. For details, see page 22.

If the engine does not start on the first try, repeat the procedure. If the engine does not start after 4-5

attempts, turn the throttle between $\frac{1}{8}$ and $\frac{1}{4}$, and try again. If a warm engine does not start,

open the throttle fully and try again. If the engine still does not start, see page 43

Warming up the engine.

For models with manual start.

1. After starting the engine, let it idle for 3 minutes to warm up. Failure to do this reduces engine life. Gradually move the starter enricher to the run position as the engine warms up.

23

NOTE:

If you do not open the throttle while driving, the engine will begin to choke or stall.

At air temperatures below 5C, let the engine run with the enrichment button pulled in for about 30 seconds after start.

2. Check that cooling water flows smoothly through the inspection hole.

ATTENTION:

- The passage of water through the inspection hole indicates that the pump is pumping water through the cooling system. If water does not always flow out of the hole when the engine is running, stop the engine and check to see if the cooling inlet port at the bottom or the inspection hole is clogged. If the problem is not found and corrected on site, please contact our dealer.

Gear shift.

WARNING!

Before engaging the gear, make sure that there are no people or objects near the engine

CAUTION:

- To change direction or shift gears from forward to reverse, close the throttle to idle.
Forward or backward.

1. Place the throttle control in the closed position.

24

2. Quickly and accurately move the shift lever from the neutral (N) position to the forward (F) or reverse ® position.

WARNING!

Reverse slowly and do not turn the throttle more than halfway. Otherwise , the boat may behave unpredictably and lose control, which could result in an accident

Turn off the engine.

Before turning off the engine, let it cool down by idling or idling . A sudden stop of the engine at full power is not advisable.

Procedure

1. Press and hold the STOP button until the engine stops completely.

2. Tighten the breather screw on the fuel tank cap and set the fuel cock to the closed position.

3. Disconnect the auxiliary tank.

25

NOTES:

If the engine is equipped with an emergency engine stop pin with a cord, the engine can be stopped by pulling the pin.

Motor tilt.

Adjusting the angle of your outboard motor will help determine the tilt of the boat in the water. The correct angle of inclination will help improve performance and efficiency, reducing the load on the motor. The correct angle of inclination depends on the relationship between the boat, motor and propeller. The angle of inclination depends on variables such as boat loading, water conditions and travel speed.

WARNING!

For steering purposes, leaning too much (no matter in which direction) can cause the boat to behave unstable and make the boat more difficult to control. This increases the likelihood of an accident. If you feel the boat is unstable or hard to control, slow down or stop to get the right angle.

Angle adjustment.

There are 5 holes in the motor mounting bracket for changing the angle of inclination.

1. Stop the engine.
2. Carefully pull out the retaining pin of the mounting bracket, lifting the motor slightly.
3. Move the pin into the desired hole. Try different motor angles that work best for the boat under different operating conditions.

26

WARNING!

Always stop the engine before adjusting the engine tilt. Carefully insert and remove the pin to avoid distortion. Be careful after the first adjustment. Gently increase speed while watching for signs of boat instability or loss of control. Incorrect tilt angle may cause loss of control.

NOTE:

Moving the pin one hole changes the angle by approximately 4 degrees.

Adjusting the tilt of the boat.

When the boat is level, tilting up will reduce drag and improve handling and efficiency. Especially when the keel line of the boat is raised by 3-5 degrees. With such an inclination there may be a greater tendency to wobble. Compensate for this with your steering wheel. Tilt of the motor can also reduce this effect. When the boat's angle is lower, the boat is easier to accelerate.

Tilt of the boat upward (roll to the stern).

Too much engine tilt causes the boat to roll too far. Performance and efficiency drop because the boat's hull pushes the water and air resistance increases. Excessive tilt of the motor can cause cavitation, which can cause the boat to bounce through the water and throw people overboard.

27

Tilt forward (bow roll).

Leaning too far down can cause

the boat to sink into the water, reducing efficiency and hindering the boat's acceleration. Steering a boat with an excessive downward tilt at high speed makes the boat unruly. Stability is sharply reduced and the tendency to roll laterally increases, making control difficult and dangerous.

NOTE:

The effect of engine tilt on the roll of the boat when moving depends on the type of boat.

Raising and lowering the motor.

If the engine is stopped for a period of time or if the boat is moored in the shallows, the engine should be raised to protect the propeller and surrounding parts from damage from collisions with obstacles and also to reduce the likelihood of corrosion.

WARNING!

Make sure that there are no people nearby when tilting the motor up and down, and be careful not to get any body parts pinched between the motor housing and the mounting bracket.

Tighten the breather screw and turn the fuel valve to the closed position if the engine is raised for more than a few minutes. Otherwise, fuel may begin to leak.

28

WARNING:

- Before lifting the engine, turn off the engine as described in this chapter. Never lift the engine while the engine is running. Overheating can cause serious damage.
- Do not lift the engine by the tiller, as this may damage it.
- Always keep the engine compartment above the propeller, otherwise water may enter the cylinder and damage it.
- The engine must not be lifted when it is in reverse.

How to raise the motor.

1. Stop the engine and place the gear shift in the forward (F) position.
2. Tighten the tank plug vent. On models equipped with a fuel line connector, disconnect it from the engine.
3. Close the fuel valve.

29

4. Grasp the handle on the fairing and lift the motor all the way up.
5. The spring-loaded latch will engage automatically and lock the motor in the raised position.

The procedure for lowering the engine.

1. Raise the motor slightly.
2. Pull the release lever. Carefully lower the motor down.

Characteristics.

Dimensions:

Overall length: 700 mm (27.6")

Overall width: 310 mm (12.2")

Overall height S: 1007 mm (39.6")

Transom height S: 436 mm (17.1")

Weight (AL)S: 20.0 kg (43.8" lb)

30

Power:

Maximum power speed: M5.0HP-4500- 5500 rpm

M6.0HP -5000-6000 rpm

Maximum power: M5.0HP - 3.6kW/5.0hp at 5500 rpm

M6.0HP – 4.4kW/6.0hp at 5500 rpm

Idle speed (neutral (N)) - 1000 -100 rpm

Engine: Type: 2-stroke

Displacement: - 102 cc

Bore/stroke - 55.0mm /43.0mm (2.17"/1.69")

Ignition system: CDI

Spark plug (NGK) - BB6HS, gap between electrodes – 0.9mm (0.035")

Exhaust system: direct exhaust

Cooling system: combined air-water

Starting system: manual pull-out starter

Start enricher: air damper in the carburetor

Transmission operating modes:

lever position: forward (F) - neutral (N) - reverse (R).

Gearbox ratio: 2.08

Tilt and lift system: manual lift

Fuel and oil:

Recommended fuel: 92 unleaded gasoline

Volume of built-in fuel tank: 2.5L.

Volume of additional fuel tank: 12 l.

Recommended engine oil: 2-stroke synthetic outboard motor oil

Fuel mixture: gasoline - 50(25), oil - 1

Recommended gear oil: hypoid gear oil SAE80W90

Gear oil volume: 195 ml (6.6 fl.oz.)

Tightening torques : Spark plug: 25.0 Nm (2.55 kg/m), Drain plug: 18.0 Nm (1.84 kg/m)

31

Maintenance

Transporting and storing the outboard motor.

WARNING!

Leaking fuel may cause a fire. When transporting or storing the outboard motor, close the gas tank vent and fuel cock to prevent fuel leakage.

BE CAREFUL when carrying an extra tank in a boat or car.

DO NOT FILL fuel containers to their full capacity. Gasoline expands greatly when heated and creates pressure in the fuel container. This may cause leakage and possible fire.

Avoid standing under the bottom of the motor when the motor is raised, even if the

motor holding latch is closed. Falling motor can cause serious injury.

WARNING:

- Do not use the motor lifter when transporting a boat with the motor on the transom.
- The motor may become loose, jump off the retainer and fall. If it is not possible to transport the motor in the working position, use an additional mount for the raised motor.
- The outboard motor must be transported and stored in its normal operating position. If there is not enough height to transport in this position, then transport the motor in a raised position using a special mounting.

For hanging models.

When transporting or moving the outboard motor without a boat, do so as follows:

NOTE: Place a soft mat or the like under the motor to protect it from damage.

32

Storing a boat motor.

When storing your outboard motor for a long period of time (2 months or longer), there are several important procedures that need to be followed to prevent damage.

WARNING:

- When transporting or storing the motor separately from the boat, place it in a visible place.
- Do not place the engine on its side until the cooling system water has completely drained from the engine, otherwise water may enter the cylinder and damage it.
- Store the motor in a dry, well-ventilated area, avoiding direct sunlight.

Flushing the motor in a test container.

WARNING:

- Do not run the engine without cooling water available. The cooling pump and then the motor may be damaged due to overheating. Before starting the engine, make sure there is a supply of cooling water.
1. Wash the engine with clean fresh water. More details on page 34.
 2. Close the fuel valve. Close the vent on the tank lid.
 3. Remove the fairing.
 4. Remove the plug and gasket from the cooling inspection hole.
 5. Place the hose there, open the tap slightly and flush the cooling system for 3-5 minutes.

a - gasket b – flushing device

33

WARNING!

Do not touch or move parts of the electrical system when starting or operating the engine. Keep your hands, hair, and clothing away from the flywheel and other rotating parts of the engine while it is running.

6. Start the engine and let it idle for a few minutes in Neutral (N)

7. Then close the valve and squirt Fogging Oil into the carburetor inlet, or the preservation port on the intake muffler, until the engine stalls .

8. If you do not have Fogging Oil, close the fuel valve and wait until the engine has used up all the fuel in the carburetor and stalled.

9. Then unscrew the spark plug, pour 20-30 ml of clean engine oil into the cylinder. And crank the engine several times with a recoil starter. Screw the spark plug back in.

NOTE:

Flushing the cooling system is important to prevent blockages from salt, sand, or dirt. In addition, forcing the engine to "Fogging Oil" will prevent excessive corrosion damage to the engine. At the same time, the engine is washed and preserved.

10. Drain the gasoline from the built-in tank.

11. Install the fairing.

12. Drain all cooling water from the cooling system. Wipe the outside of the motor thoroughly.

Lubrication.

1. Lubricate the spark plug threads with grease before inserting and tighten to specification. More details on page 37

2. Change the transmission oil. More details on page 41. Check for water in the oil, which will indicate a seal leak.

3. Lubricate all parts that require lubrication with grease. More details on page 36.

34

Washing the outboard motor.

After use, wash the outside of your outboard motor with clean fresh water. Also flush the cooling system.

NOTE:

For how to flush the cooling system, see page 32.

Checking the painted surfaces of your outboard motor.

Inspect the motor for scratches, chips and leaks. Areas with damaged paint are susceptible to corrosion. If necessary, clean and paint these areas.

Maintenance frequency.

WARNING!

Make sure the engine is turned off before performing any maintenance work, regardless of

the nature of the service. If you do not have experience in servicing and repairing equipment, contact our dealer or other qualified service center.

Replacement of elements.

If replacement of any parts is necessary, use only original

HANGKAI spare parts or the same spare parts of equivalent strength and material quality.

Poor quality parts

may not function properly, which could be dangerous for the operator and passengers.

You can purchase spare parts and accessories from our dealers.

Maintenance.

Maintenance table.

Maintenance intervals may vary depending on operating conditions, but the following table provides basic guidelines. The table is intended to explain the actions to the motor owner. NOTE: Flush the cooling water passages with clean, fresh water each time after driving through salty, cloudy or dirty water. The “#” symbol means that you can perform these actions yourself. The “O” symbol indicates that these steps must be performed by our dealer.

Item	Work	Primary	Subsequent	10 hours (1 month)	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)
Anode(s)	Inspection/replacement	#/O	#/O				
Cooling water movement	Flushing	#	#				
Fairing latch	Check	#					
Fuel filter (in tank)	Check/clean	O					
Fuel system	Check	#	#				
Fuel tank (in-line)	Check/clean	O					
Gear oil	Replace	#	#				
Lubrication points	Lubrication	#					
Idle speed (carburetor)	Check	#/O	#/O				
Screw and cotter pin	Check/Replace	#	#				
Gear switch connection	Check/Adjust	O					
Thermostat	Check/Replace	O					
Throttle connection/Throttle cable/Throttle timing	Check/Adjust	O					
Cooling pump	Check/Replace	O					
Spark plug	Clean/Adjust/Replace	#	#				
Muffler /collector	Check/replace	O					

36 Lubrication. Waterproof lubricant. a - rotary bracket, b - regulator. Cleaning and adjusting the spark plug. WARNING! When unscrewing and tightening the spark plug, do not damage the insulator. A damaged insulator may spark, leading to an explosion or fire. The spark plug is an important engine part and is easy to check. The spark plug condition shows some parameters of the engine condition. For example, if the center electrode insulator is very light, this may indicate an air leak or a problem with the carburetor. Do not try to diagnose any problems yourself; on the contrary, you need to take the motor to our dealer. You must periodically unscrew and inspect the spark plugs, because under the influence of high temperatures and soot they gradually fail and burn out. If the electrode burns out excessively, or too much carbon deposits form, it is necessary to replace the spark plug with the same one or the desired type. Spark plug standard - BR6HS(NGK) Before screwing in the spark plug, measure the gap between the electrodes. Adjust if necessary clearance to specification. 1 – gap between electrodes; 2 – spark plug type Gap between electrodes - 0.9mm (0.035 in) Every time you screw in the spark plug, clean or replace the O-ring. Clean both the threads on the engine and the spark plug so they turn on easily. Plug Torque - 25 Nm (2.55 kg/m) NOTE: If you do not have a torque wrench, hand-tighten the spark plug as far as it will go, then tighten it ¼ to ½ turn with the wrench. Then check the tightness with a torque wrench as soon as possible. Checking the fuel system. Gasoline is highly flammable, and its vapors are also explosive. Do not smoke and stay away from open flames and sparks and other sources of ignition. WARNING! Leaking fuel may cause a fire or explosion. Check the fuel system regularly for leaks. 38 If leaks are found, they must be repaired by an experienced mechanic, otherwise the operation of the motor will be unsafe. Check the fuel line for leaks, cracks, blockages, and kinks. If a malfunction is found, please contact our dealer or other qualified service center to have the problem repaired immediately. Check points: Leaks in fuel system parts Leaks in connections Cracks or other damage to the fuel system Leaks in connectors

Checking idle speed WARNING Do not touch or move electrical system parts when starting or running the engine. Keep your hands, hair, and clothing away from the flywheel and other rotating parts of the engine while it is running. ATTENTION: • Perform all procedures while the motor is on the water. You can use a test container and a rinsing attachment. For this procedure you need to use a diagnostic tachometer. The result may vary depending on whether the test is performed using a rinsing device, in a test container, or in water. 1. Start the engine and let it warm up in neutral. until it starts running smoothly. NOTE: 39 Correctly measuring idle speed can only be done on a warm engine. If the engine is not warm enough, the idle speed may be higher than normal. If you are unable to measure the idle speed, or if it requires adjustment, consult our dealer or

another qualified mechanic.

2. Check that the idle speed matches the value in the table on page 29

Checking the wiring and electrical connections.

Check the reliability of each wire at the base. Check the quality of all connections.

Exhaust gas leaks.

Start the engine and check that there are no exhaust gas leaks from the connections between

the muffler, cylinder and engine cylinder head.

Water leak.

Start the engine and check that there are no water leaks from the connections between the muffler,

cylinder and engine cylinder head

. Oil leaks.

Inspect the engine for oil leaks.

Checking the screw.

WARNING!

A rotating propeller can cause serious injury.

Before checking, removing or installing the screw, ensure that

the engine cannot be started accidentally, such as removing the spark plug cap, setting the transmission mode selection to

the neutral (N) position, and removing the engine emergency stop check, etc.

40

Do not try to hold the screw with your hands when loosening or tightening the screw nut. Insert a block of wood between the propeller blades and the anti-cavitation plate to prevent the propeller from rotating.

Control points.

- Check each propeller blade for wear, damage from cavitation and rotation, and other damage.
- Check the propeller shaft for damage and wear.
- Check the cotter pins for damage and wear.
- Check the fish release at the propeller shaft.
- Check the propeller shaft seal for damage.

Removing the screw.

(For cotter pin models)

1. Straighten the cotter pin and pull it out with pliers.

2. Unscrew the nut and remove the washer.

3. Remove the screw and support washer.

41

Installing the screw.

(For cotter pin models)

NOTE Before installing the propeller, be sure to install the backing washer, otherwise the

gear housing and propeller hub

may be damaged . Always use a new cotter pin and bend the ends securely. Otherwise, the screw may fly off while moving and get lost. 1. Lubricate the propeller shaft with water-repellent grease. 2. Install the support washer and screw onto the screw shaft. 3. Install the washer. Tighten the screw nut so that the screw does not turn on the shaft. 4. Align the grooves of the nut with the hole on the shaft. Insert a new cotter pin and straighten its ends. NOTE If, after tightening the nut, the groove on the nut does not line up with the hole on the shaft, loosen the nut until they line up. Changing the oil in the gearbox. WARNING Make sure the motor is securely mounted to the transom or stand. Falling motor can cause serious injury. Avoid standing under the bottom of the motor when the motor is raised, even if the motor lift lock is closed. 1. Tilt the engine so that the oil drain plug is in the lowest position. 2. Place a container of suitable size under the gear housing. 3. Unscrew the drain plug. 4. Unscrew the control hole plug to allow the oil to drain better. 42 NOTE: Always install new gaskets. Gaskets are not reused. ATTENTION: After the oil has drained, examine it carefully. If an emulsion (white oil) appears , this means that water is entering the crankcase and can cause gearbox failure. Consult our dealer about oil seal replacement 5. Using a flexible container or syringe, fill the oil through the filler hole. Recommended transmission oil: Hypoid oil SAE 80W90 Crankcase volume: 195 ml (6.6 fl. oz.) 6. When oil appears in the inspection hole, tighten the inspection hole plug. 7. Tighten the filler plug. Checking and replacing anodes. Our motors are protected from corrosion by external destructible anodes. Check the external anode periodically. Remove scale from the anode surface. Consult our dealer for anode replacement. ATTENTION! • Do not apply paint to the anodes, as this may reduce their effectiveness and cause accelerated corrosion of the motor. Covering the bottom of the boat. Cleaning the boat's hull does not impair its seaworthiness. It is necessary to clean the bottom of the boat from various growths as often as possible. If necessary, the bottom of the boat can be coated with paint that protects against growths that are typical in your region. Do not use coating against build-up that contains copper or graphite. These coatings can cause accelerated engine corrosion. 43 Troubleshooting. Problems with the fuel, compression or ignition system can cause poor starting, loss of power and other problems. This section describes the main breakdowns and the possibility of eliminating them. Type of malfunction Possible cause Remedy The starter does not work Defective parts of the starter Repair it at our dealer The engine does not start (the starter is working) There is no fuel in the tank Pour clean, fresh fuel into the tank The fuel is contaminated or not fresh Pour clean, fresh fuel into the tank The spark plug is dirty or not that type Check the spark plug. Clean or replace with the correct type of spark plug The spark plug cap is not on correctly Remove and put on the cap again Ignition wiring is damaged or poorly connected Check the wires for wear or breaks. Tighten loose connections. Replace worn or torn wires Ignition system parts have come out Repair it at our dealer The emergency pin is not inserted Insert the pin Internal parts are damaged Repair it at our dealer The engine does not idle and stalls The spark plug is dirty or not Check the spark plug. Clean or replace with the correct ones Fuel flow is poor Check for pinched, kinked or other obstructions in the fuel line Fuel is dirty or not fresh Fill tank with clean, fresh fuel Incorrect spark plug gap Check and adjust according to table Ignition wiring is damaged or poorly connected Check wires for wear and tear. Tighten loose connections. Replace worn or broken wires Wrong engine oil is being used Check and replace with the correct mixture Out of order or clogged Repair at our dealer Carburetor not adjusted Repair at our dealer 44 Carburetor is clogged Repair at our dealer Fuel tank vent is closed Open fuel tank vent Choke is not adjusted Have it repaired by our dealer. The enrichment valve is closed. Place it in the working position. The motor is strongly tilted. Place it in the normal position. The motor does not pull. The propeller is damaged. Repair or replace the propeller . Incorrect tilt of the motor. Set the tilt angle at which the

motor pulls best . Motor is not installed correctly in height . Set the optimal one. height
The bottom of the boat is covered with sediment Clean the bottom of the boat Algae or
other material is wrapped around the gear case Clean the bottom of the motor The spark
plug is dirty or the wrong type Check the spark plug. Clean or replace with the correct type
of spark plug Fuel flow is poor Check for pinched, kinked or other problems in the fuel line
Fuel is dirty or not fresh Fill the tank with clean, fresh fuel Incorrect spark plug gap Check
and adjust according to table Ignition wiring is damaged or poorly connected Check wires
for wear and tear. Tighten loose connections. Replace worn or broken wires. Ignition
system parts are faulty . Have it repaired by our dealer . Emergency procedures. Damage
due to collision. **WARNING! 45** The outboard motor can be seriously damaged if it collides
during operation or transportation. A damaged motor may not be safe to operate. If the
motor encounters any obstacle in the water, proceed as follows. 1. Stop the engine
immediately. 2. Check the steering and other elements for damage. 3. Regardless of
whether damage is detected or not, slowly and carefully get to the nearest place where
you can moor. 4. Have the motor inspected by our dealer before operating again. The
starter does not work. If the recoil starter mechanism fails, the engine can be started
using the emergency starter cord. • Use this method only in an emergency and only to
return to a place where you can moor for repairs. • When using the emergency starter, the
protection that prevents the engine from starting in gear will not operate. Make sure the
gear shift is in neutral (N). Otherwise, the boat may start to move, which could lead to an
accident. • Attach the safety cord to a secure place on your clothing, arm or leg. • Do not
attach the safety cord to clothing that could fly off. Do not place the cord where it could
become tangled, making it difficult to operate • Avoid accidentally pulling the cord while
the engine is running. A sudden loss of engine power causes deterioration in
controllability. When the 46 engine is turned off, the boat slows down quickly. This can
cause people and objects in the boat to suddenly move forward. • Make sure that no one
is standing behind you when you pull the starter cord. It can severely whip and injure the
person behind. • Rotating engine parts with the fairing removed are very dangerous. Keep
loose clothing and other objects away from the running engine. Use the emergency
starter strictly according to the instructions. Do not touch the flywheel or other moving
parts while the engine is running. Do not attempt to reinstall the starter and upper fairing
while the engine is running. • Do not touch the magneto, high-voltage wire, spark plug cap
and other live parts during starting and operation. You may receive an electric shock.
Emergency engine start. 1. Remove the upper fairing. 2. Make sure the shifter is in neutral
(N). 3. Disconnect the winding mechanism from the starter assembly. 4. Remove the
starter by unscrewing the three bolts. 47 5. Insert the knotted end of the emergency
starter into the slot in the flywheel rotor and make several turns clockwise around the
flywheel. 6. Pull the cord until you feel resistance. 7. Give a strong jerk to crank and start
the engine. Repeat if necessary . Restoring the performance of a sunken motor. If the
motor has been completely submerged in water, take it to our dealer immediately.
Otherwise, corrosion will occur in the engine. If it is not possible to take the engine to the
dealer, you must do the following: 1. Completely wash off all dirt with clean water 2.
Remove the spark plug. Then turn the engine down with the spark plug hole to allow dirt
and other impurities to flow out. 3. Drain the remaining gasoline from the carburetor and
fuel filter of the fuel system. Drain all the oil. 4. Squirt Fogging Oil into the carburetor and
spark plug hole, or pour in a little motor oil while cranking the engine with the starter. 5.
Bring the motor to our dealer as quickly as possible. **WARNING:** Do not attempt to start
the engine until it has been thoroughly inspected.