

User manual

Basic information.

Thank you for purchasing a HANGKAI outboard motor.

A good knowledge of the instructions will help you to properly operate, maintain and store motor.

If there are any questions regarding this manual, please consult your HANGKAI dealer.

Please read this manual carefully and try to fully understand all information before operating your outboard motor.

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.
- Do not install a motor that exceeds the power rating indicated 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 design. This may lead to reduced safety during its operation.
- Do not start the engine after drinking 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, 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.
- Check the throttle, drive mode switch and steering before starting the engine.
- It is necessary to know and follow local boating regulations and laws.
- Be aware of weather forecasts before traveling by boat. 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 attentive to bathers and swimmers.
- Stay away from swimming areas.
- If a swimmer suddenly appears nearby, turn off the engine.

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 gets on 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 fuel container to a 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.

Safety.

- Operating the motor indoors is prohibited.
- Do not place hands or feet near moving or rotating parts of the motor.

- It is prohibited to store or spill gasoline near sources of sparks and fire (for example: stoves, fireplaces, water heaters, heat guns, etc.). This may cause a fire.
- It is prohibited to dilute gasoline and oil indoors.
- Do not remove or fill the fuel tank while the engine is running or just turned off (Allow the engine to cool for 2 minutes before refueling).
- Do not start the outboard motor in a place where oil or other flammable products have been spilled (Move the motor away from places where there are any leaks or oil stains to avoid fire).
- It is forbidden to leave the engine turned off with the starter enrichment turned on.
- Do not hit the flywheel with a hammer or other heavy objects to prevent it from flying off when the engine is running.
- It is forbidden to suddenly increase the gas to full when the boat is turning.
- It is forbidden to start the engine without a muffler. You should periodically monitor the condition of the muffler and promptly replace it if it is suspected of being damaged.
- It is forbidden to suddenly close the gas at maximum speed. This may accidentally throw off the carburetor adjustments.
- It is forbidden to store the engine in such a way that there is any debris or flammable materials near the muffler.
- Do not touch the muffler or cylinder cooling fins to avoid burns.

- It is forbidden to start the engine without an air filter or filter element in it.
- It is forbidden to start the engine if any of its parts are loose or poorly secured.
- In order to avoid accidents, when installing a motor and other devices on a boat, remove the cap from the spark plug and check the grounding.
- Please use only fresh fuel mixture to avoid carburetor clogging and starting problems.
- Check the fuel system pipes for leaks and leaks and replace them if necessary.
- Please use original spare parts otherwise the motor may be damaged.

Preparation for use.

1. Oils and lubricants.

Please use only clean, high quality oils and lubricants; it is not recommended to use lubricants or oils with special additives.

It is recommended to use semi-synthetic or synthetic motor oil for 2-stroke outboard engines.

Devices similar to a boat engine operate well at air temperatures from -20 to +40; if the ambient temperature is outside these limits, this can adversely affect their operation.

2. Gasoline.

Use clean unleaded gasoline with an octane rating of at least 90-92. Gasoline must be used within 30 days of purchase. It is prohibited to use types of gasoline that may contain methyl alcohol.

3. Preparation of the motor mixture.

The normal ratio in a mixture of gasoline and oil is 25:1. Note this ratio for yourself so as not to accidentally confuse the proportions.

To prepare the motor mixture in a canister, use a measuring cup, which you will also need in the future.

Make the amount of mixture that you intend to use in the near future. Place the unused mixture in a visible place; engine oil may precipitate, so the mixture must be shaken occasionally. Otherwise, the engine may not work well or even not start at all.

ATTENTION:

Before closing the container with the remaining mixture, let it cool for 2-3 minutes.

Exploitation.

1. Preparing for launch.

Pump fuel into the carburetor until it fills the fuel system.

Move the starting enrichment device to the start position (the valve is closed). If the engine is warm, there is no need to do this.

2. Start.

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

If the engine flashes several times and stalls, fuel may have flooded the spark plug. Turn off the ignition, unscrew the spark plug, move the starting enrichment to the working position (the throttle is fully open) and crank the engine five to six times with the starter. Screw in the spark plug, turn on the ignition and try to start the engine again.

After the engine starts, warm it up for 2-3 minutes at idle speed.

3. Turn off the engine.

Before turning off the engine, let it idle for approximately 30 seconds. Do not try to stop the engine with starter enrichment. This may cause engine damage and fire.

Service.

Maintenance frequency.

The frequency of maintenance outlined below is a guideline.

Constantly check that the bolts and nuts are tight, that there are oil and fuel leaks and that there is no leakage.
air.

Every 8 hours of operation, it is necessary to wash the outer parts of the engine and rinse the air filter element with gasoline.

Every 50 hours of operation it is necessary to flush the fuel tank, sump and carburetor. Remove accumulated dirt from the spark plug, check and adjust the gap between the electrodes and check the spark plug and ignition elements for cracks.

Every 100 hours of operation, it is necessary to remove accumulated dirt from the entire engine, clean the cylinder cooling fins, check and clean the muffler, and ensure that there are no exhaust gases or water leaks from the connections between the muffler, cylinder and engine cylinder head.?

Maintenance of individual elements.

Air filter.

Replace damaged or dirty filter elements.

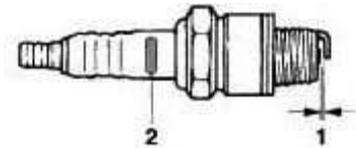
Unscrew the bolt and remove the filter cover.

Turn the lid over and pull out the filter element.

Wash the filter housing with water and detergent or gasoline. Saturate the filter element with gasoline and squeeze it out. Dry off the oil with a dry, clean cloth. If the filter element is damaged, replace it.

Spark plug.

Unscrew the spark plug to check the condition of the ceramic parts every 50 hours of operation. Every 100 hours, also check and adjust the gap between the electrodes. It should be 0.6-0.8 mm. (1)



Magneto.

The gap between the ignition breaker cams (if any) should be 0.4-06 mm.

Keeping the engine clean.

Periodically wash the engine to remove dust, dirt and oil stains with clean fresh water. Use a brush to clean hard-to-reach areas. Blow out the motor with compressed air if possible.

Before each start, remove anything from the muffler that may have gotten there, especially flammable materials. The presence of foreign objects in the muffler area may cause a fire.

Periodically flush the cooling system and check the water circulation in it. A clogged cooling system can lead to engine failure due to overheating.

Storage and transportation.

If you are storing your outboard motor for a long period of time (2 months or longer), we recommend that you have the motor prepared for long-term storage at our dealers. However, you yourself, having a minimum set of funds, can perform the following operations.

ATTENTION:

- ***Do not place the engine on its side until the water from the cooling system has completely drained from the engine.***
- ***Store the motor in a dry, well-ventilated area, avoiding direct sunlight.***

1. Wash the engine with clean fresh water.
2. Close the fuel valve, disconnect the fuel line and close the vent.
3. Remove the air filter.
4. Place the motor in the test container.
5. Fill the test container with water until the anti-cavitation plate is hidden.

ATTENTION:

If the water level is below the anti-cavitation plate, or the incoming water is not enough, the engine may seize.

6. Start the engine. Flush the cooling system. Simultaneously with washing, apply the “Fogging Oil” treatment, which will help protect the engine from rust.



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.**
7. Let the engine idle for several minutes.
 8. Then close the valve and squirt Fogging Oil into the carburetor inlet, or the preservation port on the intake muffler, until the engine stalls.
 9. 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 stalls.
 10. 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.
 11. Drain all fuel from the tank.

Shipping.

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.

ATTENTION:

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.



WARNING

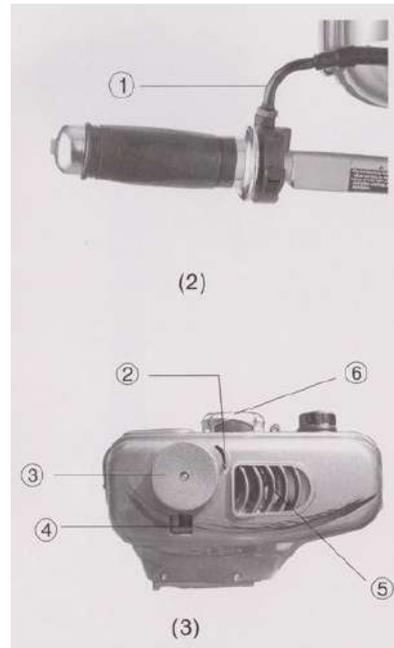
-  Avoid standing under a raised engine, even if additional support is used.**
-  When transporting and storing the motor separately from the boat, place it in a visible place.**

Trouble-shooting.

| <i>Type of malfunction</i> | <i>Possible reason</i> | <i>Remedy</i> |
|---|--|--|
| Starter doesn't work | Defective starter parts | Get it repaired by our dealer |
| The engine does not start (the starter works) | No fuel in tank | Fill the tank with clean, fresh fuel |
| | Fuel is dirty or not fresh | Fill the tank with clean, fresh fuel |
| | The spark plug is dirty or the wrong type | Check the spark plug. Clean or replace with the correct type of spark plug |
| | The candle cap is not on correctly | Remove and put on the cap again |
| | Ignition wiring is damaged or poorly connected | Check the wires for wear and tear. Tighten loose connections. Replace worn or broken wires |
| | Ignition system parts are faulty | Get it repaired by our dealer |
| | Emergency stop pin not inserted | Insert the receipt |
| The engine does not idle and stalls | Damaged internal engine parts | Get it repaired by our dealer |
| | The spark plug is dirty or the wrong type | Check the spark plug. Clean or |
| | Poor fuel supply | Check if the fuel line is pinched, kinked or otherwise |
| | Fuel is dirty or not fresh | Fill the tank with clean, fresh fuel |
| | Incorrect spark plug gap | Check and adjust according |
| | Ignition wiring is damaged or poorly connected | Check the wires for wear and tear. Tighten loose connections. Replace worn or broken wires |
| | The wrong engine oil is being used | Check and replace with the correct mixture |
| | Thermostat is faulty or clogged | Get it repaired by our dealer |
| | Carburetor not adjusted | Get it repaired by our dealer |
| | Carburetor clogged | Get it repaired by our dealer |
| | Fuel tank vent is closed | Open the fuel tank vent |
| | Throttle valve not adjusted | Get it repaired by our dealer |
| | Enrichment valve closed | Place in working position |

| | | |
|--|--|--|
| | The motor is very tilted | Put it in normal position |
| The engine does not pull | Damaged screw | Repair or replace the screw |
| | Incorrect motor tilt | Set the angle of inclination at which the motor pulls best |
| | The motor is not installed correctly in height | Set the optimal 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 housing | 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 |
| | Poor fuel supply | Check if the fuel line is pinched, kinked or otherwise |
| | Fuel is dirty or not fresh | Fill the tank with clean, fresh fuel |
| | Incorrect spark plug gap | Check and adjust according |
| | Ignition wiring is damaged or poorly connected | Check the wires for wear and tear. Tighten loose connections. Replace worn or broken wires |
| | Ignition system parts are faulty | Get it repaired by our dealer |
| | The wrong engine oil is being used | Check and replace with the correct mixture |
| | Fuel tank vent is closed | Open the fuel tank vent |
| | Fuel line not connected correctly | Connect correctly |
| A spark plug installed that does not comply with the recommendations | Check and replace with the one that is recommended | |
| The motor vibrates a lot | Damaged screw | Repair or replace the screw |
| | Damaged propeller shaft | Get it repaired by our dealer |
| | Algae wrapped around the propeller | Clean the screw |
| | The motor mounting bolts are loose | Tighten the bolts |
| | Reduced steering friction | Adjust |
| | Damaged steering mechanism | Get it repaired by our dealer |

Essential elements



Rice. 1.1 - tank cover, 2 - upper fairing, 3 - cooling grille, 4 - throttle handle, 5 - mounting bracket, 6 - mounting screws, 7 - exhaust hole, 8 - steering slide adjuster, 9 - engine lift lock, 10 - water cooling window, 11 - anti-cavitation plate, 12 - screw, 13 - STOP button

Rice. 2.1 - throttle cable

Rice. 3.2 - starting enrichment, 3 - air filter housing, 4 - boost pump, 5 - cooling grille, 6 - starter housing

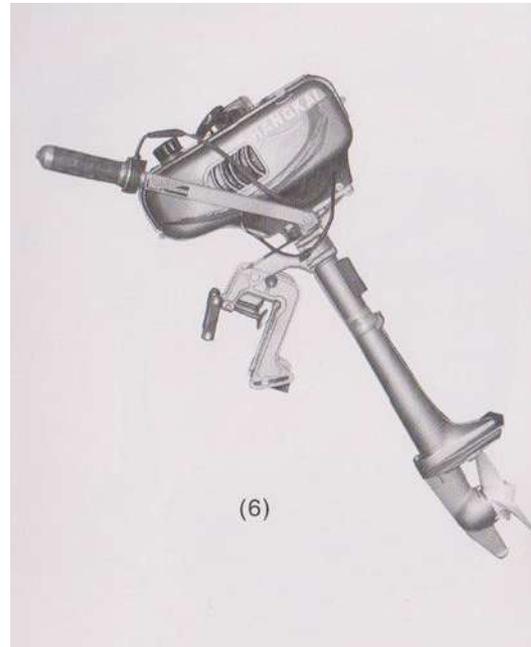
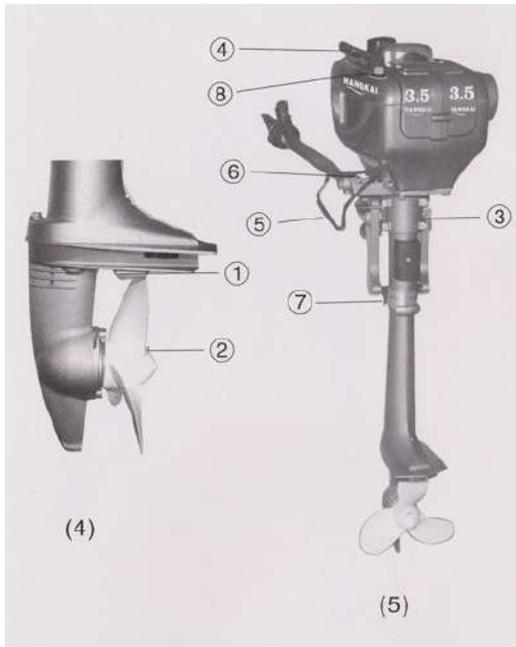


Fig 4.1 – external anode, 2 – screw cotter pin.

Fig 5.3 – steering lubrication point, 4 – starter handle, 5 – emergency stop cord, 6 – throttle cable, 7 – tilt mechanism stop, 8 – STOP button

Fig 6. Formovement in shallow waterthe motor may be partially raised.

When driving in shallow water, the lock mechanism must not be closed. Move at the lowest possible speed, avoiding raising the engine above the water, as this may cause the boat to lose control. Return the motor to normal position once you have reached sufficient depth. The water cooling inlet port should not be above the surface of the water when you install the motor for shallow water travel. Otherwise, the engine may fail due to overheating.



(8)

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

Place the throttle stick in the idle position. Turn the motor 180° as in **Rice.8**.

Make sure the tilt lock lever is in the locked/down position.

After **moving through salty or dirty water** Flush the cooling water channels with fresh water to prevent salt deposits from clogging them.

Do not place the engine on its side while water is draining from the cooling system. will not leak completely.

Characteristics.

| Parameter/Motor Model | M2.0HP | M3.5HP |
|------------------------------------|---------------------|---------------------|
| Transom height | 0.42m | 0.42m |
| Dry weight | 9.7kg | 9.7kg |
| Maximum power | 1.5kW/2.0hp | 2.6kW/3.5hp |
| Dimensions (length, width, height) | 920x365x220mm | 920x365x220mm |
| Engine capacity | 49.0cm ³ | 49.0cm ³ |
| Maximum power speed | 4000-5000 rpm | 4000-5500 rpm |
| main gear | 2.08 | 2.08 |
| Bore/Stroke | 44x33mm | 44x33mm |
| Shifting gears | centrifugal clutch | centrifugal clutch |
| Control system | Tiller | Tiller |
| Ignition system | CDI | CDI |
| Built-in fuel tank | 1.3l | 1.3l |
| Additional fuel tank | - | - |
| Start system | Manual | Manual |
| Recommended screw size | 4.5"-7.0" | 4.5"-7.0" |
| Recommended fuel grade | 92+ unleaded | 92+ unleaded |
| Recommended gear oil grade | SAE80W90 | SAE80W90 |
| Engine lubrication system | 1:20-50 | 1:20-50 |
| Gross weight | 12.5 kg | 12.5kg |