



OWNER'S MANUAL

T25BM JET

T30BM JET

SUZHOU PARSUN POWER MACHINE CO., LTD.

Before Operating Outboards

WARNING:

- Read this manual carefully. Learn the difference in handling characteristics between a jet drive outboard motor and a propeller driven outboard motor. If you have any questions, contact your dealer.
- Unlike propeller driven outboard motor, steering at the low speeds, the jet drive outboard motor tends to lose steering control as less water is drawn in and expelled. Increase speed slightly to regain steering.
- The jet drive is highly maneuverable at higher speeds, more so, than propeller driven outboard motors. Use caution when turning to prevent spin - outs.
- The impeller will continue to rotate while the engine is in neutral. Although the approximate balancing of forward and reverse thrust will minimize outboard motor movement, the outboard motor may tend to move slowly forward or backward. This is normal for a direct - drive jet driven outboard motor. The operator should be aware of this and use caution whenever the engine is running.

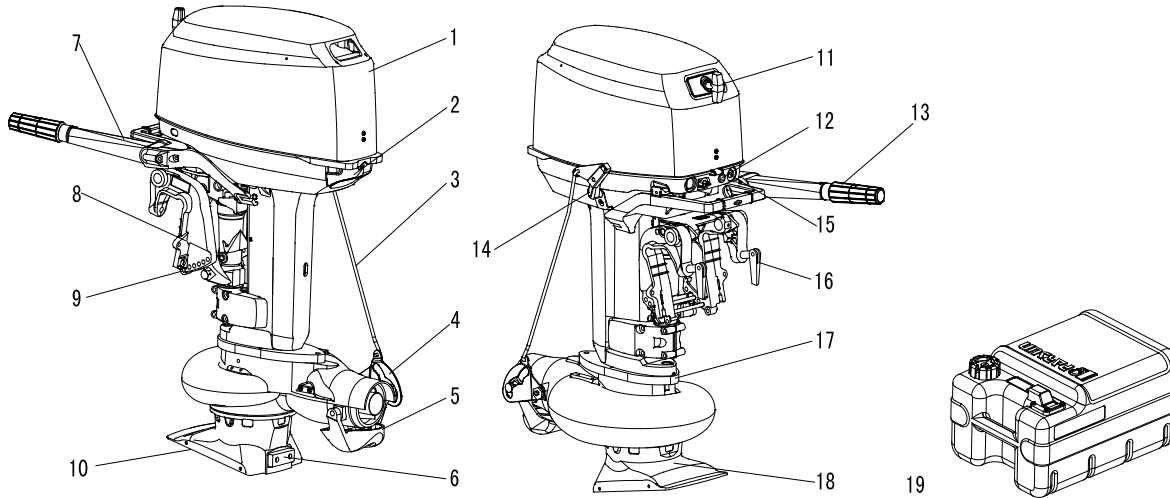
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1. Main components and General information

1.1 Main components



1.Top cowling

2.Top cowling lock handle

3.Gear shift link lever

4.Shift cam plate

5.Reverse gate

6.Anode

7.Steering handle

8.Clamp bracket

9. Tilt & trim rod

10.Water inlet

11.Starters handle

12.Air choke handle

13.Throttle grip

14.Gear shift handle

15. Engine stop button

16.Clam bolt

17.Water pump adapter

18.Intake seat

19.Fuel tank

1.2 Specification

Main technical data:

Items	Data	Items	Data
Type of engine	Two cylinders,2-stroke	Spark plug	BPR7HS
Displacement	496cm ³	Recommended fuel	Unleaded regular gasoline
Bore X stroke	72mm×61mm	Mixing ratio	50:1
Overall length	913mm	Fuel tank capacity	24L
Overall width	420mm	Recommended engine oil	2-stroke engine oil
Overall height	1025mm	Recommended transom height	381mm
Trim stages	4	Weight	63Kg
Gear reduction ration	1: 1		

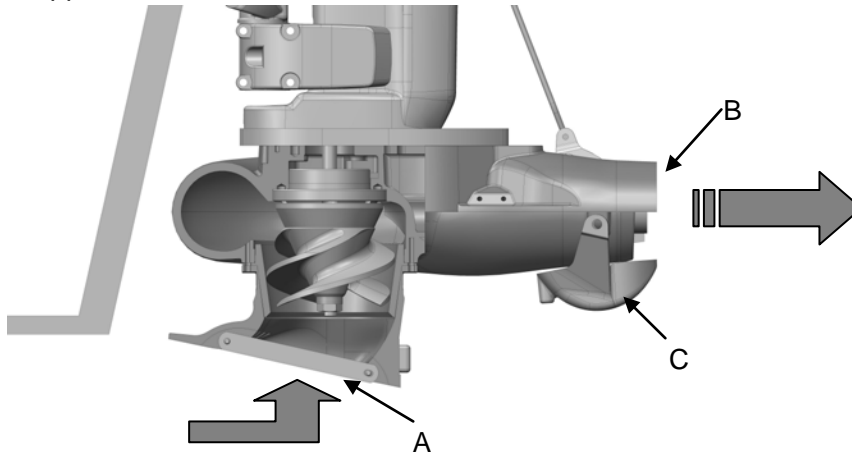
Main performance:

Items	Data	Items	Data	
Maximum output	18.4Kw/5000rpm(25HP)	Tightening torque for engine	Spark plug	18.0Nm
	22 Kw/5500rpm(30HP)			
Full throttle operating range	4500~5500rpm			
Idling speed (in neutral)	1100±50rpm			

2. Operation

2.1 How the Jet Drive operates

A jet driven outboard motor has substantially different handling characteristics compared to a propeller driven outboard motor. It is recommended that the operator adjusts to these characteristics by experimenting in open water at both high and low speeds. The driveshaft driven impeller draws water up through the water intake and then redirects it at a high pressure through the water outlet nozzle to create forward thrust. To obtain reverse, the reverse gate moves over the outlet nozzle to direct the water in the opposite direction.



A-Water intake

B-Water outlet nozzle

C-Reverse gate

When the jet drive is in neutral, the impeller continues to rotate. However, the reverse gate is positioned so that some of the forward thrust is diverted to create reverse thrust. This approximate balancing of forward and reverse thrust will minimize any boat movement. Because the impeller is always rotating and creating thrust when the engine is running, the boat may tend to move slowly forward or backward. This is normal for a direct-drive jet driven boat. The operator should be aware of this and use caution whenever the engine is running.

 **WARNING:**

- Avoid injury resulting from contacting the rotating impeller or having hair, clothing, or loose objects drawn into the water intake and wrapping around the impeller shaft. Stay away from the water intake and never insert an object into the water intake or water outlet nozzle when the engine is running.
- The jet drive is always drawing water into the housing when the engine is running. Do not operate the jet drive with the grate removed from the water intake. Keep hands, feet, hair, loose clothing, life jackets, etc., away from the water intake. Never insert an object into the water intake or water outlet nozzle when the engine is running.
- In an emergency, putting the jet outboard into reverse and applying reverse throttle can rapidly slow down the boat and reduce stopping distance. However, such a maneuver may cause occupants in the boat to be thrown forward or possibly out of the boat.

2.2 Steering the boat

The jet drive is dependent on water jet thrust for steering the boat. If the water jet thrust should ever stop (water blockage, engine stops, etc.), the boat will slow to a stop. However, while slowing there will be a reduced ability to steer the boat.

WARNING:

- Steering the vessel in a tight turn can result in loss of boat control. In some cases, the boat can spin out or roll over, causing serious injury or death. Avoid steering beyond the capabilities of the vessel, especially at high speeds.
- A loss or reduction in water jet thrust will directly affect boat directional control, and may result in property damage, personal injury, or death. Boat directional control can also be substantially reduced or lost altogether by a sudden loss of power such as running out of gas, quickly backing off the throttle, turning off the ignition switch, activating the lanyard stop switch, or plugging the water intake to the jet pump. Use caution when maneuvering at high speeds in areas where debris (weeds, logs, gravel, etc.) could be picked up into the jet drive. The ability to take evasive action is dependent on sufficient water jet thrust to control the boat.
- While steering the boat at engine speeds above idle, the boat will respond quickly; but, due to the relatively flat-bottom hulls and lack of a gear case in the water, the boat will tend to skid on turns. Turns must be started early and use sufficient power to maintain steering control.

2.3 Mooring the Boat

Be sure to tilt the jet drive out of the water when the boat is pulled onto a beach or tied to a dock in shallow water. Failure to do this may cause the water intake housing to fill with sand or debris and could prevent the outboard from cranking over for starting.

WARNING:

- A rotating impeller could cause injury if contact is made with hands, clothing, or tools. To avoid injury, keep hands and clothing away from the inlet or outlet of the jet drive, regardless of whether the boat is in the water. Secure tools and loose items to avoid being struck by projectiles as a result of contact with the rotating impeller, and to prevent damage to the impeller.
- A large amount of debris being drawn into the water intake may result in a loss of power. Intake suction holding debris against the grate will result in restricted water flow. Shutting the engine off may allow the debris to fall off the intake grate allowing full power to be restored. If debris does not fall off the intake grate, the engine must be shut off and debris physically removed from the grate.

2.4 Cleaning the Impeller

WARNING:

- Rotating the flywheel to free a lodged impeller can accidentally start the engine, resulting in serious injury or death. Always remove the lanyard of emergency stop switch and remove all spark plugs.
- It is possible for debris to lodge between the impeller and jet housing wall, especially after the engine has been stopped. This will lock the driveshaft and will prevent the engine from being able to crank over for starting. Following are steps for dislodging the impeller.

1. Position lanyard stop switch to the “OFF” position.

2. Remove spark plug leads to prevent the engine from accidentally starting.

3. Remove flywheel or rewind cover and rotate the engine flywheel counterclockwise.

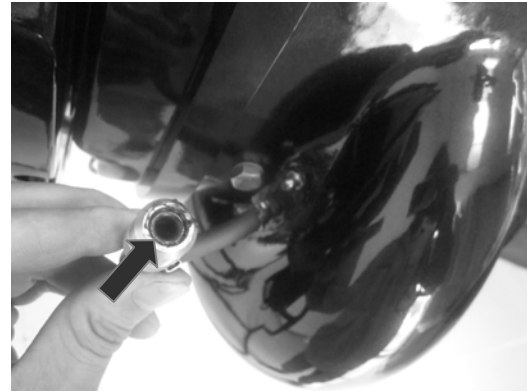
If this does not dislodge the impeller, it will be necessary to remove the six screws and water intake housing.

2.5 Lubricating the Driveshaft Bearing

Before each use, lubricate the driveshaft bearing.



1



2

1. Remove lubricating oil hose from the grease fitting.
2. Pump in grease through the grease fitting, using the grease gun.
3. Reconnect the hose to the grease fitting when excess grease exits the hose.

CAUTION:

The lubricant recommended is a water resistant grease of the proper consistency for this application. If a substitute is used, be sure that it is water resistant and of the same consistency.

Photos are for reference only

2.6 Operating In Freezing Temperatures

If there is a chance of ice forming on the water, the jet drive should be raised out of the water and drained completely of water. If ice should form at the water level inside the outboard driveshaft housing, it will block water flow to the engine causing possible damage. Do not start the engine until the ice is clear.

2.7 Pre-Starting Check List

- Operator knows safe navigation, boating, and operating procedures.
- An approved personal flotation device of suitable size for each person aboard and readily accessible (it is the law).
- A ring type life buoy or buoyant cushion designed to be thrown to a person in the water.
- Know your boats maximum load capacity. Look at the boat capacity plate.
- Fuel supply OK.
- Ensure the boat drain plug is installed.
- Arrange passengers and load in the boat so the weight is distributed evenly and everyone is seated in a proper seat.
- Tell someone where you are going and when you expect to return.
Know the waters and area you will be boating; tides, currents, sand bars, rocks, and other hazards.
- Check steering for free operation.
- Check for debris around the rudder and reverse gate which may jam or hinder operation.
- Before launching, examine the jet drive water intake for obstructions which may prevent pumping of water.
- Ensure the driveshaft bearing on the jet drive is lubricated.

2.8 Operating In Salt Water or Polluted Water

If the boat is kept moored in the water, always tilt the outboard so the water intake is completely out of water when not in use.

Wash down the outboard exterior and flush out the exhaust outlet of the jet drive with fresh water after each use.

When used in salt water more than in fresh water, remove mounting hardware, grease, and reassemble once a year. Failure to do this may result in hardware that is difficult if not impossible to remove at a later date.

2.9 Operating In Shallow Water

The life of the impeller and water intake can be greatly increased by avoiding the intake of sand and gravel. The intake suction will act like a dredge when the water intake comes close to the bottom. It is better to stop the engine and drift up to shore when landing, and to shove off with an oar when leaving. The engine can idle through areas of water less than 61 cm (2 ft.) deep, but there should be more than 61 cm (2 ft.) of water under the boat when increasing speed to reach full plane.

Once the boat is on plane, the boat speed will prevent the ingestion of gravel and other debris from the bottom. The suction is still present, but the water intake passes too quickly over the bottom to allow debris to be drawn into the water intake.

When boating through shallow water areas, choose a course of travel that avoids sharp rocks and other underwater obstacles that could damage the boat. Running the boat through these areas on full plane may be helpful as the boat will be riding higher in the water. If the boat gets stuck on the bottom, immediately stop the engine and move the boat to deeper water.

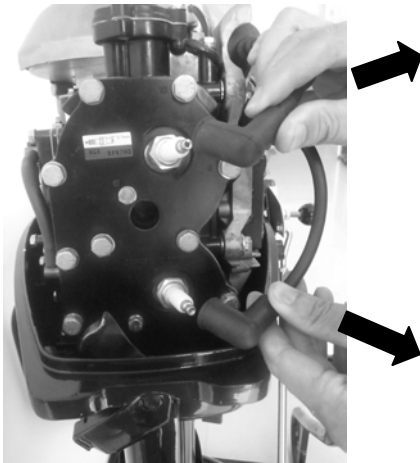
3. Maintenance

3. 1 Impeller Removal and Installation

⚠ WARNING:

Rotating the driveshaft may cause the engine to crank over and start. To prevent this type of accidental engine starting and possible serious injury caused from being struck by a rotating impeller, always turn the ignition key or lanyard stop switch to the “OFF” position and remove the spark plug leads from the spark plugs while servicing the impeller.

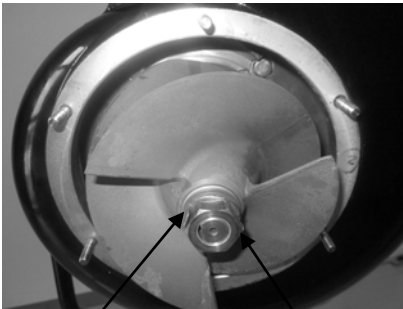
1. Position the key switch or lanyard stop switch to the “OFF” position.
2. Remove the spark plug leads to prevent the engine from starting.



3. Remove the six nuts securing the water intake housing, and remove the water intake housing.



4. Straighten the bent tabs on the impeller nut retainer and remove the impeller nut.



b

a

a - Tabs

b - Impeller nut

5. Pull the impeller straight off the shaft.

If the impeller is tight, use a hammer and a block of wood to rotate the impeller clockwise on the shaft until the keyway is directly above the flat on the shaft. This will free the jammed key and allow removal.

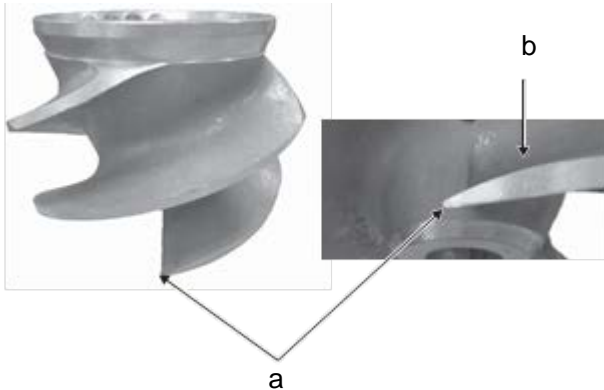
3.2 Worn/Dull Impeller

The intake of gravel through the pump can round off and wear the leading edges of the impeller. Some conditions that could be experienced from a worn/dull impeller are as follows:

- Noticeable performance loss, especially on acceleration
- Difficulty getting the boat on plane
- An increase in engine RPM at wide open throttle

CAUTION:

Do not sharpen or alter the top side lifting angle. Check the impeller blades occasionally for damage. Use a flat file to re sharpen the leading edges. Sharpen to a 0.8 mm (1/32 in.) radius by removing material from bottom side only.

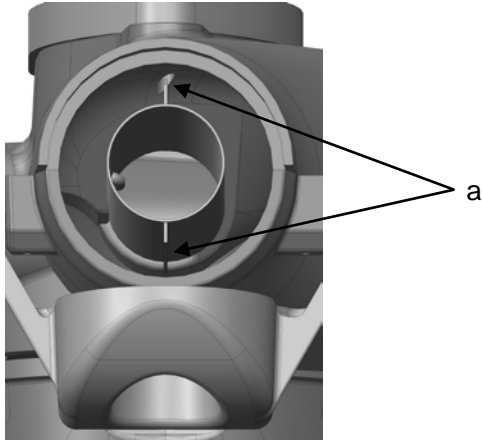


a - Leading edge

b - Top side lifting angle

3.3 Steering Pull Adjustment

The steering on some boats will have the tendency to pull towards starboard. This pulling condition can be corrected by using a pliers and bending the ends of the exhaust fins 1/16 in. (1.5mm) toward the starboard side of the outboard.

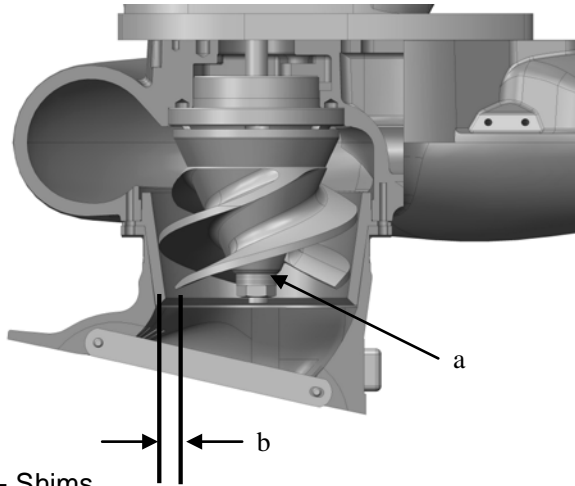


a - Exhaust fin

3.4 Impeller Clearance Adjustment

The impeller should be adjusted so there is approximately 0.8 mm (0.031 in.) clearance between the impeller edge and liner. Operating the jet drive in waters that contain sand and gravel can cause wear to the impeller blades, and the clearance will start to exceed 0.8 mm (0.031 in.).

As the blades wear, shims located in the stack outside of the impeller can be transferred behind the impeller. This will move the impeller further down into the tapered liner to reduce the clearance.



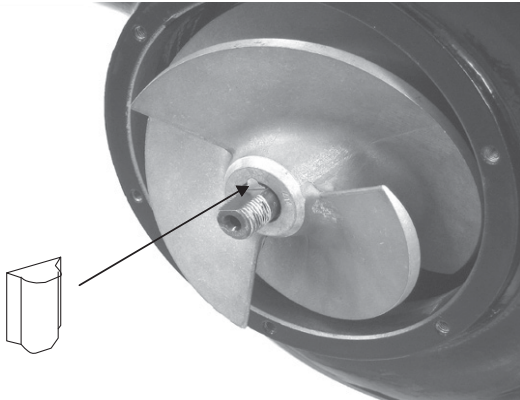
a - Shims

b - Clearance between impeller edge and liner

Check the impeller clearance by sliding a feeler gauge through the intake grate and measure the clearance between the impeller edge and liner. If adjustment is required, refer to 3.1 Impeller Removal and Installation.

3.5 Replaceable Jet Drive Shear Key

The jet drive is equipped with a shear key to protect it in the event of a lodged impeller. The shear key can be reached by removing the water intake housing and impeller. Grease the drive shaft, shear key, and impeller bore when replaces these parts. Refer to 3.1 Impeller Removal and Installation.



3.6 Shift Cable Adjustment

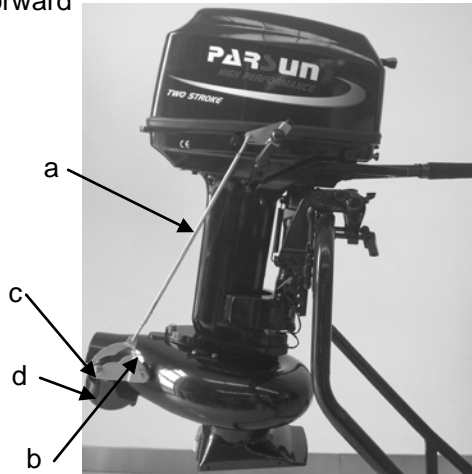
WARNING:

Pressurized water hitting the reverse gate may cause it to engage, causing sudden and unexpected slowing of the boat. This can cause serious injury or death from occupants being thrown within or out of the boat. Adjust the shift link rod to lock the reverse gate, preventing it from interfering with water flow.

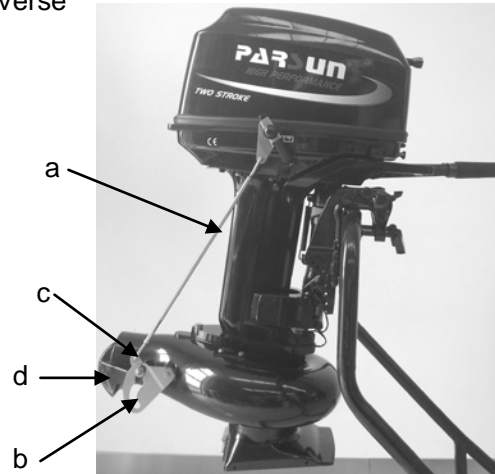
CHECKING SHIFT LINK ROD ADJUSTMENT

Check the shift link rod adjustment in forward shift position. The correct adjustment will position the shift cam far enough on the roller in order to lock the reverse gate into forward position. The reverse gate should not be able to be forced up towards neutral. Pull on the reverse gate by hand to verify.

Forward

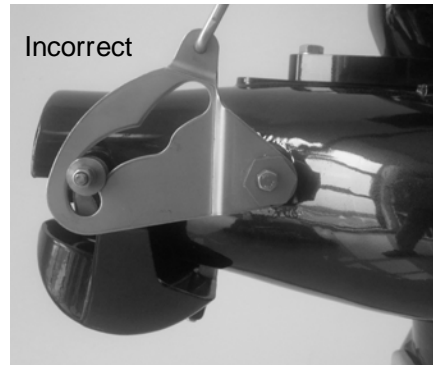
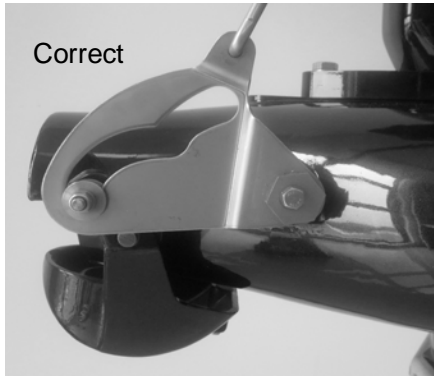


Reverse



a - Shift lever b - Shift cam c - Roller d - Reverse gate

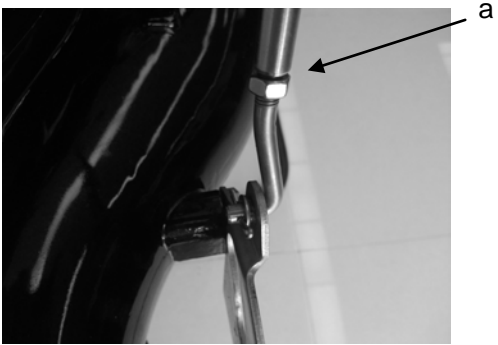
1. Place roller at bottom of shift cam groove as shown.



2. Place the shift lever and shift cam into full forward position.

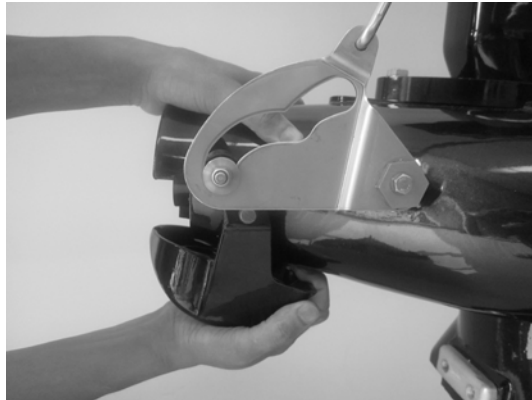


3. Adjust and tighten M7 nut to make sure the shift cam at the correct position.



a – M7 nut

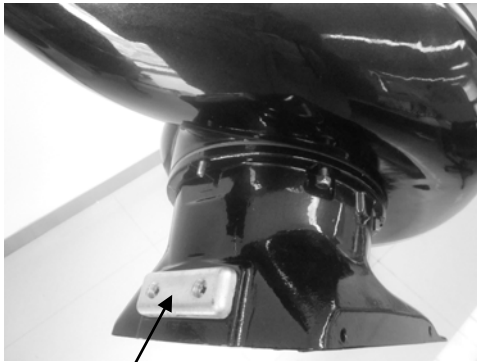
4. The reverse gate should not be able to be forced up towards neutral. Pull on the reverse gate by hand to verify.



3.7 Corrosion Control Anode

An anode helps protect the outboard against galvanic corrosion by sacrificing its metal to be slowly corroded instead of the outboard metals.

An anode is located on the water intake housing. An anode requires periodic inspection, especially in salt water which will accelerate the erosion. To maintain this corrosion protection, always replace the anode before it is completely eroded. Never paint or apply a protective coating on the anode as this will reduce effectiveness of the anode.



a

a - Water intake housing anode

3.8 Lubricating the Driveshaft Bearing

Lubricate the driveshaft bearing before each use.

Description	Where to used	Part No.
Grease	Drive shaft bearing	water resistant grease
Grease Gun	Drive shaft bearing	Special gun with the JET

CAUTION:

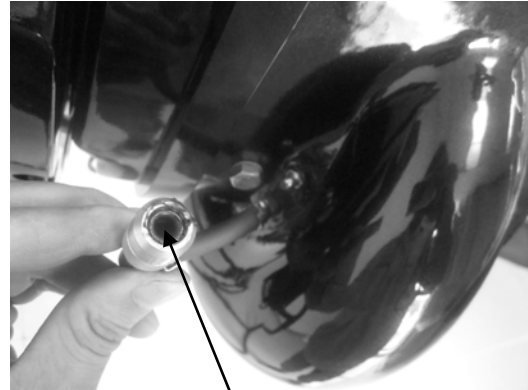
The lubricant recommended is a water resistant grease of the proper consistency for this application. If a substitute is used, be sure that it is water resistant and of the same consistency.

1. Pull the vent hose off of the grease fitting.
2. Pump in grease through the grease fitting, using the grease gun provided, until excess grease starts to exit the vent hose.

3. Reconnect the vent hose onto the grease fitting after greasing.



a



b

a - Grease fitting b - Vent hose

CAUTION:

After 30 hours of operation, pump in extra grease to purge out any moisture.

Visually inspecting the purged grease at this time will give an indication of conditions inside the bearing housing. A gradual increase in moisture content indicates seal wear. If the grease begins to turn dark or dirty gray, the driveshaft bearing and seals should be inspected and replaced if necessary. Some discoloration of the grease is normal during the break-in period on a new set of seals.

4. Engine installation

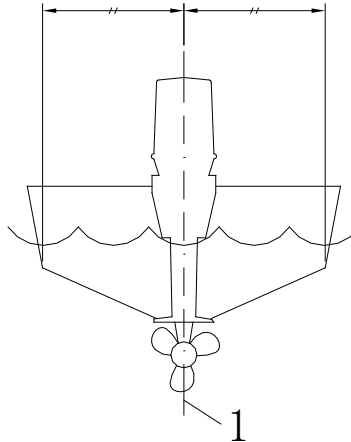
4.1 Transom height of the boat

Outboards with jet drives will be mounted approximately 7 inches higher on the transom than propeller driven outboards. This requires outboards that have a 15 in. shaft length to be installed on boats having a 22 in. transom height.

If the boat transom is of insufficient height, and the outboard cannot be installed to the recommended height, contact the boat manufacturer for recommended procedure to build up the boat transom.

4.2 Locate center line of the outboard

Mount the outboard motor on the center line (keel line) of the boat. For boats without a keel or which are asymmetrical, consult your dealers.



1. Center line (keel line)

4.3 Determining the Mounting Height of the Outboard

The following outboard mounting height settings will work well for most applications, however, because of different boat/hull designs, the setting should be rechecked by test running the boat. Refer to **Water Testing**.

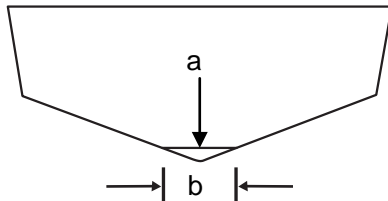
CAUTION:

- Installing the outboard too high on the transom will allow the water intake to suck in air and cause cavitation. Cavitation causes the engine to overspeed in spurts and reduce thrust. This condition should be avoided by proper height setting.
- Installing the outboard too low on the transom will allow excessive drag.

BOATS WITH A “V” BOTTOM HULL

1. Measure the width of the leading edge on the water intake housing.

Make a horizontal line on the transom up from the “V” bottom the same length as the width of the water intake housing.



a - Horizontal line b - Width of the leading edge on the water intake housing

2. Place (center) the outboard on the boat transom.

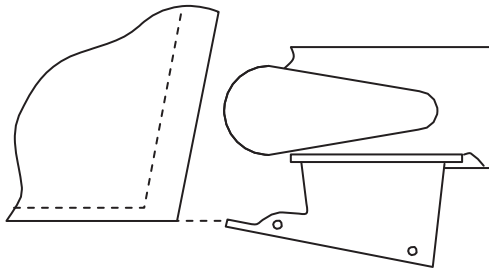
Set the height of the outboard on the boat transom so that the front edge of the water intake housing is in line with the horizontal line

3. Fasten the outboard to the transom at this height.

BOATS WITH A FLAT BOTTOM HULL

1. Place (center) the outboard on the boat transom.

Set the height of the outboard on the boat transom so that the front edge of the water intake housing is in line with the bottom of the boat as shown. Fasten outboard to the transom at this height.



4.4 Water Testing

CHECKING FOR CAVITATION

The initial outboard height setting should be close to the optimum setting for the outboard. However, because of the hull design of some boats, obstructions, or imperfections in the hull ahead of the water intake, adjustments may be required to prevent cavitation at running speeds. When operating the boat, the outboard driveshaft housing should be vertical, or tilted toward the boat, when planning to provide a scooping angle on the water intake. Tilting the outboard out beyond a vertical position reduces the scoop angle and can cause impeller slippage and cavitation.

WARNING:

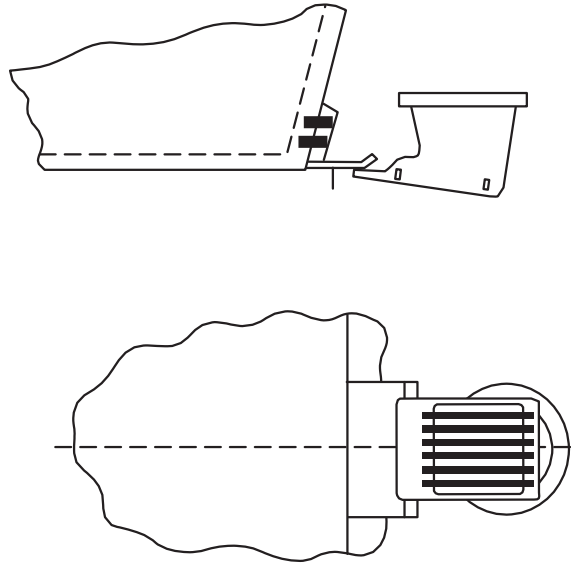
If the angle of the boat transom does not allow the driveshaft housing to be positioned vertical, a wedge kit should be installed behind the transom brackets to increase the tilt-in angle.

CAUTION:

Slight cavitation in sharp turns and rough water is acceptable, but excessive cavitation is harmful to the outboard and should be avoided. Test runs the boat. If cavitation occurs (air enters the pump), the first thing to try is lowering the outboard mounting height.

If cavitation still exists after lowering the outboard, it may be helpful to seek advice from the boat manufacturer.

Another option to further reduce cavitation is a rough water plate. A rough water plate may be helpful in reducing cavitation when running in windy, rough water conditions where air is sucked into the water intake when jumping waves. Install a 0.8 mm (1/32 in.) metal plate that extends from the hull bottom to the top of the water intake housing. This plate tends to reduce air intake as well as reduce spray.



a - Rough water plate

5. Troubleshooting

Trouble type	Possible reason
Engine over-speed(Excessive RPM)	Outboard mounted too high on the transom
	Worn jet pump impeller or liner
	Incorrect jet pump impeller clearance adjustment
	Tilting the outboard out beyond a vertical position
	Cavitation of the impeller due to rough water or obstruction in the boat hull
Engine performance loss	Blockage of the water intake
	Throttle not fully open
	Damaged impeller
	Incorrect engine timing, adjustment or setup.
	Boat overloaded or load improperly distributed
	Excessive water in bilge
Boat bottom is dirty or damaged	