



User's Guide

VERSION 1.1

# ELECTRIC PROPULSION OUTBOARD

SPORTS & COMMERCIAL  
SERIES



# ELECTRIC PROPULSION OUTBOARD

## User's Guide

Originality  
Innovation  
Creation



Dear customer,

We are delighted that you have chosen EZ outboard. In terms of drive technology and efficiency, your EZ outboard is cutting-edge technology. It has been designed and manufactured with the utmost care and with a special focus on comfort, user-friendliness, safety, and has been extensively tested before delivery.

Please take the time to read this operating manual carefully so that you can use the outboard properly and enjoy it for a long time.

We constantly strive to improve the outboard. Should you have any comments on the design or use of our products, please do not hesitate to contact us.

We hope you have a lot of fun with this product.

Your EZ outboard team

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### To the User

EZ outboards are designed to operate safely and reliably as long as they are used according to the User's Guide. Please read this manual carefully before you start the motor. Ignoring these instructions can cause property damage or personal injury. Golden Motor accepts no liability for any damage caused by actions that contradict this guide. In the User's Guide particularly important information is distinguished in the following ways.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



A CAUTION indicates special precautions that must be taken to avoid damage to the electric outboard or other property.

### TIP:

A TIP provides key information to make procedures easier or clearer.

### Note

We continually seek advancements in product design and quality. Therefore, while this manual contains the most current product information available at the time of printing, there may be minor discrepancies between your product and this manual. If there is any question concerning this manual, please consult your EZ outboards dealer. To ensure long product life, we recommend that you use the product and perform the specified periodic inspections and maintenance by correctly following the instructions in the guide. Some countries have laws or regulations restricting users from taking the product out of the country where it was purchased, and it may be impossible to register the product in the destination country. Additionally, the warranty may not apply in certain regions. When planning to take the product to another country, consult the dealer where the product was purchased for further information. If the product was purchased used, please consult your closest dealer for customer registration, and to be eligible for the specified services.

## 1 Safety Information

### 1.1 Outboard motor safety

#### 1.11 Propeller

People can be injured or killed if they come in contact with the propeller. The propeller can keep moving even when the motor is in neutral, and sharp edges of the propeller can cut even when stationary. Stop the motor when a person is in the water near you. Keep people out of reach of the propeller, even the motor is off.

#### 1.12 Rotating parts

Hands, feet, hair, jewelry, clothing, PFD (personal flotation device) straps, etc. can become entangled with internal rotating parts of the motor resulting in serious injury or death. Keep the top cowling in place whenever possible. Do not remove or replace the cowling with the motor running. Only operate the motor with the cowling removed according to the specific instructions in the manual. Keep hands, feet, hair, jewelry, clothing, PFD straps, etc. away from any exposed moving parts.

#### 1.13 Electric shock

Do not touch any electrical parts while starting or operating the motor. They can cause shock or electrocution.

#### 1.14 Modifications

Do not attempt to modify this outboard motor. Modifications may reduce safety and reliability, and render the outboard unsafe or illegal to use.

### 1.2 Boating safety

This section includes a few of the many important safety precautions that you should follow when boating.

#### 1.21 Alcohol and drugs

Never operate after drinking alcohol or taking drugs. Intoxication is one of the most common factors contributing to boating fatalities.

#### 1.22 Personal flotation devices

Have an approved personal flotation device (PFD) on board for every occupant. We recommend that you must wear a PFD whenever boating. At a minimum, children and non-swimmers should always wear PFDs. Everyone should wear PFDs when there are potentially hazardous boating conditions.

#### 1.23 People in the water

Always watch carefully for people in the water, such as swimmers, skiers or divers whenever the motor is running. When someone is in the water near the boat, stop the motor immediately.

#### 1.24 Passengers

Consult your boat manufacturer's instructions for details about appropriate passenger locations in your boat and be sure all passengers are positioned properly before accelerating.

Standing or sitting in non-designated locations may result in being thrown either overboard or within the boat due to waves or sudden changes in speed or direction.

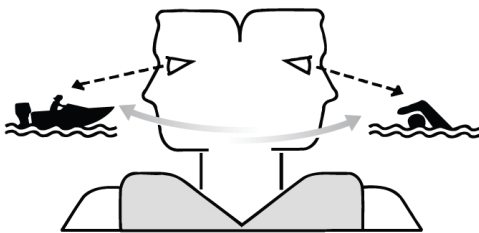
Even when people are positioned properly, alert your passengers if you must make any unusual maneuver. Always avoid jumping waves.

### 1.25 Overloading

Do not overload the boat. Consult the boat manufacturer for maximum weight and number of passengers. Be sure that weight is properly distributed according to the boat manufacturer's instructions. Overloading or incorrect weight distribution can compromise the boats handling and lead to an accident, capsizing or swamping.

### 1.26 Avoid collisions

Scan constantly for people, objects and other boats. Be alert for conditions that limit your visibility or block your vision of others.



Operate defensively at safe speeds and keep a safe distance away from people, objects and other boats.

- Do not follow directly behind other boats or Water skiers.
- Avoid sharp turns or other maneuvers that make it hard for others to avoid you or understand where you are going.
- Avoid areas with submerged objects or shallow water.
- Ride within your limits and avoid aggressive maneuvers to reduce the risk of loss of control and collision.
- Take early action to avoid collisions.

Remember, boats do not have brakes, and stopping the motor or reducing throttle can reduce the ability to steer. If you are not sure that you can stop in time before hitting an obstacle, apply throttle and turn in another direction.

### 1.27 Weather

Stay informed about the weather. Check weather forecasts before boating. Avoid boating in hazardous weather.

### 1.28 Passenger training

Make sure at least one other passenger is trained to operate the boat in the event of an emergency.

### 1.29 Laws and regulations

Know the marine laws and regulations where you will be boating and obey them. Several sets of rules prevail according to geographic location, but all are basically the same as the International Rules of the Road. The motor controllers are programmable via smart-phones to setup speed limit, maximum current, lower voltage limit as you desire to meet your needs and local authority's regulations.

## 2 Series and Specifications

### 2.1 Sports & Commercial Series

**SPORTS & COMMERCIAL SERIES**

*Brushless & Gearless Motor*



Learn to Operate in Minutes  
Simple and Smooth Control  
Selectable Speed Modes  
Extreme High Efficiency  
Zero Maintenance  
Adjustable Transom Lengths  
Optional Electric Tilting

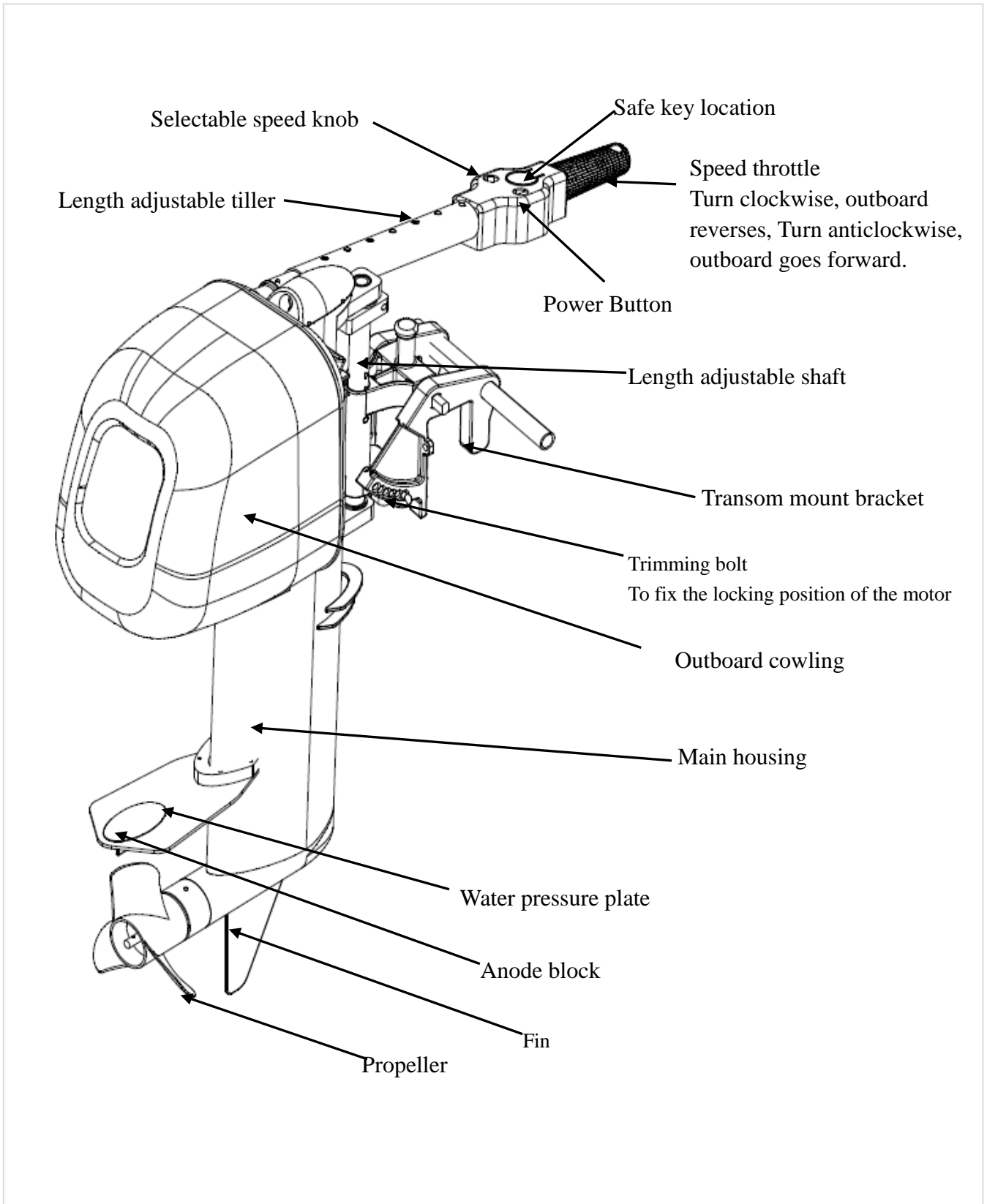
**Specifications**

Product Model	<b>S06</b>	<b>S10</b>	<b>S20</b>
Rated Voltage (Vdc)	48	48	48
Input Power (kW/A)	4.3 / 90	6.5 / 135	10.5 / 220
Comparable Petrol Engine (hp)	6	10	20
Maximum Propeller Speed (RPM)	2500	2500	2500
Static Thrust Force (lb)	128	172	260
Propeller Size (inch)	7.8X8	8.5X8	9.25X7
Control	Tiller or Remote	Tiller or Remote	Tiller or Remote
Tilting	Manual or Electric	Manual or Electric	Manual or Electric
Net Weight (kg)	31	35	48

www.EZoutboard.com      www.goldenmotor.com

Sports and Commercial Series are for those customers who want to get the similar boat speeds as driven by gasoline outboards, the propeller speeds are between 2500-2800rpm. Power range: 6HP, 10HP, 20HP.

### 2.11 Components





### 2.12 Specifications

Model Parameters	Measurement Units	EZ--S06T/R	EZ--S10T/R	EZ--S20T/R
Equivalent Gasoline Engine Power	HP	6	10	20
Norminal Voltage	V	48	48	48
Input Current	A	90	135	220
FOC Controller (Sine Wave)		VEC240	VEC300	VEC500
Max Motor Efficiency		≥90%	≥90%	≥90%
Max Propeller Speed	r/min	2500	2500	2500
Length	mm (in.)	460 (18.1)	460 (18.1)	500 (19.7)
Width	mm (in.)	266 (10.5)	266 (10.5)	266 (10.5)
Height	mm (in.)	960 (37.8)	960 (37.8)	1000 (39.4)
Transom Height	mm (in.)	381-508 (15-20)	381-508 (15-20)	381-508 (15-20)
Propeller Spec	in.	7.8*8	8.5*8	9.25*7
Net Weight	kg	31	35	48
Thrust	lb	128	172	260
Trim and Tilt System		Electric/Manual	Electric/Manual	Electric/Manual
Control System		Tiller/Remote	Tiller/Remote	Tiller/Remote

## 2.2 Battery Selection

### How do I determine the capacity of the battery pack needed?

Battery is the new form of "fuel" for electric propulsion outboards, you never need to go to gasoline station to refuel your outboard anymore. You only need to recharge your batteries at home or docking place.

Once you've chosen an electric outboard that properly fits the weight and efficiency of your loaded boat, the next task is to size the battery bank that will store the energy to drive it. The size of the battery bank will depend on the amp draw you plan to regularly place upon it and the range of miles you desire to travel. It is not easy to know the current draw before you try it as each boat is different from others in hull shape, length, load, speed and daily operation hour you want, not like electric cars which is fixed for each car model in factory. Our expandable battery module will make your life much easier to determine how big the battery bank you need to meet your purpose. You can just invest one battery module first to test boat performance with electric propel outboard and find out accurate amp draw for your special boat setup in different speed. After initial boat trial testing, then you can easily figure out how many such battery modules required to get the boat speed and travel duration you want. You can easily parallel connect multiple expandable battery modules to form a larger capacity battery bank. Each battery module is light weight for one person to carry around. You can always buy more standalone modules as you need them. Each module has its own battery management system (BMS) and charger.

We choose the most safe LiFePO4 battery cells for our expandable battery modules, the materials used inside cell will not cause any fire or explosion. The quality of cell is very consistent and can last more than 2000 charging cycles. Its C-rating is 3 times, that means a single 48V50AH module can output 150A continuously. That's why you can just buy one or two battery modules to test the outboard motor performance and amp draw.

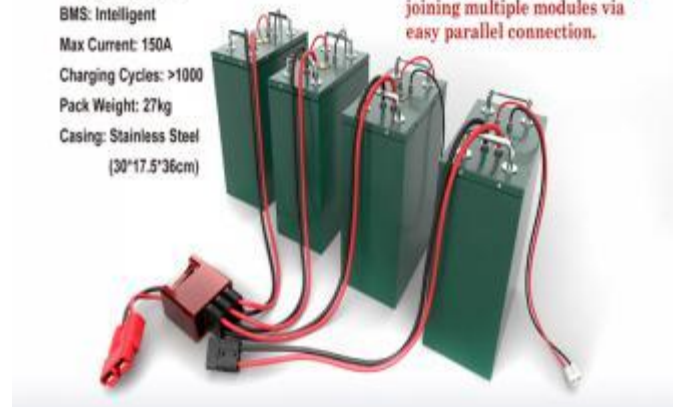
Why we choose 48V system for outboard motor and battery pack, because it is safe for human and easy to pass local government regulations.

Of course, you can always use other type of batteries you can find locally, as long as its output voltage is 48V, and capacity is enough to drive the electric outboards.

### Expandable LiFePO4 Battery Pack

Capacity: 48V50AH  
BMS: Intelligent  
Max Current: 150A  
Charging Cycles: >1000  
Pack Weight: 27kg  
Casing: Stainless Steel  
(30\*17.5\*36cm)

Expand your battery pack capacity as you need by simply joining multiple modules via easy parallel connection.



### 2.3 System Protection Characteristics

<b>When the outboard fails, the controller keeps beeping showing error code</b>		
<b>System protection features</b>		<b>Beeping times</b>
Over-voltage protection	Battery voltage is higher than default value.	1
Under-voltage protection	Battery voltage is lower than default value.	2
Motor over-current protection	Motor phase is short-circuit or phase to B+ is short-circuit.	3
Stalling protection	The impeller is blocked by foreign matter.	4
HALL protection	HALL input is abnormal.	5
MOSFET protection	MOSFET self-checking is abnormal.	6
Phase winding disconnect protection	One of motor phase wires is disconnected.	7
Self-checking error protection	Self-checking is abnormal if internal system power on.	10
Controller over-heat protection	Controller operation temperature is higher than default value	11
Motor over-heat protection	Motor temperature is higher than default value.	13
Throttle protection	Throttle input is abnormal, make sure the throttle is at "N".	14
Signal power protection	The controller signal power is abnormal	16

### 3 Installation and Operation

#### 3.1 Installation

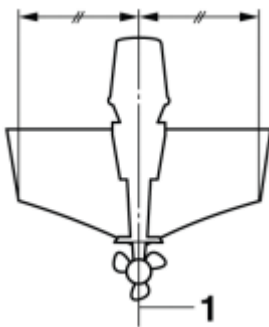
##### 3.1.1 Installation indication



Your dealer or other person experienced in proper outboard motor mounting should show you how to mount your outboard motor.

There is **no more long shaft and short shaft differences**, as EZ outboard products are user adjustable in transom length to cater for different boat installations, or boat loads which may change from time to time. This feature makes boat builders, owners and outboard dealers life much easier, no more confusion on shaft lengths, no more excessive stock for long, medium and short shaft outboards!

The outboard motor should be mounted so that the boat is well balanced. Otherwise, the boat could be hard to steer. For single-motor boats, mount the outboard motor on the center line (keel line) of the boat.

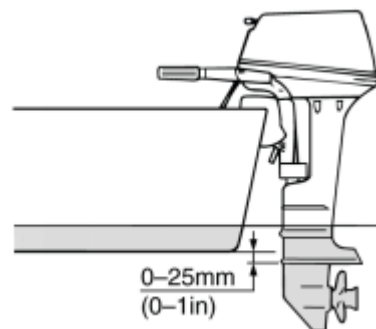


**Center line (keel line)**

##### 3.1.2 Mounting height

To run your boat at optimum efficiency, the water resistance (drag) of the boat and outboard motor must be made as little as possible. The mounting height of the outboard motor greatly affects the water resistance. If the mounting height is too high, cavitation tends to occur, thus decreasing the propulsion; and if the propeller tips cut the air, the motor speed will rise abnormally and cause the motor overheat. If the mounting height is too low, the water resistance will increase and thereby reduce motor efficiency. Mount the outboard motor so that the anti-cavitation plate is between the bottom of the boat and a level 25 mm (1 in) below it.

Test runs at different heights can help determine the optimum mounting height. Consult your dealer or boat manufacturer for further information on determining the proper mounting height.

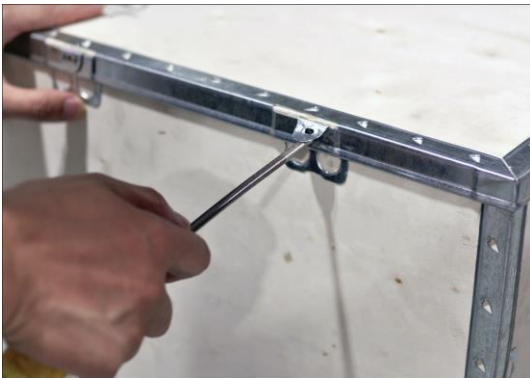


### 3.13 Installation Instructions

1. When you receive the goods, you will see this wooden box.



2. Use screw driver to open the wooden box.



3. Open the wooden box carefully, do not damage it.



4. Overview of the outboard in opened wooden box



5. After opening the box, check parts below:

- ① Trolley bar
- ② Trolley wheel
- ③ Anderson connector for battery
- ④ Safety key set
- ⑤ Propeller
- ⑥ Replaceable fin/skeg
- ⑦ Tiller



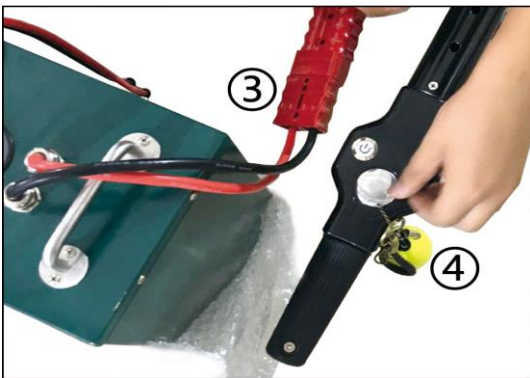
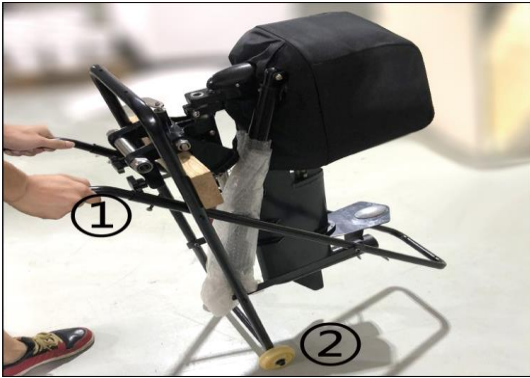
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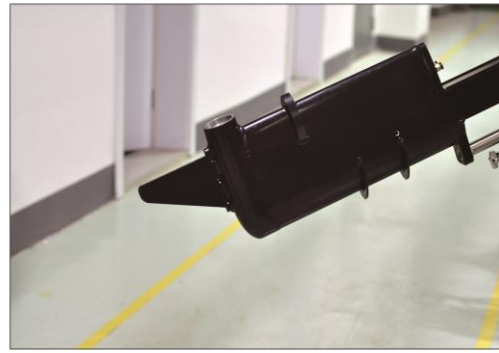
6. Safety key should be attached to operator's arm. In case the operator falls overboard, it can cut off the power to prevent the boat from running away under power, or hurting people.



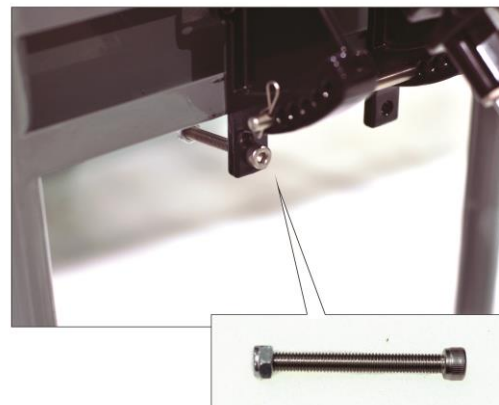
7. Please step on the trolley bottom to prevent sliding or falling when lifting out the outboard.



8. Install the fin/skeg with screws



9. Tighten the screws after mounting the outboard to the boat tailgate. Both screws must be completely tightened, otherwise the uneven force might lead to bracket breaking while operating.



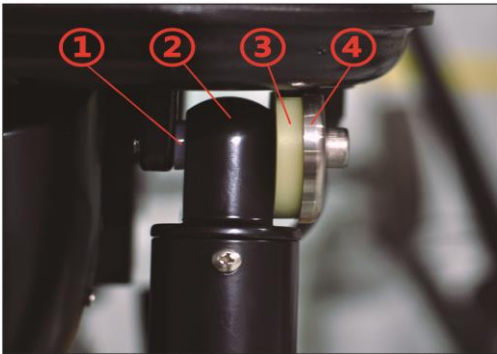
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### 10. Tiller installation



- ① small nylon ring
- ② tiller
- ③ big nylon ring
- ④ metal ring



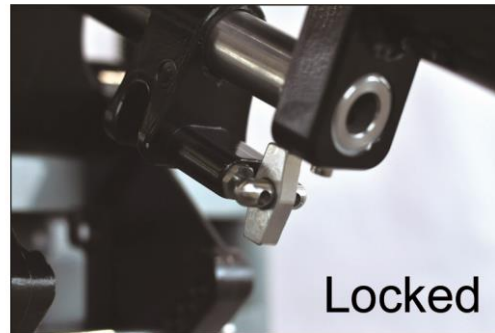
### 11. Outboard tilting up and down

Tilting up: Unlock tilting switch A, then tilt up the outboard until you hear "click", tilting switch B is locked automatically.

Tilting down: Slightly tilt up the outboard, unlock tilting switch B, then tilt down the outboard and lock tilting switch A.

Tilting switch A must be locked before usage.

Tilting Switch A:



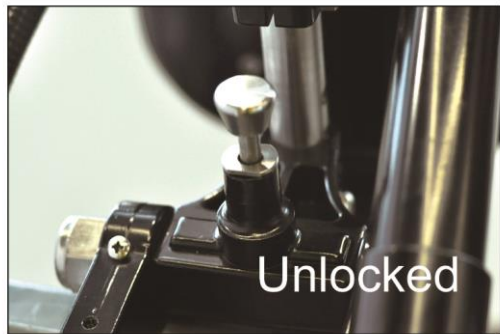
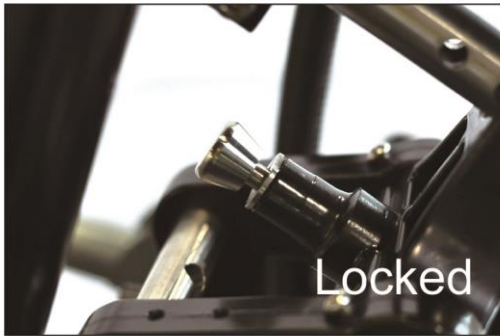
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### Tilting Switch B



### 12. Outboard trimming

There are 6 holes provided in the bracket to adjust trim angle.

1. Unlock tilting switch A, remove clip pin and slightly tilt the outboard, then take out trim locking rod to adjust the outboard to desired position.
2. Reposition the trim locking rod in desired hole and secure it with clip pin, lock tilting switch A.

Tips: Make test runs with the trim set to different angles to find the best position that works best for your boat and operating conditions.

Power off before adjusting the trim angle.  
Make sure the trim locking rod in middle.

Use caution when trying a trim position for the first time, improper trim angle can cause loss of control when reverse.





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### 13. Height adjustment

There are 5 holes provided in the shaft to adjust the outboard motor height.

Loosen screw and remove it to adjust the shaft length, tighten up the screw with a screwdriver.

Make sure you adjust the shaft length according to your boat transom height before lifting to boat, otherwise you will spend much more strength to adjust it on boat.



14. Open the buckle and outboard cover, then remove the tank cap to add coolant. (The same coolant as used in your car, which suits for local weather)

Press the power button to let coolant flow in pipe, the coolant level will drop after circuit. After one minute, switch off the power button then add coolant again.

You need add at least two times to ensure the tank is filled with the coolant before operating.

**Notice: Don't forget to close the tank cap tightly after adding coolant to avoid leakage .**



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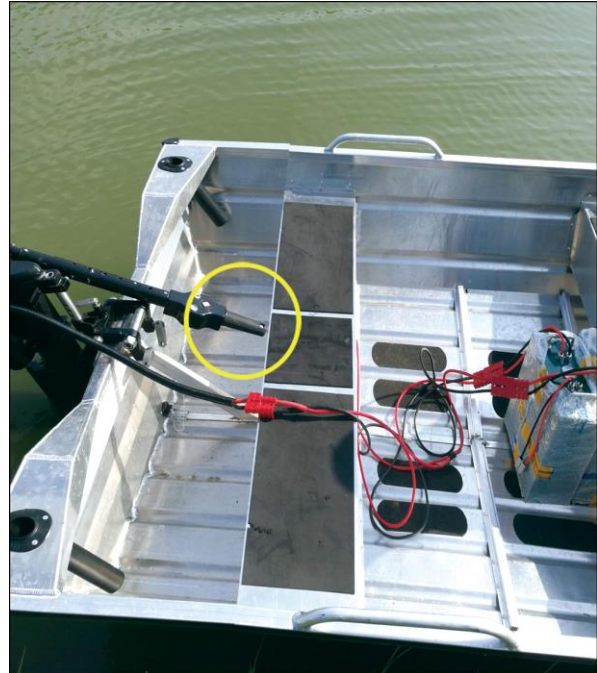
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15. Tighten the screws after mounting the outboard to boat tailgate.



17. Slowly twist throttle to avoid overturn for small boat!



16. Check if battery nominal voltage matches outboard's nominal voltage before connecting battery to outboard.



### 3.2 Operation

The information presented in this section is intended as reference only. It is not possible to provide complete instructions for every possible boat and motor combination. Proper mounting depends in part on experience and the specific boat and motor combination.

#### 3.21 Caution



- Check the status and function of the outboard motor before each use.
  - Only operate the motor while the propeller is submerged in water. If the motor is running in air for a longer period of time, the shaft seals are getting damaged which seal the motor at the drive shaft against water intrusion. Additionally, the motor might overheat.
  - If you are running the motor at full throttle in high ambient temperatures, the motor may reduce speed automatically to reduce motor and battery temperature.
  - Familiarize yourself with all the motor controls. For instance, you should be able to stop the motor quickly if necessary.
  - Only allow adults who have been instructed on how to operate the motor to run it.
  - Stop the motor immediately if someone goes overboard.
  - Never operate the motor if someone is in the water close to the boat.
- Follow the boat manufacturer's instructions on the permissible motorization of your boat. Do not exceed the capacity limits.
  - Overpowering a boat could cause severe instability. Do not install an outboard motor with more horsepower than the maximum rating on the capacity plate of the boat. If the boat does not have a capacity plate, consult the boat manufacturer.
  - Improper mounting of the outboard motor could result in hazardous conditions such as poor handling, loss of control or fire hazards. For permanently mounted models, your dealer or other person experienced in proper rigging should mount the motor.

### 3.22 Operation



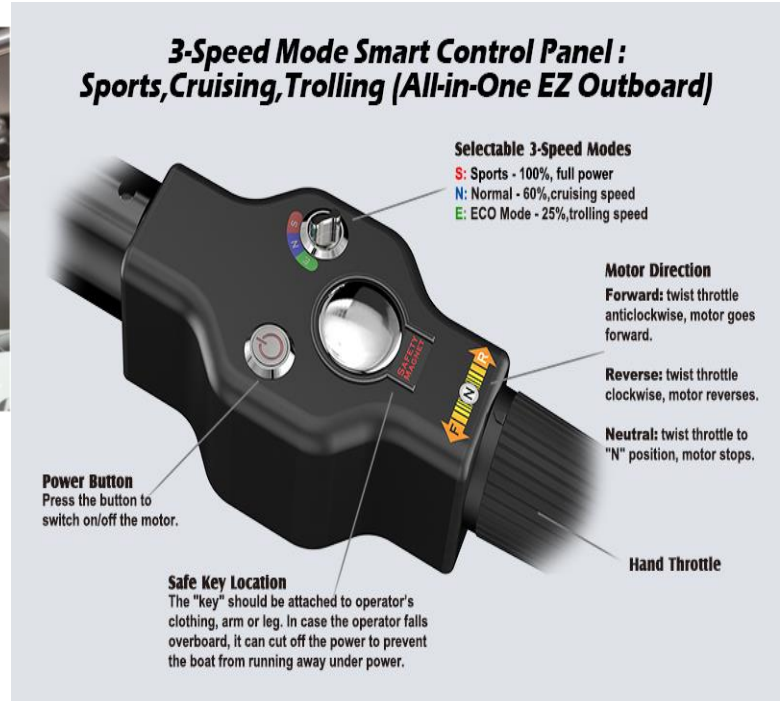
**1. Put the safely key at its grooved place on throttle set, if it's removed, the outboard will lose power and don't working.**

**2. Make sure throttle is at N position before operating. If throttle twists to F/R, it will stop working and keep beeping to show error.**

3. Select speed mode you like (Sports, Normal, ECO). Normally in Sports mode to reach best performance, ECO mode to save energy at slow boat speed.

4. Press the power button, it will light when power is on.

5. Twist throttle lever slowly to F (Forward) or R (Reverse), then outboard starts working and boat starts running!



## 4 Storage and Maintenance

### 4.1 Storing outboard motor

When storing your outboard motor for prolonged periods of time (2 months or longer), several important procedures must be performed to prevent excessive damage. It is advisable to have your outboard motor serviced by an authorized dealer prior to storage. However, you the owner with a minimum of tools, can perform the following procedures.

- After use, the motor should as a general rule, be taken out of the water. You can do this using the tilt mechanism of the transom bracket.
- The connector plug and main switch must be protected from moisture.
- Rinse the motor with fresh water after operation in salt water or brackish water.
- Only store the motor in a dry, well-ventilated place, not in direct sunlight.
- The threads of the transom mounting bolts need to be re lubricated regularly with marine grease (e.g. LiquiMoly)

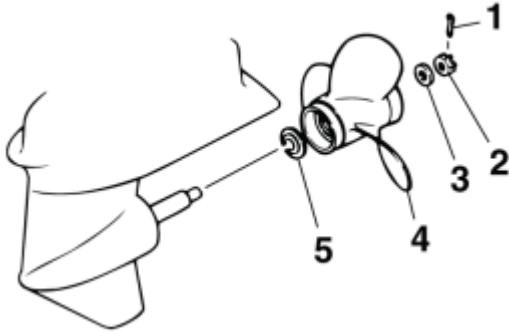
### 4.2 Replacement parts

EZ **gear-less and shaft-less** design makes it very unique, quiet, reliable, efficient and less vibration. The new design also takes consideration of compatibility of installation, teleflex remote control and exchangeable propellers with ordinary gasoline outboards. The BLDC motors are optimally tuned for electric outboards with motor speeds (2000rpm-2500rpm) matching to common propellers without speed reduction gears, so you can get the same boat speeds as by gasoline outboards with similar horse powers. If replacement parts are necessary, use only genuine outboard parts or parts of equivalent design and quality. Any part of inferior quality may malfunction, and the resulting loss of control could endanger the operator and passengers. Outboard genuine parts and accessories are available from your dealer.

### 4.3 Removing propeller

#### 4.31 Spline models

1. Straighten the cotter pin and pull it out using a pair of pliers.
2. Remove the propeller nut, washer, and spacer(if equipped). **WARNING!** Do not use your hand to hold the propeller when loosening the propeller nut.



1. Cotter pin
2. Propeller nut
3. Washer
4. Propeller
5. Thrust washer

#### 4.32 Installing propeller

##### CAUTION

Be sure to use a new cotter pin and bend the ends over securely. Otherwise the propeller could come off during operation and be lost.

1. Apply outboard marine grease or a corrosion resistant grease to the propeller shaft.

2. Install the spacer (if equipped), thrust washer, washer (if equipped), and propeller on the propeller shaft.

**NOTICE:** Be sure to install the thrust washer before installing the propeller, otherwise the lower case and propeller boss could be damaged.

3. Install the spacer (if equipped) and the washer. Tighten the propeller nut to the specified torque.

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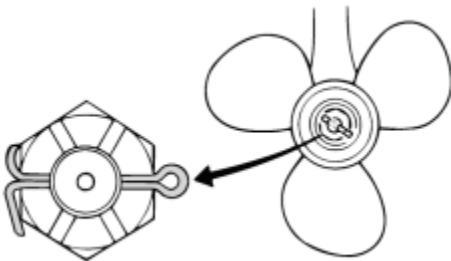
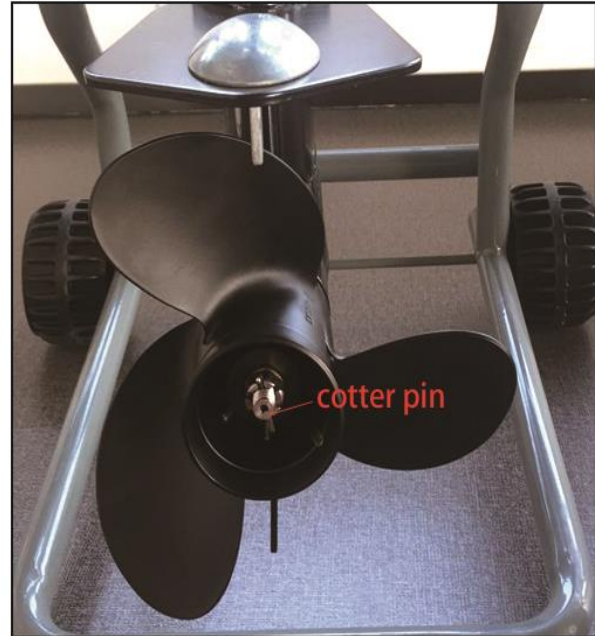


Propeller nut tightening torque:  
17.0 Nm (1.73 kgf-m, 12.5 ft-lb)

4. Align the propeller nut with the propeller shaft hole. Insert a new cotter pin in the hole and bend the cotter pin ends. **NOTICE:** Do not reuse the cotter pin installed. Other-wise the propeller can come off during operation.

### **TIP:**

If the propeller nut does not align with the propeller shaft hole after tightening to the specified torque, tighten the nut further to align it with the hole.



## 5 Return and Repairs

We offer a flexible 14 day return policy if you simply don't like what you've ordered and the package unopened or the products unused.

Contact us before you make a return.

Goods must be returned within 14 days of receipt.

Goods must be in original packaging.

Goods must not be fitted or used.

The customer is responsible for the return postage costs. The customer is responsible for ensuring that the goods arrive in good condition (we recommend that return shipment be insured).

If you have any issues with a product within 30 days of purchase, please contact our local dealers for assistance. + Feel free to contact us with any other concerns or questions regarding your purchase.

## 6 Warranty

### How the warranty applies

As the makers, we warranty against possible material or construction defects, provided the following conditions are satisfied :

- ❖ Proof of purchase. The warranty starts on the date of purchase.
- ❖ Only the first owner is entitled to the warranty.
- ❖ 2 years for the frame,, all mechanical and electrical parts, except normal wear and tear items.

### How the warranty does not apply

- ❖ Inadequate maintenance.
- ❖ Unauthorized alteration, modification or misuse.
- ❖ Damage through abuse, neglect or accident.
- ❖ Assembly in disregard of instructions in this manual.
- ❖ Repairs by persons other than Golden Motor Authorized Dealers. (If you need local repair and a Golden Motor dealer is not nearby, contact us for assistance in authorizing repair).
- ❖ Normal wear and tear.
- ❖ Poor maintenance or modifications that no longer comply with regulations or original specifications.
- ❖ Damage due to external causes.
- ❖ The battery pack is used incorrectly or damaged. This also applies to improper charging.
- ❖ Compensatory costs arising from

This warranty does not cover use for commercial purposes.

### How the warranty works

- ❖ Original defective parts that are sent or returned to the dealer for assessment will be replaced by the same or equal value part.
- ❖ Labor and transportation charges are not included.



# ELECTRIC PROPULSION OUTBOARD

## User's Guide

Originality  
Innovation  
Creation



**CAUTION** Unauthorized changes/modification or tampering with any part of this product, or operation in any way other than as detailed in this User Manual, will render manufacturer's warranty void.



**GOLDEN MOTOR**  
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