



SPIRIT 1.0R USER MANUAL

March, 2019 Version 1.2

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Acknowledgement

Thanks for choosing ePropulsion products, your trust and support in our company are sincerely appreciated. We are dedicated to providing high-performance electric outboard motors, sup/kayak motors, reliable lithium batteries and accessories.

Welcome to visit www.epropulsion.com and contact us if you have any concerns.

Using this manual

Before using this product, please read this user manual fully to understand the correct and safe operations. By using this product, you hereby agree that you have fully understood and accepted all the contents of this manual. ePropulsion accepts no liability for any damage or injury caused by operations that contradict this manual.

Due to ongoing optimization of our products, ePropulsion reserves the rights of constantly adjusting the contents described in the manual. ePropulsion also reserves the intellectual property rights and industrial property rights including copyrights, patents, logos and designs, etc.

This manual is subject to update without prior notice. Please visit our website www.epropulsion.com for the latest version. If you find any discrepancy between your products and this manual, or should you have any doubts concerning the product or the manual, please visit www.epropulsion.com.

ePropulsion reserves the right of final interpretation of this manual.

This manual is multilingual, in case of any discrepancy in interpretation of different language versions, the English version shall prevail.

Symbols

The following symbols will help you acquire some key information.



Important instructions or warnings



Useful information or tips

Product Identification

Below figures indicate the position of the product labels on which the serial numbers locate. Please record the serial numbers for access to maintenance or other after-sale services.

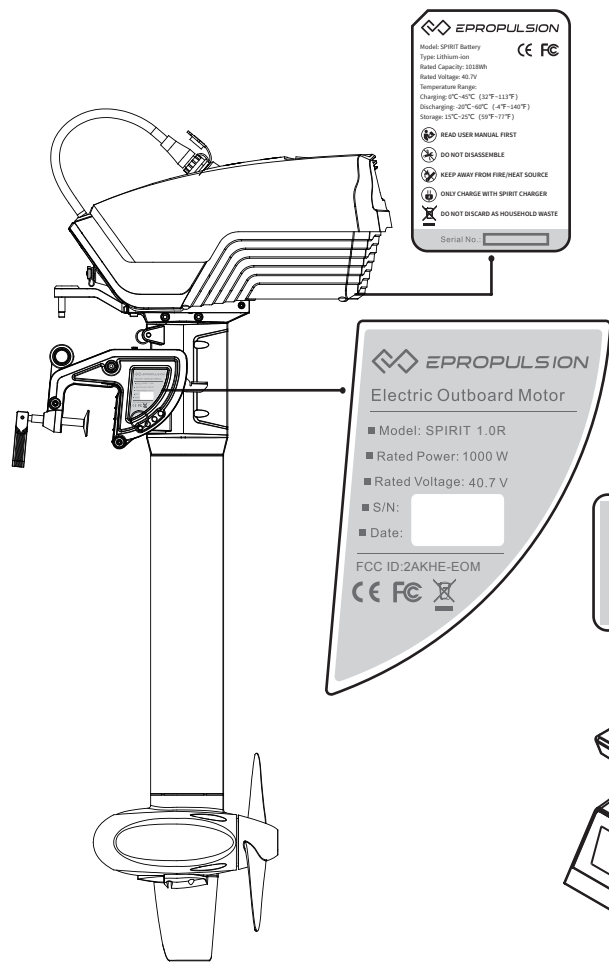


Figure 0-1

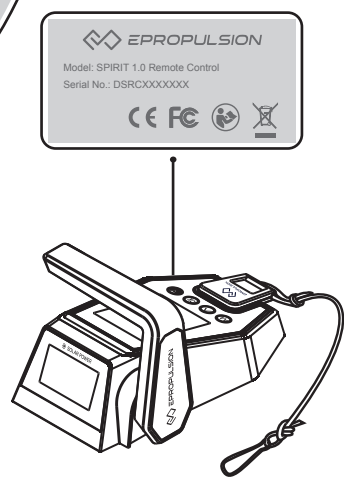


Figure 0-2

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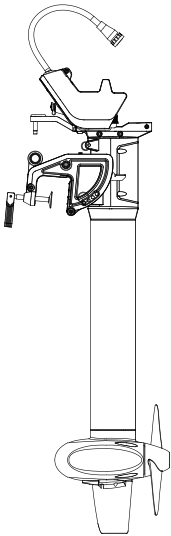
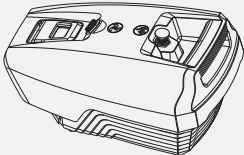
1 Product Overview

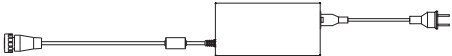


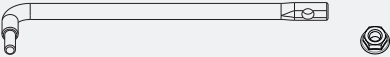
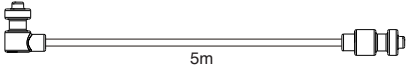
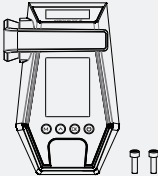
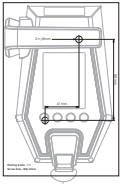

SPIRIT 1.0R is an 1kw (3hp equivalent) electric outboard with high overall efficiency. The self-contained battery is detachable and will float if it falls into water. Wireless remote control is free and flexible. It is an ideal option for medium and small sized boats.

SPIRIT 1.0R includes both longshaft, shortshaft and extra shortshaft models. Longshaft models are recommended for the transom height of 400mm-500mm, shortshaft models are recommended for the transom height of 300mm-400mm and extra shortshaft models are recommended for the transom height of 200mm-300mm.

1.1 In the Package

Check all the items inside the package against the table below. If there is any damage or lack of any listed item, please contact your dealer immediately.

Items	Qty./Unit	Figure
Outboard (Main part)	1 set	
Battery	1 set	

Items	Qty./Unit	Figure
Battery Charger	1 set	
Kill Switch	2 sets	
Steering Lock Pin	2 sets	
Link Arm	1 set	
Communication Cable	1 piece	
Remote Control	1 piece	
Fixing Guide	1 set	
User Manual, Invitation Card, Warranty Card & Quality Certificate	1 set	

- 💡 Save the ePropulsion original package for the outboard storage.
- 💡 Other accessories mentioned in this manual need to be purchased additionally from ePropulsion authorized dealers.
- 💡 There are three types of chargers for SPIRIT Battery: standard charger (included in the package), fast charger and solar charger (require separate purchase from ePropulsion authorized dealers).

1.2 Parts and Diagram

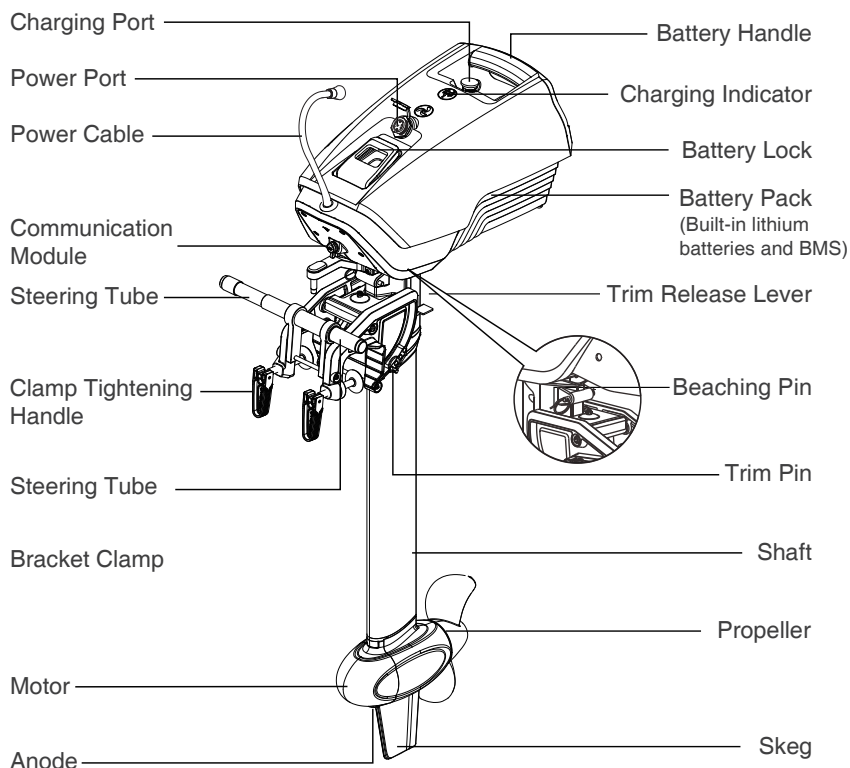


Figure 1-1

1.3 Specifications

SPIRIT 1.0R-L / SPIRIT 1.0R-S / SPIRIT 1.0R-XS	
Type	Electric
Maximum Input Power	1 kW
Rated Current	24.6 A
Comparable Petrol Outboard	3 HP
Maximum Overall Efficiency	55%
Rated Rotation Speed	1200 rpm
Control System	Remote Control / Side Mount Control
Communication	Wireless / Wired
Communication Distance	≤ 10 m
Weight (without battery)	10.1 kg / 22.3 lbs. (XS) 10.3 kg / 22.7 lbs. (S) 10.6 kg / 23.4 lbs. (L)
Dimension (with battery) (L×W×H)	464 mm × 321 mm × 1010(XS) / 1110mm (S) / 1235mm (L) 18.3"×12.6"×39.8" (XS) / 43.7" (S) / 48.6" (L)
Shaft Length	525mm / 20.7" (XS) 625mm / 24.6" (S) 750mm / 29.5" (L)
Trim Angle	0°, 7°, 14°, 21°, 75°
Propeller Diameter/Pitch	280 mm (11") / 5.8"

SPIRIT Battery	
Type	Lithium-Polymer
Rated Capacity	1018Wh
Rated Voltage	40.7V
Cutoff Voltage	33V
Full Charged Voltage	46.2V

SPIRIT Battery	
Charging Time	~ 7 Hrs.
Cycle Life	≥ 500 cycles (80% of Rated Capacity)
Temperature Range	Charging: 0°C ~ 45°C (32°F ~ 113°F) Discharging: -10°C ~ 60°C (14°F ~ 140°F)
Dimension (L×W×H)	416 mm × 275 mm × 202 mm
Weight	8.5 kg / 18.7 lbs.

SPIRIT Standard Charger	
Output Power	180 W
Output Voltage	46.2 V DC
Output Current	4 A
Cutoff Current	0.4 A
Voltage Accuracy	0.5% V
Temperature Range	Operation: -29°C ~ 45.5°C (-20.2°F ~ 113.9°F) Storage: -40°C ~ 75°C (-40°F ~ 167°F)
Rated Input Voltage	100 ~ 264 V AC
Output Voltage	50 Hz / 60 Hz
Input Current (Max)	2 A @ 220 V
Efficiency	87%

1.4 Declaration of Conformity

Object of the Declaration:

Product: SPIRIT 1.0R

Model: SPIRIT 1.0R-S, SPIRIT 1.0R-L, SPIRIT 1.0R-XS

Company Name: Dongguan ePropulsion Intelligence Technology Limited

Address: Room 202, Bldg.17A, Headquarter No.1, 4th XinZhu Road,
SongShan Lake District, Dong Guan, Guang Dong, China

The object of the declaration is in conformity with the following directives:

EMC-directive 2014/30/EU

MD-directive 2006/42/EC

RED-directive 2014/53/EU

Applied Standards:

EN 55014-1:2006+A1:2006+A2:2011

EN 55014-2:2015

EN 61000-3-2:2014

EN 61000-3-3:2013

EN 60204-1: 2016

EN ISO 12100:2010

EN 301 489-3: 2002 V1.4.1

EN 301 489-1: 2008 V1.8.1

The original certificate was issued by

Shenzhen An-Teng Testing Service Co., Ltd. in Shenzhen, China.

CE Test Report NO.: ATT1710200312E, ATT1710200312M, ATT1710200312D

Issued Date: October 20, 2017

This device complies with part 15 of the FCC Rules: Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference and,
- (2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Test Report NO.: GTS201709000032E01

Issued Date: July 05, 2016

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Signature: 陶师正

Shizheng Tao, Chief Executive Officer & Cofounder of
Dongguan ePropulsion Intelligence Technology Limited

2 Important Notes before Start

For safety, please read the following instructions and notes before using this product. By using this product you hereby: 1) agree to these notes and instructions; 2) agree not to use this product for purposes that infringe upon or contravene laws and regulations; 3) agree to be responsible for your own conduct while operating this product.

2.1 Outboard



WARNING

- Only allow adults who have correct and thorough understanding of this manual to operate this product.
- **Always have a paddle on board especially if the electric outboard motor is the only propulsion system.**
- Familiarize yourself with all the outboard operations, including start/stop, steering and tilting.
- Check the status of the outboard and battery level before each trip.
- Follow the boat manufacturer's instructions on the maximum allowed outboard power of your boat, do not overload the boat or the outboard.
- Take serious of battery safety. Follow battery instructions, avoid short-circuit, overheat, overcharge and over-discharge.
- Only run the outboard while the propeller is under water.
- Stop the outboard immediately if someone falls overboard.
- Tilt up the outboard above water after use.
- Wash the outboard with fresh water after operating in salt water.
- Do not leave the outboard in the water if the boat is driven by other forms of power such as sailing or rowing.
- If an error code displays and the outboard malfunctions, please reset the throttle to zero position and cut the power off, then refer to the Warning Information to acquire the solution to the error.

- For protection considerations, the motor will stop immediately if the battery voltage drops below the critical level during operation or when running.
- To keep electric connectors in good condition, please spray the connectors about every 3 months with contact spray.
- To store the outboard motor, put the machine in original ePropulsion package and keep it in a dry and ventilated place without direct sun exposure.

2.2 Battery

The SPIRIT Battery should only be charged with an ePropulsion original charger. The battery has a built-in battery management system which provides cell balancing function, over charging protection, over discharging protection, short-circuit protection, over temperature protection, under temperature protection, over current protection, communication function, etc. Though the battery has been tested to be reliable and safe during normal operation, it should be handled with care as safety is critically important. Please adhere to the following instructions when using it.

WARNING

- Do not drop, strike or squash the battery.
- Do not disassemble the battery or conduct unauthorized repair, the battery disassembly can only be conducted by ePropulsion service.
- Never charge a broken or damaged battery.
- Only charge the battery with an ePropulsion original charger.
- Do not charge the battery near flammable materials such as carpet or wood.
- Disconnect charger when not in use.
- Though the battery is IP67 waterproof, it's suggested not to immerse it in water or store it in moist environment.
- Keep conductive objects away from the discharging port and charging port to avoid damage of electronic components.

- Use the port cap to avoid accidental short-circuit.
- Never discharge the battery below 33V.
- Store the battery in dry environment.
- Charge the battery immediately after full discharge.
- **Before long-term storage, make sure the residual battery level is 60% around, store the battery at 18°C ~ 28°C (64.4°F ~ 82.4°F). If the residual battery is more than 60% for over ten days without activity, self-discharge will occur to the battery with a small current around 100mA until the battery level drops to 60% around.**
- Battery will actively discharge to 75% after 20 days without charging or discharging.
- If battery level is low for a long time, it will enter sleep mode. Charge to wake it up.
- **During long-term storage, activate the battery every 3 months by a charge condition and keep the battery level at 60% around. This activation is very important and it can help keep the battery in good condition.**
- After long-term storage, fully charge the battery before use.
- Do not leave the battery in a hot or pressurized container, such as trunk of the vehicle on hot days.
- Dispose of unusable or damaged batteries in a container specially reserved for this purpose, follow appropriate local guideline and regulations. For further information you can contact your local solid waste collecting point or your dealer.
- Never dispose the battery as general household waste or in fire.

3 Installation

Step1: Hang the electric outboard motor on the transom of your boat and tighten the two clamp handles.

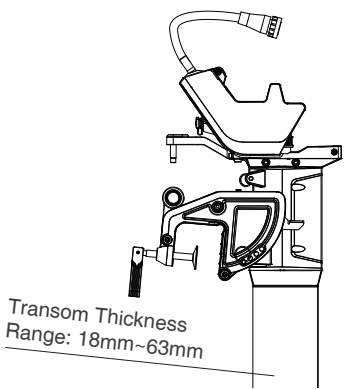


Figure 3-1

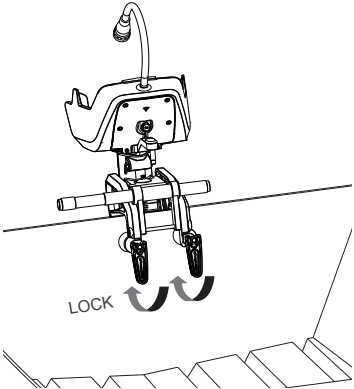

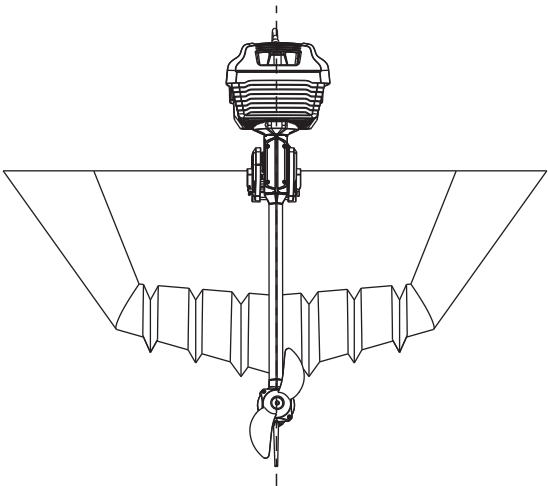


Figure 3-2

 Ensure to mount the outboard on the centerline of your boat. If the boat shape is asymmetric, please consult your dealer to get proper solution.



Center line

Figure 3-3

The mounting height of the outboard affects the running speed seriously. When the mounting height is too high, cavitation may occur to waste power. When the mounting height is too low, the water resistance will increase and it will lead

to decreased efficiency and lowered running speed. Mount the outboard and ensure the top of propeller is between 100mm and 150mm below the water. Usually, if $300\text{mm} \geq \text{transom height} \geq 200\text{mm}$, it's recommended to select an extra shortshaft SPIRIT 1.0R, and if $400\text{mm} \geq \text{transom height} \geq 300\text{mm}$, it's recommended to select a shortshaft SPIRIT 1.0R, while if $500\text{mm} \geq \text{transom height} \geq 400\text{mm}$, it's recommended to select a longshaft SPIRIT 1.0R.

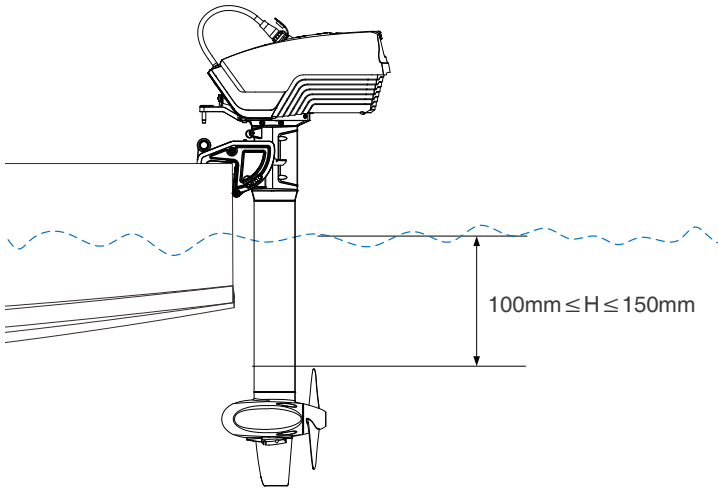


Figure 3-4

Select a proper shaft length according to your transom height and applications. The optimum mounting height is affected by the conditions of boat and requirements. It's recommended to test running at a different height to help obtain the optimum mounting height. You can consult your dealer to get more information.

Step2: Lift the battery by gripping the handle and pull up the battery lock. Align the two slots on the battery bottom to the blocks on the bracket and put down the battery. Release the battery lock and lock the battery on the bracket.



Ensure to hold the battery handle before detaching or mounting the battery.

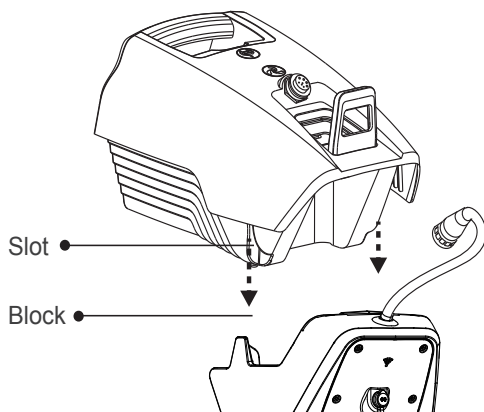


Figure 3-5

Step3: Plug the power cable in the power port and tighten the connector.

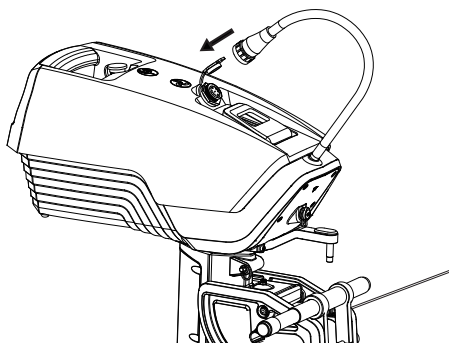


Figure 3-6

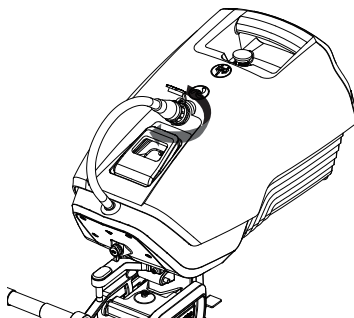


Figure 3-7

- 💡 Make sure the power cable connector and socket are dry before connecting to avoid short-circuit.
- 💡 Please spray and clean the connectors about every 3 months with contact spray.

4 Operation

4.1 Checklist before Start

1. Check and ensure the battery has enough power.
2. Ensure the outboard is correctly and firmly installed on the boat.
3. Ensure the propeller is correctly and firmly installed on the outboard.
4. Ensure the battery is correctly and firmly installed on the outboard.
5. Before start, check and ensure the throttle is in neutral position.
6. Ensure the throttle can travel smoothly.
7. Check the connections before each trip, ensure the connections are correct and secure, no disconnection or worn/aging connections.
8. Check and ensure the power port is dry to avoid short-circuit.



Only start the outboard when the propeller is under water.



If the cable has been immersed in water, please dry the cable thoroughly before connection or turning on power.

4.2 Starting

Step1: Put the kill switch on the pointed position of remote control (Figure 4-1).

Step2: Attach the other end of the kill switch to your wrist or life vest (Figure 4-2).

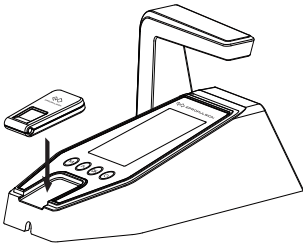


Figure 4-1

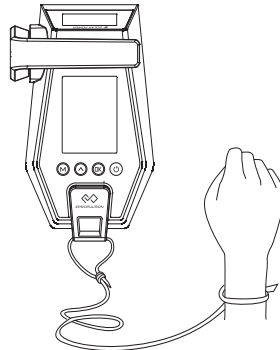





Figure 4-2



For safety consideration, always attach the lanyard of kill switch to your wrist or life vest, so that the outboard will be stopped in the event of emergency.

- ⚠ The kill switch has magnetic field, keep it 50cm/20inch away from pacemakers and other medical implants.
- ⚠ The magnetic field of kill switch may interfere with some electronic instruments, keep it away from these electronic instruments.
- ⚠ Keep the kill switch 50cm/20inch away from magnetic cards (e.g. Credit cards) and other magnetic media.

Step3: Press and hold (≥ 2 secs) the "  " button to power on the remote control (Figure 4-3).

 When powering on, "  " indicates the system is initializing.

Step4: Push/Pull the throttle from neutral position to start. Change the heading direction by turning the throttle to the reverse direction (Figure 4-4).

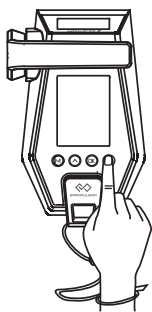


Figure 4-3

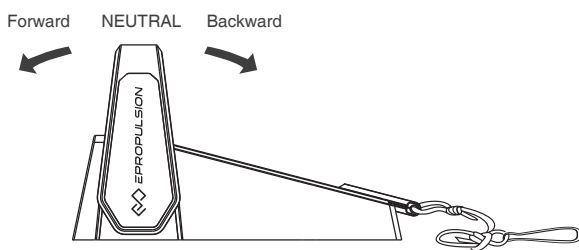
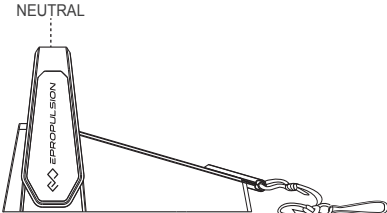
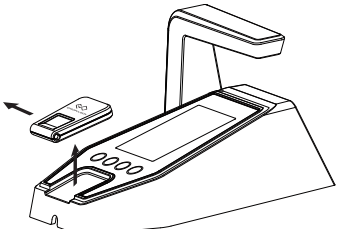
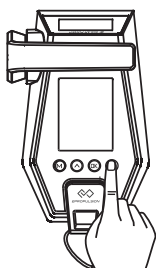


Figure 4-4

4.3 Stopping

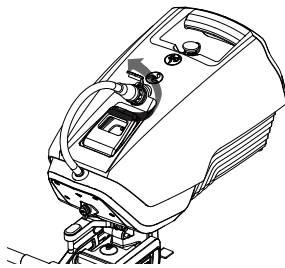
The outboard can be stopped in one of the following four ways.

<p>①</p>  <p>• Turn throttle to neutral position.</p>	<p>②</p>  <p>• Remove the Kill Switch.</p>
--	---



③


- Switch off the power button.



④

- Disconnect the power cable.

In normal operating procedure, it's recommended to stop the outboard as following steps.


1. Rotate the throttle to neutral position.
2. Wait until the outboard stops, then remove the kill switch.
3. Press and hold (≥ 2 secs) the "  " button to power off the system.
4. Tilt the outboard out of water and uninstall it from boat according to your requirement.

In abnormal situations like a fall over emergency, it's recommended to stop the outboard motor by detaching the kill switch from the remote control.

In malfunction situations, the outboard will stop immediately for protection. The outboard will stop if one of the following situations occurs.

- 1) The throttle is in neutral position.
- 2) The power button is switched off.
- 3) The kill switch is removed.
- 4) The wireless connection between the remote control and outboard breaks.
- 5) The battery is empty.
- 6) The outboard goes malfunctions (e.g. motor is blocked or the battery voltage drops below 33V).

4.4 Mounting the Steering System

 Before using Remote Control, please follow the fixing guide to fix the Remote Control in the proper position.

When using the Remote Control, please prepare a steering wheel (not supplied with SPIRIT 1.0R or the Remote Control) and mount it on the corresponding position to control the direction.

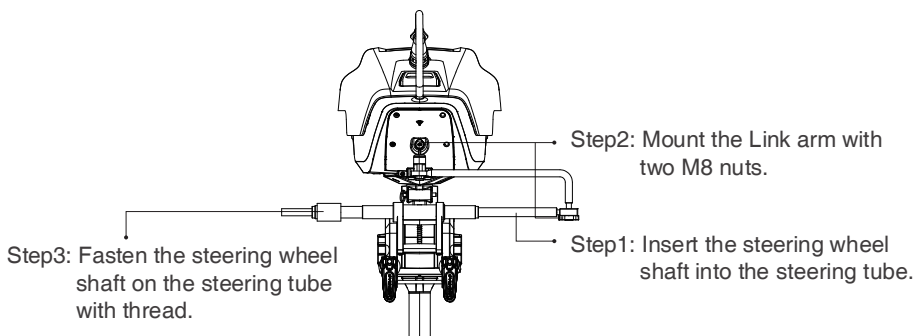


Figure 4-5

4.5 Tilting up the Outboard Motor

To tilt up, first screw off the lock nut to disconnect the Link Arm and Steering Tube. Then pull up the trim release lever and take the battery handle to tilt up the outboard motor to the maximum height. After a "click" sound, release the battery handle and the outboard will tilt up to 75° position.

To lay down the outboard, hold the battery handle and pull up the Trim Release Lever again to lay it back to the original position.

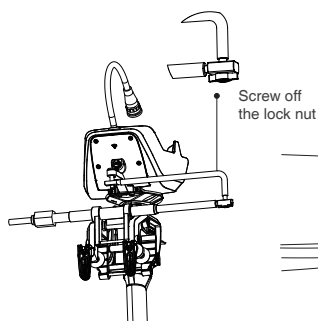


Figure 4-6

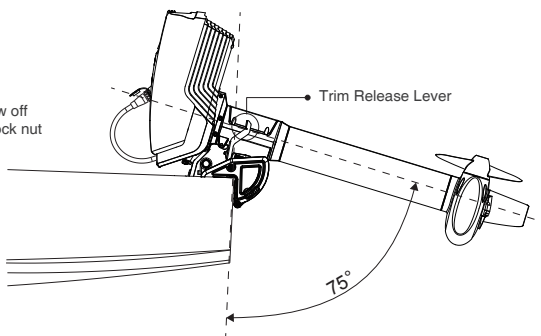


Figure 4-7

- ⚠ Never pull up the trim release lever when the propeller is rotating.
- ⚠ Careful handling is recommended when tilting up and down.
- ⚠ Tilt up the outboard out of water when the motor is not running.

4.6 Fixing the Steering Direction

Before attaching the battery, inserting the steering lock pin into the hole to fix the steering direction. Use the pin if necessary.

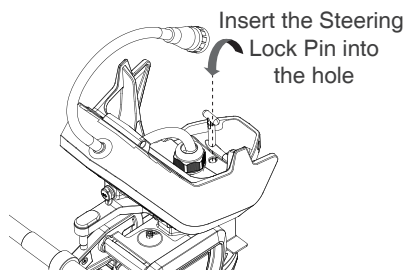


Figure 4-7

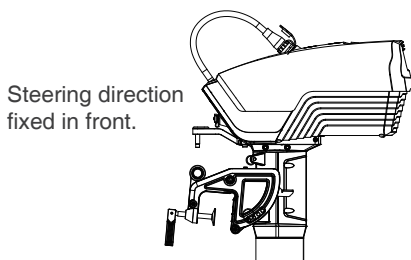


Figure 4-9

5 Remote Control

The LCD screen presents real-time cruising information during operation.

5.1 LCD Display

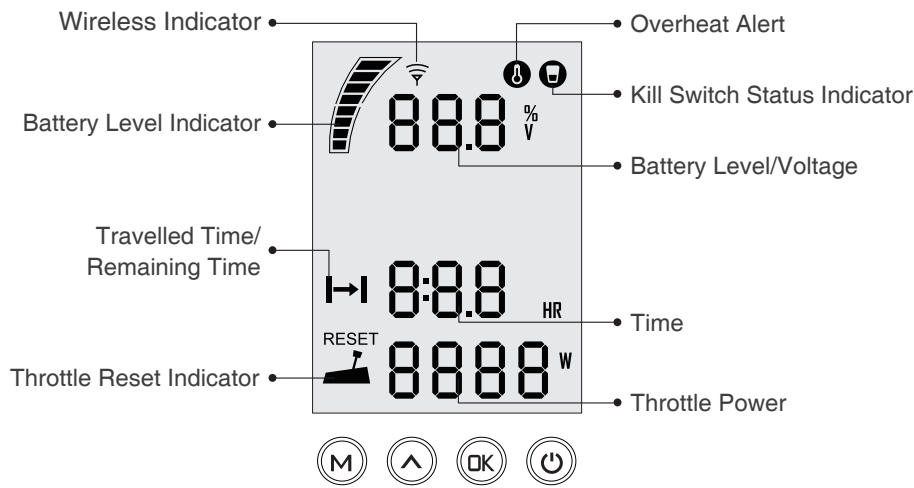



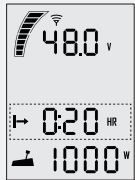
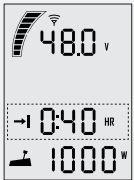











Figure 5-1











Button	Function
 "Power"	<ol style="list-style-type: none">1. In power-off state, press and hold the power button to power on the remote control.2. In power-on state, press and hold the power button to power off the remote control.
 "Ok"	<ol style="list-style-type: none">1. On setting pages, press "OK" button to save the current settings and switch to the next item.2. On setting pages, press and hold "OK" button, the system will save your settings, the display will exit from setting page and return to the main page.3. In power-on state, when the home page displays or all the characters display on the page, press "OK" button and hold 5s to enter the remote control pairing page.4. On home page, press "OK" button to switch between voltage V and battery percentage %.

 "Up"	<ol style="list-style-type: none"> 1. On any setting page, press "▲" button to view options for current setting. 2. If the home page displays in power-on state, long press "▲" button for 10s to enter the throttle calibration page. 3. On home page, press "▲" button to switch the travelling time or remaining time displaying icon between "→ " and " →". <div style="text-align: center;">  Press "▲" Button  </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> Main Page 1 Main Page 2 </div>
 "Menu"	On any page, press " M " button to return home page.

 If users do not set any parameters on the page, the current parameters displayed will be saved as user parameters by default.

 When powering on, " " indicates the system is initializing.

Icon		Function
	Battery level Indicator	The solid blocks indicate remaining battery.
	Battery level/voltage	Indicating accurate current battery level percentage/battery voltage: 100%: indicates current battery level. 48.0 V: indicates current battery voltage.
	Kill switch status indicator	 Hidden: the kill switch is well attached and works well.  Shown: the kill switch is detached.

	Over-heat alert	<ul style="list-style-type: none"> Hidden: system temperature is in normal range. Blink: system temperature is a little high. Shown constantly: system is overheat and the outboard will stop working. The outboard motor can't be restarted until the system temperature drops to a safe level.
	Time Display	Display travelled/remaining time in hour.
	Travelled/ Remaining Time	 : remaining time  : travelled time
	Throttle Power	Display realtime power input. A blinking " RESET " indicates throttle should be reset to neutral.
	Wireless Indicator	Indicating the remote control is connecting with the outboard by wireless communication.

5.2 Connecting Remote Control to the Outboard

For SPIRIT 1.0R wireless type, the remote control and the outboard are paired prior to delivery.

However, if the remote control or the wireless outboard is replaced with a new one, the original wireless communication will break and the screen will display like the figure below. In this case, users should get them paired.

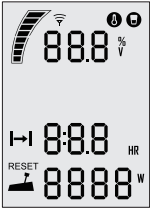


Figure 5-2

In this case, please check and make sure the remote control is close to the outboard and all the devices are under normal power supply. If everything is normal after check but the screen still displays like this, it indicates that there is something wrong with the outboard or remote control and repair is needed.

Pairing the remote to the outboard by following two methods:

Method 1. Pairing without Communication Cable

Step 1: Break the battery connection and turn off the remote control. Hold the remote control within 0.5 meters of SPIRIT 1.0R (head part).

Step 2: Press and hold the "  " button to switch on the remote control.

Step 3: Press and hold the " **OK** " button to enter the pairing page (Figure 5-3), on which blinking "Add", "SER" and a countdown timer "060" will display.

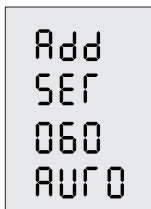


Figure 5-3

Step 4: Plug the power cable into the battery power port, and wait the outboard to finish automatic pairing with the remote control. When pairing succeeds, the screen will display like this.



Figure 5-4



If pairing fails within 60s, please restart from **Step 3**.

Method 2. Pairing with Communication Cable


Step1: Switch off system power and the remote control.

Step2: Connect the remote control and the Communication module with a communication cable.

Step3: Switch on system power and the remote control. Wait for them to get paired in seconds. Pairing succeeds when home page displays.



If " **SSS** " shows on start-up, it indicates system initialization.

 No matter it is in wireless communication status or not, it will switch to wired communication status when they are connecting by a communication cable.

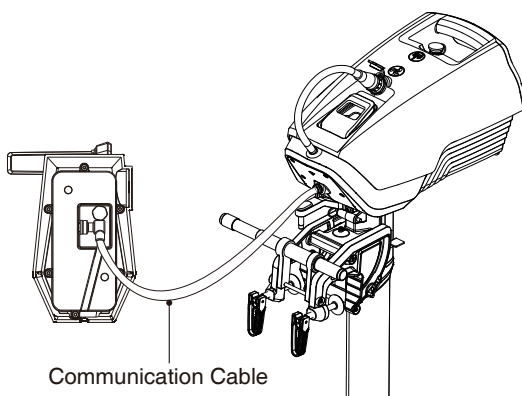



Figure 5-5

5.3 Power Adjusting

 Attach the kill switch to the remote control before operation.
(Refer to the first two steps of *4.2 Starting*).

The remote control is mainly used to adjust power for the outboard motor. When the battery is well connected and switched on, power on the remote to start the outboard, then slowly push the throttle to adjust the power. The maximum forward / backward power is 1KW.

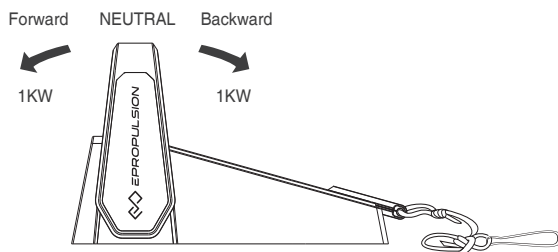





Figure 5-6

-  Before switching on the remote, please set the throttle to neutral position.
-  If you find a flickering “RESET” on the display, you are reminded to reset the throttle to neutral position.
-  If you pull the throttle from the forward position to the backward position directly, the motor will first stop shortly then start turning to the reverse direction.

5.4 Charging the Remote Control

The remote control has an in-built lithium battery for power supply. The battery will be charged automatically under normal use: get charged by solar power or wired connection.

5.4.1 Charging by Solar Power

When the solar panel receives enough sunshine, it will generate electricity to charge the in-built lithium battery.

💡 Face the solar panel of the remote control toward sunlight to get better charging effect.

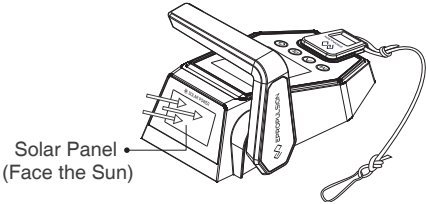


Figure 5-7

💡 Charging by solar power is recommended.

5.4.2 Charging by Wired Connection

If the remote control can't get enough solar power for a long time, the battery will run out. In this case, error code E60 (Figure 5-8) will display to remind you to charge the remote control.



Figure 5-8

In this case, charging by wired connection is faster.

Use a communication cable to connect the remote control and the Communication module. Then make sure the system battery is well connected to the outboard and powered on.

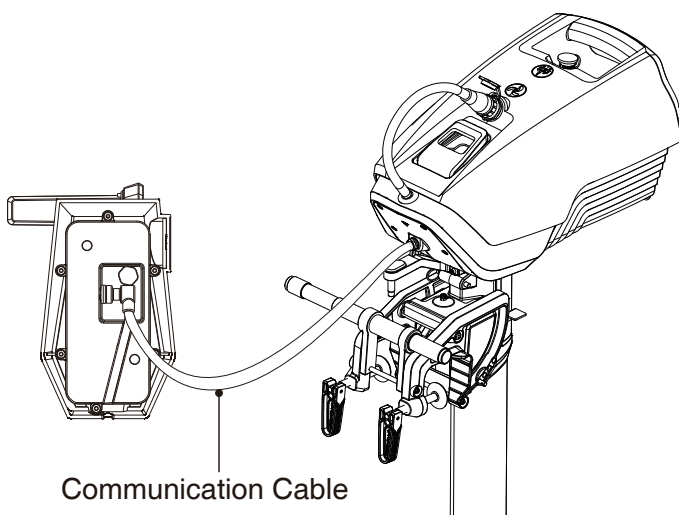





Figure 5-9






-  During long-term storage, ensure to charge the remote control every 6 months to avoid over-discharge.
-  After long-term storage, charge the remote control before use.
-  Once the communication cable disconnects, charging automatically stops and the running motor stops. Please restart the motor.


5.5 Recalibration

The throttle position sensor should be recalibrated if the error code **E30** shows.



Figure 5-10

Recalibration process	LCD Displaying
<p>Step1: Long press "▲" button for 10s until "CAL FO" displays.</p>	
<p>Step2: Push the throttle to the maximum forward power position, then press "▲" button. "CAL ST" will display and "CAL" will be blinking.</p>	
<p>Step3: Pull the throttle to the middle (neutral) position where you can hear a click sound, then press "▲" button, "CAL bA" will display and "CAL" will be blinking.</p>	
<p>Step4: Pull the throttle to the maximum backward power position, then press "▲" button. "CAL FO" will display and calibration is completed. A blinking "RESET" will display to remind you to reset the throttle to zero position.</p>	
<p>Step5: Push the throttle to Neutral position and press "M" button and return to the main page.</p>	

 Carry out the calibration procedures strictly as the above sequence.

5.6 Error Codes and Solutions

When the outboard is running in abnormal conditions or malfunctioning, a warning message will display with an error code. The table below will help you get a solution.

Code	Description	Solution
E01	Motor Over Voltage	Stop the motor and wait until the error disappears. If the problem persists, please contact your dealer.
E02	Motor Over Current	Disconnect the battery and check if the motor is blocked. If not, continue driving at low speed. If the error persists, please contact your dealer.
E03/ E04	Motor Overheating	Wait a few minutes until the motor cools down and the warning message disappears.
E05	Motor Under Voltage	Low battery. The outboard may be restarted at lower speed after the code disappears.
E10	Motor Blocked	Disconnect the battery and remove anything that is blocking the motor. Make sure the propeller can be rotated by hand smoothly.
E20	Battery Communication Fault	Turn off the motor and reconnect the battery cable. If the error still persists, please contact your dealer.
E21	Motor Communication Fault	Turn off the motor and reconnect the battery cable. If this error still exist, please contact your dealer.
E30	Throttle Calibration Required	Calibration process: Refer to section 5.5 Recalibration
E40	System running failure	Please restart the remote control and the outboard.
E51	Charge or Discharge Over Temperature	Ensure the cell temperature is 0°C~45°C. Charging will resume if cell temperature is in that range.

E54	Battery Pack Over Voltage	Stop the motor and wait until the error message disappears. If the problem persists, contact your dealer for repair.
E55	Out of Battery	Please charge your battery.
E56	Battery Charging Over Current	Restart the motor and drive at lower speed. If this problem still persists, please contact your dealer.
E57	Battery Discharging Over Current	Battery can only work between -20°C and 60°C. Motor can be started again after the battery temperature is within that range.
E58	Battery Hardware Fault	Battery has serious hardware breakdown. Please replace the battery and contact your dealer.
E59	Battery Cell Fault	Battery cell fault. Replace the battery and contact your dealer to repair the problematic battery.
E60	Remote Control Out of Battery.	Charge the remote control by solar power - face its solar panel to direct sunlight.
Other	Other faults	Please contact your dealer.



Carry out the throttle calibration procedures in strict accordance with the above sequences.

6 Battery Charging

Charge the battery when the battery is of low or empty charge level. It is recommended to charge the battery after detaching it from the outboard though it is allowed to operate and charge the outboard simultaneously.

Step1: Power off the remote control then disconnect the power cable. Hold the battery handle and pull up the battery lock to detach the battery.

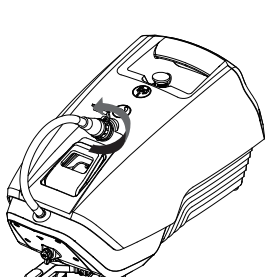


Figure 6-1

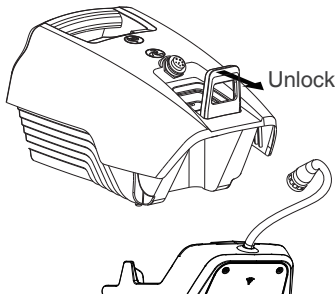


Figure 6-2

Step2: Connect the output cable of the battery charger to the battery, then connect the AC power plug of the charger to a 100V~240V wall outlet.

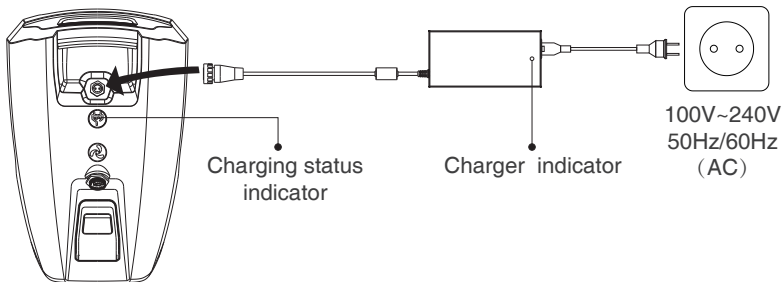


Figure 6-3

Indicator	Normal Status	Description
Charger indicator	Solid red light	The charger has been plugged into the charging port of the battery and it works well.
	Solid green light	The charger works well but has not been plugged into the charging port of the battery, or the battery has been fully charged.

Indicator	Normal Status	Description
Charging status indicator	Solid red light	The battery is being charged.
	Solid blue light	The battery has been fully charged.

Indicator	Abnormal Status	Description
Charger indicator	Light out	<ol style="list-style-type: none"> 1. Make sure the AC socket has power output. 2. Disconnect the battery with charger, if the charger indicator becomes solid green, there may be a fault in battery, please contact your dealer. 3. If the charger indicator is still off after disconnecting with the battery, there may be a fault in charger, please contact your dealer.
Charging status indicator	Light out	<ol style="list-style-type: none"> 1. Disconnect the battery with charger, if the charger indicator becomes solid green (remark for the colour), there may be a fault in battery, please contact your dealer. 2. Disconnect the battery with charger, if the charger indicator is still off, there may be a fault in charger or battery, please contact your dealer. 3. After fixing the issues of the charger, please recheck the status of charger indicator. If there are still problems with battery, please contact your dealer.

Step3: Plug the battery charger out of the wall socket after the battery has been fully charged.

7 Trim Angle Adjusting

SPIRIT 1.0R has four trim angle options: 21°, 14°, 7° and 0°. The trim angle should be adjusted based on the boat type and the running speed to achieve higher efficiency. It is recommended to try different trim angles at your desired running speed to achieve the best performance.

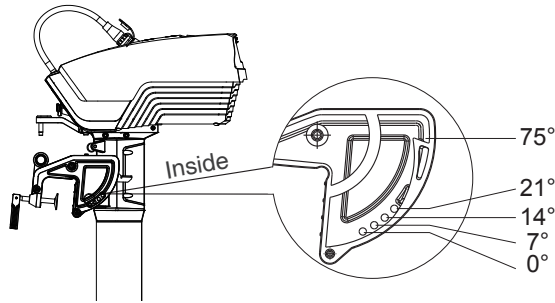


Figure 7-1

- ⚠ Only adjust the trim angle when the outboard is stopped.
- ⚠ Never toggle the trim release lever if the propeller is rotating.

To adjust trim angle

Step1: Pull the trim release lever up and tilt up the outboard to the 75° position.
(Refer to the *section 4.5 Tilting up the Outboard Motor.*)

Step2: Remove the pull ring on the trim pin then pull the trim pin out.

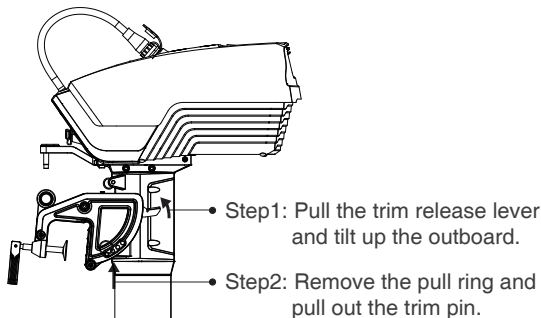


Figure 7-2

Step3: Select a desired trim angle and insert the trim pin into the corresponding hole, attach the pull ring to fix the trim pin.

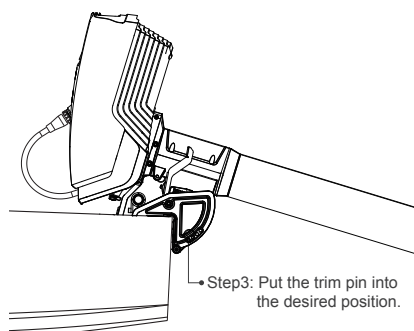


Figure 7-3

Step4: Pull the trim release lever again to lay down the outboard motor, and the outboard motor will stay at the desired trim angle.

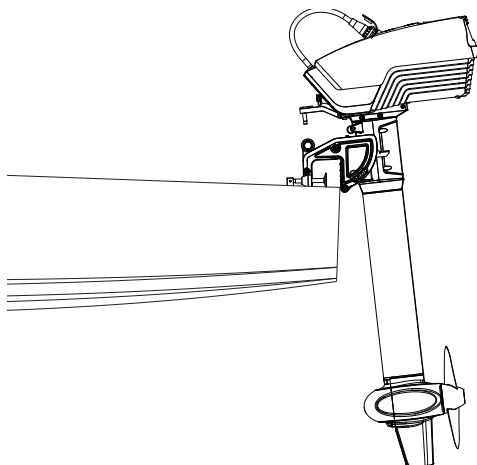


Figure 7-4

Step5: Try to tilt up the outboard and test if the angle is successfully fixed. It is recommended to try different trim angles to help find the best working trim angle for the boat and operating conditions. Please increase the speed gradually during test, watch out for water cavity and other instability problems, if the problem gets serious, stop the outboard immediately and try to reduce the trim angle.

8 Propeller Assembly

The outboard performance is seriously affected by the type of propeller. Users can select a proper propeller according to different application conditions. For a larger load boat and a low running speed, a lower-pitch propeller is more suitable. Inversely, for a smaller load boat and a fast running speed, a higher-pitch one is more suitable. Contact your dealer on propeller selection.

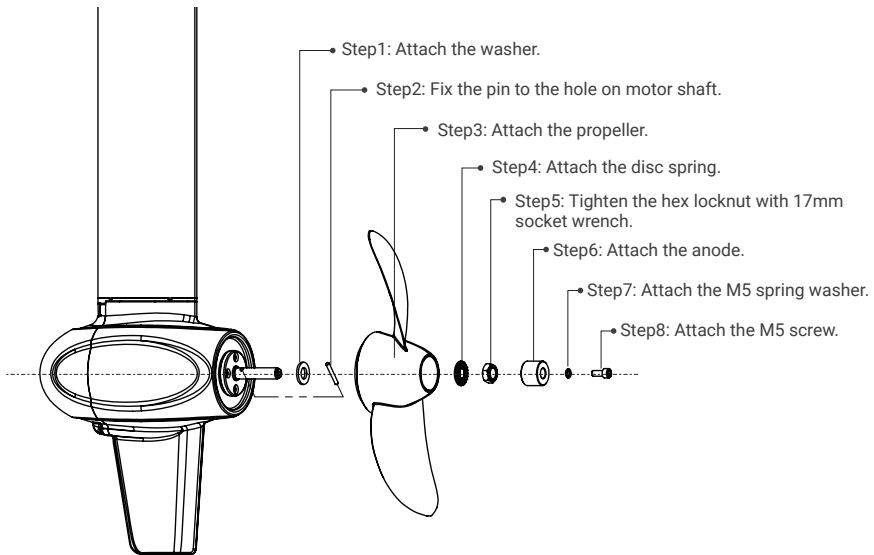


Figure 8-1

9 Anti-grounding Mode

When the boat runs in shallow water or in complicated underwater conditions, it may meet grounding dangers. Setting the outboard to anti-grounding mode will protect the outboard motor from damage if the outboard hits submerged reefs or rocks. In anti-grounding mode, the underwater part of the outboard is flexible in tilting direction and the motor will automatically tilt up if it hits something underwater.

! Never turn the throttle backward when the outboard is in anti-grounding mode.

To set the outboard in anti-grounding mode:

Step1: Pull the beaching pin to the limit and hold, then pull the trim release lever to the upmost position.

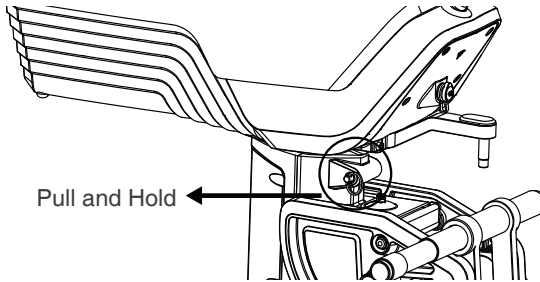


Figure 9-1

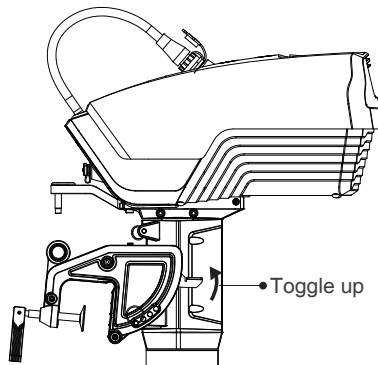


Figure 9-2

Step2: Release the beaching pin and the trim release lever will stay at the position shown in the figure below. And then the anti-grounding mode is activated.

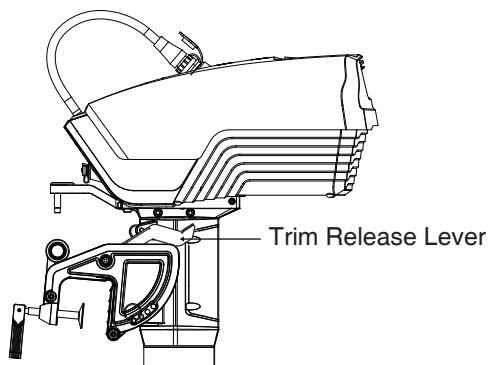


Figure 9-3

To inactivate the anti-grounding mode

Pull the beaching pin again and make the trim release lever return to horizontal position, the anti-grounding protection will be disabled and the outboard will work in normal state.

- ⚠ Never pull the trim release lever when the propeller is rotating.
- ⚠ Never activate the anti-grounding mode when the propeller is rotating.
- ⚠ Only use the anti-grounding mode in necessary conditions, such as in shallow water, near the shore or unknown underwater conditions.




10 Maintenance

10.1 Notes



Regular maintenance is beneficial to keep your outboard working in optimal condition.

Do not start the outboard in shallow or unknown water conditions. Only use the outboard in deep water area.

In order to clean and reduce corrosion, use fresh water to wash the whole outboard after use in salt water.

-  Disconnect the battery from outboard before maintenance.
-  Conduct the maintenance under instructions of professional experts or your dealer.
-  Only use ePropulsion original components for replacement and maintenance.

10.2 Propeller Maintenance

-  Ensure the battery is disconnected before each check, as a rotating propeller is dangerous.
-  Gloves are recommended to wear, in order to protect your hand from the sharp propeller edges.

Check the propeller based on the following tips, then refer to the *Chapter 8 Propeller Assembly* to replace a new propeller if necessary.

1. Check the propeller blades for wear broken and other damage.
2. Check the pin for wear and damage.
3. Check for water plants, fishing net or line twine around the propeller.

10.3 Replacing the Anode

Please refer to the figure below to replace a new anode if necessary.

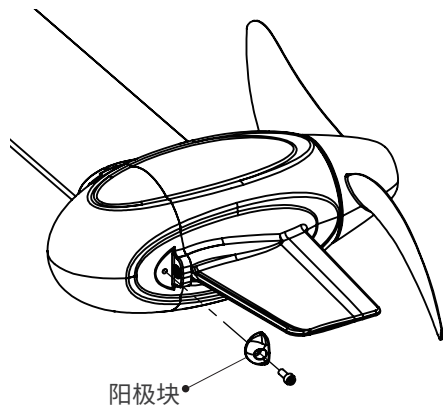


Figure 10-1

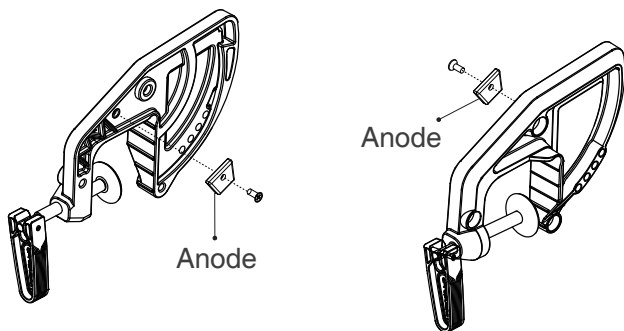


Figure 10-2

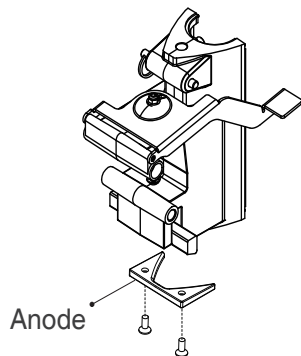


Figure 10-3

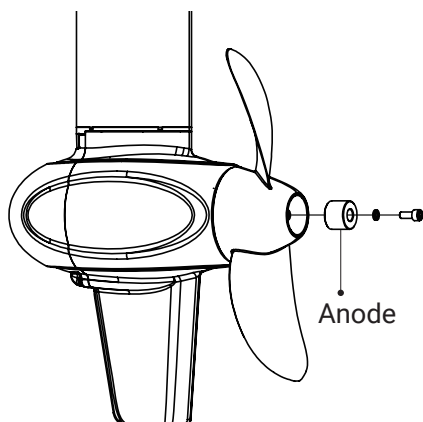


Figure 10-4

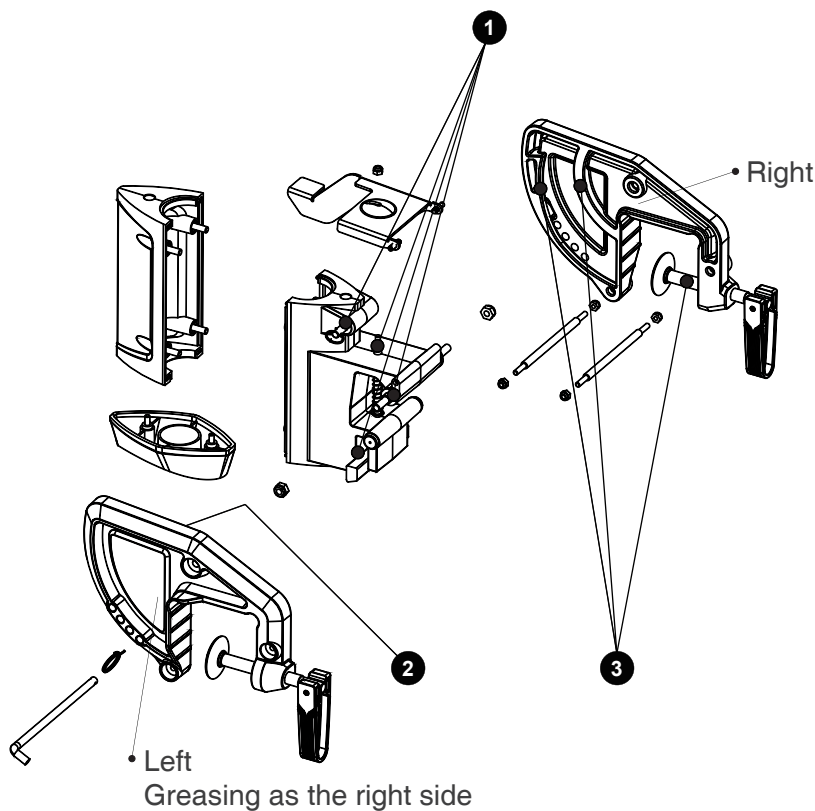
10.4 Maintenance Time Table

Regularly maintained in proper manner and used in normal condition, the outboard can work at its optimal state. The following table shows a general maintenance frequency, which however may vary according to operating conditions.

Item	Operations	Initial	Every	
		50 hours (3 months)	100 hours (6 months)	200 hours (12 months)
Anode	Check/Replace	□	□	■
Greasing points	Greasing		□	■
Propeller and pin	Check/Replace	□	□	■

💡 The "□" symbol indicates checks may be carried out by users. The "■" symbol indicates work to be carried out by your dealer.

Greasing Map



11 Transportation and Storage

11.1 Transportation

For long distance transport, please use the ePropulsion original package to pack the outboard before transportation.

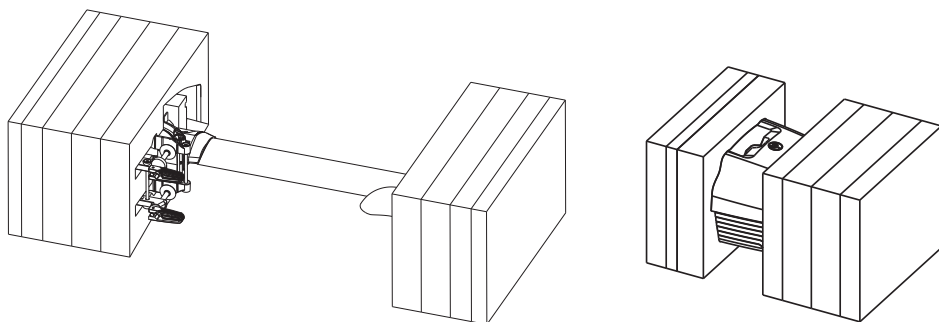


Figure 11-1

11.2 Placement

When place the outboard on the ground, ensure the ground is flat and clean. It's better to put some damping cotton or cushion under the outboard to prevent damage.

⚠ The Li-ion batteries over 100Wh are not allowed in the aircraft. The Li-ion batteries are classified under Class 9 (dangerous goods - see *Lithium Battery Guidance Document IATA 2015 Revision 1 – I-Site www.iata.org*).

⚠ Never ship a damaged or broken battery.

11.3 Storage

If your outboard is going to be stored for more than 2 months, it's advised to have the outboard cleaned, checked prior to storage. It's recommended to pack the outboard with ePropulsion original package for storage.

⚠ Take adequate damping-absorber for protection before transport and storage. And ensure the propeller receives no pressure if the propeller is installed on the propeller shaft.

⚠ Store the outboard in a dry, well ventilated place without direct sun exposure.

12 Emergency Situations ---

12.1 Impact Damage

If the outboard strikes some object in the water, please follow the procedures below.

1. Stop the outboard immediately.
2. Check the propeller and other components before you start the motor again.
3. Return to the nearest harbor or beach.
4. If the motor is damaged, find your dealer or ePropulsion service center for help.

12.2 Sodden Outboard

If the outboard is sodden, stop it immediately and disconnect the battery. Then take the outboard to a dealer immediately. Ensure the outboard is thoroughly inspected before re-operation.

12.3 Low Battery Level

When the battery voltage is lower than a set threshold, the outboard will stop automatically to prevent battery from over-discharging. If this happens when the outboard is far away from the shore, and no new battery can be replaced, it's recommended to wait until the battery voltage recovers, and you can restart the outboard to return with throttle power under 100W.





13 Warranty




The ePropulsion limited warranty is provided for the first end purchaser of an ePropulsion product. Consumers are entitled to a free repair or replacement of defective parts or parts which do not conform with the sales contract. This warranty operates in addition to your statutory rights under your local consumer law.

13.1 Warranty Policies

ePropulsion warrants its products to be free of defects in material and workmanship for a limited period since the date of purchase. Once a fault is discovered, the user has the right to make a warranty claim under the ePropulsion warranty policies.

Product	Warranty Expiry Date
SPIRIT 1.0R	Two years after the date of purchase.
Repaired/Replaced Components	Three months since the date of maintenance. Note: <ol style="list-style-type: none">1. If the three-month period overlaps with the original warranty period, the warranty against these replaced or repaired parts still expires two years after the date of purchase.2. If the three-month period exceeds the original warranty period, the repaired or replaced parts continue applying to warranty during the extended period.

-  In order to validate the warranty, users are required to fill in the Warranty Card in the package in advance.
-  Keep the product label in intact state and record the serial number on the label. Never tear the label off the product. An ePropulsion product without the original product label will not be applicable to warranty services provided by ePropulsion.
-  The warranty is valid only when the information is correct and complete.
-  Free warranty is only validated upon the presentation of legal serial number, Warranty Card, and evidence of purchase from an authorized ePropulsion dealer.


-  Valid date of purchase should be established by the first-hand purchaser with original sales slip.
-  Free warranty is not transferable and will not be reissued.
-  Within the limits of the applicable laws, the warranty policies of ePropulsion may update without prior notice. The latest version is available at our website www.epropulsion.com.


13.2 Out of Warranty

Make sure the product is properly packed during delivery, the original ePropulsion package is recommended. If the product got further damaged due to improper packing during delivery, the furtherly damaged part will be deemed as out of warranty coverage.

In addition, faults or damages caused by the following reasons are also excluded from warranty scope within the covered period:

- Any improper operation contradicts the user manual.
- Accident, misuse, wishful abuse, physical damage overcharging or unauthorized repair.
- Dropping, improper care or storage.


 You should be noted that minor faults like normal wear and tear that pose no influence on the intended function of the product are also not covered by the warranty.

 Consumables are out of warranty scope.

13.3 Warranty Claim Procedures

If you find your product defective, you can make a claim to your dealer following below procedures:

1. Fill in the Warranty Card correctly and completely in advance. Then make your warranty claim by sending it to your authorized ePropulsion service partner together with valid proof of purchase. Usually these documents are required when making a warranty claim: the Warranty Card, ex-factory serial number, and evidence of purchase.
2. Send the defective product to your authorized ePropulsion service point after getting the confirmation. Note that the label should be kept intact. You can also deliver the product to your authorized ePropulsion dealer after getting confirmation.

3. The defective components or parts will be either repaired or replaced according to the diagnosis made by the ePropulsion authorized service partner.
 4. If your warranty claim is accepted, the equipment will be repaired or replaced free of charge. Note that any delivery cost incurred in the process is at your charge.
 5. After careful examination and confirmation by ePropulsion authorized dealer, the defective or faulty components will be repaired or replaced with brand new ones against the actual condition.
 6. In case your warranty claim be rejected, an estimated repair charge with round trip delivery cost will be sent for confirmation. ePropulsion authorized service point will conduct maintenance accordingly only after your confirmation.
-  If warranty expires, you can still enjoy maintenance services from authorized ePropulsion service partners with minimum maintenance charge.

Thanks for reading this user manual.

If you have any concerns or find any problems while reading, please don't hesitate to contact us. We are delighted to offer service for you.

Dongguan ePropulsion Intelligence Technology Limited

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Email: service@epropulsion.com