

Solar Light Tower

VSLT240-MH



***OPERATION AND MAINTENANCE
MANUAL***

This manual covers the following machines:

SN No.	Production Date

Operating/Parts Information

You must be familiar with the operation of this machine before you attempt to troubleshoot or repair it. Basic operating and maintenance procedures are described in the Operator's Manual supplied with machine. Keep a copy of the Operator's Manual with the machine at all times. If you are missing the document, please contact us to order a replacement.

Damage caused by misuse or neglect of the unit should be brought to the attention of the operator to prevent similar occurrences from happening in the future.

This manual provides information and procedures to safely repair and maintain the S4 solar lighting tower. For your own safety and protection from injury, carefully read, understand, and observe all instructions described in this manual. **THE INFORMATION CONTAINED IN THIS MANUAL IS BASED ON MACHINES MANUFACTURED UP TO THE TIME OF PUBLICATION. HARBINGER RESERVE THE RIGHT TO CHANGE ANY PORTION OF THIS INFORMATION WITHOUT NOTICE.**

Foreword

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Safety Information

1. Safety Information

This manual contains *DANGER*, *WARNING*, *CAUTION*, *NOTICE* and *NOTE* callouts which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.

The followings are the safety alert words. 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.

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

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

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: Used without the safety alert symbol, ***NOTICE*** indicates a hazardous situation which, if not avoided, could result in property damage.

Note: Contains additional information important to a procedure.

1.1 Operating Safety

WARNING: Familiarity and proper training are required for the safe operation of the machine. Machines operated improperly or by untrained personnel can be dangerous. Read the operating instructions carefully and familiarize yourself with location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the machine before being allowed to operate it.

- 1.1.1 The area immediately surrounding the Light Tower should be clean, neat, and free of debris.
- 1.1.2 *ALWAYS* be sure the machine is on a firm, level surface and will not tip, roll, slide or fall while operating.
- 1.1.3 *NEVER* start a unit in need of repair.
- 1.1.4 Lower the tower when not in use, or if high winds or electrical storms are expected in the areas.
- 1.1.5 *ALWAYS* make certain the machine is well-grounded and securely fastened to a good earthen ground per national and local regulations.
- 1.1.6 The tower extends up to **8.5m(27.9ft.)**. Make sure the area above the trailer is open and clear of overhead wires and obstructions.
- 1.1.7 Keep the area behind the trailer clear of people while raising and lowering the mast.
- 1.1.8 The trailer must be leveled and the outriggers extended before raising the tower. The outriggers must remain extended while the tower is up.
- 1.1.9 If for any reason any part of the mast hangs up or the cable develops slack while raising or lowering the tower, **STOP** immediately!
- 1.1.10 *NEVER* remove the mast locking pin while the tower is up!
- 1.1.11 *NEVER* use the machine if the insulation on the electrical cord is cut or worn through.
- 1.1.12 *NEVER* operate the lights without the protective lens cover in place or with a lens cover that is cracked or damaged!
- 1.1.13 *NEVER* adjust the mast while the unit is operating.
- 1.1.14 *NEVER* raise the mast or operate the machine in high winds.

Safety Information

1.2 Towing Safety

WARNING: Towing a large trailer requires special care. Both the trailer and vehicle must be in good condition and securely fastened to each other to reduce the possibility of an accident.

1.2.1 ALWAYS check that the hitch and coupling on the vehicle are rated equal to, or greater than, the trailer's "gross vehicle weight rating"(GVWR).

1.2.2 ALWAYS inspect the hitch and coupling for wear or damage. DO NOT tow the trailer using defective parts.

1.2.3 ALWAYS make sure the coupling is securely fastened to the vehicle.

1.2.4 ALWAYS check the tires on the trailer for tread wear, inflation, and condition. Replace worn tires.

1.2.5 ALWAYS connect the safety chains.

1.2.6 ALWAYS make sure directional and trailer lights are connected and working properly.

1.2.7 ALWAYS check that the lug nuts holding the wheels are tight and that none are missing.

1.2.8 The maximum recommended speed for highway towing is 72km/hour (45MPH). Recommended off-road towing speed is not to exceed 16 km/hour (10MPH) or less depending on terrain.

1.2.9 ALWAYS refer to the applicable Department of Transportation regulations before towing.

1.3 Service Safety

Only a qualified electrician should troubleshoot or repair electrical problems occurring with this equipment.

1.3.1 ALWAYS replace the safety devices and guards after repairs and maintenance.

1.3.2 Before servicing the Light Tower, make sure the circuit breakers are open(off), and the negative terminal on battery is disconnected. NEVER perform even routine service(hydraulic oil changes, cleaning, etc.) unless all electrical components are shut down.

1.3.3 DO NOT allow water to accumulate around the base of the machine. If water is present, move the machine and allow the machine to dry before servicing.

1.3.4 DO NOT service the machine if your clothing or skin is wet.

1.3.5 ALWAYS keep the machine clean and labels legible. Replace all missing and hard-to-read labels. Labels provide important operating instructions and warn of dangers and hazards.

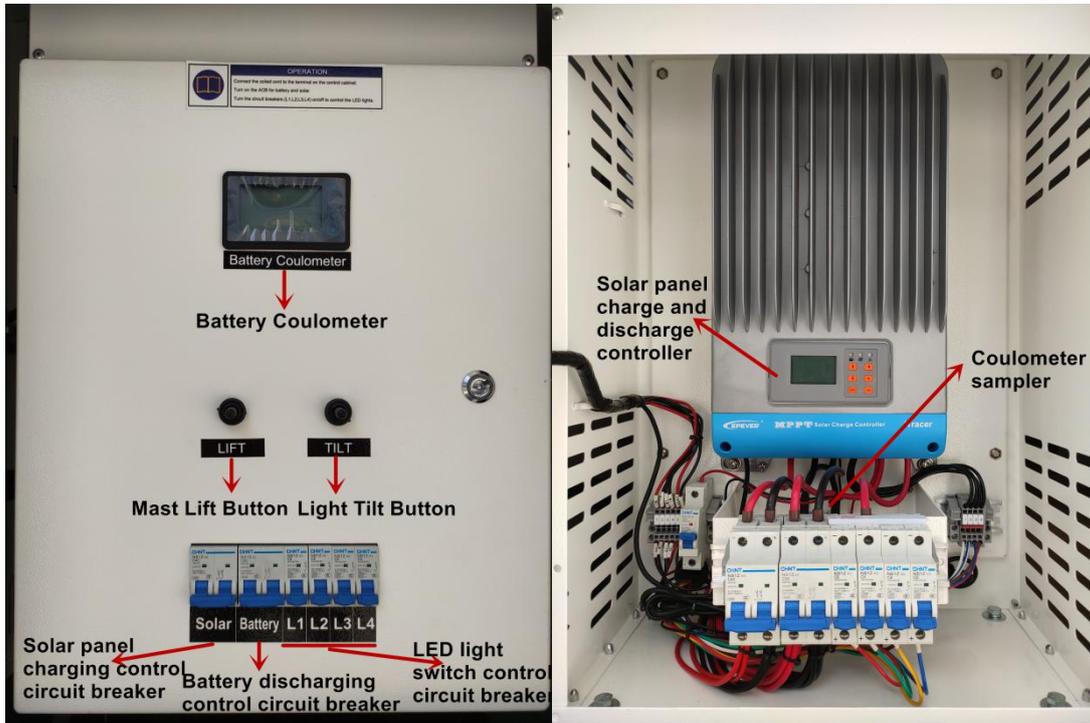
1.3.6 ALWAYS make sure slings, chains, hooks, ramps, jacks and other types of lifting devices are attached securely and have enough weight-bearing capacity to lift or hold the machine safely.

Always remain aware of the location of other people around when lifting the machine.

1.3.7 Always turn off the light circuit breakers before disconnecting the light fixtures or changing the light bulbs.

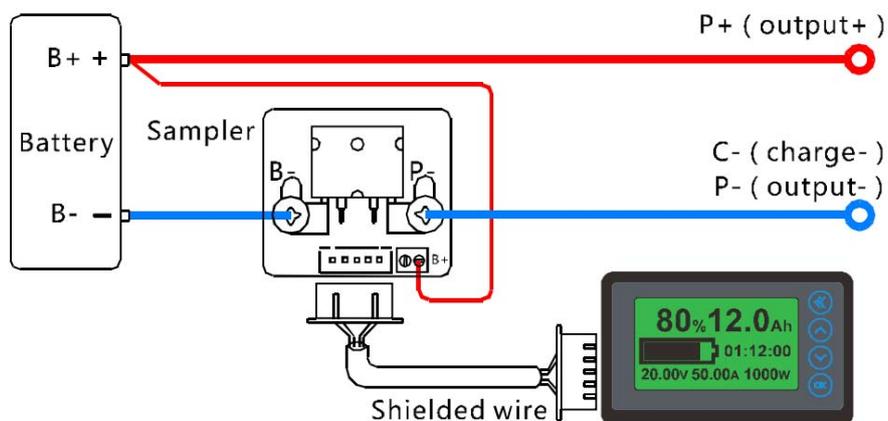
Control Box

2. Control Box



2.1 Battery coulometer

2.1.1 Connection of coulometer.



We can accurately get the battery capacity information through the parameters on the coulometer.

Control Box

2.2 Circuit breaker

2.2.1 Solar panel charging control circuit breaker.

We can use this circuit breaker to control whether the solar panels charge the batteries.

2.2.2 Battery discharge control circuit breaker.

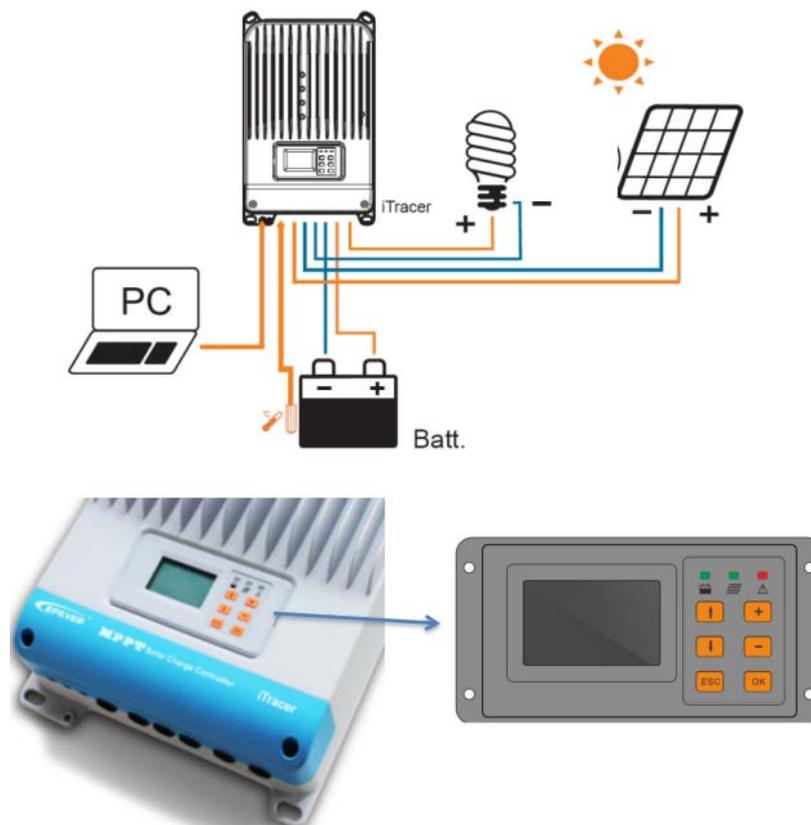
We can use this circuit breaker to control whether the batteries supply power to the load.

2.2.3 LED light switch control circuit breaker.

We can use this circuit breaker to control the lighting on and off of the LED lights.

2.3 Solar panel charge and discharge controller

2.3.1 Charging controller wiring system



Key	Explain
	※Enter the corresponding interface※Save data
	※Under any interface, return to the main interface※Cancel operation
	※Move Cursor※Browsing parameters
	※Modified value※Modify time parameters

The solar panel charges the battery through this charging controller, which can also control the battery discharge.

2.4 Charging and discharging steps

2.4.1 Charging steps

- Step1: Expanding solar panels
- Step2: Turn on the solar panel charging control circuit breaker
- Step3: Turn on the battery discharge control circuit breaker

2.4.2 Discharging steps (Turn on the LED lights)

- Step1: Turn on the battery discharge control circuit breaker
- Step2: Turn on the LED light switch control circuit breaker one by one

2.5 Lift and Tilt button

2.5.1 Lift button

- Step1: Press the button up to control the hydraulic system to lift the mast.
- Step2: Press the button down to control the hydraulic system to down the mast.

2.5.2 Tilt button

- Step1: Press the button to adjust the Angle of the light.

Control Box

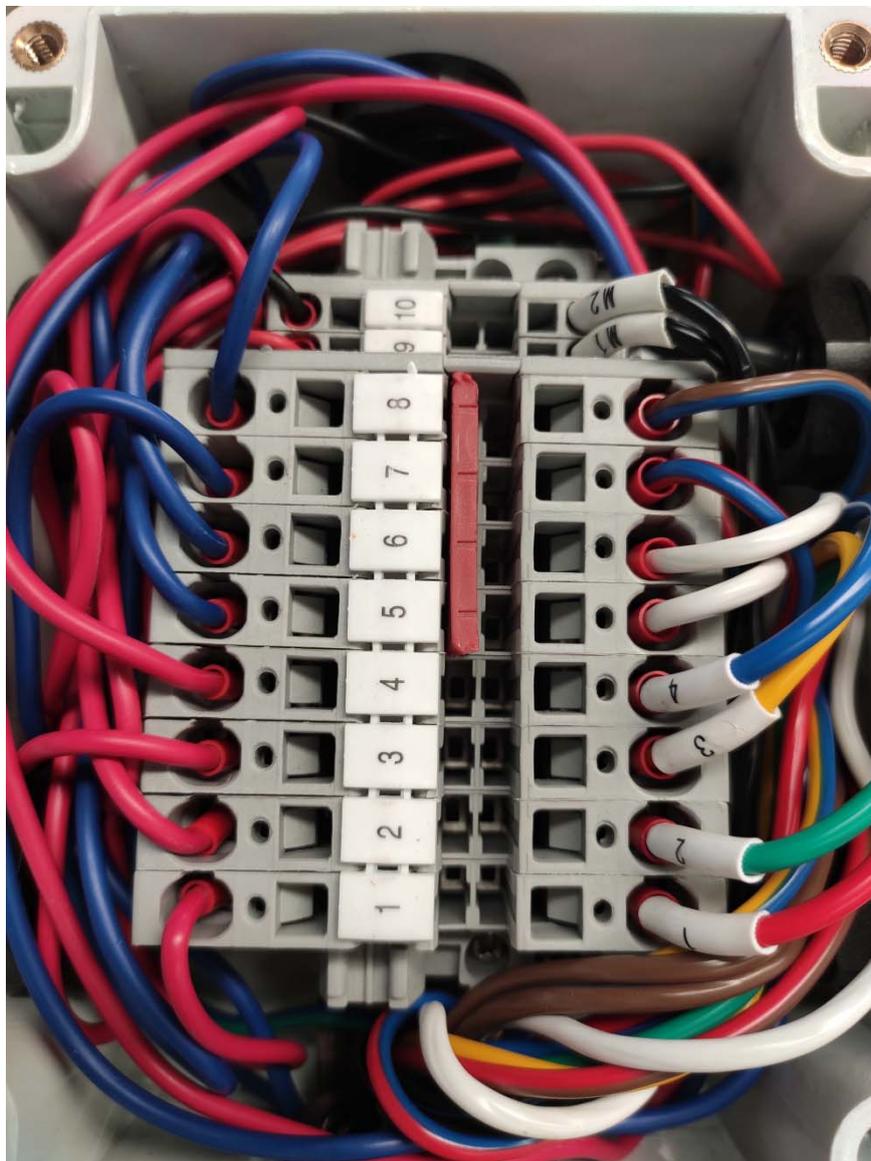
2.6 Junction box and light cable

Step1: Fix the LED light on the horizontal bar, and fix the light cable on the horizontal bar with wire clip.

Step2: Thread the light cable from the waterproof lock to the junction box.

Step3: Thread the coil cord from the waterproof lock to the junction box.

Step4: Refer to the following picture for wiring.



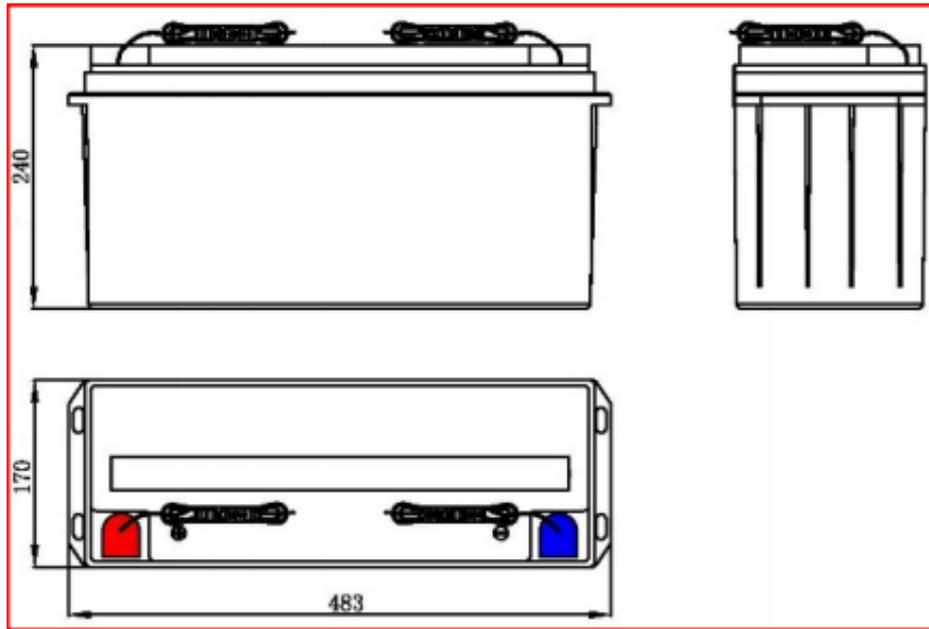
Control Box



Battery

3. Battery

3.1 Battery parameters



Rated voltage	12V	
Rated capacity	150 Ah(10hr, 1.80V/cell, 25℃)	
Gross weight	40.2kg	
Battery terminal	Leading wire(4.0 mm ² x 1.8m)	
Maximum charging current	37.5A	
Applicable temperature range	-35~55 ℃	
Size(±3%)	Length	483mm
	Width	170mm
	Height	240mm
	Total height	240mm
Cover material	ABS	
Applications	Suitable for solar(wind) household systems, off-grid power stations, the sun energy(wind) communication/communication base station, solar(wind) street lamp, mobile energy storage system, solar traffic lights, solar buildings system etc.	

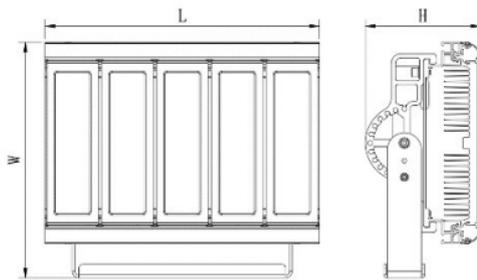
4. LED light

Descriptions

The luminaire contains constant-current driver(s) and LED module(s).

It works under technical conditions as the product labels indicate.

Its modular design makes it convenient to replace whichever of the modules that failed.



4.1 LED light parameters

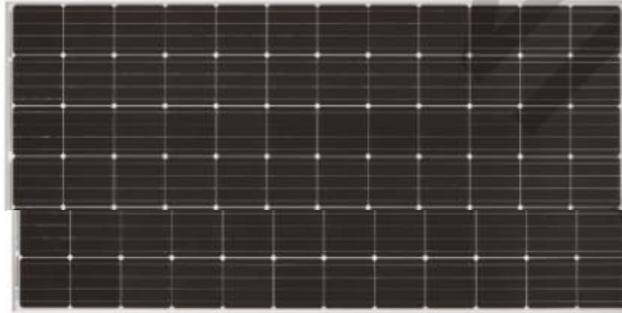
Model	Harbinger-60W
Module Quantity	1
Power	60W
Input Voltage	DC24V
Working Environment	-40°C~+50°C 10%~90%RH
Bolt Torque	17Nm
Mounting Height	3~35m
Dimensions (L*W*H)mm	340*160*135
Net Weight	2.8KG
Degree of Protection	IP67

LED Light

4.2 Adjust lighting Angle

Adjust the direction of the light by rotating the LED's body in the direction it faces.

5. Solar panel



5.1 Solar panel parameters

Rated maximum power(Pmax)	360W
Output tolerance	0 ~ +4.99W
Current at Pmax	9.33A
Voltage at Pmax	38.6V
Short-circuit current	9.98A
Open-circuit voltage	47.7V
Nominal operating cell temp	45±2 °C
Weight	22KG
Dimension	1956*992*40mm
Maximum system voltage	DC1000V
Maximum series fuse rating	20A
All technical data at standard test condition AM=1.5 E=1000W/m ² Tc=25°C	

5.2 Steps to expand the solar panel

Step1: Draw back the pull pin on the upper part of the solar panel and lock it.

Step2: Lift the guide rail buckle up and pull out a small section of the solar panel.

Step3: Lower the buckle and stretch until the buckle is locked.

5.3 Steps to retract the solar panel

Step1: Lift the guide rail buckle up and retract a small section of the solar panel.

Step2: Lower the buckle and retract until the buckle is locked.

Solar panel

5.4 In normal use, please pay attention to the protection of solar panels, to avoid the impact of hard objects.

6. Mast



6.1 Raise and lower the mast

- (1). First fix the mast with the locating bolt to ensure that the mast does not rotate.
- (2). Check the condition of the wire rope before lifting or lowering the mast.
- (3). Use toggle switch('Lift' label) of control box to lift and lower the mast.

6.2 Rotate the mast

- (1). First draw back the locating bolt.
- (2). Rotate the mast to the desired angle by rotating the handle.
- (3). Rotate the mast slowly to ensure safety.

Mast

NOTE: The mast can only be rotated clockwise.

6.3 Tilt the lamp horizontal mast

Use toggle switch('Tilt' label) of control box to tilt the lamp horizontal mast.

7.Axle and Towing system



7.1 Make sure tire pressure is adequate and check regularly for screw tightness in axle system.

7.2 Check the reliability of the brake system regularly.

7.3 When using the lighting tower, use the jack as an auxiliary support to ensure the overall horizontal state.

7.4 When using tow bar to tow the lighting tower, use the tongue jack to raise the trailer tongue up and then lower it over hitch on towing vehicle. Lock the hitch to coupling and attach the safety chains(optional). Swivel the tongue jack and lock it in place, make sure the tow bar head is firmly secured to the trailer and the brake is loose, meanwhile hook up the trailer with the towing hook.

Axle and Towing system

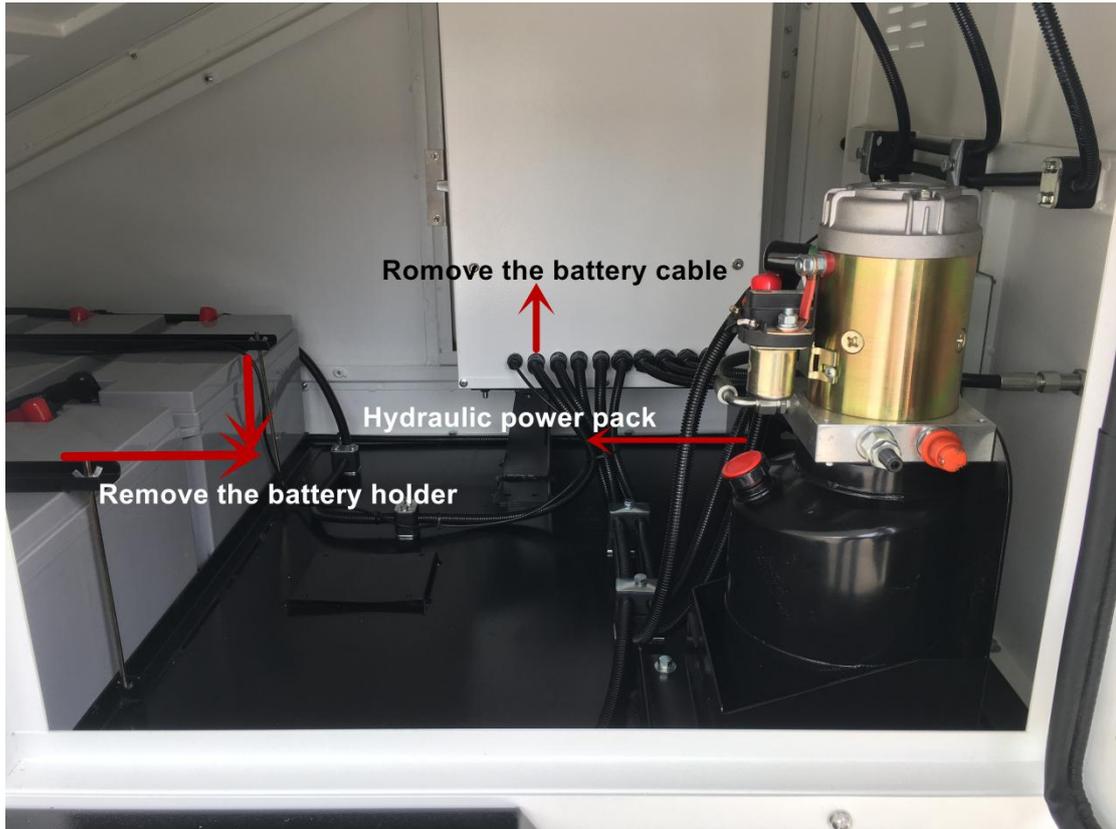
7.5 When the light tower is in normal use, the mounting hole between the towbar and the chassis is a mounting hole at the end of the towbar. Then insert a latch in the hole and insert the end of the pin with the R-pin.

NOTE: The latch and the hole are tight fit. When installing the latch, slowly insert the latch by shaking the towbar.

7.6 When transporting, you can use a hole in the middle of the towbar as the fixing hole between the towbar and the chassis to reduce the transportation size.

8.Maintenance

8.1 Replace the batteries



8.1.1 Open the cover of the electric box and remove the battery cable, then remove battery holder.

8.1.2 Move out the old batteries and replace them with new ones.

8.2 Hydraulic part

8.2.1 Check the hydraulic oil pipeline regularly to see if there is oil leakage.

8.2.2 Replace hydraulic oil regularly.

NOTE: please replace the oil once in the first month after use, and then replace or filter the hydraulic oil every 1000 hours or half a year depending on the use. If it is not used for a long time, it is necessary to keep sufficient oil in the tank and start it once a week.

Caution

9. Caution

9.1 When using a forklift to move the lighting tower, only the forklift pockets located at the rear of the lighting tower should be used.

9.2 Prior to using a forklift to lift the lighting tower, ensure that the mast is lowered to the stowed position.