

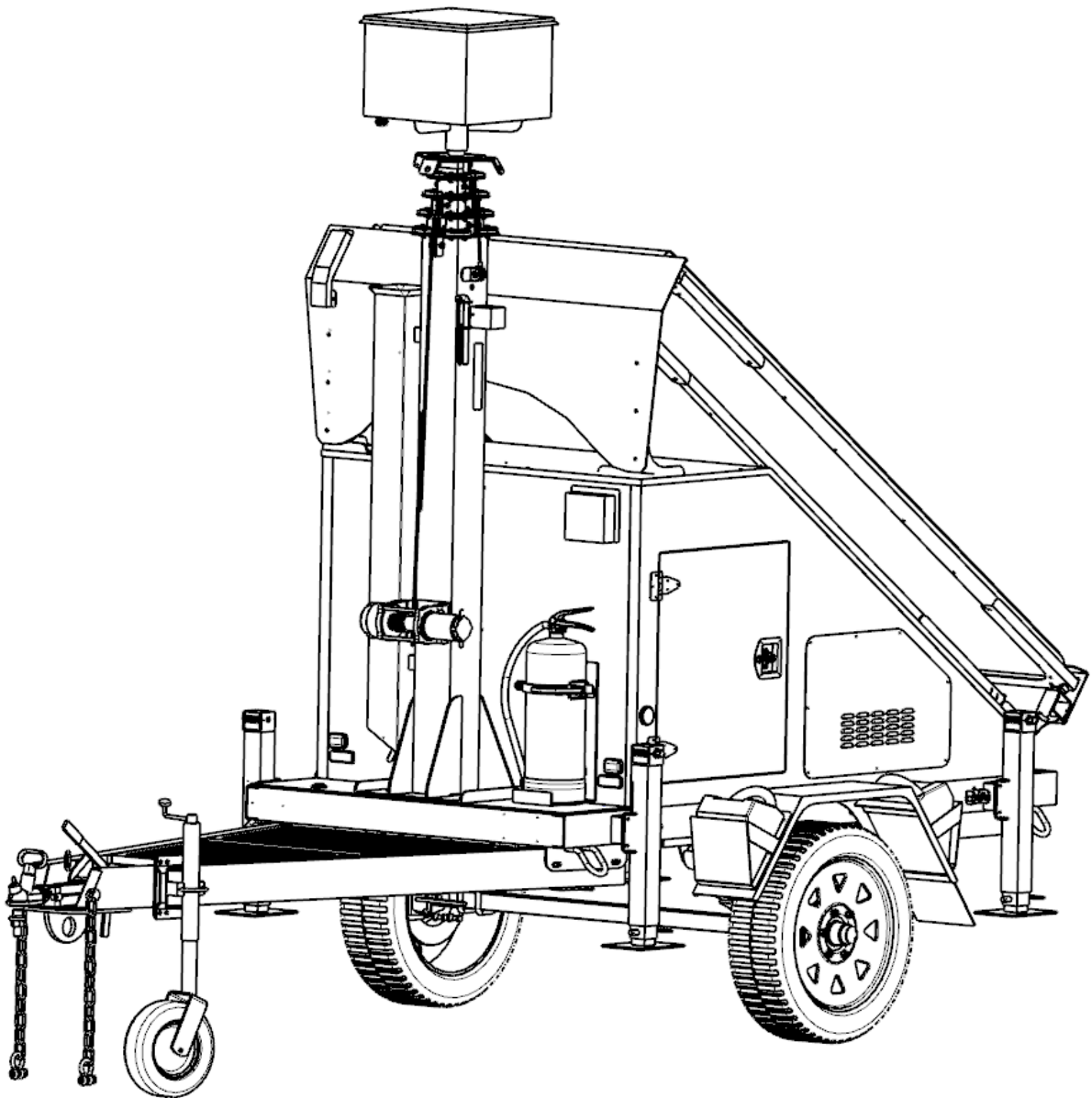


Operating Manual

MS3

MOBILE SECURITY

MST-1350 PRO



Mobile Security & Surveillance Systems, LLC

Phone: 330-659-2244

www.vms3.com

INTRODUCTION

This manual provides information and procedures to safely operate and maintain the solar trailer. For your own safety and protection from physical injury, carefully read, understand, and observe the safety instructions described in this manual. *The information contained in this manual was based on machines in production at the time of publication. MS3 reserves the right to change any portion of this information without notice.*

DO NOT MODIFY or use this equipment for any application other than which it was designed for.

Mobile Security & Surveillance Systems, LLC recommends that a trained and licensed professional perform all electrical wiring and testing functions.

The manual provides detailed operation and maintenance procedures.

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**WHEN CALLING FOR PARTS OR TECHNICAL SERVICE INFORMATION, PLEASE
HAVE YOUR UNIT SERIAL NUMBER READY TO HELP
FACILITATE YOUR CALL.**

Unit Model Number: _

Unit Serial Number: _

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SAFETY NOTES



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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.

This manual contains DANGERS, WARNINGS, CAUTIONS, NOTICES and NOTES which must be followed to prevent the possibility of improper service, damage to the equipment, personal injury or death. The following formatting options will apply when calling the readers attention to the DANGERS, WARNINGS, CAUTIONS, NOTICES and NOTES.

⚠ 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, may result in minor or moderate injury.

NOTICE

Indicates a hazardous situation which, if not avoided, may result in property or equipment damage.

Note: Notes contain additional information important to a procedure and will be found within the regular text body of this manual.

OPERATING SAFETY



Before using the solar trailer, be sure you read and understand all of the instructions! This equipment was designed for specific applications; DO NOT modify or use this equipment for any application other than which it was designed for. Equipment operated improperly or by untrained personnel can be dangerous! Read the operating instructions and familiarize yourself with the location and proper use of all instruments and controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate or set up the solar trailer. The following points should be practiced at all times:

- The area immediately surrounding the solar trailer should be dry, clean, and free of debris.
- Position and operate the solar trailer on a firm, level surface.
- **NEVER** operate a unit in need of repair.
- Lower tower when not in use, or if high winds or electrical storms are expected in the area.
- Make certain solar trailer is well grounded and securely fastened to a good earthen ground.
- When the mast is raising, make sure area above devices is open and clear of overhead wires and obstructions.
- Keep area beside trailer clear of people while raising and lowering mast!
- Trailer must be leveled and outriggers extended before raising tower. Outriggers must remain extended while tower is up.
- If for any reason any part of mast hangs up or winch cable develops worn while raising or lowering tower, STOP immediately and replace it.
- **NEVER** remove safety pin or pull mast locking pin while tower is up!
- **NEVER** use tower if insulation on electrical cord is cut or worn through.
- If used in dense crowds, please set up guards 5 meters away from the unit.
- **NEVER** take power directly from the batteries.



- If not being used for a long time, please turn off the breaker for the batteries.
- **NEVER** operate electric winch in neutral position when the mast is extending.
- (Optional electric winch is selected.)
- During mast extending, once the hole for locking pin aligns, stop operating the manual/electric winch.
- During solar charge process, do not unplug each panels and the connectors for solar input on the trailer. It will lead to severe personal injury and equipment damage.
- **NEVER** put conductive metal objects on the batteries.
- Do not forget to insert the safety locking pin when cranking up the outrigger.

SERVICE SAFETY



This unit includes solar modules and batteries which are with high voltage circuits capable of causing serious injury or death. Only a qualified electrician should troubleshoot or repair electrical problems occurring in this equipment.

- Before servicing solar trailer, make sure the breakers for solar modules, batteries and cameras are turned OFF. Disconnect the solar panels and batteries.
- **NEVER** allow water to accumulate around the base of the tower. If water is present, **DO NOT** service!
- **NEVER** wash the unit with a power washer or high pressure hose.
- Please wear goggles and insulating gloves, using insulation wrench to replace the batteries.
- **NEVER** disassemble and repair the mast in uneven place. The mast must be hung and installed with equipment.
- **NEVER** replace the tyres and outriggers or adjust and fix the brake system in uneven place.
- **NEVER** replace the manual (electric/hydraulic cylinder) winch when the mast is extending.
- Make sure slings, chains, hooks, jacks, and other types of lifting devices are attached securely and have enough weight-bearing capacity to lift or hold the equipment safely. Always remain aware of the position of other people around you when lifting the equipment.
- WIRE ROPE LUBRICANT WRG3600 is recommended and needs to be maintained once a year.
- Regularly clean the ropes of mast and exposed part.

TOWING SAFETY



Towing a trailer requires care! Both the trailer and vehicle must be in good condition and securely fastened to each other to reduce the possibility of an accident. Also, some countries require that trailers be registered and licensed. Contact your local Department of Transportation office to check on license requirements for your particular unit.

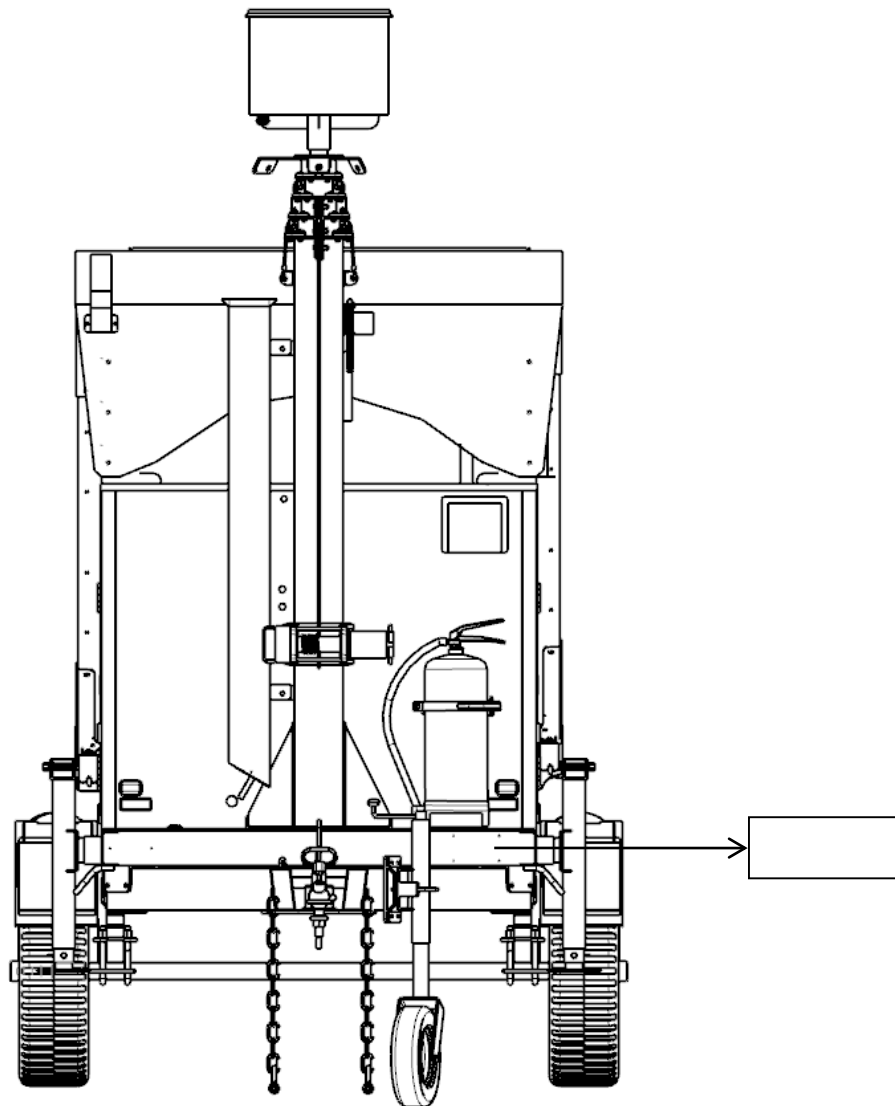
- Check that the hitch and coupling on the towing vehicle are rated equal to, or greater than, the trailer's "gross vehicle weight rating" (GVWR).
- Check tires on trailer for tread wear, inflation, and condition.
- Inspect the hitch and coupling for wear or damage. **DO NOT** tow trailer using defective parts!
- Make sure the trailer hitch and the coupling are compatible. Make sure the coupling is securely fastened to the vehicle.
- Connect safety chains in a crossing pattern under the tongue and if the trailer is with electric brake, attach the breakaway cable **TO THE REAR BUMPER OF THE TOWING VEHICLE**. Do not attach the cable to the trailer hitch.
- Make sure directional and brake lights on the trailer are connected and working properly.
- Check that all lug nuts holding wheels on are tight and that none are missing.
- Maximum recommended speed for highway towing is 45 m.p.h (72km/h). Recommended off-road towing speed is not to exceed 10 m.p.h. or less depending on terrain.

When towing, maintain extra space between vehicles and avoid soft shoulders, curbs, and sudden lane changes. If you have not pulled a trailer before, practice turning, stopping, and backing up in an area away from heavy traffic.

Fill grease on the coupler will extend coupler life and eliminate squeaking. Wipe the coupler clean and apply fresh grease each time the trailer is towed.

UNIT ID/VIN PLATE LOCATIONS

Refer to the locations illustrated below to find the unit ID plate. Important information, such as the unit VIN number, GVWR and GAWR for your trailer are found on the plate. Record the information from the plate, so it is available if it is lost or damaged. When ordering parts or requesting technical service information, you may be asked to specify this information.



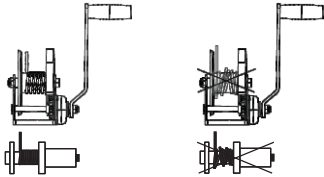
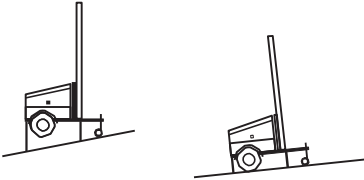

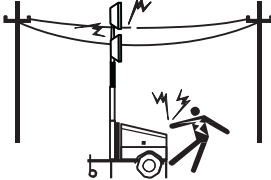

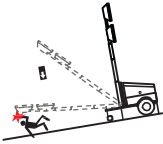
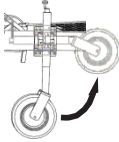
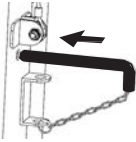
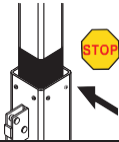



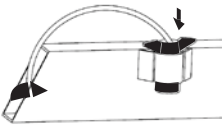



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SAFETY SYMBOLS SUMMARY

This equipment has been supplied with numerous safety and operating decals. These decals provide important operating instructions and warn of dangers and hazards.

	<p>Always keep tension on steel wires! Slack may cause wire damage and excessive wear!</p>
<p>Trailer Level Trailer Not Level</p> 	<p>Do not exceed trailer installation angles as below.</p>
	<p>Electricity storage devices inside. Contact a qualified electrician for service or to open electrical cabinet. Electric shock will cause serious injury or death.</p>
	<p>Contact with overhead electric wire will cause serious injury or death. Do not place the trailer under electric wire.</p>
 <p>Crush hazard! A falling top device can cause death or serious injury.</p>	 <p>Crush hazard! A falling mast can cause death or serious injury.</p>
 <p>When towing trailer, pull the jockey wheel to horizontal position.</p>	 <p>Fix with pin when mast completely extends.</p>
 <p>Stop operating mast when the warning area appears.</p>	 <p>Pinch point area.</p>
 <p>Anchor/tie down point.</p>	 <p>Forklift here only.</p>
 <p>Place the 7-pin plug to the required position after it comes across the Plug Out draw bar tube.</p>	 <p>Read and understand the supplied operator's manual before operating unit.</p>

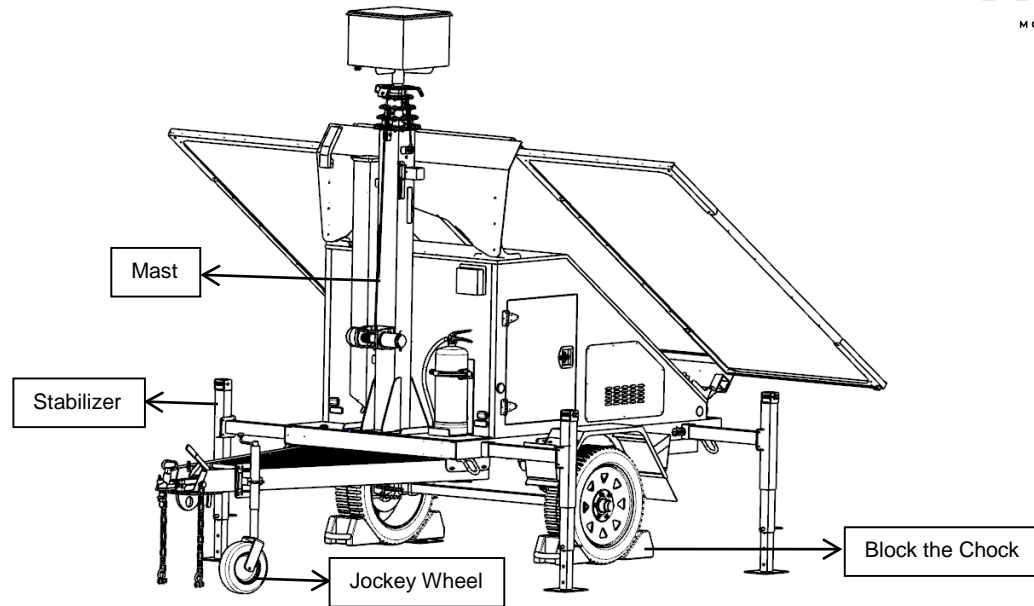
SPECIFICATIONS

Models, Dimension & Weight:	
Model	MST-1350-PRO Series
Estimate Dimensions (mm)	2100*1850*2200
Weight (Kg)	1200
System Parameter:	
Run Time	34 hours (Assume that the total output power is 200W)
Charge Time	6 hours
System Voltage	DC24V
Wind Rating Speed	100KPH
Protection Level	IP65
Solar Panel:	
Solar system	Solar
No. of Solar Panel	3
Panel Wattage	450W
Panel Output	1350W
Panel Material	Monocrystal Silicon
Solar controller	MPPT Solar Charge Controller
Battery:	
No. of Battery	2 x 230Ah
Capacity	460Ah/DC24V
Material	Lithium
Mast Tower:	
Type	Manual Mast (optional Electric)
Total Height	24'
Operate for Extend and Lower	manual operation
Trailer:	
Trailer	Single axle, mechanical brake
Trailer Suspension System	Steel plate spring
Tire	215R15 LT
Tow hitch	2" ball hitch
Paint	Powder coat to prevent corrosion



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SOLAR TRAILER SET UP

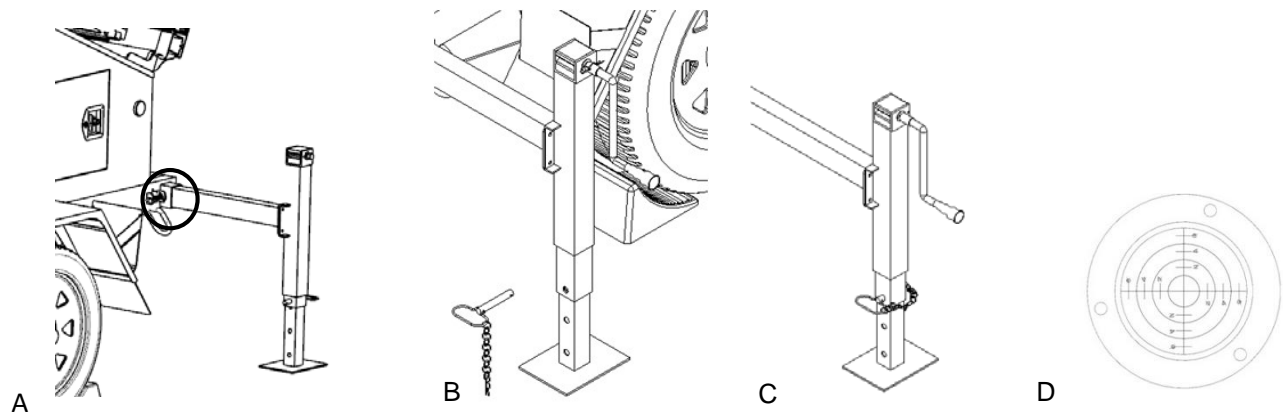


1. For maximum light coverage, place the unit at the open ground location.

⚠ WARNING

The tower extends up to 24.61ft (7.5m). Make sure area above the trailer is open and clear of overhead wires and obstructions.

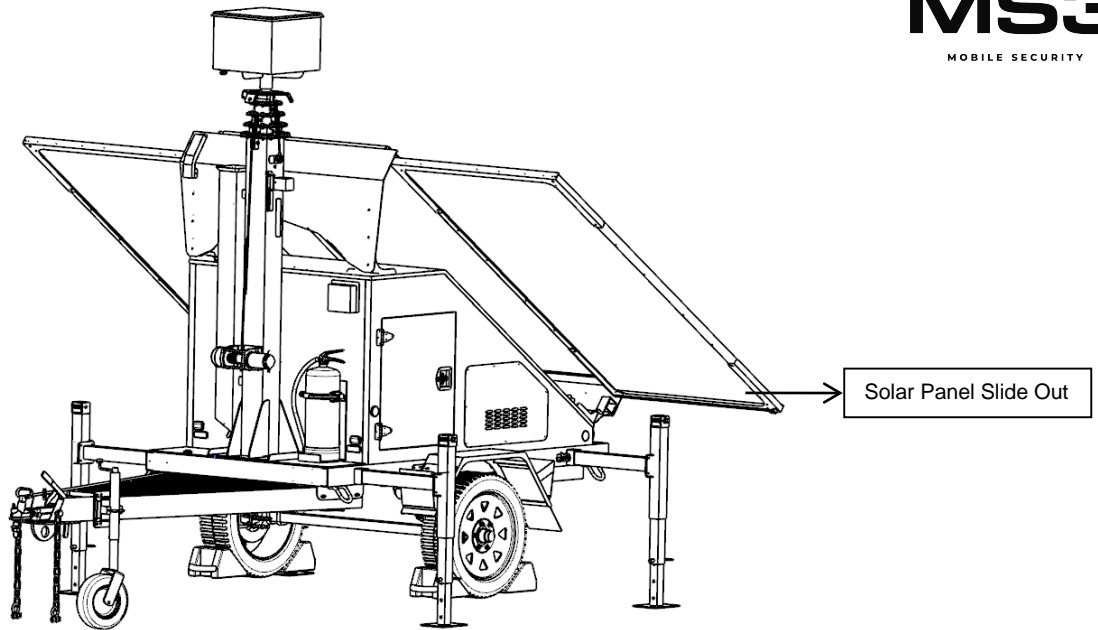
2. Place the trailer on firm ground that is relatively flat. This will make it easier to level the tower. Apply the hand brake and block the wheels on the trailer to keep it from moving.
3. Pull the locking pin on the jockey wheel and rotate it 90° until the spring loaded pin snaps back into place. Turn the jack handle anticlockwise to raise the trailer drawbar off of the towing vehicle.
4. Pull the locking pins on the outriggers and extend each outrigger until the locking pin snaps back into place (A). Pull out the locking pin in the bottom of the outrigger and fit it to the third hole above (B). Apply the same action for the other 3 outriggers. Turn the jack handle clockwise to start leveling the trailer. Adjust all four jacks by turning their handles clockwise until they are firmly in contact with the ground and the trailer is as level as possible (C). (D is the level meter.)



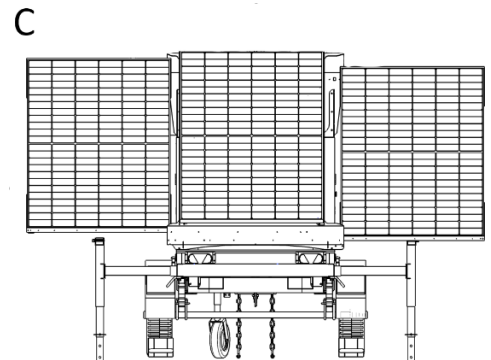
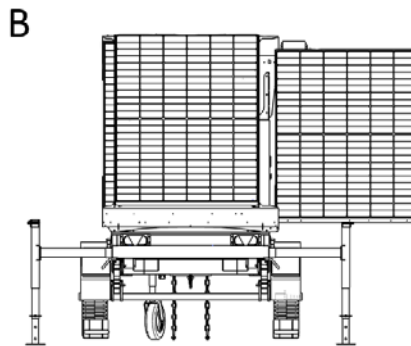
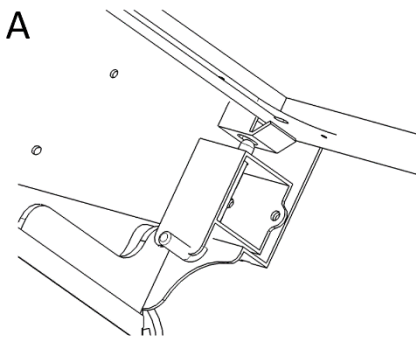
SOLAR PANELS SLIDING OUT



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1. Unlock the lock pin (A), and pull the panels to the outermost position and make sure lock (A) snaps back into place (B). Apply the same action for another one panel, make sure the solar panels all slide out fully (C).



2. Turn on the breakers for solar panels and batteries in the control cabinet.

NOTICE

Under charging condition, make sure the solar panels are faced to the direction of the sun, no shading and the surface is clean.

NOTICE

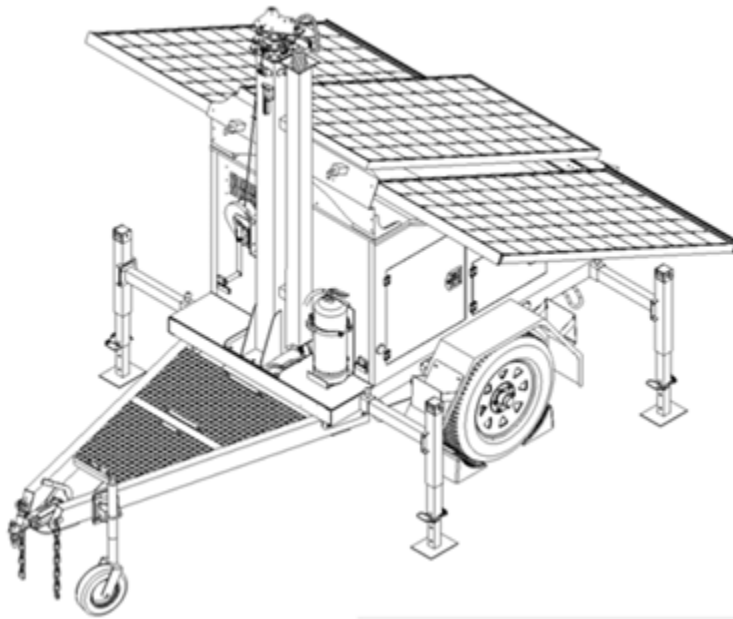
Do not operate the unit in the dangerous area where there are macadams fly and under weather condition with strong wind. It will damage the solar panels.

⚠ WARNING

Do not unplug the solar panel connectors when it is under charging condition. (It may cause personal injury.)



RAISING THE TOWER



1. Before raising the tower it is be necessary to install the top devices and adjust them to the required condition.

WARNING

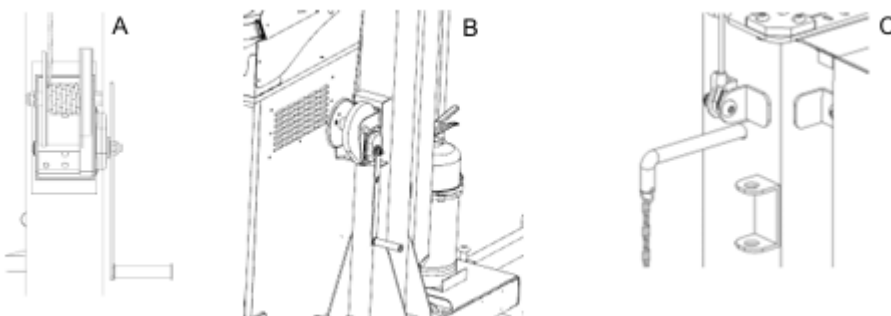
The trailer must be leveled with the outriggers extended before raising the tower. The outriggers must remain extended while the tower is up. Failure to level the trailer or extend the outriggers will severely reduce the stability of the unit and could allow the tower to tip and fall.

2. Check mast ropes for excessive wear or damage. Make sure the ropes are properly centered in each pulley. Check the mast electrical cord for damage.

⚠WARNING

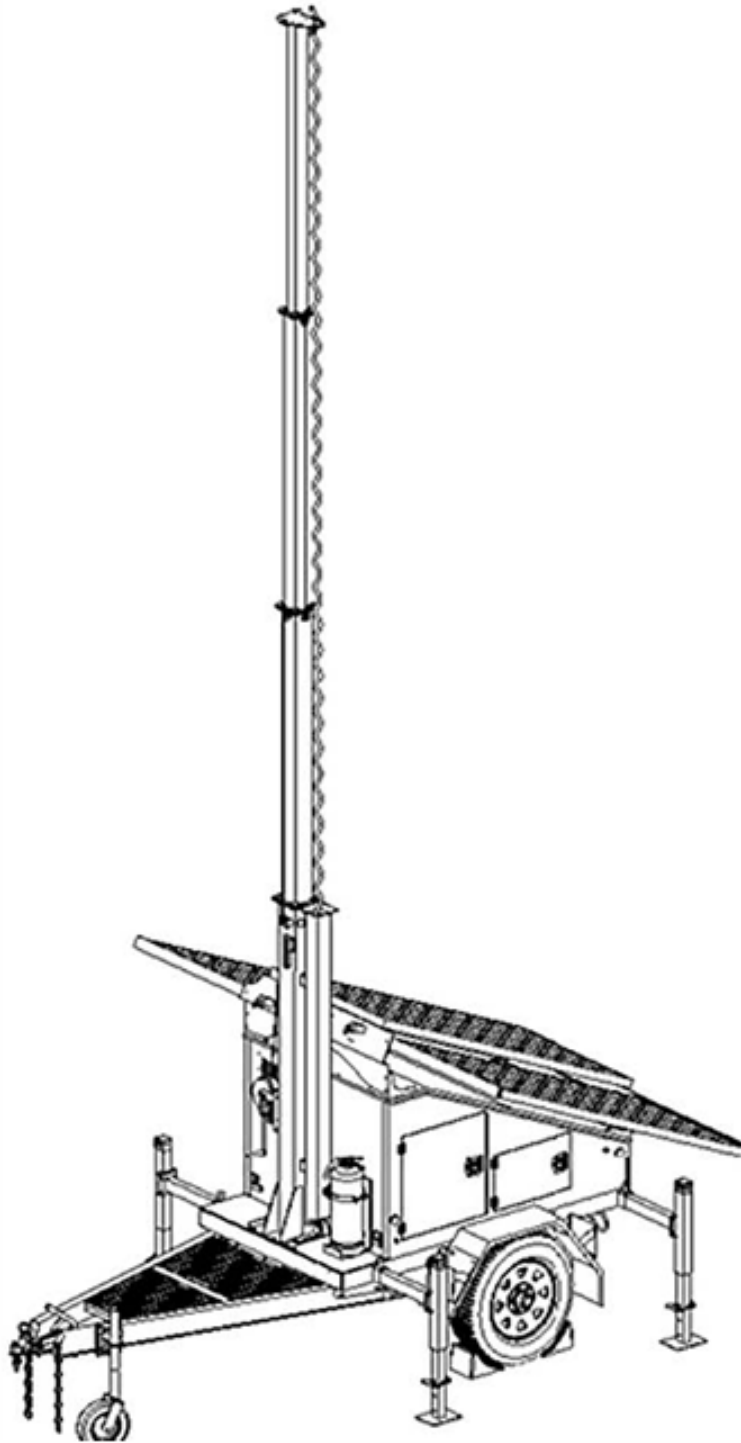
The trailer must be leveled with the outriggers extended before raising the tower. The outriggers must remain extended while the tower is up. Failure to level the trailer or extend the outriggers will severely reduce the stability of the unit and could allow the tower to tip and fall.

3. Before raising the tower, make sure the steel ropes are orderly and tightened (A). If slack, it will lead to steel ropes wear and even breakage. Crank up the mast clockwise (B) and extend it to the required height. If it is extended to the maximum height, please insert the safety locking pin (C). Extend the mast slowly, making sure that the electrical cord is extending at the top sections of the mast. If, for any reason, the cable begins to develop slack or any of the tower sections get stuck, STOP IMMEDIATELY and contact an authorized service center.





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RAISING THE TOWER WITH ELECTRIC WINCH

Before raising the tower it is necessary to check the top devices and adjust them to the required condition.

1. Set up and level the solar trailer as described on page 9 and 10.

⚠ WARNING

The trailer must be leveled with the outriggers extended before raising the tower. The outriggers must remain extended while the tower is up. Failure to level the trailer or extend the outriggers will severely reduce the stability of the unit and could allow the tower to tip and fall.

2. Check mast ropes for excessive wear or damage. Make sure the ropes are properly centered in each pulley.
3. Check the mast electrical cord. Make sure there is no damage.

⚠ WARNING

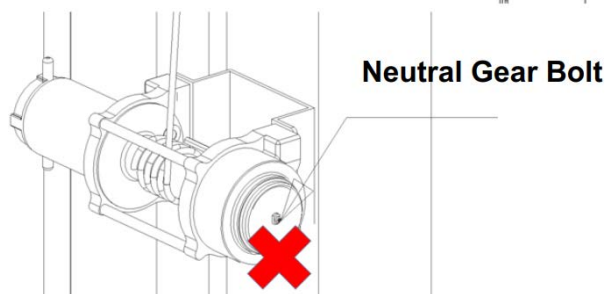
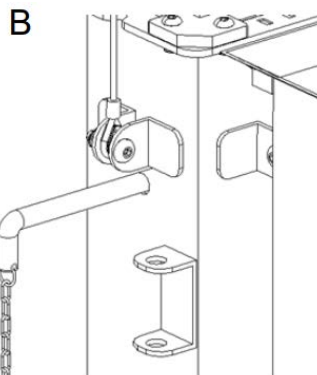
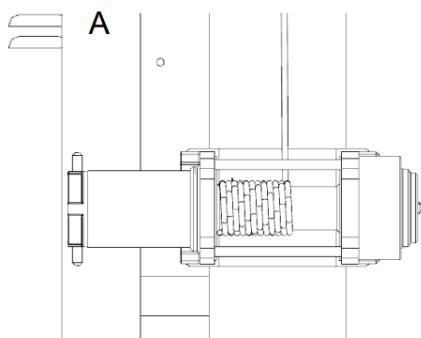
Do not operate the unit if the insulation on the electrical cord is cut or worn through. Bare wires in contact with the mast or frame may energize the trailer and cause electrocution. Repair or replace cord.

4. Before raising the tower, make sure the steel ropes on the winch are orderly and tightened (A). If slack, it will lead to steel ropes wear and even breakage. Then press the extending button on the controller and lift the mast to the required height. When the mast reaches its maximum height, the limit switch will cut the power off automatically, and please insert the locking pin (B).

⚠ CAUTION

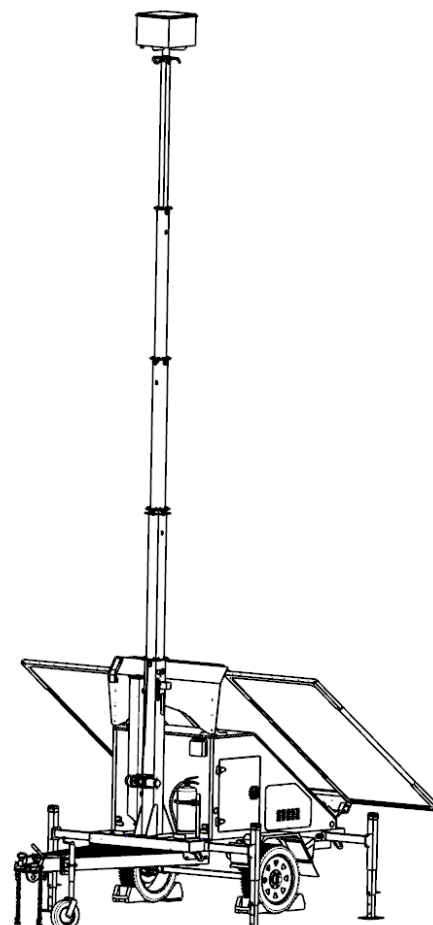
For any reason, the cable begins to develop slack or any of the tower sections get stuck, STOP IMMEDIATELY and contact an authorized service center.

On solar trailers equipped with the electric winch option, a limit switch on the main mast section will disconnect power to prevent over extending the mast.



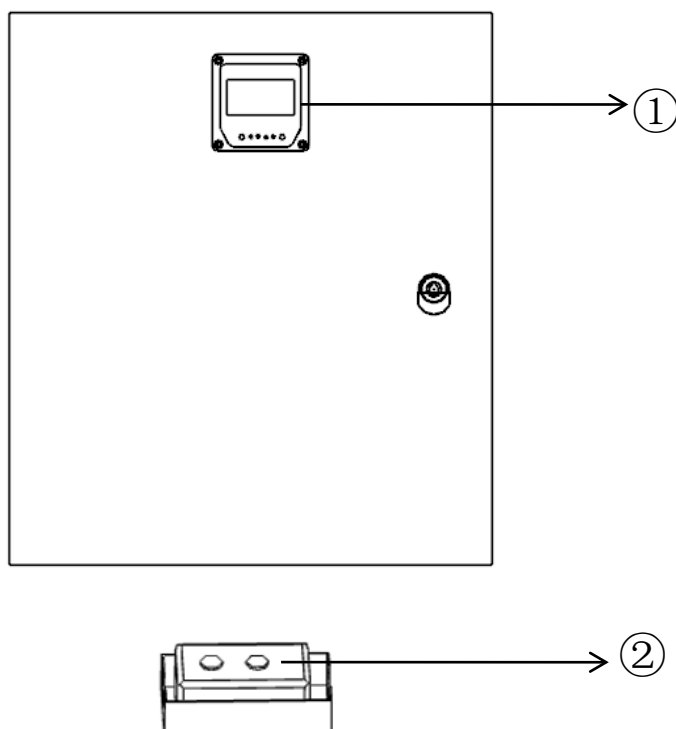
WARNING

When the mast is extended, do not operate the neutral gear bolt on the electric winch. It will lead to sudden falling of the mast and cause equipment damage and personal injury or death.





MAIN CONTROL PANEL COMPONENTS



1. **MT50 METER:** Real-time data view, load mode setting (manual, timer or light on/off).
2. **MAST “UP/DOWN” CONTROLLER**

VICTRON OPERATION (OPTION)

VICTRON MPPT

1. Please check all the wires are in good connection inside the control cabinet.
2. Turn ON all the breakers inside the control cabinet. (Indicator light flashes while open)

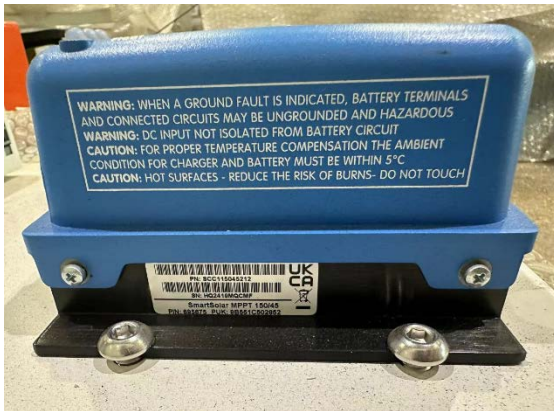


3. Open VINCTRON APP or Website, enter password then connect MPPT (Indicator light flashes while connecting), After connecting successful, you can check data on phone or computer.



Password

Solar smart MPPT:000000 (if it's not correct, check the PIN number on MPPT)



Cerbo GX

1. Please check all the wires are in good connection inside the control cabinet.
2. Turn ON all the breakers inside the control cabinet. (Indicator light flashes while open)
3. Open Victron APP or Website, enter password then connect with Cerbo GX (Indicator light flashes while connecting), Cerbo GX should be connect with Internet then you can check data on phone or computer.

Password

Cerbo GX (Check PIN number)





ELECTRICAL OPERATION

1. Please check all the wires are in good connection inside the control cabinet.
2. Turn ON all the breakers inside the control cabinet.
3. Press UP/DOWN controller to raise/lower the mast with the ② button.
4. MT50 meter detailed setting, please refer to instruction manual below.

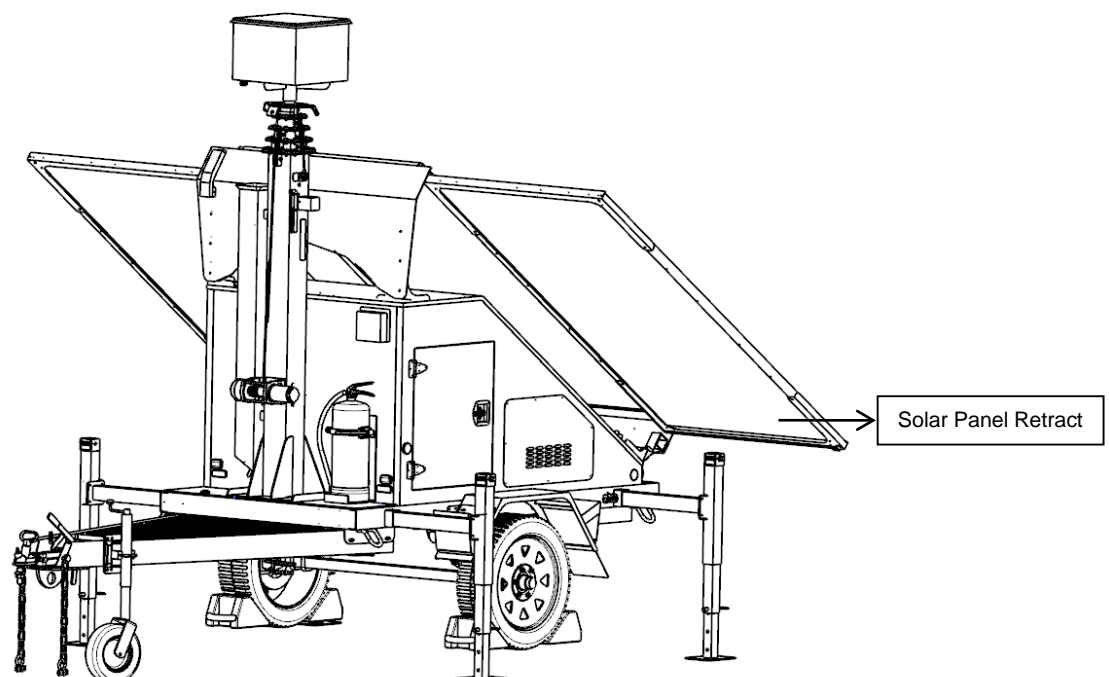
① Manual control

Mode	Introductions
On	Load is on all the time if battery capacity is enough and no abnormal conditions happen.
Off	Load is Off all the time.

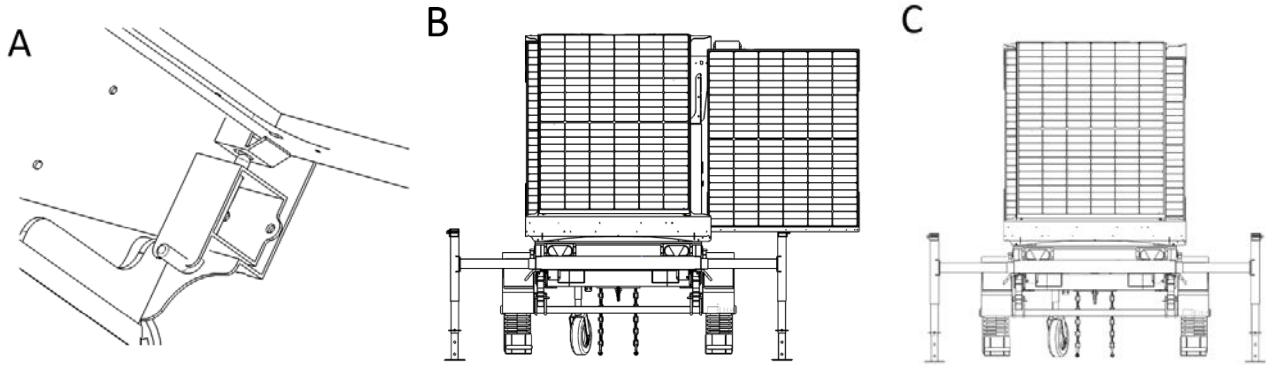
② Time control

Working time1 (T1)	Control on/off time of load through real-time clock mode.	Working time 1 is the compulsory load working time interval. Working time 2 is an optional.
Working time2 (T2)	Realize the dual timer function of the load control through real-time clock mode.	

SOLAR PANELS RETRACT



1. Unlock the lock pin (A), and push the panels to the innermost position and make sure lock (A) snaps back into place (B). Apply the same action for another one panel, make sure the solar panels all retract fully (C).



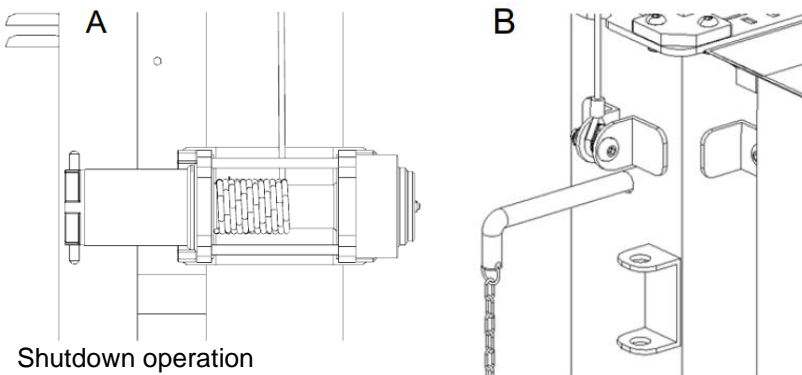
LOWER THE TOWER WITH ELECTRIC WINCH

1. Check mast ropes for excessive wear or damage. Make sure the ropes are properly centered in each pulley.
2. Check the mast electrical cord. Make sure there is no damage.

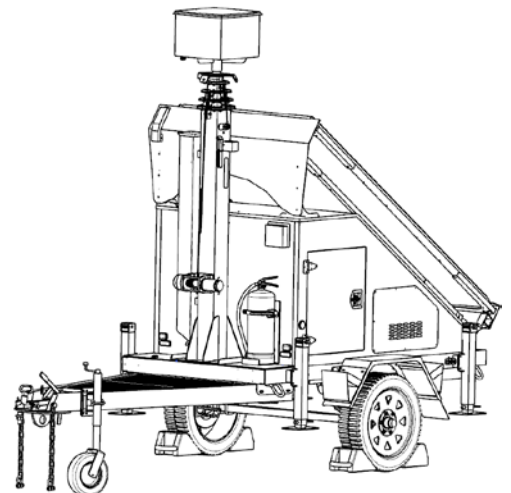
⚠WARNING

Do not operate the unit if the insulation on the electrical cord is cut or worn through. Bare wires in contact with the mast or frame may energize the trailer and cause electrocution. Repair or replace cord.

3. Pull the locking pin out (B), press the lower button on the electric winch controller, lower the mast to its original static height and make sure the steel rope is orderly (A).

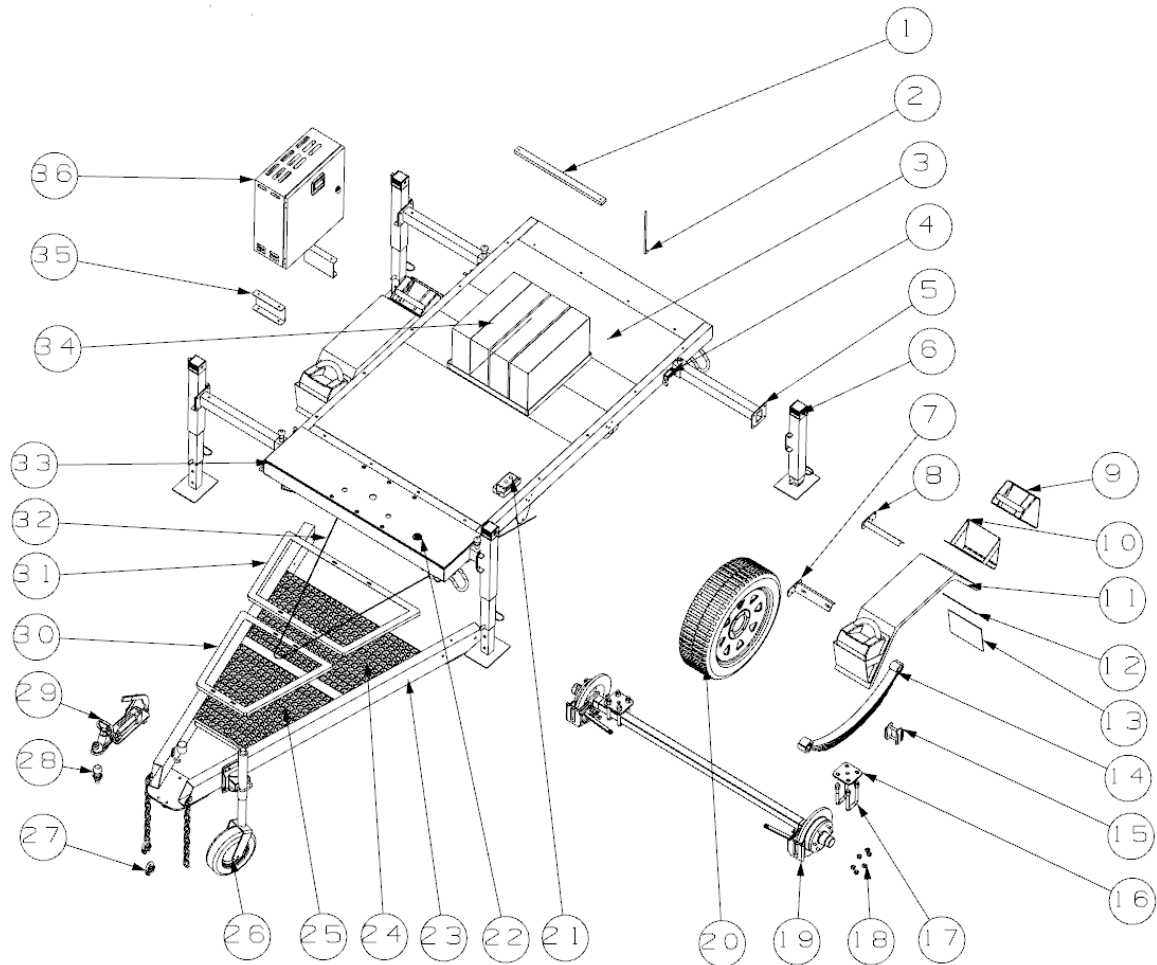


4. Shutdown operation
Turn off the breaker for Solar, Battery and Load on the control panel.





TRAILER CHASSIS ASSEMBLY



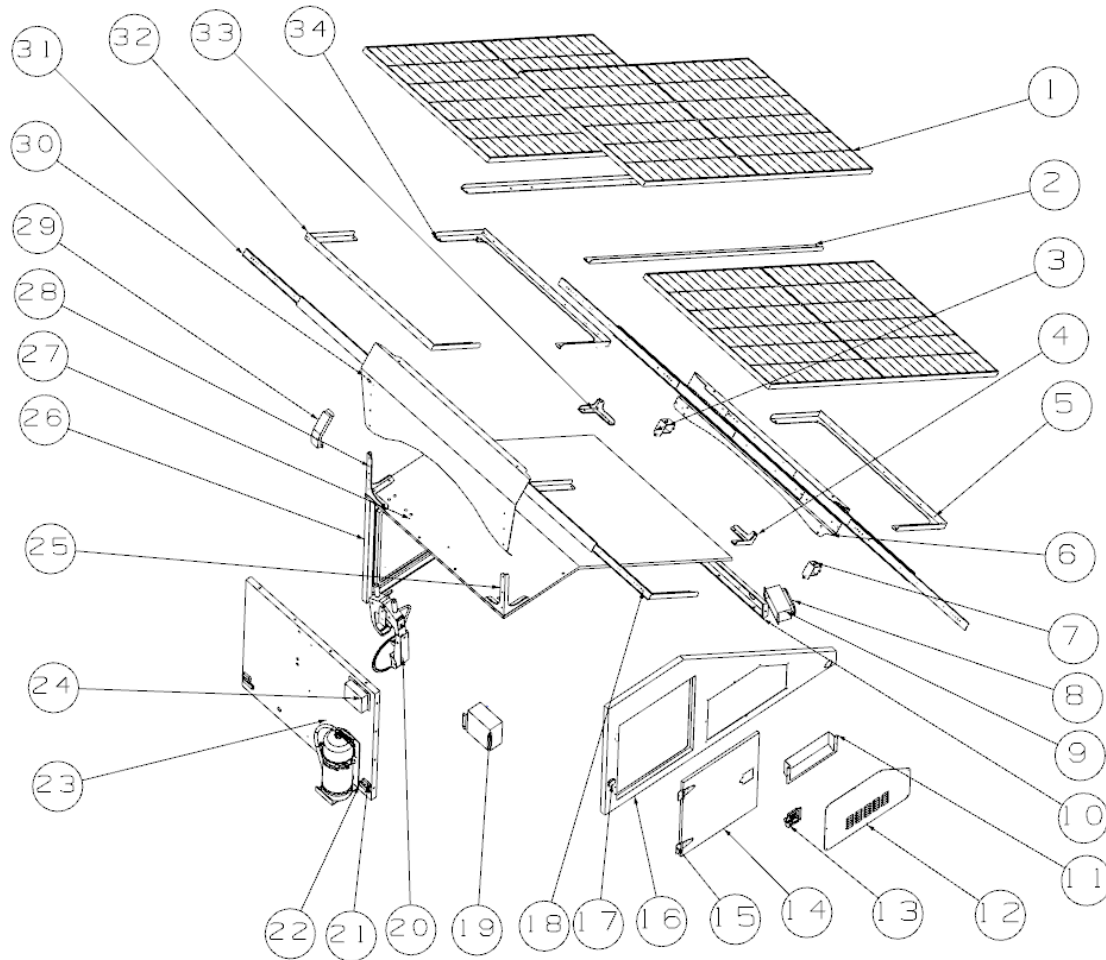
Item No.	Qty	Description
1/2	1/2	Battery fixture
3	1	Base
4	4	Lock pin for stabilizer
5	4	Side tube for stabilizer
6	4	Stabilizer
7	2	Fender mounting bracket (front)
8	2	Fender mounting bracket (rear)
9	2	Wheel chock
10	2	Wheel chock bracket
11	2	Fender
12	2	Rubber fender clamp



13	2	Rubber fender
14	2	Spring plate
15	2	Spring plate fitting
16	2	Plate
17	4	U-bolt
18	12	Tyre nuts
19	1	Axle with brake disc
20	2	Tyre
21	1	Mast Controller
22	1	Bubble level
23	1	Drawbar
24/25	1/1	Grid plate
26	1	Jockey Wheel
27	2	D-type connector for safety chains
28	1	50mm ball
29	1	Ball hitch
30/31	1/1	Grid clamp
32	1	Brake cable
33	1	Chassis
34	4	Battery
35	2	Control cabinet bracket
36	1	Control cabinet



TRAILER CABINET ASSEMBLY



Item No.	Qty	Description
1	3	Solar panel
2	2	Top panel bracket
3	1	Left panel lock pin bracket
4/33	1/1	Rear mounting bracket
5/18	1/1	Right panel bracket
6	1	Mounting bracket for solar slides-rear
7	1	Right panel lock pin bracket
8	2	Taillight
9	2	Taillight bracket
10	1	Rear plate for trailer enclosure
11	2	Side ventilation filter holder

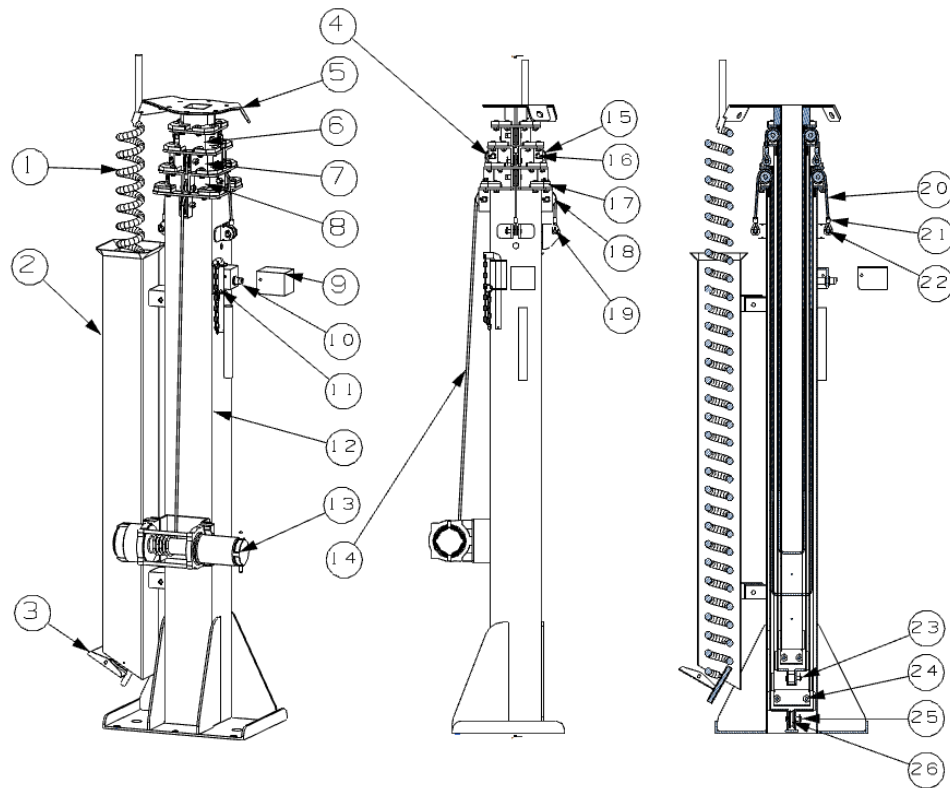
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12	2	Side blanking plate
13	2	Door lock
14	2	Door
15	4	Door hinge
16	1	Right plate for trailer enclosure
17	10	Side reflector
19	1	Mast electric winch relay box
20	1	Wheel lock
21	2	Front marker light
22	2	Front reflector
23	1	Front plate for trailer enclosure
24	1	Ventilation filter holder
25/28	1/1	Front mounting bracket
26	1	Left plate for trailer enclosure
27	1	Top plate for trailer enclosure
29	1	Cover
30	1	Mounting bracket for solar slides-front
31	1	Front ventilation filter holder
32/34	1/1	Left panel bracket

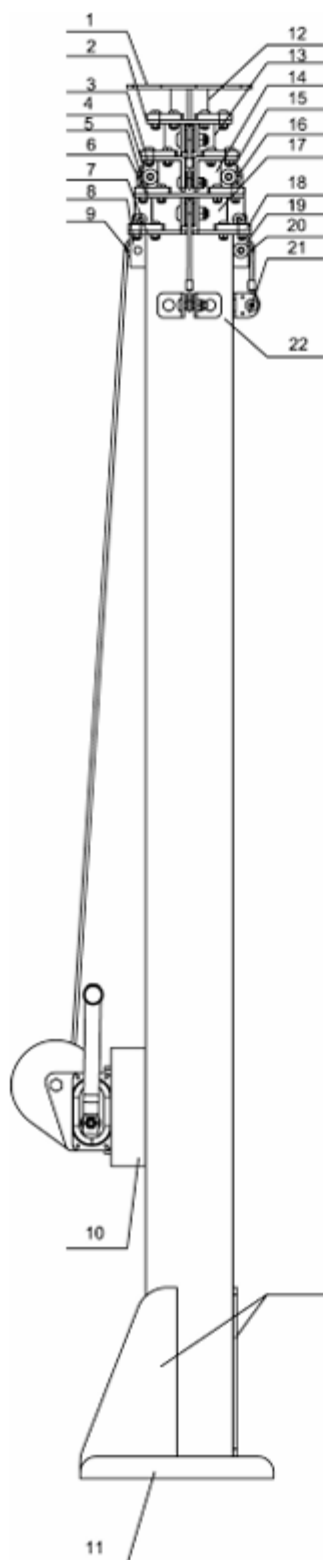


MAST ASSEMBLY



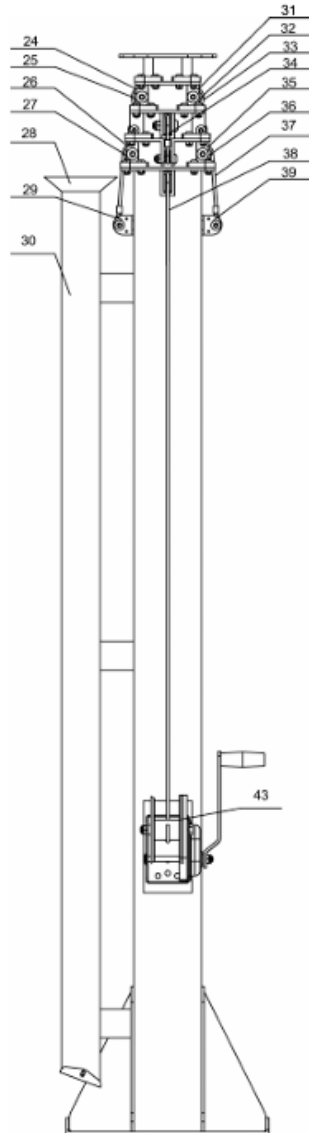
1	Coil cable	2	Cable tube
3	Coil cable fixture	4	Stainless steel cable $\phi 5\text{mm}$
5	Top section tube 60*60*2mm	6	Second section tube 80*80*2mm
7	Third section tube 100*100*2mm	8	Fourth section tube 120*120*2mm
9	Limit switch cover	10	Limit switch
11	Lock pin	12	Fifth section tube 140*140*2.5mm
13	Electric winch	14	$\Phi 6\text{mm}$ rope
15	Pulley UK-40	16	$\Phi 10*40$ pin
17	Nylon slide	18	Pulley UK-49
19	$\Phi 12*40$ pin	20	Stainless steel cable $\phi 5\text{mm}$
21	Rope cramp	22	Rope loop
23	Roller $\phi 20$	24	$\Phi 10*40$ pin
25	$\Phi 12*40$ pin	26	Pulley UK-49

Right view of mast



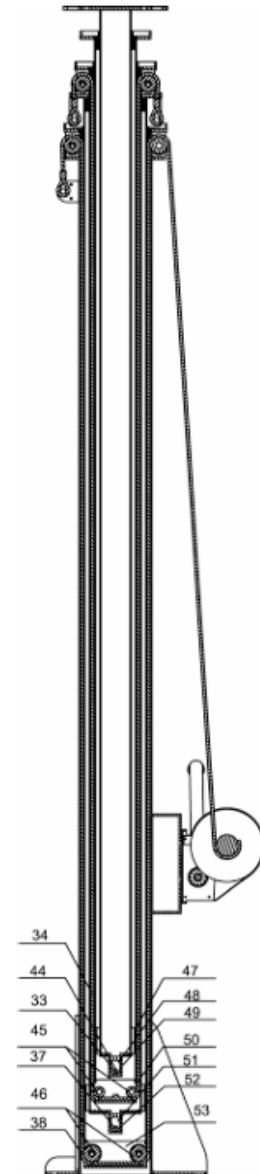
1. Mounting plate for top tube
2. Top flange of second tube
3. Top flange of third tube
4. Left pulley mounting seat for third tube
5. Left pulley of third tube
6. Top flange of fourth tube
7. Top flange of base tube
8. Left pulley mounting seat for base tube
9. Left pulley of base tube
10. Mounting seat for manual winch
11. Bottom mounting plate
12. Top tube
13. Second tube
14. Third tube
15. Right pulley mounting seat for third tube
16. Right pulley of third tube
17. Fourth tube
18. Nylon block
19. Right pulley mounting seat for base tube
20. Right pulley of base tube
21. Fixture for steel cable
22. Base tube
23. Strengthening part

Front view



- 24. Left pulley mounting seat for second tube
- 25. Left pulley of second tube
- 26. Left pulley mounting seat for fourth tube
- 27. Left pulley of fourth tube
- 28. Cable tube mouth
- 29. Left fixture for steel cable
- 30. Cable tube
- 31. Right pulley mounting seat for second tube
- 32. Right pulley of second tube
- 33. Steel cable
- 34. Steel cable
- 35. Right pulley mounting seat for fourth tube
- 36. Right pulley of fourth tube
- 37. Steel cable
- 38. Steel cable
- 39. Right fixture for steel cable
- 43. Manual winch
- 44. Buckle for steel cable
- 45. Inside pulley of second tube
- 46. Inside pulley of fourth tube
- 47. Limit block
- 48. Inside pulley of top tube
- 49. Bottom flange of top tube
- 50. Bottom flange of second tube
- 51. Inside pulley of third tube
- 52. Bottom flange of third tube
- 53. Bottom flange of fourth tube

Left section view



MAINTENANCE CHECKS

Use the schedule in the following table as a guide for regular maintenance intervals.

Item	Before each Setup	Inspection before each towing	6 months	12 months
Coupler, safety chains and brakes		★		★
Tyres and wheels		★		★
Wheel nuts (120 Nm torque)				★
Jockey wheel		★		
Drawbar		★		
Trailer light connections		★		★
Doors and door seal secured	★			
Trailer service and inspection				★
Batteries			★	
Electrical wiring	★			
Solar panels, clean as required	★		★	
Oil filter, replaced as required				★
Air filter, clean/replace as required				★
Mast cable	★			
Wheel bearings	★			

TRAILER LIGHTS WIRING (USA)

