



Operation and Safety Manual

Model

Lighting Tower

Metro-MH

1001206598

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Quality
Endorsed
Company

ISO 9001 Lic 6080



CONTENTS

Section One.....Operation and Safety

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INTRODUCTION

This manual provides the information necessary for the safe use and operation of the JLG Metro-MH lighting tower.

The manual is divided into the following sections;

- Section 1 Operation and Safety
- Section 2 Maintenance and Service
- Section 3 Illustrated Parts
- Section 4 Recommended Spare Parts

Specific operating details are contained in this publication to familiarise the operating personnel with the correct and safe procedures necessary to operate this equipment.

Take time to read and become familiar with all four sections of this manual.

If you are uncertain about any of the information presented, contact your JLG Service Office before operations commence.

All instructions in this manual are based on the machine being used under the operating conditions for which it was designed. In reading this manual, particular attention should be given to safety related Cautions and Warnings.

SECTION ONE

OPERATION AND SAFETY MANUAL

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GENERAL

This section prescribes the proper and safe practices for machine operation. In order to promote proper usage of the machine, it is mandatory that a daily routine be established based on the regular maintenance schedule in the service and maintenance section of this manual. A maintenance program shall also be established by a competent person and should be followed to ensure that the machine is safe to operate.

The user/operator of the machine shall not accept operating responsibility until this manual has been read and operation of the machine under the supervision of an experienced and competent operator has been completed. If there is a question on application and/or operation, JLG Industries Customer Support Department should be consulted on (02) 6581 1111 (Australia).



MODIFICATION OF THE MACHINE WITHOUT THE PRIOR WRITTEN APPROVAL OF JLG INDUSTRIES (AUSTRALIA) IS PROHIBITED.

SAFETY ALERT SYMBOLS AND SAFETY SIGNAL WORDS



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

DANGER

INDICATES AN IMMINENTLY HAZARDOUS SITUATION. IF NOT AVOIDED, WILL RESULT IN SERIOUS INJURY OR DEATH.

WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION. IF NOT AVOIDED, COULD RESULT IN SERIOUS INJURY OR DEATH.

CAUTION

INDICATES A POTENTIALLY HAZARDOUS SITUATION. IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY. IT MAY ALSO ALERT AGAINST UNSAFE PRACTICES.

NOTICE

INDICATES INFORMATION OR A COMPANY POLICY THAT RELATES DIRECTLY OR INDIRECTLY TO THE SAFETY AND PROTECTION OF PERSONNEL AND PROPERTY.

SAFETY PRECAUTIONS

SAFETY PRECAUTIONS

This section outlines the safety precautions applicable to the general use of this product.

NOTICE

The safety precautions applicable to the service and maintenance of the machine are covered in the SAFETY PRECAUTIONS section of the Service and Maintenance Manual.

The user of this machine must read this manual thoroughly to ensure that all operating procedures are clearly understood prior to accepting responsibility.

1. Modifications or alterations to the lighting tower are not permitted without the prior written permission of the manufacturer.
2. Failure to comply with the safety precautions listed here and elsewhere in the manual may result in injury or death.
3. When handling the lighting tower other than towing for the purposes of lifting or manoeuvring, there are forklift tyne pockets provided at the rear of the machine and a single lifting-point provided on the main frame for lifting by a crane. Ensure that the forklift or crane is of suitable capacity prior to attempting the lift.
Refer to the diagrams shown elsewhere in this manual for correct handling procedures using a crane and forklift.

! DANGER

DO NOT MANOEUVRE THE MACHINE OR PERSONNEL INSIDE THE PROHIBITED ZONE (M.A.D.). ASSUME ALL ELECTRICAL PARTS AND WIRING ARE ENERGISED, UNLESS KNOWN OTHERWISE.

1. Maintain distance from electrical lines, apparatus, or any energized (exposed or insulated) parts according to the Minimum Approach Distance (MAD) as shown in Table 1-1.

Table 1-1. Minimum Approach Distances (M.A.D.)

Voltage Range (phase-to-phase)	Minimum Approach Distance	
	metres	(feet)
0 to 50 kV	3	(10)
over 50 kV to 200 kV	5	(15)
over 200 kV to 350 kV	6	(20)
over 350 kV to 500 kV	8	(25)
over 500 kV to 750 kV	11	(35)
over 750 kV to 1000 kV	14	(45)

Note: This requirement shall apply except where employer, local or government regulations are more stringent.

2. Maintain a clearance of at least 10 ft. (3 m) between any part of the machine and its occupants, their tools, and their equipment from any electrical line or apparatus carrying up to 50 000 volts.

An additional clearance of one foot (0.3 m) is required for each additional 30 000 volts or less of line voltage.

3. The minimum approach distance may be reduced if insulating barriers are installed to prevent contact, and the barriers are rated for the voltage line being guarded. These barriers shall not be part of (or attached to) the machine.

The minimum approach distance shall be reduced to a distance within the designed working dimensions of the insulating barrier.

This determination shall be made by a qualified person in accordance with the employer, local, or governmental requirements for work practices near energized equipment.

SAFETY PRECAUTIONS

The Metro-MH machine electrical system includes an alternator which generates high electrical voltages. Do NOT operate the machine without all safety covers in place, covering all wiring and electrical equipment and devices.

 DANGER

DO NOT TOUCH ELECTRICAL SYSTEM COMPONENTS, LAMP TERMINALS AND/OR SOCKETS. DANGEROUS VOLTAGES MAY BE PRESENT EVEN WHEN POWER IS OFF.

1. Do NOT alter the electrical wiring in any way without receiving prior written approval and advice from JLG.
2. The lighting tower is NOT a mobile generator set. It should only be used for its intended design purpose.
3. The hydraulically operated mast has hazardous crushing/pinch points. Do NOT put arms, hands etc. near the mast structure while it is in operation.
4. Do not operate the lights within easy reach of people's hands. Lamp fixtures become hot during operation. Lamp fixtures can remain hot for some time after the lights have been switched off.
5. Do NOT replace lights with alternative lights without being authorised by JLG.
6. The mast is not a crane. Do NOT attempt to lift any object by using or modifying or altering the mast and/or the lighting tower hydraulic system.
7. There are moving parts in and around the engine and alternator area of the unit. Prior to carrying out any maintenance checks or accessing the engine area, ensure unit's engine is shut-down and the mast retracted.

Become familiar with all machine controls and the machine's operating envelope, prior to operating the machine. The machine's mast uses a hydraulic/wire rope system to lift and lower the mast.

1. Before raising the mast, ensure that the ground is suitable to support and level the machine, particularly under each of the outrigger pads.
2. Mechanical damage will result if the machine's mast is allowed to strike external structures such as buildings etc.

 WARNING

FAILURE OF THE OUTRIGGERS TO SUPPORT THE MACHINE ON SOFT SURFACES COULD CAUSE THE MACHINE TO TIP OVER. NEVER RAISE THE MAST FULLY WITHOUT FIRST SETTING ALL FOUR (4) OUTRIGGERS AND ENSURING THE LIGHTING TOWER IS LEVEL. A BUBBLE LEVEL IS MOUNTED AT THE FRONT OF THE MACHINE NEAR THE BASE OF THE MAST TO AID IN LEVELLING OF THE MACHINE.

 DANGER

DO NOT ERECT OR OPERATE THE MACHINE IN CONDITIONS WHERE THE WINDSPEEDS ARE LIKELY TO EXCEED 100 km/hr.

TIPPING OR OVERTURNING OF THE LIGHTING TOWER IS POSSIBLE.

SAFETY PRECAUTIONS**PREPARATION FOR USE**

1. Some sites or locations may require that checks are made with regulatory authorities (councils) prior to the set up and use of this lighting tower.
2. Ensure the machine's set-up location is clear of any dangers such as roadways with moving traffic, moving machinery etc.
3. Ensure that the lighting tower is securely parked prior to use. Barriers, fences and warning signs may need to be erected to ensure awareness of the unit in operation.
4. Carefully inspect the lighting tower for evidence of damage resulting from shipment.
5. Ensure that all warning decals and signage have been read and understood prior to operating lighting tower.
6. Preparation for use of the machine requires a complete function check together with a visual inspection to ensure a properly working unit. Check the following mechanical sub-assemblies function correctly;
 - a) Confirm all four outrigger inner-arms slide in and out freely and that the spring-operated plunger pins engage and lock the arms when fully extended and fully retracted. Confirm all outrigger jacking legs can be wound up and down freely and that the jack feet are not bent or distorted.
 - b) Confirm the telescopic mast moves smoothly when raised and lowered and wire ropes are free of fraying and signs of adverse wear.
7. Prior to use, check the following machine fluid levels.
 - a) engine radiator coolant
 - b) engine oil level.
 - c) fuel tank level.
 - d) hydraulic tank level.

DELIVERY AND PERIODIC INSPECTION**IMPORTANT****REGULAR PERIODIC INSPECTIONS ARE NECESSARY FOR MACHINE SERVICING AND MAINTENANCE.**

1. This machine requires periodic safety and maintenance inspections by competent personnel.
2. Particular attention is required during checks to ensure that the machine functions as it was designed to.
3. There should be no abnormal noises or vibrations evident during the machine's operation. In the event that an operator becomes aware of any abnormal operation while using the machine, then it should be shut down immediately, stowed safely and the problem reported to an authorised person.
4. All machines require both preventive and corrective maintenance throughout their useful service life to maintain the machine in a safe and reliable condition.
5. Reference should be made to Section 2 of this manual (Service and Maintenance) for procedures relating to regular and periodic inspections.

METRO-MH

MACHINE SPECIFICATION

1.1 DIMENSIONAL ENVELOPES

Envelope:	towed/stowed
Length	2.90 m/2.25 m
Width	1.65 m/1.75 m
Height	2.40 m
Ground Clearance (min.)	0.25 m

Envelope: Outriggers deployed

Height mast raised	9.00 m
Length	2.34 m
Width front outrigger	2.00 m
rear outrigger	2.15 m

1.2 MACHINE (TRAILER) MASS

Aggregate (ATM)	1150 kg
Towball "weight"	100 kg
Maximum Towing Speed	80 km/hr

1.3 MACHINE PERFORMANCE

Alternator electrical output	6500 W
Diesel fuel consumption (with 4 lights) (at continuous rating)	2.25 L/hr
Load: 4x Metal Halide (HID) Lights	4000 W
Sound Pressure Level @ 7 m	65 dB _A
Wind Speed Rating	100 km/hr
Mast Raise Time	25.0 s
Mast Lower Time	12.5 s

1.4 STORED FLUID VOLUMES

Hydraulic Oil Tank	5.15 L
Fuel Tank (diesel)	125 L
Radiator Coolant	3.1 L
Engine Oil Sump	5.1 L
Fluid Bund Capacity	120%

1.5 HYDRAULIC SYSTEM RELIEF

Relief Valve Setting	125 bar (1800 psi)
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1.6 COMPONENT SPECIFICATION

Engine: D905-BG2 JLG-1

3-Cylinder, water-cooled, asperated	
Total Displacement	898 cm ³
Rated Power Output	5.5 kW @1500 rpm

Alternator: Sincro SK160SA1

Frequency:	4 pole-50 Hz
Voltage:	230 V _{rms}
	230 V _{rms}
Power output:	9 kVA
Configuration:	single-phase

Hydraulic System

Pump motor (standard duty)	12 V DC
Operating Pressure (max.)	240 bar
Pump Displacement	0.78 cm ³ / rev

Light Head: Metal Halide (MH) Lights

Type: Metal Halide (HID)	230 V _{rms}
Rating: (electrical power input)	1000 W
Total Light Output (initial)	105 000 lm
Total Light Output (mean)	85 000 lm
Lighthouse Tilt angle	0 ≤ θ ≤ 45°
Rotation angle	-58° ≤ φ ≤ 58°

Electrical Controls (Protection)

Motor (hydraulic powepack)	1 x 20 A
Engine control circuit breaker	1 x 20 A
RCD /MCB circuit breaker	1 x 25 A

Battery

Model	MF50ZZ
Voltage	12 V DC
C.C.A.	600 A
Reserve Capacity	120 min @ 25 A
Capacity	75 A hr (20 hr)

Axle / Brake Type

Single High Mount/ Low Swing Arm Axle
Independent Rubber Suspension (IRS)

Drum and shoe (hydraulic operation)
or
Disc Calliper (wire cable operation)

Tyres and Wheels

Tyre Dimensions:	205/80 x 16"
Wheel Dimensions:	14" x 6J
Tyre pressure (gauge) :	450 kPa
Wheel Nut Torque :	125 Nm

METRO-MH

MACHINE CONTROLS

LIGHTING TOWER CONTROL PANEL STANDARD METRO-MH MODULE



- 1 The Metro-MH control panel consists of a IWE electronic module to control the engine genset and two-way switches and buttons to control lighting tower mast movements.
- 2 The ENABLE switch must remain depressed to allow the mast to raise/lower or for the lighthouse to rotate or tilt.
- 3 LIGHTS-OFF Button
- 4 LIGHTS-ON Button
- 5 MAST LIFT Switch
- 6 ROTATE LIGHTS Switch
- 7 TILT LIGHTS Switch

STANDARD METRO-MH MODULE

The DSE 3000 series module allows the operator to start and stop the engine-generator set as well as transfer the load.

The DSE 3000 module monitors the engine, indicating the operational status and fault conditions, automatically shutting down the engine with true first-up fault condition of an engine failure. The LCD display indicates the fault.





 **STOP/RESET** places the module into its **Stop/Reset** mode.

This will clear any existing alarm conditions. If the engine is running and the module is in the Stop mode, the module will automatically instruct the changeover device to unload the generator, and shut-down the engine.

Remote Start is not possible in Stop mode.

 **AUTO MODE (NOT USED)**

 **START**
Pressing this button in the auto-mode will start the engine and will run the engine off-load. Pressing this button on the STOP/RESET mode will turn on the CAN engine ECU. (when correctly configured and fitted to a compatible engine ECU).

 **PAGE**
Scrolls the display to show the various instruments.

METRO-MH

MACHINE CONTROLS

OPTIONAL CONTROL PANEL METRO-MH MODULE



- 1 Lighting tower module controls operation of engine and lights.
- 2 Mast and Lighthouse function enable switch. Toggle switch “up” and hold before and whilst toggling the other mast control switches.
- 3 Mast raise/lower toggle switch. Toggle switch “up” to raise mast. Toggle switch “down” to lower mast. Note: centre position on switch is “off”.
- 4 Lighthouse tilt toggle switch, tilts the lighthouse up to 45° from the horizontal. Note: centre position on switch is “off”.
- 5 Lighthouse rotate toggle switch, rotates the lighthouse $\pm 58^\circ$ of the lighting tower’s longitudinal centre-line. Note: centre position on switch is “off”.

IMPORTANT

RELEASE EMERGENCY-STOP BUTTON,
BEFORE OPERATING THE CONTROLLER.

METRO-MH

MACHINE CONTROLS

LIGHTING TOWER CONTROLLER OPTIONAL METRO-MH MODULE



Control Panel Push Buttons



Stop/Reset

Stop lighting tower operation
Reset alarm when failure occurs
Lamp test in stop mode
(press for at least three seconds)



Manual Start Mode

Press this key to enter Manual Mode.



Auto Mode

Press this key to enter auto start mode select interface; use up/down arrow keys to select mode and press "AUTO" to confirm selection.

The mode allows automatic control of the generator. The module monitors the remote start input. On receiving a start request, the genset starts automatically and go on-load.

Upon removal of the starting signal, the module transfers the load from the generator then shutdown the genset after the stop delay period and engine cooling times expire. The module acts on the next Start event.



Mute

If an alarm occurs, pressing the mute button can remove alarm siren, and the indicator will light up; press the button again to reset the alarm and the indicator will turn off. If alarm retriggers in mute status, the controller cancels mute status.



Strobe Light / Beacon

Switches the beacon light on or off.
(only when the engine is running)



Start

Start lighting tower set in Manual Mode.



Light Off

During running in manual mode, turn off one light for each press of the button.



Light On

During running in normal manual mode, turn on one light for each press of the button.



Menu / Confirm

Press this key to enter menu interface. In parameter setting interface press this key to right shift cursor and confirm the setting.



Down/Config

1) Screen Scroll

2) Down cursor and decrease value of menu setting



Up/Config

1) Screen Scroll

2) Up cursor and increase value of menu setting.

METRO-MH

MACHINE CONTROLS

OPTIONAL METRO-MH MODULE AUTO-START INSTRUCTIONS

1. Complete all lighting tower operating safety checks.
2. Switch battery and engine starter isolators to “on” and check that the emergency stop button is released.
3. Press the Auto button on the MH controller to show the AUTO MODE SELECT screen.
4. Use the UP and DOWN ARROWS to scroll to 01 AUTO TIMER MODE. Press the MENU/CONFIRM button.



5. Scroll to 03 TIMER SET using the UP or DOWN arrows.



6. Press MENU/CONFIRM to open the Timer Running Action screen.



7. Scroll with the DOWN ARROW to 02 AUTO RUN TIMER screen. Press the MENU/CONFIRM button.
8. Set the starting time using the UP and DOWN arrow buttons to change the numbers in each digit place. To enter the next digit place, press MENU/CONFIRM.



9. Set the required “Duration” period of operation, then press MENU/CONFIRM until the cursor disappears.



10. Press the STOP button to return to the home screen.

MACHINE CONTROLS

- 11. Press the DOWN ARROW to display a summary of the current machine settings.



- 12. 10 seconds before engine start-up an audible alarm sounds.
- 13. At the programmed starting-time the engine will commence the pre-heat cycle and, after 5 seconds the starter-motor cranks the engine.
- 14. the controller setting allows the engine to “warm-up” for 10 seconds.



- 15. After completing engine ‘warm-up’, each tower light is switched-on sequenced at 3 second intervals.



- 16. The lighting tower will now run in the AUTO MODE.
- 17. The following machine conditions will cause the lighting tower to shut-down when running in AUTOMODE.
 - Pushing the Emergency Stop button.
 - Opening the trailer canopy.
 - Pressing the STOP button on the MH controller.
- Triggering of the following engine alarm conditions;
 - a) low oil pressure
 - b) low water level
 - c) high temperature
 - d) low fuel level
- 18. When the COUNTDOWN time has elapsed all tower lights will be switched-off in sequence.
- 19. The controller will allow the engine a 20 second cooling cycle before initiating engine shut-down.



METRO-MH

MACHINE CONTROLS

OPTIONAL METRO-MH MODULE SETTING THE DATE & TIME

1. Press the MENU/CONFIRM button.



2. Scroll to '3 Time Calibration'.
3. Press MENU/CONFIRM to enter the time calibration.



4. The SET MODULE DATE/TIME screen display.
5. Use the UP /DOWN arrows to adjust the values assigned to date/time. Enter MENU/CONFIRM to advance to the next field.

Note the date format is DD-MM-YY.




6. Set the time using the UP /DOWN arrows. Press MENU/CONFIRM to advance to the next place in the 24 hour clock (HR/MIN/SEC).
7. After pressing MENU/CONFIRM the home screen will be displayed. The current time can be viewed by pushing the DOWN arrow once.

METRO-LED CONTROLLER "POWER-SAVE" MODE

If the controller remains inactive for more than ten (10) minutes, the controller will switch to the "power-save" mode (controller screen turns-off).

To return the controller from "power-save" mode,

press  for six to ten (6-10) seconds.

Note: Three (3) minutes before a programmed machine auto-start, the controller returns from the "power-save" mode to initiate the auto-start sequence

METRO-MH

MACHINE CONTROLS

EMERGENCY STOP BUTTON (AUTOSTART DISABLE)



Emergency Stop Button - Circled

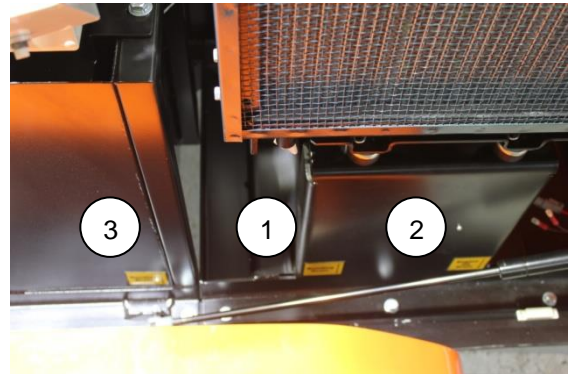
IMPORTANT

DEPRESS THE EMERGENCY-STOP
BUTTON BEFORE PACKING-UP THE
LIGHTING TOWER OR PERFORMING
MACHINE SERVICE AND MAINTENANCE.

BUNDING DRAINS/ENGINE OIL DRAIN

The Metro-MH has three bund drains
which are to be drained separately.

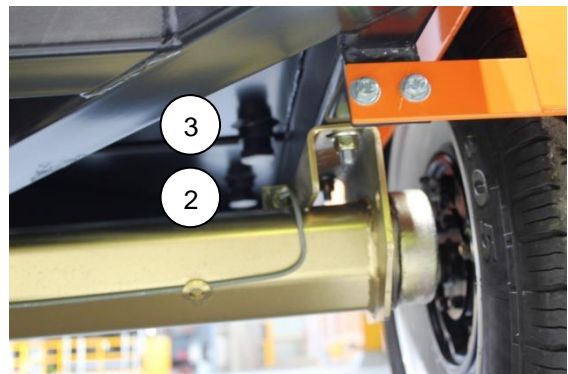
1. An engine tray bund drain plug,
located under the tray on the rear
right hand side of the trailer.
2. A small drain plug located on
underside of the engine bund tray
the front right hand side of trailer
3. A fuel tank bund drain plug,
located on the front right hand side
of the trailer.



The machine bunding is capable of
holding 120% of the maximum total
liquids volume.

NOTICE

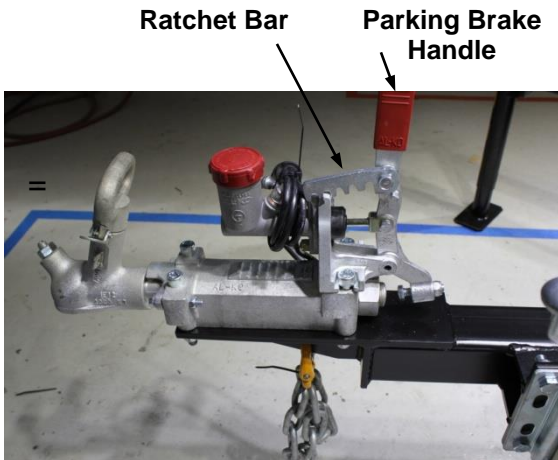
ENSURE ALL DRAINED BUNDING FLUIDS
ARE COLLECTED AND DISPOSED OF IN
ACCORDANCE WITH THE RELEVANT
GOVERNMENT ENVIRONMENTAL
REGULATIONS.



METRO-MH

MACHINE CONTROLS

PARKING BRAKE (HYDRAULIC)



The parking brake handle shown acts on the hydraulic master cylinder. It is locked into position by the ratchet locking bar.

To apply the parking brake, pull the handle forward and lock the ratchet bar into place as shown.

! DANGER

PRIOR TO TOWING VEHICLE, ENSURE THAT THE MAST IS LOWERED INTO THE STOWED POSITION.

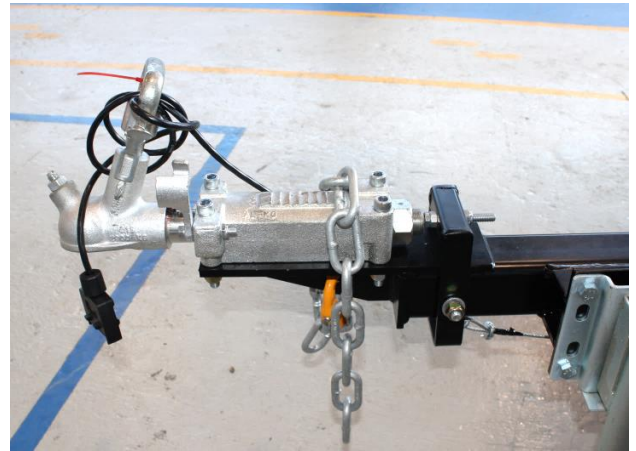
FAILURE TO DO SO COULD CAUSE;

- A) THE MACHINE TO CONTACT LIVE OVERHEAD POWER LINES.**
- B) THE MACHINE TO TIP OVER WHEN TRAILER IS BEING TOWED.**
- C) THE MAST TO STRIKE AN OVERHEAD STRUCTURE.**

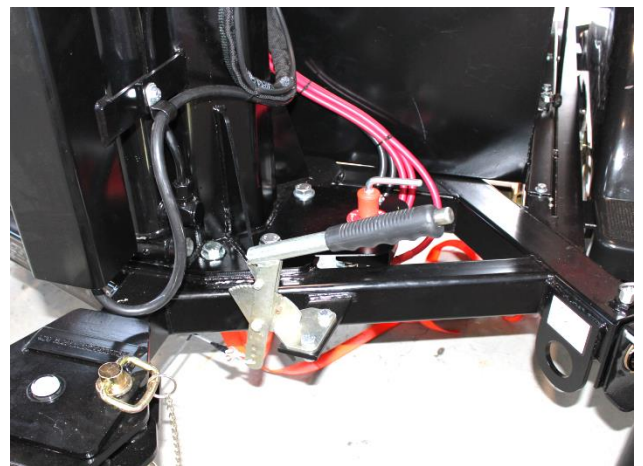
! WARNING

PRIOR TO TOWING THE VEHICLE, ENSURE THE PARKING BRAKE IS RELEASED AND THAT THE RATCHET BAR IS SWUNG CLEAR. FAILURE TO DO THIS COULD CAUSE THE BRAKES TO LOCK ON DURING TOWING.

PARKING BRAKE (CABLE OPERATED)



The tow ball coupling fitted to trailer axles with cable operated disc and drum brakes.



The parking brake handle tensions the wire cable connecting the disc brake callipers on each wheel.

The hand-brake is applied by pushing and holding the ratchet button in, at the same time pivoting the handle upwards.

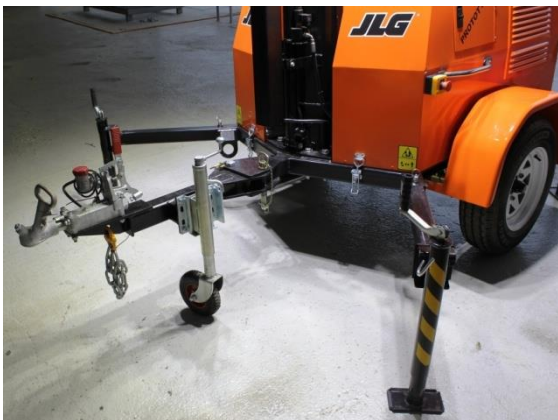
To release the handbrake, slightly lift and hold the handle. Push and hold the button in, before allowing the handle to pivot downwards. Release the ratchet button.

The cable-operated handbrake can be applied with the lighting tower drawbar folded or unfolded.

MACHINE OPERATION**MACHINE SET-UP****IMPORTANT**

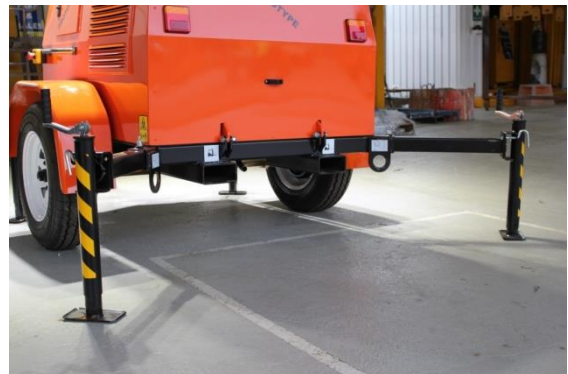
The following setup instructions are applicable when the machine is towed into position. A jockey wheel is provided to assist in manually manoeuvring the machine. Do not use the transport leg or jockey wheel to support the machine when raising the mast.

1. Select a flat level area to park the machine.
2. Ensure parking brake is applied prior to unhitching the machine from towing vehicle. Disconnect the safety chain and electrical trailer lights cable.
3. Extend the jockey wheel until the machine unhitches from vehicle's tow-ball. Drive the towing vehicle forward clear of the draw bar coupling.
4. At the front of the machine locate and slide out the left outrigger arm and pin into position. Rotate the jack from the stowed position until the foot is just above the ground. Lower the front outrigger jack to take the weight of the unit.
5. Repeat step 4 for the front outrigger arm located on the right hand side.



6. Retract the jockey wheel until the outriggers support the entire trailer weight.

7. At the rear of the unit, locate and slide out the left outrigger arm and lock pin into position. Rotate the jack from the stowed position until the foot is just above the ground. Turn the jack handle to lower the foot against the ground.
8. Repeat step 7 for the right hand outrigger arm and jack.



9. Raise the front of the machine by adjusting the front outrigger jacks until the machine is level and each outrigger support jack is pressing firmly against the ground, about two turns after contact with the ground.

Do not attempt to raise the lighting tower by overextending the jack leg.

IMPORTANT

It is not necessary to raise the trailer wheels off the ground when lowering the outrigger jacks.

When set up correctly the wheels may still be in firm contact with the ground. If the surface is uneven though, one wheel may need to be raised off the ground to level the machine.

A bubble level is provided on the front of the machine to assist in levelling.

MACHINE OPERATION**⚠ CAUTION**

DO NOT USE THE JOCKEY WHEEL TO SUPPORT THE MACHINE WHEN THE MAST IS RAISED. PRIOR TO RAISING THE MAST, CHECK AND ENSURE THAT NO OVERHEAD OBSTRUCTIONS EXIST.

10. Raise the mast to desired elevation by operating the enable and lift control toggle switches simultaneously.
11. Adjust the lighthouse tilt angle by operating the enable and tilt control toggle switches simultaneously.
12. Adjust the angle lighthouse rotation to desired angle by operating the enable and rotate control toggle switch while simultaneously.

⚠ CAUTION

TO AVOID CRUSHING INJURIES, REMAIN CLEAR OF MOVING TOWER, MAST SECTIONS AND LIGHTHEAD.

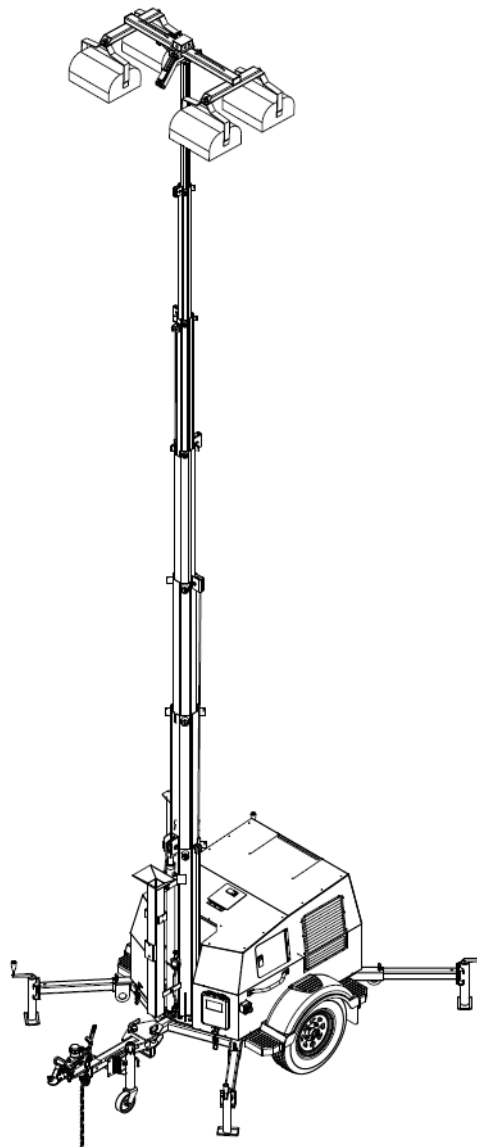
TURNING-ON THE ENGINE/LIGHTS CONTROLLER MODULE**IMPORTANT**

BEFORE OPERATING THE CONTROLLER, RELEASE THE EMERGENCY-STOP.

WHEN THE BATTERY IS CONNECTED, THE CONTROLLER BOOTS IN AUTO-MODE.

PRESS THE CONTROLLER  BUTTON

TO INITIATE CONTROLLER "STAND-BY" MODE.



MACHINE OPERATION



TURNING-ON THE ENGINE/LIGHTS
OPTIONAL CONTROLLER MODULE



Manual Start/Stop - Summary


Manual Start/Stop is initiated by the following pushbutton sequence.

Start

- A) **press**  then 
wait for engine start-up period
wait for machine to warm-up

- B) **press**  to turn each light

Stop

- C) **press**  to shut-down.
wait for machine to complete shutdown sequence.

2) Auto Start/Stop - Summary






- A) **press** 
for each screen shown in Fig 1 to Fig 3
press  and  to select
press  or  to confirm

Fig 1:	AUTO MODE SELECT 01 AUTO TIMER MODE 02 AUTO SMS MODE 03 SUNRISE/SUNSET MODE
Fig 2:	AUTO TIMER MODE 01 TIMER START 02 TIMER STOP
Fig 3:	AUTO TIMER MODE START TIME 16:28:00 CURRENT TIME 12:05:18 GENERATOR AT REST

- B) 10 seconds before engine start-up time an audible **alarm sounds**
At pre-set start time, engine cranks

Fig 4:	STOP DELAY 07:25:00 START TIME 17:26:00 CURRENT TIME 17:26:02 CRANKING 5s
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- C) **wait** for generator to reach the **“on-load”** requirement.

Fig 5:	STOP DELAY 10:07:42 START TIME 16:28:00 CURRENT TIME 16:32:18 2# LIGHT ON 09s
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Fig 6:	STOP DELAY 09:06:02 START TIME 16:28:00 CURRENT TIME 16:33:58 GENERATOR NORMAL RUNNING
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- D) When the **“stop delay”** time is reached all lights will turn off in sequence. When all lights are off, the engine runs through a cool-down cycle before stopping.

Fig 7:	STOP DELAY 00:00:00 START TIME 16:28:00 CURRENT TIME 23:32:18 7# LIGHT OFF 09s
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Fig 8:	AUTO TIMER MODE START TIME 16:28:00 CURRENT TIME 23:33:58 COOLING TIME 29s
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MACHINE OPERATION

Setting Controller Parameters

After the controller powers up,

Press [Enter], then

select **1 Set Parameters**, then

Press [Enter] again to advanced parameter password confirmation interface.

Press [Up] and [Down] to increase or decrease values to enter the correct password 0~9;

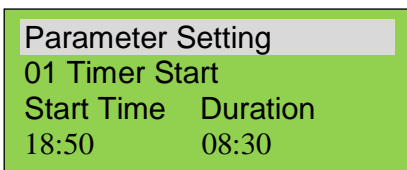
Press [Enter] to move right, entering the password number for all 4 positions.

Press [Enter] key to save password. (Factory default password is **1234** and users can modify it via PC connection.)

Press [Up] key and [Up] key to scroll screen; select parameter you want to

configure and Press [Enter] key (the parameter will highlight with black),

Press [Up] key or [Down] key to change parameter value,



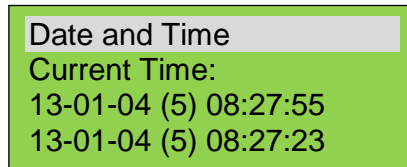
Press [Enter] key to confirm setting and the set value will be saved into internal FLASH

Date and Time Setting:

After controller powers up, Press [Enter], then select **3 Time Calibration**,

Press [Enter] again to the Date and Time Setting interface. The first line is current date and time and the second line is the time information of user's modification.

Press [Up] key or [Down] key to increase or decrease the value.



Press [Enter] key to confirm setting and the bit will right move automatically. Number "5" in the parenthesis is the week information. It is set by the microprocessor based on current date, so the user does not need to modify it.

If the controller remains inactive for more than ten (10) minutes, the controller will switch to the "power-save" mode (the controller screen turns-off).

To return from the "power-save" mode,

press [Hand icon] for ten (10) seconds.

METRO-MH

MACHINE OPERATION

MACHINE PACK-UP

Pack-up the lighting tower by completing the lighting tower set-up steps in reverse order.

IMPORTANT

Before coupling the lighting tower drawbar to the tow vehicle's hitch;

Ensure the trailer parking brake is applied and prevents the trailer from moving.

1. Ensure the mast is lowered and the lighthouse is tilted and rotated into the stowed position prior to towing or transporting.
2. Extend the jockey wheel to contact the ground and lock its height in position.
3. Retract all outrigger legs. Slide front and rear outrigger arms fully-in. Make sure all plunger-pins engage and lock the outrigger arms.
4. Fold-up all jack winding levers and turn handles inward towards jack body as shown.



5. Depress the emergency-stop button.



Emergency-Stop Button (circled)

The machine can then be moved onto a truck tray, into a container or prepared for towing.

If the machine is attached to the towing vehicle, ensure that the jockey wheel is raised and locked in the stowed position.

When loading the machine onto a tilt-tray truck, do not winch the machine while it is supported by the jockey wheel. Lateral forces can cause the jockey wheel to collapse resulting in machine damage.

When transporting the machine on a tray of a truck or the floor of a container, ensure that the front outriggers are resting on the floor prior to tying down the machine so as to remove the load on the jockey wheel and prevent potential failure.

LIFTING & TRANSPORTING MACHINE

FORKLIFTING MACHINE



Fork-lift Procedure

! CAUTION

WHEN USING A FORKLIFT TO MOVE THE MACHINE ONLY THE FORKLIFT POCKETS LOCATED AT THE REAR OF THE MACHINE SHOULD BE USED.

Prior to using a forklift to lift the machine, ensure that the mast is lowered to the stowed position, the lights are stowed and the engine generator is shut down.

The maximum trailer mass is approximately 1100 kg. Ensure that only a suitable forklift with adequate capacity is used to lift the machine.

When positioning the forklift tines into the forklift pockets, ensure the tines go through far enough to bear against the frame diagonals.

CRANING MACHINE

Craning Procedure

! WARNING

USE ONLY THE LIFTING POINT (IF PROVIDED) TO LIFT THE LIGHTING TOWER WITH A CRANE. DO NOT LIFT THE ASSEMBLY BY THE MAST. DOING SO WILL RESULT IN SEVERE DAMAGE TO THE UNIT AND POSSIBLE INJURY TO THE PERSONNEL UNDERTAKING THIS TASK.

The mast and lights should be in the stowed position and the engine generator shut down prior to lifting the machine off the ground. Ensure all outrigger legs are in the retracted and locked into position.

Open the central lid on top of canopy to allow access to the lifting lug.

Using suitable lifting equipment, pass the crane hook or sling through the lifting lug in the centre of the machine, proceed to lift the machine as per the instructions provided for the lifting crane.



LIFTING & TRANSPORTING MACHINE**TRANSPORTING MACHINE****Transport Procedure****⚠ CAUTION**

USE ONLY THE SPECIFIED TIE DOWN POINTS TO STRAP MACHINE TO THE TRANSPORT BED. DO NOT WINCH MACHINE ONTO A TILT TRAY BED. ENSURE THAT NO PART OF THE MACHINE OVERHANGS ANY EDGE OF THE TRANSPORT BED.

Forklift or Crane the machine onto the transport bed ensuring that no part of the machine overhangs the transport platform. Wind down the four outrigger jack-legs so that the feet just contact the transport bed.

Attach a ratchet-type strap/chain to the edge of the transport bed. Thread the strap/chain through the tie down point provided and fasten to the transport bed.

Remove any slack in the strap/chain with a the load-binding mechanism.

Repeat this tensioning on all four chains.

Secure the jack handle to prevent possible unwinding of the outrigger.

If required the lighting tower can be positioned and secured lengthways across the trailer deck by unpinning folding drawbar as shown.



TOWING INSTRUCTIONS** CAUTION**

PRIOR TO TOWING THE LIGHTING TOWER UNIT THIS MANUAL MUST BE READ AND UNDERSTOOD.

THE GROSS TRAILER MASS IS 1100 kg.

ENSURE THAT THE TOWING VEHICLE AND TOW BAR ARE RATED TO SAFELY TOW THIS LIGHTING TOWER.

THE LIGHT TOWER USES EITHER A HYDRAULIC OR CABLE OVERRIDING BRAKE MECHANISM. YOU MUST MAKE SURE YOU UNDERSTAND THE OPERATION OF EITHER MECHANISM PRIOR TO USE.

VEHICLE TOW COUPLING

The standard tow coupling is the 50 mm ball type. Others are available as an option upon request. Prior to towing ensure that the coupling operates properly and automatically latches in position. Keep the ball pocket and latch mechanism free from dirt and contamination as this can prevent proper operation of the latch mechanism.

JOCKEY WHEEL

The jockey wheel is designed to be swivelled and stowed horizontally. In both vertical and horizontal positions, the plunger pin must be securely engaged in the allocated hole in the mounting bracket.

SAFETY CHAIN

A safety chain is supplied to connect the trailer to towing vehicle while towing.

Ensure the safety chain has enough slack to permit tight turns, but far enough from road surface to hold coupler above road should the trailer uncouple. Inspect safety chain and shackle for wear and damage.

Replace worn or damaged chain and/or shackle before towing.

ELECTRICAL CABLES

The trailers lights are to be attached to the tow vehicle's electrical system using the electrical connector supplied. Prior to towing check all lights for proper operation of the brake lights, indicators and reversing lights.

OVERRIDE LOCKOUT LEVER

The overriding brake lockout lever is used to engage the braking system on the trailer. While towing the lockout lever should be disengaged to allow function of the trailers brakes. When reversing the trailer, engage the lock-out by rotating the lever down between the actuator and the coupling body.

 WARNING

Failure to properly engage the overriding brake mechanism could cause uncontrolled vehicle movements leading to death or serious injury.

NOTICE

OBSERVE AND OBEY ALL MOTOR TRAFFIC AND VEHICLE REGULATIONS.

WHEN REVERSING THE TRAILER, ENGAGE THE BRAKE LOCKOUT OVERRIDE TO PREVENT TRAILER BRAKES BEING APPLIED.

TOWING INSTRUCTIONS

PRIOR TO TOWING THE TRAILER

1. Wipe the hitch ball clean and inspect visually and by feel for flat spots, cracks and pits.
2. Ensure that machine is shut down, the mast correctly stowed and access doors closed.
3. Retract and stow front and rear outriggers making sure plunger pin is securely engaged.

HITCHING THE TRAILER TO THE VEHICLE.

1. Raise the bottom surface of the coupler to be above the top of the hitch ball by using the jockey wheel
2. Release the coupling collar/locking mechanism and lift coupler handle to open the coupler.
3. Align the tow vehicle hitch ball with the coupling and lower the trailer using the jockey wheel so that the entire weight of the trailer is on the hitch ball.
4. Release the coupling lever and allow the coupling handle to lower so that the collar is in place. Ensure the coupler is properly connect to the hitch ball and the collar/locking mechanism is engaged.
5. Insert pin into the hole in collar to lock into place.
6. Attach safety chain.
7. Connect and test trailer lights.
8. Disengage handbrake.
9. Ensure override lockout lever is swung up to allow brakes to work
10. Retract jockey wheel and rotate into stowed position ensuring plunger pin is firmly engaged.
11. Drive tow vehicle forward slowly and apply brakes gently to test coupling.

UNHITCHING THE TRAILER

1. Engage Handbrake
2. Disconnect electrical connector
3. Undo safety chain
4. Ensure ground surface below jockey wheel is firm and will support drawbar weight. Swing jockey bar down and extend
5. Follow steps 1-5 of connect trailer
6. instructions in reverse order

TOWING GUIDELEINES

1. Before towing the trailer, check coupling safety chain, safety brake, tyres, wheels and lights.
2. Check the trailer wheel nuts for tightness.
3. Check tow-ball coupling tightness after towing the trailer 80 km and at 80 km intervals thereafter.
4. Be aware of the width of the trailer. This is important when turning, passing, and pulling next to a curb.
5. Be aware of the height of the trailer, especially when approaching roofed areas and around trees.
6. Be sure your rear view mirrors are adjusted properly. Use your mirrors to verify that you have room to change lanes or pull into traffic.
7. Use your turn signals well in advance.
8. Increase speed slowly when starting the tow. Carefully watch the trailer and make sure there is no trailer sway.
9. Allow plenty of stopping space for your trailer and tow vehicle.
10. Never drive faster than 80km/hr when towing the trailer.
11. Allow plenty of room for passing. Passing/overtaking distance with a trailer requires four (4) times the passing distance without a trailer.
12. Shift your automatic transmission into a lower gear for city driving.
13. Do not ride the brakes while descending grades. Use lower gears for climbing and descending grades.
14. Slow down for bumps in the road. Take your foot off the brake when crossing the bump.
15. Do not apply the brakes to correct extreme trailer swaying. Continue pulling the trailer, with slight acceleration will stabilise trailer motion.

PRE-TOWING INSPECTION

TOWING INSTRUCTIONS

Prior to each tow, a Pre-Tow Inspection must be performed. Check each item as on following list.

1. The coupler is secure and locked onto the hitch ball.
 2. Electrical trailer cables are connected.
 3. There is appropriate slack in the safety chain.
 4. The trailer and towing vehicle tyres are inflated to the gauge pressures recommended by the manufacturers.
- INSPECTION NOTE:** On all components, make sure there are no loose or missing parts, that they are securely fastened, and display no visible damage, leaks or excessive wear exists in addition to any other criteria mentioned.
5. Brake fluid reservoir level full. Brakes are properly adjusted and function correctly.
If trailer is fitted with cable operated brakes check cable tensions and cable anchor security.
 6. Wheel and tyres - Properly secured, no missing wheel nuts, proper inflation.
 7. Trailer coupling - Secured, locked, and in proper operating condition.
 8. Coupling tow ball - Secured and in proper operating condition. Rock the hitch ball coupling in all directions to ensure it is tight to the hitch, and visually check that the hitch ball nut is solid against the lock washer and hitch frame.
 9. Safety chain - Check that the chain is properly rigged to tow vehicle, not to detachable hitch components.
 10. Trailer lights and turn signals. Check tail lights, brake lights, turn signals and reversing lights work correctly. Replace/repair non-working lights.
 11. Jockey wheel – Retracted/stowed.
 12. Licence Plate is mounted properly.

13. Mast and lighthouse – fully lowered and properly secured.
14. Outriggers – stowed and secured.
15. Parking brake – released and ratchet lever clear locking plate.



MAXIMUM TOWING SPEED IS 80 km/hr.

TO AVOID POSSIBLE INJURY, BE SURE MACHINE POWER IS OFF AND BATTERY ISOLATED.

DO NOT TOW MACHINE UNTIL ALL MALFUNCTIONS/FAULTS HAVE BEEN CORRECTED.



METRO-MH

MACHINE STORAGE

If the lighting tower is to be stored and not operated for more than three months;

1. Ensure the lighting tower mast is fully retracted in the stowed position.
2. Park the lighting tower undercover on a level hard-standing in a reasonably well-ventilated area.
3. Ensure the emergency stop button is "on". (pushed in).
4. Disconnect the machine's battery and fit plastic terminal caps.
5. Support and level the lighting tower on the four outrigger jacks legs with the tyres just clear of ground contact.
6. Release the parking brake if applied.
7. Consult the engine manufacturer's maintenance and service manual to complete the necessary engine storage instructions.
8. Empty the fuel tank. Plug all vent holes to prevent ingress of moisture and reduce likelihood of condensation and corrosion.
9. Wipe clean all exterior surfaces and remove any collected or accumulated plant or leaf matter.

