

metrolite



HLT-6150 OPERATOR'S MANUAL

Dec. 2022

LIMITED metrolite HLT-6150 WARRANTY

1. Products

This limited warranty is issued by Metrolite for the supply of the following products: Metrolite HLT-6150 Light Towers.

2. Description and Warranty Period

- i) **Machine:** Without prejudice to the legal warranty, Metrolite extends the warranty on manufacturing defects relating to the equipment supplied up to a period of 2 (two) years/ 2000 hours (whichever comes first) from the date of sale (invoice). Therefore, the total legal and limited warranty period will be 2 (two) years / 2000 hours (whichever comes first) from the invoice date. The determination whether the product is defective will be made by Metrolite in its sole discretion, considering the general performance given by the product.
- ii) **Basic 150 LED Light:** Without prejudice to the legal warranty, Metrolite extends the warranty on manufacturing defects relating to the equipment supplied up to a period of 5 (five) years from the date of sale (invoice). Therefore, the total legal and limited warranty period will be 5 (five) years from the invoice date. The determination whether the product is defective will be made by Metrolite in its sole discretion, considering the general performance given by the product. A product cannot be considered defective only as result of a malfunction of the single LED component that emits light, if the number of non-functioning components is less than 10% of the total number of LED components in the product.

The reduction of the luminous flux is a phenomenon expected during the life of the LEDs and is therefore not covered by the warranty.

3. Warranty Terms and Conditions

The guarantee is valid provided that:

- The products are stored, installed, used and maintained in compliance with the technical specifications indicated in the product marking (with specific reference to the voltage and operating temperature), to the instructions supplied with the product, to what is indicated in the respective catalogs and to the standards in force;
- Installation and maintenance are carried out by qualified technical personnel, all service records must be available for warranty purposes;
- The reported defect affects the functionality of the product;
- The product has not been modified, altered or treated with chemicals or in any other way in any way;
- The product covered by the guarantee is made available to Metrolite for further technical analysis for the time necessary to carry it out;
- The defect is reported in writing, by certified or registered email with return receipt to Metrolite within 30 (thirty) days from the receipt of the products (in the case of apparent defects) or from the discovery of the defect (in the case of hidden defects) by sending a photographic feedback of the label on the product; Metrolite PO Box 148 Oxbow, Saskatchewan S0C 2B0 Tel 306.483.2305 | Toll-Free 844.732.9466

In the event that the defect is recognized by Metrolite, Metrolite will choose at its discretion whether to repair or replace the defective product with the same product or an equivalent one, taking into consideration the technical evolution of the products and that of their components. Any technical intervention or replacement (partial or complete) of the product carried out pursuant to the warranty will not in any case give the right to extensions or renewals of the same beyond 2 (two) years/2000 hours (whichever comes first) from the invoice date. The repair and replacement of the product recognized as defective by Metrolite does not include costs or expenses for its removal or reinstallation.

Metrolite is not responsible for, and therefore will not reimburse, any consequential loss or indirect, compensatory or other damage suffered due to a defective products, such as, by way of example and not limited to, shipping costs, assembly costs, on-site installation, any downtime costs, loss of profit or overall cost of buyers.

4. Exclusions and Limitations

This limited warranty does not cover:

- Labour costs and expenses, equipment and warehouse costs and expenses, or any other extra costs relating to and / or resulting from any intervention necessary to repair the defect (such as, by way of example, costs / expenses for assembly, disassembly, and transport of defective appliances, to be repaired or new products which will be the sole responsibility of the customer);
- Electrical products subject to wear which are comparable to consumables;
- Products made on specific customer request;
- Damage to products due to negligence, transportation or unforeseen and unforeseeable events that do not fall within normal conditions of use (such as, for example, electric shock and lightning);
- Appliances not used for the purpose for which they were made;

This warranty does not guarantee the integrity of the painting when the product is used in a saline environment.

WARRANTY VOID IF NOT REGISTERED

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LIGHT TOWER WITH HYDRAULIC MAST

WARRANTY REGISTRATION FORM & INSPECTION REPORT

WARRANTY REGISTRATION

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Customer's Name _____	Dealer's Name _____
Address _____	Address _____
City, State/Prov., Code _____	City, State/Prov., Code _____
Phone Number (_____) _____	
Light Tower Model _____	
Serial Numbers HLT-6150 _____	Alternator _____
Serial Numbers Engine _____	
Delivery Date _____	

DEALER INSPECTION REPORT

- _____ Tire Pressure Checked
- _____ Wheel Bolts Torqued
- _____ Inspect Electrical System
- _____ Hydraulic Hoses Free, Fittings Tight
- _____ Check Oil Level in Hydraulic Reservoir
- _____ Lubricate Machine
- _____ Check Engine Fluid Levels

SAFETY

- _____ Guards/Shields Installed & Secured
- _____ All Decals Installed & Legible
- _____ Safety Chain on Hitch
- _____ Review Operating and Safety Instructions

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date _____ Dealer's Rep. Signature _____

Signature _____

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

Date _____ Owner's Signature _____

WHITE	YELLOW	PINK
METROLITE	DEALER	CUSTOMER

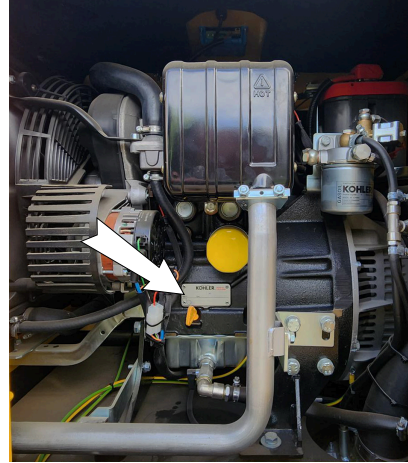
SERIAL NUMBER LOCATIONS

Always give your dealer the serial number of your Metrolite HLT-6150 when ordering parts or requesting service or other information.

The serial number plates are located where indicated. Please mark the number in the space provided for easy reference.



HLT-6150



ENGINE



ALTERNATOR

Model	HLT-6150	
Serial Number	Machine	_____
	Engine	_____
	Alternator	_____

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1 INTRODUCTION

Congratulations on your choice of a Metrolite HLT-6150 light tower and welcome to Metrolite's quality line of lighting equipment. This equipment is designed and manufactured to meet the needs of a discriminating buyer in the industry for lighting work sites.

Safe, efficient and trouble free operation of your new Metrolite HLT-6150 light tower requires that you, and anyone else who will be operating or maintaining the machine, read, understand and practice ALL of the Safety, Operation, Maintenance and Trouble Shooting recommendations contained within this Operator's Manual.



This manual applies to all HLT-6150 light towers manufactured by Metrolite. Certain options may be available to specifically tailor the light tower to your operation and may not be included in this manual. Please contact the manufacturer regarding additional information about these options. Use the Table of Contents and Index as a guide to find specific information.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections and product revisions at any time without notice.

The warnings in this manual and on decals on the unit are not all inclusive. If using a procedure or operating techniques that the manufacturer does not specifically recommend, verify that it is safe for others. Also, make sure the procedure does not render the equipment unsafe.

Keep this manual handy for frequent reference and so that it will be passed on to new operators or owners. Call your Metrolite dealer if you need assistance, information or additional copies of this manual.

MACHINE ORIENTATION - The hitch end of the light tower is the front. All electrical controls are on the left side.

2 SAFETY

SAFETY ALERT SYMBOL

This Safety Alert symbol means
ATTENTION! BECOME ALERT!
YOUR SAFETY IS INVOLVED!



The Safety Alert symbol identifies important safety messages on your Metrolite light tower and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons

Accidents Disable and Kill
Accidents Cost You Money
Accidents Can Be Avoided

SIGNAL WORDS:

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

- | | |
|------------------|--|
| DANGER - | Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded. |
| WARNING - | Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices. |
| CAUTION - | Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. |

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer or Metrolite, Phone: 1-866-918-6976, Email: service@axiomequipmentgroup.com.



SAFETY

YOU are responsible for the **SAFE** operation and maintenance of your Metrolite light tower. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the machine be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices while operating the light tower.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but, also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this machine is familiar with the procedures recommended and follows safety precautions. Remember, most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Read and understand the Operator's Manual and all safety signs before supplying power to, operating, maintaining or adjusting the light tower.
- Light tower owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter.
- The most important safety device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Most accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate this machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- The manual comes with the original documentation for the engine and the alternator: we recommend keeping it all in a safe place and have qualified personnel to carry out operations. In case of transfer of equipment ownership, attach all the documentation, as it is an integral part of the product.
- Our customer service and technical assistance department is available to assist you in any way.
- Only use genuine parts in case replacement is required; failure to comply will void your warranty automatically.

2.1 GENERAL SAFETY

- Read and understand the Operator's Manual and all safety signs before supplying power to, operating, maintaining or adjusting the light tower. 
- Only trained, competent persons shall operate the light tower. An untrained operator is not qualified to operate this machine.
- Provide a first-aid kit for use in case of an accident. Store in a highly visible place. 

- Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.
- Install and properly secure all guards and shields before operating.

- Wear appropriate protective gear. This list includes but is not limited to:
 - Protective shoes with slip resistant soles
 - Protective glasses or goggles
 - Heavy gloves
 - Hearing protection
- Turn machine OFF, place all controls in their OFF position, shut down and lockout power supply, relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining, repairing or cleaning.
- Do not damage this manual, do not remove or tear any pages and keep it away from moisture and heat sources. Please note that the drawings contained in the manual are merely to help you identify the parts described and, therefore, they might not correspond precisely to your product.
- Know the emergency medical center number for your area.
- Review safety related items with all operators annually.



2.2 EQUIPMENT SAFETY GUIDELINES

- Safety of the operator and bystanders is one of the main concerns in designing and developing a machine. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury or death, study the following precautions and insist those working with you, or for you, follow them.
- In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.
- Replace any safety sign or instruction sign that is not readable or is missing. Location of such safety signs is indicated in this manual.
- Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.
- **Under no circumstances should young children be allowed to work with this equipment. Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works.** Review the safety instructions with all users annually.
- This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible, properly trained and physically able person familiar with the machinery and trained in this equipment's operations. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.
- Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question - **DON'T TRY IT.**
- Do not modify the equipment in any way. Unauthorized modification result in serious injury or death and may impair the function and life of the equipment.
- The contents of this manual are not binding. The manufacturer reserves the right to make changes and improvements to accessories and details without altering the essential characteristics of the model described and illustrated here and without committing to promptly updating this manual.
- In addition to the design and configuration of this implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the auxiliary equipment and machine Manuals. Pay close attention to the Safety Signs affixed to the auxiliary equipment and the machine.

2.3 SAFETY TRAINING

- Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.
- In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.
- It has been said, "The best safety feature is an informed, careful operator." We ask you to be that kind of an operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Accidents can be avoided.
- **Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your auxiliary equipment, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than yourself. It is the machine owner's responsibility to make certain that the operator, prior to operating:**
 - i. **Reads and understands the operator's manuals.**
 - ii. **Is instructed in safe and proper use.**
- Know your controls and how to stop light towers and any other auxiliary equipment quickly in an emergency. Read this manual and the one provided with your other equipment.
- Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will operate the machinery. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death. If the elderly are assisting with work, their physical limitations need to be recognized and accommodated.



2.4 SAFETY SIGNS

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or have become illegible.
- Replaced parts that displayed a safety sign should also display the current sign.
- Safety signs displayed in Section 3 each have a part number in the lower right-hand corner. Use this part number when ordering replacement parts.
- Safety signs are available from your authorized Distributor or Dealer Parts Department or the factory.

How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Determine exact position before you remove the backing paper. (See Section 3).
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

2.5 STORAGE SAFETY

- Store the light tower on a firm level surface.
- If required, make sure the unit is firmly blocked up.
- Make certain that all mechanical locks and jacks are safely and positively connected before storing.
- Store away from areas of human activity.
- Do not allow children to play on or around the stored light tower.
- Lock out power by turning off master control panel or junction box and padlocking the door shut to prevent electrocution or unauthorized start up of the light tower.

2.6 PREPARATION

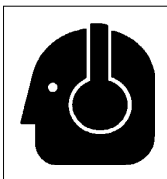
- Never operate the light tower and auxiliary equipment until you have read and completely understand this manual, the auxiliary equipment Operator's Manual, and each of the Safety Messages found on the safety signs on the light tower and auxiliary equipment.

- Personal protection equipment including hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, or moving the light tower. Do not allow long hair, loose fitting clothing or jewelry to be around equipment.



- **PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!**

Motors or equipment attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a full-time basis if the noise in the Operator's position exceeds 80db. Noise over 85db on a long-term basis can cause severe hearing loss. Noise over 90db adjacent to the Operator over a long-term basis may cause permanent, total hearing loss. **NOTE:** Hearing loss from loud noise (from tractors, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.



- Clear working area of debris, trash or hidden obstacles that might be hooked or snagged, causing injury, damage or tripping.
- Operate only in daylight or good artificial light.
- Be sure machine is properly anchored, adjusted and in good operating condition.
- Ensure that all safety shielding and safety signs are properly installed and in good condition.
- Before starting, give the machine a "once over" for any loose bolts, worn parts, cracks, leaks, frayed belts and make necessary repairs. Always follow maintenance instructions.

2.7 INSTALLATION SAFETY

- Review layout of the worksite. Position light tower where it can provide maximum illumination with minimal interference with the access and operation of other equipment. Select a different position if there is interference.
- Position light tower base on a solid, level surface to avoid tipping, sliding or falls during operation. Avoid placing the tower on a surface with a slope of over 10°.
- Do not position light tower close to overhead power lines or obstructions to prevent electrocution or other problems. Electrocution can occur without contact.
- Position machine so the engine exhaust is directed away from personnel on the worksite. Direct the gases away from the worksite.
- Before raising mast, fully extend and pin/lock each outrigger. Lower each outrigger jack as required to level frame. Center both bubbles in spirit levels to position frame tower frame in a perfectly level plane.
- Do not raise or use light tower if wind speeds exceed specified safe speeds or if storms or thunderstorms are expected in the area.
- Lower tower when not in use.
- Use ground terminal inside frame to ground unit in compliance with local laws and regulations.
- Do not operate machine with wet hands or clothing.
- All electrical wires, plugs, sockets and other components must always be in good condition when operating.
- Close and latch the doors during normal operation. Open the doors when the engine is stopped and machine is being serviced.
- Keep engine cooling slot on doors and frame clean to allow engine to cool when running. Clean when trash plugs slots.
- Do not place any items next to exhaust or muffler to prevent burns or items from catching on fire from high temperatures.
- Do not turn lamps on if protective glass is damaged or broken.
- Do not touch flood lamps while they are on to prevent burns. Allow time for them to cool before touching to service or maintain.
- Stop engine, turn lights off and disconnect power if a malfunction occurs. Identify and resolve the malfunction before turning machine on and resuming work.

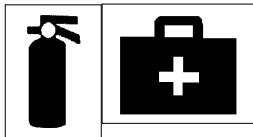
2.8 MAINTENANCE SAFETY

- Read and understand all the information contained in the Operator's Manual regarding operating, servicing, adjusting, maintaining and repairing.
- **Turn machine OFF, shut down and lock out power supply, relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.**
- Exercise extreme caution when working around, or with, high-pressure hydraulic systems. Depressurize the system before working on it.
- Follow good shop practices:

- Keep service area clean and dry.
- Be sure electrical outlets and tools are properly grounded.
- Use adequate light for the job at hand.

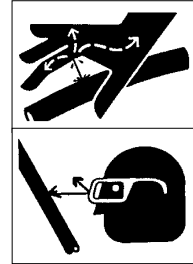


- Wear heavy gloves and eye protection when searching for suspected hydraulic leaks. Use a piece of wood or cardboard as a backstop instead of hand to isolate and identify a leak. A high pressure concentrated stream of hydraulic fluid can pierce the skin. If such happens, seek immediate medical attention as infection and toxic reaction could develop.
- Make sure all guards and doors are in place and properly secured when operating the light tower.
- Do not work on light tower electrical system unless the power cord is unplugged or the power supply is locked out. Lock-out tag-out power source before performing any maintenance work.
- A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
- Disconnect lamps from power supply and wait for them to cool before performing any service or maintenance or replacing them.
- Do not touch engine, manifold, pipes and muffler while engine is running. Allow engine to cool before performing any service work on it.
- Always replace guards and shields and close doors when service and repair work has been completed.
- Do not remove radiator cap when engine is running or still hot to prevent leaks and scalding burns.



2.9 HYDRAULIC SAFETY

- Make sure that all the components in the pump system are kept in good condition and are clean.
- Before applying pressure to the system, make sure all components are tight, and that lines, hoses and couplings are not damaged.
- Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tapes, clamps or cements. The hydraulic system operates under extremely high pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.
- Wear proper hand and eye protection when searching for a high pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.
- If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.
- Relieve pressure on hydraulic system before servicing, maintaining or repairing the hydraulic system.



2.10 LOCK-OUT TAG-OUT SAFETY

- Establish a formal Lock-Out Tag-Out program for your operation.
- Train all operators and service personnel before allowing them to work around the light tower.
- Provide tags at the work site and a sign-up sheet to record tag out details.
- Do not service or maintain the light tower unless motor is OFF and the power locked out with the master switch.

2.11 BATTERY SAFETY

- Keep all sparks and flames away from batteries, as gas given off by electrolyte is explosive. Always wear gloves.
- Avoid contact with battery electrolyte: wash off any spilled electrolyte immediately.
- Wear safety glasses when working near batteries.
- Do not tip batteries more than 45° to avoid electrolyte loss.
- To avoid injury from spark or short circuit, disconnect battery ground cable before servicing any part of the electrical system.

2.12 OPERATING SAFETY

- Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or repairing the light tower.
- Turn machine OFF, place master controls in their OFF position, relieve hydraulic pressure, shut down and lock out power source, unplug power cord and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Keep all electrical components tight, dry and in good repair.
- Clear the area of bystanders, especially small children.
- Replace all worn or failed components immediately with Metrolite approved parts.
- Install and secure all guards before operating.
- Keep hands, feet, hair and clothing away from moving parts.
- Review worksite. Position light tower to provide maximum lighting and minimal interference with other equipment.
- Extend and pin outriggers, lower jacks to level frame before raising tower.
- Before applying pressure to the hydraulic system make sure all components are tight and that all steel lines, hoses and couplings are not damaged.
- Stay away from overhead power lines and obstructions when raising or lowering light tower. Electrocutation can occur without direct contact.
- Do not stand or climb on machine when running. Keep others off.
- Keep the working area clean and dry.
- Review safety instructions annually.

2.13 TIRE SAFETY

- Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.
- Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
- Have a qualified tire dealer or repair service perform required tire maintenance.
- When replacing worn tires, make sure they meet the original tire specifications. Never under-size.

2.14 TRANSPORT SAFETY

- Make certain that you are in compliance with local, state/provincial and federal regulations regarding transporting equipment on public roadways.
- Make certain that all wheels and tires are in good repair and that tires are inflated to proper pressure. Do not under-inflate or over-inflate.
- Make certain that all wheel bolts/lug nuts are tightened to proper torque specifications (refer to specification chart in Section 7.2).
- Fully lower light tower before transporting.
- Secure and lock access doors before transporting.
- Raise jacks into their fully UP position, retract outriggers, and secure with lock pins.
- Do not park light tower on a steep slope.
- Be sure that any necessary signs, reflectors and lights required by law are in proper place and are clearly visible to oncoming and overtaking traffic.
- Be sure that the light tower is positively hitched to the towing vehicle. Use a safety cable to assure a safe hitch hook-up when transporting.
- Use a 3/4 ton pickup or larger truck to tow machine.
- Do not allow anyone to ride on the light tower during transport.
- Clear the area of obstacles and unnecessary personnel.
- Do not place any objects or loads on the frame to prevent changing the center of gravity or overloading the frame.
- Do not exceed a safe travel speed of 90 km/55mph with trailer. Slow down for corners and rough surface conditions.

2.15 ELECTRICAL SAFETY

- Use the terminal inside the frame to ground unit in compliance with local laws and regulations.
- All electrical wires, outlets, sockets and other components must always be in good condition when operating.
- Turn master battery and electrical switches off when shutting down unit.
- Allow light components to cool for several minutes before touching them for servicing or adjusting to prevent burns from hot components.
- Do not operate machine with wet hands or clothing.
- Do not position light tower close to overhead power lines or obstructions to prevent electrocution or the problems. Electrocutation can occur without direct contact.

2.16 DIESEL ENGINE SAFETY

BEFORE STARTING ENGINE, READ AND UNDERSTAND THE OPERATING AND MAINTENANCE INSTRUCTIONS THAT CAME WITH YOUR ENGINE.

WARNING: DO NOT

- DO NOT run engine in an enclosed area. Exhaust gases contain carbon monoxide, an odorless and deadly poison.
- DO NOT place hands or feet near moving or rotating parts.
- DO NOT store, spill, or use fuel near an open flame, or devices such as a stove, furnace, or water heater which use a pilot light or devices which can create a spark.
- DO NOT refuel indoors where area is not well ventilated. Outdoor refuelling is preferred.
- DO NOT fill fuel tank while engine is running. Allow engine to cool for 5 minutes before refuelling. Store fuel in approved safety containers.
- DO NOT remove fuel tank cap while engine is running.
- DO NOT operate engine if fuel is spilled. Move machine away from the spill and avoid creating any ignition until the fuel has evaporated.
- DO NOT smoke when filling fuel tank.
- Whenever possible, gradually reduce engine speed before stopping.
- DO NOT run engine above rated speeds. This may result in injury.
- DO NOT tamper with parts which may increase the governed engine speed.
- DO NOT tamper with the engine speed selected by the original equipment manufacturer.
- DO NOT strike flywheel with a hard object or metal tool as this may cause flywheel to shatter in operation. Use proper tools to service engine.
- DO NOT operate engine without a muffler. Inspect periodically and replace, if necessary. If engine is equipped with muffler deflector, inspect periodically and replace, if necessary with correct deflector.
- DO NOT operate engine with an accumulation of grass, leaves, dirt or other combustible materials in the muffler area.
- DO NOT use this engine on any forest covered, brush covered, or grass covered unimproved land unless a spark arrester is installed on the muffler. The arrester must be maintained in effective working order by the operator. In the State of California the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands.
- DO NOT touch hot muffler, cylinder or manifold because contact may cause burns.

- DO NOT run engine with air cleaner or air cleaner cover removed.

WARNING: DO

- ALWAYS Disconnect the negative wire from the battery terminal before servicing engine to prevent accidental starting.
- DO examine muffler periodically to be sure it is functioning effectively. A worn or leaking muffler should be repaired or replaced as necessary.
- DO use fresh fuel. Stale fuel can gum fuel injection system.
- DO check fuel lines and fittings frequently for cracks or leaks. Replace if necessary.

2.17 REFUELLING SAFETY

- Handle fuel with care. It is highly flammable.
- Allow engine to cool for 5 minutes before refueling. Clean up spilled fuel before restarting engine.
- Do not refuel the machine while smoking or when near open flame or sparks.
- Fill fuel tank outdoors.
- Prevent fires by keeping machine clean of accumulated trash, grease and debris.



2.18 EMPLOYEE SIGN-OFF FORM

Metrolite follows the general Safety Standards specified by the American Society of Agricultural and Biological Engineers (ASABE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining a Metrolite built machine must read and clearly understand ALL Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Annually review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. We feel that an untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the operation of the equipment. Copy this page and use it as your sign-off form

SIGN-OFF FORM

DATE	EMPLOYEE'S SIGNATURE	EMPLOYER'S SIGNATURE


3 SAFETY SIGN LOCATIONS


The types of safety signs and locations on the equipment are shown in the illustrations that follow. Good safety requires that you familiarize yourself with the various Safety Signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!



A


CAUTION

- Read engine, alternator electrical component and machine manuals before starting. Review safety instructions annually. 
- Stop engine, disconnect engine and battery power circuits and wait for all moving parts to stop before servicing, adjusting, repairing or maintaining.
- Keep all electric and hydraulic components tight, dry and in good condition.
- Replace all worn or failed components immediately.
- Extend and pin outriggers, lower jacks and level frame before raising tower.
- Lower tower, raise jacks, retract and pin outriggers before moving or transporting machine.
- Stay away from overhead power lines and obstructions to prevent electrocution. Electrocution can occur without direct contact.
- Do not smoke when refuelling.
- Allow light components to cool before touching or servicing.
- Do not raise tower if wind speed exceeds 100 km/h (60 mph) or a storm is forecast.

19539

B


DANGER



ELECTROCUTION HAZARD
KEEP AWAY FROM POWER LINES

To prevent serious injury or death from electrocution:

- Stay well away from power lines. Electrocution can occur without direct contact.
- Lower light tower well below level of power lines before transporting or moving.

19451

REMEMBER - If Safety Signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

The types of safety signs and locations on the equipment are shown in the illustrations that follow. Good safety requires that you familiarize yourself with the various Safety Signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

• Think SAFETY! Work SAFELY!



REMEMBER - If Safety Signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

4 OPERATION



OPERATING SAFETY

- Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or repairing the light tower.
- Turn machine OFF, place master controls in their OFF position, relieve hydraulic pressure, shut down and lock out power source, unplug power cord and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Keep all electrical components tight, dry and in good repair.
- Clear the area of bystanders, especially small children.
- Replace all worn or failed components immediately with Metrolite approved parts.
- Install and secure all guards before operating.
- Keep hands, feet, hair and clothing away from moving parts.
- Review worksite. Position light tower to provide maximum lighting and minimal interference with other equipment.
- Extend and pin outriggers, lower jacks to level frame before raising tower.
- Before applying pressure to the hydraulic system make sure all components are tight and that all steel lines, hoses and couplings are not damaged.
- Stay away from overhead power lines and obstructions when raising or lowering light tower. Electrocutation can occur without direct contact.
- Do not stand or climb on machine when running. Keep others off.
- Keep the working area clean and dry.
- Review safety instructions annually.

4.1 TO THE NEW OPERATOR OR OWNER

The Metrolite light tower is designed to provide lighting over a large area by providing electrical power to banks of LED lights using a diesel engine in combination with batteries. Several operating modes are available appropriate for a variety of applications.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, and prudence of personnel involved in the operation, transport, maintenance and storage of equipment or in the use of facilities.

Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the worksite. Untrained operators are not qualified to operate the machine.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum efficiency. By following the operating instructions in conjunction with a good maintenance program, your Metrolite light tower will provide many years of trouble-free service.

4.2 MACHINE COMPONENTS

The Metrolite light tower is a diesel engine powering an alternator to generate electricity. This electricity is used to charge the batteries or power the LED lights on the tower. The unit is designed with 5 operating modes to accommodate differing application requirements.

Batteries inside the frame provide power to the lights, hydraulic pump, power for power and starting the engine. Hydraulics raise and lower the mast to position the lights to provide maximum illumination of the area.

LED light banks on top of the mast provide the lighting. Each bank can be turned and banked to direct the light where required.

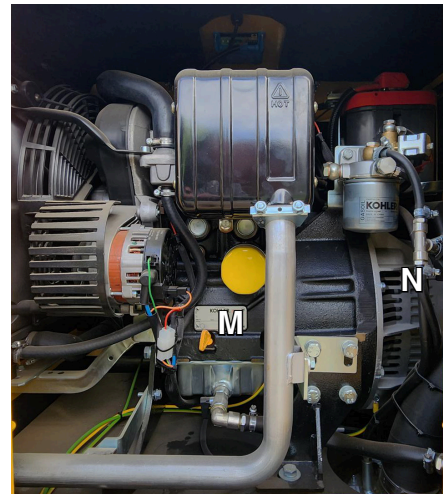
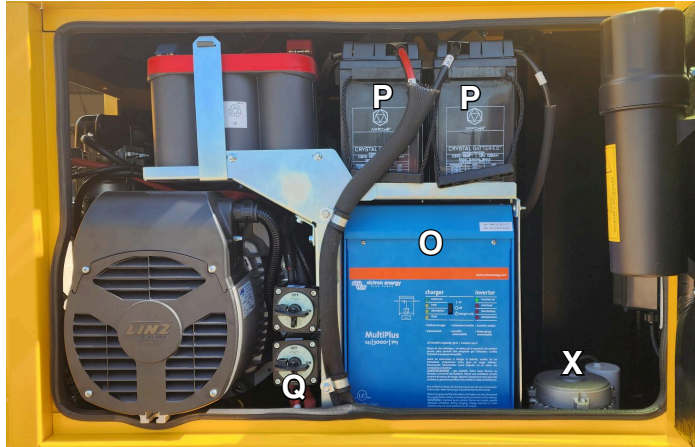
Outriggers are located on each corner of the frame and are pinned in position both extended and retracted. Manually operated jacks on the end of each outrigger frame are used to level the frame. Spirit levels on top of the frame are used to assist the operator to level the frame. The bubbles in both levels must be centred before the mast is raised.

The mast frame is pinned on the top of the frame to prevent turning. The mast can be turned through a 330° arc to allow lighting in any direction.

Slots in the front and side doors need to be kept clean to allow for free flow of air to cool the engine when it is running.

A red light on top of the frame is illuminated when the unit needs refuelling. An outlet on the left front corner allows for shore power to run the unit and provides 2 110 volt outlets.





4.3 MACHINE BREAK-IN

Although there are no operational restrictions on the Metrolite light tower when used for the first time, it is recommended that the following mechanical items be checked:

- A. Read all manuals before starting including light tower's, engine and Victron Controller.
- B. **After 75 hours of operation:**
 - 1. Change the engine oil and oil filter. Replace with recommended oil.
 - 2. Then go to regularly scheduled service schedule for 500 hours.

4.4 PRE-OPERATION CHECKLIST

Safe and efficient operation of your new light tower requires that each operator reads and follows all safety precautions and operating procedures contained in this section. Performing the following pre-operation checklist is important for personal safety as well as for continued mechanical soundness and longevity of your new Metrolite light tower. The checklist should be performed before operating the light tower and prior to each operation thereafter.

- Lubricate the machine according to the schedule prescribed in the "Maintenance Section".
- Insure that proper protective gear is in good repair and available for use by each operator. Make certain that each operator uses the protective gear. Protective gear includes but, is not limited to:



- Leather gloves
 - Safety glasses or face shield
 - Full length protective clothing
 - Steel toed boots with slip resistant soles.
 - Hearing protection.
- Check the oil level in the hydraulic reservoir as prescribed in the Maintenance Section.
 - Check for hydraulic leaks. Tighten fittings or re-route hoses as required to maintain a leak-free system.
 - Insure that all safety guards and shields are in good repair and securely in place.
 - Check that frame is level. Adjust as required.
 - Make sure that all electrical switches are in the OFF position before starting engine or supplying power.
 - Check that all electrical connections are tight and cords are routed out of the way or protected.
 - Be sure the working area is clean and dry to prevent tripping or slipping.

4.5 CONTROLS

It is recommended that all operators read the Sea Electronics module manual to learn how to operate and navigate through the module features. Knowledge and understanding of this control module allows the operator to monitor and set a variety of engine and machine parameters. The module is designed to control all machine functions and parameters.

1. Control Unit:

DSE7320 MKII:

Always refer to the manual provided with the unit or refer to the unit on line for detailed instructions on setting and operation of unit.

DSE7320 MKII is an Auto start controller that monitors the unit and indicates operational status and fault conditions. The controller can be programmed to automatically start or stop based on time schedule, fault condition or load demand.

The controller constantly monitors vital generator and engine functions for a number of pre-programmed alarm and fault conditions. When a fault condition occurs, the engine shuts down automatically and the LCD window shows the fault that caused the shutdown. To resume operation, the fault must be corrected. The controller records a history of unit performance, which may be viewed at any time and will not be lost when the controller is powered down.

2. Controller:

a. Liquid Crystal Display (LCD) Window:

Displays the various operating screens. By viewing these screens, the operator can monitor both the engine and generator status while the unit is running.

b. Start Button:

Starts the engine if there are no shutdown errors and the engine is in 'ready to start' status.

c. Stop/Reset Mode Button:

The generators remain at rest.

d. Manual Mode Button:

This button places the module into its Manual Mode. Once in Manual Mode, the module responds to Start Button to start the generator.

e. Test Mode Button:

This button places the module into its Test Mode. Once in Test Mode the module responds to the Start Button to start the generator.

f. Auto Mode Button:

This button places the module into its Manual Mode. This mode allows the module to control the function of the generator automatically:

g. Alarm Mute/lamp Test:

This button silences the audible alarm in the controller and illuminates all the LEDs on the module's face as a lamp test function.

h. Menu Navigation:

Use these arrows to navigate through the various operator screens.

NOTE

To prevent damage to the floodlights and connected equipment, remove all loads from the generator and switch LEDs off before pressing the STOP button.

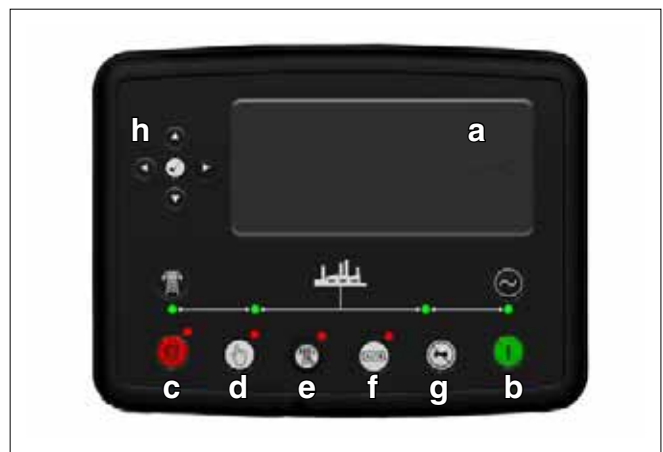


FIG. 2 DSE7320 MKII CONTROLLER

For further information, refer to the DSE7320 MKII technical manual supplied with the documentation or available on the website: <https://www.deepseaelectronics.com/genset/auto-mains-utility-failure-control-modules/dse7320-mkii>

3. Switches:

a. Mast Position:

This 3 position spring-loaded-to centre-neutral rocker switch controls the flow of oil to the hydraulic cylinders on the mast. Depress and hold the top portion of the switch to raise the mast. Depress and hold the bottom portion of the switch to lower the mast. Release the switch and it will stop the flow of oil and the mast will stop moving.

b. LED 1-4:

This 2 position rotary switch controls the power to the 1 through 4 bank of LED lights. Turn the switch full clockwise to turn the 1 through 4 bank of lights on. Turn fully counterclockwise to turn off.

c. LED 5-6:

This 2 position rotary switch controls the power to the 5 through 6 bank of LED lights. Turn fully clockwise to turn 5 through 6 lights on. Turn fully counterclockwise to turn off.

d. Service light:

This 2 position rotary switch controls the power to the service light inside the frame. Turn clockwise to turn the light on and counterclockwise to turn off.

e. Selection Breaker:

This 3 position breaker is located to the right of the main breakers and selects the manual of automatic modes for the lights. Move the breaker dial up to operate the lights in the automatic mode. Move the breaker dial down to operate in the manual mode.

f. Main Breakers:

The control panel is equipped with 3 main breakers to electrically protect 3 circuits. If the lights have an electrical problem, their breaker is tripped and it moves down. Determine and correct the problem before resuming work. Move the breaker up to reset it and resume work.



FIG. 3 CONTROL PANEL

4. Curb Side Door:

a. Victron Control Module:

This module controls the operation of the electrical system.

A 3 position rocker switch selects the on, off and charger only operating modes. In addition, lights on the module are illuminated when different operating conditions occur. This allows the operator to take appropriate measures if there are problems. Refer to the Victron manual provided with the machine for more detailed instructions.

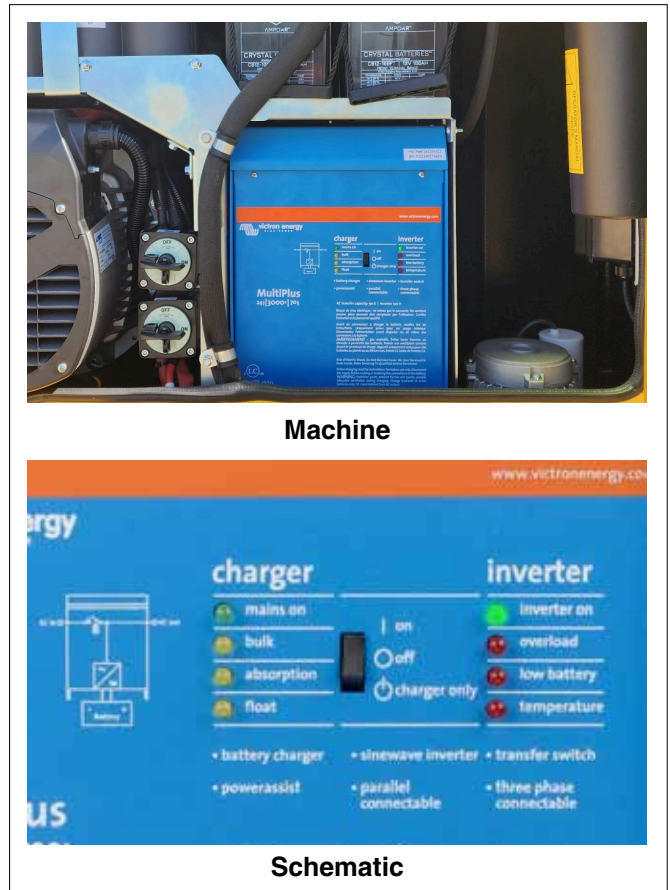


FIG. 4 VICTRON MODULE

b. Master Engine Disconnect Switch:

This 2 position rotary switch controls the electrical power to the engine operating system. Turn the switch clockwise to turn the system on and the engine will start and run with the green portion of the switch on top and visible. Turn the switch 1/4 turn counterclockwise to turn power to the engine off and the indicator will be pointing up. Always turn the engine system off when the unit is stopped for the day, being serviced, stored or transported.

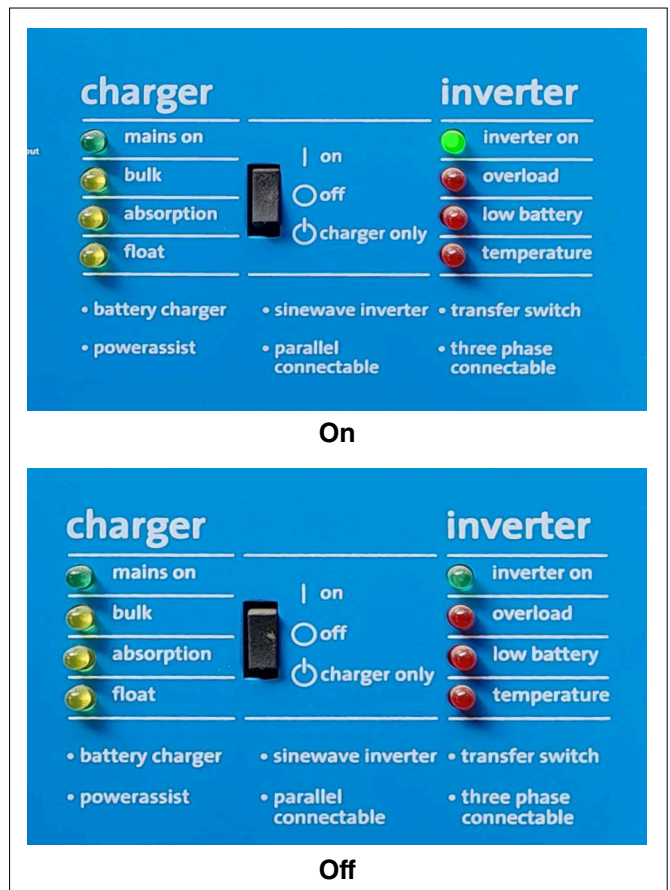


FIG. 5 MASTER ENGINE DISCONNECT

5. **Red Emergency Stop:**

This red switch is connected to a micro switch that sends a signal to the controller to shut the unit down. Depress switch and the machine will stop. Turn the switch 1/4 turn to release the switch and it will pop out and the unit can operate. Switch must be out for unit to run. If switch was depressed due to an emergency or condition, correct condition before resuming work.

6. **Shore Power:**

The unit is designed so it can be operated from a land based power source or 'Shore Power'. The terminals and outlets are located on the left front corner of the frame.

1. To have the ability charge the batteries without running the engine, to use this function make sure the Victron Controller switch is in the charge only position.
2. The unit could be utilized as a full electric light tower without the engine running. To utilize this function make sure the Victron Controller switch is turned on and the light function breaker is in either on or in auto.

a. **Input Power:**

Lift the cover and attach the power cord from the worksite.

b. **Output Terminals:**

Lift the lid to see the 2 110V 15A outlets. Use as required.

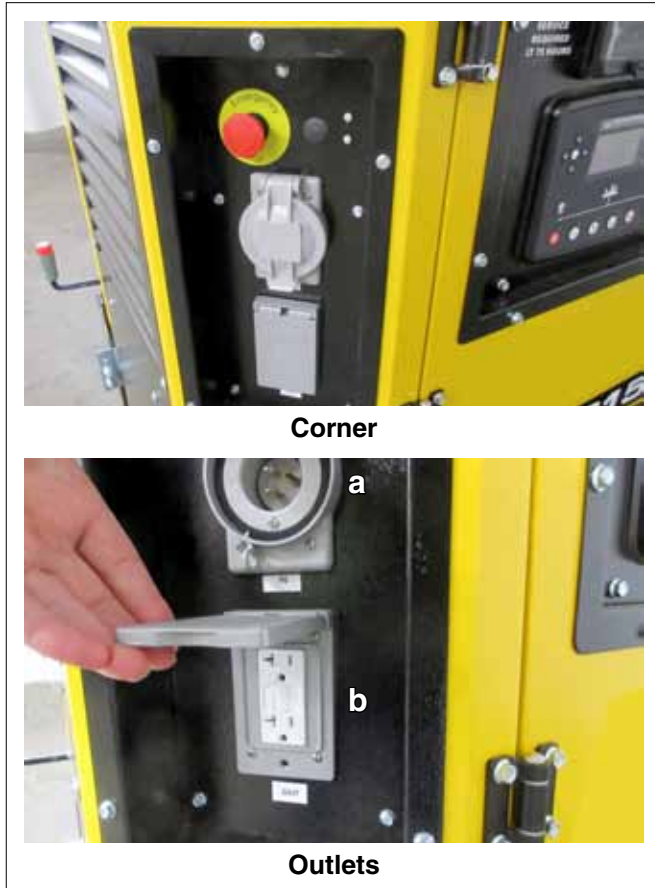



FIG. 6 LEFT FRONT COVER

4.6 MACHINE PREPARATION

4.6.1 MECHANICAL PREPARATION:

1. Batteries:

Batteries are an integral component in the successful operation of the light tower and must be kept in top condition for the unit to perform as designed. A starter battery is provided when the unit is new and is used to start the engine and charge the other batteries as required.

- a. Connect the cable to the battery terminal before starting the light tower set. 
- b. Tighten battery pole clamp to its specified torque.
- c. Check the battery isolator if unit is equipped with one.
- d. Use rubber gloves when working with batteries as they contain sulphuric acid. Always rinse with large amounts of fresh water if contacting battery acid to prevent acid burns. It is recommended that the cable be disconnected from the battery prior to transporting the unit.

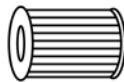
2. Engine Oil:

It is recommended that the engine oil level be checked daily to prevent running low and damaging the engine. Refer to engine operator's manual for detailed instructions and information on oil specification for varying operating environments. Do not overfill crankcase.



3. Air Filter:

Check the air filter canister when the unit is new to verify it has a filter installed. Squeeze the rubber flapper valve daily to remove any dirt that has accumulated. Open canister and remove filter if it is dirty. When operating in dusty dirty conditions, it may be necessary to clean the filter every few days. Replace filter after it has been cleaned 4 or 5 times. Do not overclean. Removing and installing the filter can damage seals. Damaged seals can allow dust to enter the engine and damage it.



4. Diesel Fuel:

Check the fuel level every day to prevent running out. A red light on top of the frame flashes when the fuel level drops to a pre-set level. Since the unit can run for 35 to 40 days without refuelling under ideal conditions, the flashing red light alerts personnel on the worksite to fill the fuel tank.



Turn engine off before refuelling. Do not smoke when refuelling and keep all sparks and burning material away. Refuel outside or in a well ventilated environment. Do not spill fuel. Clean it up before starting. Refer to engine manual for details on types of fuel to use in various temperature environments. Do not overfill tank. Leave 10 mm (1/2 inch) of space between level of fuel and top of tank to allow for fuel expansion. Use winter diesel or add special additives to fuel when operating in cold temperatures.

5. Antifreeze/Coolant:

When the engine is new, it is filled with an anti-freeze solution that is rated to -40° C. The anti-freeze prevents both interior corrosion and protection against freezing. To maintain this protection, do not mix different types of antifreeze. Refer to engine operator's manual to determine the specifications of the approved antifreeze. If the cooling system requires servicing, do not remove radiator cap when the engine is running or is still hot as the coolant could spill out abruptly and cause serious burns. Remove cap slowly and carefully. Always maintain the integrity of the coolant overflow tank. It receives the excess coolant as the system heats up and expands. It provides coolant into the radiator as the system cools and contracts.



4.6.2 HANDLING:

The machine is designed with features that allow it to be easily and conveniently moved, positioned and transported.

Three features are available to assist in handling:

1. Lifting with hoist:

A bracket on the top of the machine is positioned at the machine centre of gravity. This allows for a hoist to raise the unit without the machine tilting. Attach the hook on the hoist to the centre slot for the best results.

Turn the tower so the light banks are at right angles to the longitudinal axis to minimize interference with the hoist. Always stand on the front step when attaching hoist.



FIG. 7 LIFTING

2. Forklifts:

The frame is designed with 2 lateral pockets extending across the frame for lifting the machine. Push the forks completely through the frame until they extend out the other side to keep the machine level and even when lifted. Raise slowly and raise only as high as required. Use the signs on the frame as a guide for the fork positioning.

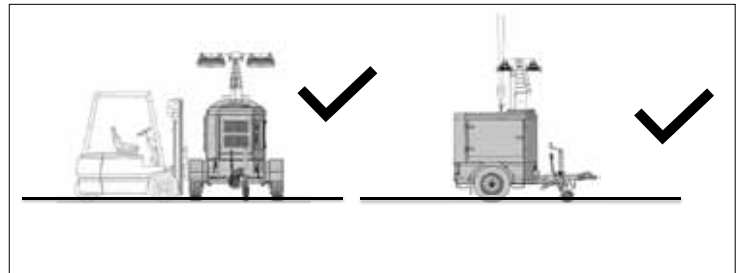


FIG. 8 FORKLIFT POSITIONING

3. Tie Downs:

The frame is designed with slots on each corner of the frame for use to attach tie downs to when transporting on another vehicle. Always attach tie downs to both sides to load the frame evenly. Do not attach to any other place to tie down unit when transporting.

4.6.3 ELECTRICAL PREPARATION:

Every operator should review the operator's manuals from the Victron, Deep Sea Electronics and alternator manufacturers provided in the document package. Follow the detailed instructions in each manual:

Connect the neutral point of the light tower set to the machine ground. By using the TN or TT distribution system, the differential switch guarantee protection against indirect contact. If complex systems are connected to the machine which require or use additional electrical protective devices you must check the coordination between the protective devices. Use the prepared terminal to earth. Comply with local and/or current regulations on installation and electrical safety.

4.6.4 POSITIONING:

Machine positioning and placement are important to the functioning and reliability of the light tower. Since the tower rises to 8.5 m, the base machine must be set in a level position to support the mast.

When positioning machine, follow this procedure:

1. Review the worksite and select an area where the machine is out of the way and not interfere with the other equipment on the worksite and yet illuminate the required area.
2. Tow the machine to the selected spot (Refer to Transport Section).
3. Select the area so the right side is facing south so solar panel is exposed to the maximum amount of sunlight for the best performance of the solar panel.
4. Unhook from the tow vehicle.
5. Unpin and extend outrigger arms on the front and corners of the frame.
6. Use the spirit levels on top of the frame as a guide to lower jacks on each corner to level the frame.



FIG. 9 LEVELING

4.6.5 DSE 890 MK11

The machine is designed with the DSEWebNet Gateway system used in conjunction with supported DSE controllers to provide monitoring and communication via the DSEWebNet advanced communication system. The DSEWebNet Gateway communicates to a maximum of 5 DSE controller(s) monitoring the instrumentation and operating state.

When this data changes, the new data is logged in the internal memory. At regular intervals the logged data is transmitted to the DSE hosted server. The DSE hosted server is then integrated into the DSEWebNet® which can be accessed via an internet connected device and web browser to allow remote monitoring and control of multiple DSE controllers worldwide. GSM, GPS and combined GSM & GPS Antenna's are available as standard on your DLT-18HD light tower.

You can easily download installation instruction from: <https://www.deepseaelectronics.com/genset/remote-communications-overview-displays/dse890>

4.6.6 VICTRON CONTROLLER MULTI-PLUS 24V 3000VA 70A

The lighting tower is equipped with an Victron Controller that converts the current generated by the batteries to alternating current. Its mechanism is automatic.

For more information on the Victron Controller Multiplus, please refer to its manual supplied with documentation.

4.6.7 DUSK TO DAWN SENSOR

The dusk to dawn sensor is composed of (2) devices controlled by DSE control unit: A relay which is placed inside the control panel and a photocell placed on top of the telescopic mast. The relay inside the control panel is already set up with a standard LUX to give the starting input. The manufacturer suggests to read the dusk to dawn sensor manual instruction before doing this operation. For more information on Dusk To Dawn Relay and its controls, please refer to its manual supplied with documentation.

4.6.8 RECEPTACLE PANEL

The panel is equipped with 1 input socket (115 V 15 A) and 2 output sockets (110 V 20A).



FIG. 10 VICTRON CONTROL MODULE



FIG. 11 PANEL

4.7 OPERATION



OPERATING SAFETY

- Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or repairing the light tower.
- Turn machine OFF, place master controls in their OFF position, relieve hydraulic pressure, shut down and lock out power source, unplug power cord and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Keep all electrical components tight, dry and in good repair.
- Clear the area of bystanders, especially small children.
- Replace all worn or failed components immediately with Metrolite approved parts.
- Install and secure all guards before operating.
- Keep hands, feet, hair and clothing away from moving parts.
- Review worksite. Position light tower to provide maximum lighting and minimal interference with other equipment.
- Extend and pin outriggers, lower jacks to level frame before raising tower.
- Before applying pressure to the hydraulic system make sure all components are tight and that all steel lines, hoses and couplings are not damaged.
- Stay away from overhead power lines and obstructions when raising or lowering light tower. Electrocutation can occur without direct contact.
- Do not stand or climb on machine when running. Keep others off.
- Keep the working area clean and dry.
- Review safety instructions annually.

Follow this procedure when using the light tower:

1. Move unit to work site and unhook (refer to Transport Section).
2. Review Section 4.6 Machine Preparation and follow all the instructions.
3. Review and follow the pre-operation checklist (See Section 4.4).
4. Review the location and function of all controls (See Section 4.5).



FIG. 12 MACHINE (TYPICAL)

5. Operating Mode:

The machine is designed to be operated in 5 different ways to allow the operator to set the operating mode appropriate for the application. Review the options and set appropriate for the application:

- a. Auto lights/Auto Engine Mode.
- b. Continuous light/Continuous Engine Mode.
- c. Auto lights/Continuous Engine Mode.
- d. Continuous light/Auto Engine Mode.
- e. Shore Power Run Mode.

Several of the machine preparation steps are the same for the a through d operating modes. Follow these steps to be sure the unit will perform as required.

Operating mode 'e' uses a slightly differing machine preparation sequence and it will be explained when defining that operating mode.

6. Machine Preparation Steps:

- a. Refer to and follow the machine preparation and set-up sections. Be sure machine is located on a firm level base.
- b. Extend and pin the front and rear outrigger arms. Lower the jacks to level the frame. Use the bubbles in the spirit levels on top of the frame as a guide.



FIG. 13 SPIRIT LEVELS

c. Adjust the tilt and angle of the light heads.

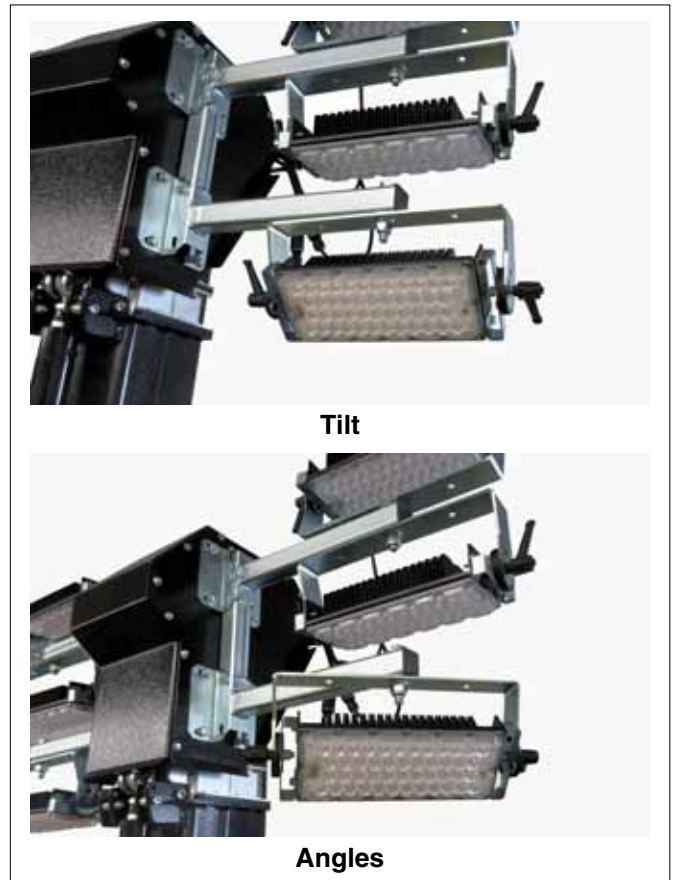


FIG. 14 LIGHT HEADS

- d. Release the clips securing the solar panel.
- e. Raise the solar panel and support it against its bracket.

NOTE

The solar panel only holds and maintain the engine battery voltage and not the 24v circuit for the Victron Controller.

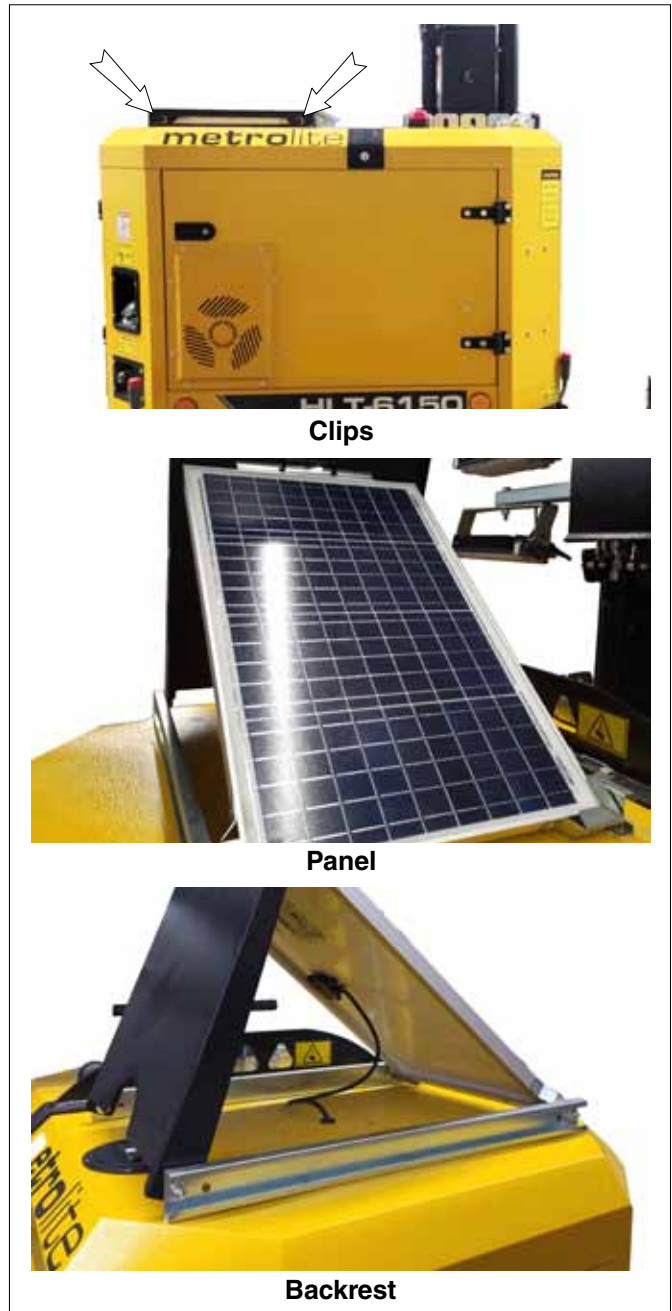


FIG. 15 SOLAR PANEL

- f. Turn the mast to the desired angle by retracting the lock pin, turn the mast to the required lamp angle (use the handles on each side of the mast) and release the lock pin.

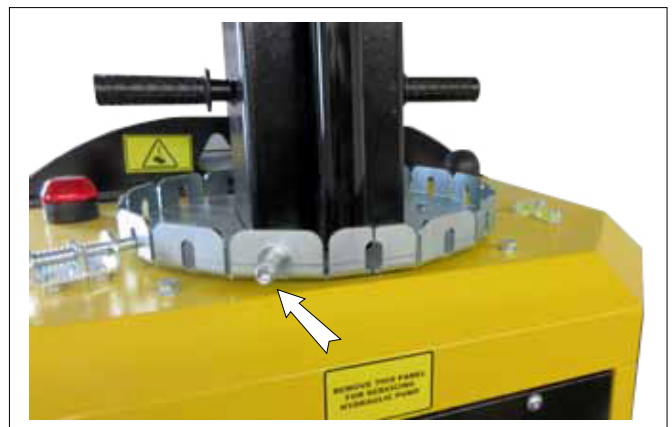


FIG. 16 MAST ANGLE

- g. Release the red emergency stop switch by turning it 1/4 turn clockwise.



FIG. 17 EMERGENCY STOP

- h. Open the passenger side canopy door and turn the Victron Control Module switch to the 'on' position. Wait for the 'on' light to illuminate.
- i. Turn the main battery disconnect switch 'on'.
- j. Close the passenger side canopy door.



FIG. 18 VICTRON CONTROL MODULE

- k. Move to the driver side of the machine, check and ensure all the breakers are in the 'on' position.
- l. Start machine.
- m. Use the rocker switch to raise the mast. Do not raise mast if there are overhead electrical power lines.



FIG. 19 DRIVER'S SIDE



7. **Auto lights/Auto Engine Mode:**

In this operating mode, the photocell located on the top of the mast measures the ambient light intensity and sends the information to the relay inside the control panel. When the light intensity drops below a pre-set level, the lights are turned on. When the battery level drops below a certain voltage/charge, the engine is automatically started so the alternator will provide power to the lights plus charge the batteries.

If you want to change the value of the light intensity pre-set relay, read the operating instructions for the relay provided in the documentation package. This operating mode provides the most economical operation for the least fuel consumption. In some operations, the machine only needs to be refuelled every 35 to 40 hours depending on the night to day time ratios.

Starting:

- a. Perform all the operations described in the steps a through l of number 5 in this section.
- b. Move the 3 position breaker to 'Auto' located on the right side of the main breakers.
- c. Press the "Auto" button and screen will read "Auto".
- d. Turn on the light switches.

Machine Shut Down/Stopping:

- a. Turn all the light switches off.
- b. Lower mast to its lowest position.
- c. Press the red button on the DSE controller to turn the engine 'off'.
- d. Turn the main battery disconnect switch 'off'.
- e. Turn the Victron Controller 'off'.
- f. Raise outrigger jacks, retract outriggers and pin.

Emergency Stop:

Depress the red e-Stop switch on the right front corner of the frame. Identify 'emergency' and resolve before resuming work.

8. **Continuous lights/Auto Engine Mode:**

In this operating mode, the lights are set to be on all the time. The control system starts the engine when the battery charge drops to a pre-set level to power the lights and charge the batteries. When the batteries are charged, the engine is automatically turned off.

Starting:

- a. Perform all the operations described in steps a through l of number 5 in they section.
- b. Move the 3 position breaker to 'Man' located on the right side of the main breakers.
- c. Press the 'Auto' button - screen will read 'Auto Mode'.
- d. Turn on the light switches.

Machine Shut Down/Stopping:

- a. Turn all the light switches off.
- b. Lower mast to its lowest position.
- c. Set the 3 position switch to the centre position located to the right of the main breakers.
- d. Press the red button on the DSE controller to turn the engine 'off'.
- e. Turn the main battery disconnect switch 'off'.
- f. Turn the Victron Controller 'off'.
- g. Raise outrigger jacks, retract outriggers and pin.

Emergency Stop:

Depress the red e-Stop switch on the right front corner of the frame. Identify 'emergency' and resolve before resuming work.

9. Auto lights/Continuous Engine Mode:

In this operating mode, the photocell located on top of the mast measures the ambient light intensity and sends this information to the relay inside the control panel. When the light intensity drops below a pre-set level, the lights are turned on.

The engine is set to run all the time whether the lights are on or off and maintain the batteries at full charge.

Starting:

- a. Perform all the steps in a through l of number 5 in this section.
- b. Set the 3 position breaker to 'auto' located to the right of the main breakers.
- c. Press the 'Hand' button - screen will read 'Manual Mode'.
- d. Press the 'green' button.
- e. Turn on the light switches.

Machine Shut Down/Stopping:

- a. Turn all the light switches off.
- b. Lower mast to its lowest position.
- c. Set the 3 position switch to the centre position located to the right of the main breakers.
- d. Press the red button on the DSE controller to turn the engine 'off'.
- e. Turn the main battery disconnect switch 'off'.
- f. Turn the Victron Controller 'off'.
- g. Raise outrigger jacks, retract outriggers and pin.

Emergency Stop:

Depress the red e-Stop switch on the right front corner of the frame. Identify 'emergency' and resolve before resuming work.

10. Continuous lights/Continuous Engine Run Mode:

In this operating mode, the lights are set to be on all the time and the engine is running all the time. Both lights and engine are manually turned off when appropriate.

Starting:

- a. Perform all the steps in a through l of number 5 in this section.
- b. Set the 3 position switch to 'Manual' located on the right side of the main breakers. Turn on the light switches.
- c. Press the "Auto" button - screen will read "Manual Mode".

Machine Shut Down/Stopping:

- a. Turn all the light switches off.
- b. Lower mast to its lowest position.
- c. Set the 3 position switch to the centre position located to the right of the main breakers.
- d. Press the red button on the DSE controller to turn the engine 'off'.
- e. Turn the main battery disconnect switch 'off'.
- f. Turn the Victron Controller 'off'.
- g. Raise outrigger jacks, retract outriggers and pin.

Emergency Stop:

Depress the red e-Stop switch on the right front corner of the frame. Identify 'emergency' and resolve before resuming work.

11. Operating Hints:

a. Raising the Mast:

Use the UP and DOWN arrows on the control panel to raise and lower the mast. Stay away from overhead power lines to avoid electrocution.



Arrows



light Mast - Lowered



Raising

Raised

FIG. 20 RAISING MAST

- b. Extend outrigger arms and pin. Lower jacks to level machine. Use bubbles in spirit levels when levelling machine.

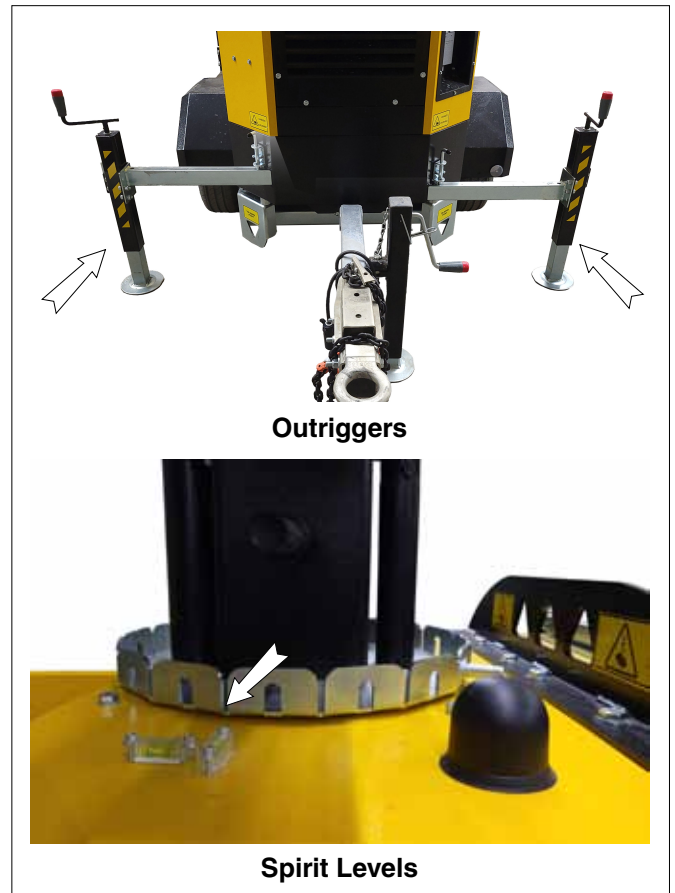


FIG. 21 LEVELLING

4.8 STORAGE



STORAGE SAFETY

- Store the light tower on a firm level surface.
- If required, make sure the unit is firmly blocked up.
- Make certain that all mechanical locks and jacks are safely and positively connected before storing.
- Store away from areas of human activity.
- Do not allow children to play on or around the stored light tower.

4.10.1 PLACING IN STORAGE

At the end of the season, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the beginning of the next season. Follow this procedure:

- Start the engine and run for 10 minutes to bring the oil to operating temperature. Change the oil filter. Change the engine oil as specified in the Maintenance Section.
- Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris or residue.
- Plan to finish working when the fuel tank is close to empty.
- Turn lights OFF.
- Lower mast into its fully DOWN position.
- Lower solar panel to its fully DOWN position and secure with clips.
- Set the 3 position switch into its center position located to the right of the main breakers.
- Press the red switch on the DSE controller to turn engine OFF.
- Turn main battery disconnect OFF.
- Turn Victron Control Module OFF.
- Unplug power cord if the machine was used in "shore power" mode.
- Raise all outrigger jacks into their fully UP position, retract outriggers and pin in their retracted position.
- Touch up all paint nicks and scratches to prevent rusting.
- Select a storage area that is dry, level and free of debris.

4.10.2 REMOVING FROM STORAGE

When preparing to use the machine at the start of the season, follow this procedure:

- Transport or move to the working area.
- Check
 - a. Engine fluid levels.
 - b. Hydraulic and electrical systems and components.
 - c. All hardware. Tighten as required.
 - e. Air pressure in tires. Add as required.
- Replace any defective components.
- Go through the pre-operation checklist (section 4.4) before starting.



FIG. 22 STORED

4.9 TRANSPORT



TRANSPORT SAFETY

- Make certain that all wheels and tires are in good repair and that tires are inflated to proper pressure. Do not under-inflate or over-inflate.
- Make certain that all wheel bolts/lug nuts are tightened to proper torque specifications (refer to specification chart in Section 7.2).
- Fully lower light tower before transporting.
- Secure and lock access doors before transporting.
- Raise jacks into their fully UP position, retract outriggers, and secure with lock pins.
- Do not park light tower on a steep slope.
- Be sure that any necessary signs, reflectors and lights required by law are in proper place and are clearly visible to oncoming and overtaking traffic.
- Be sure that the light tower is positively hitched to the towing vehicle. Use a safety cable to assure a safe hitch hook-up when transporting.
- Use a 3/4 ton pickup or larger truck to tow machine.
- Do not allow anyone to ride on the light tower during transport.
- Clear the area of obstacles and unnecessary personnel.
- Do not place any objects or loads on the frame to prevent changing the center of gravity or overloading the frame.
- Do not exceed a safe travel speed of 90 km/55mph with trailer. Slow down for corners and rough surface conditions.

Metrolite HLT-6150 light towers are designed and equipped to be towed on public roadways by vehicles with sufficient weight and braking capability.

Prepare the unit by:

- Turn lights OFF.
- Lower mast to its fully DOWN position.
- Set the 3 position switch into its center position located to the right of the main breakers.
- Press the red switch on the DSE controller to turn engine OFF.
- Turn main battery disconnect OFF.
- Turn Victron Controller OFF.
- Unplug power cord if the machine was used in "shore power" mode.
- Raise all outrigger jacks into their fully UP position, retract outriggers and pin in their retracted position.
- Hook up to tow unit.
 - a. Align hitches while backing up to hitch.
 - b. Connect pintle hitch.
 - c. Secure hitch with retainer to prevent unexpected separation.

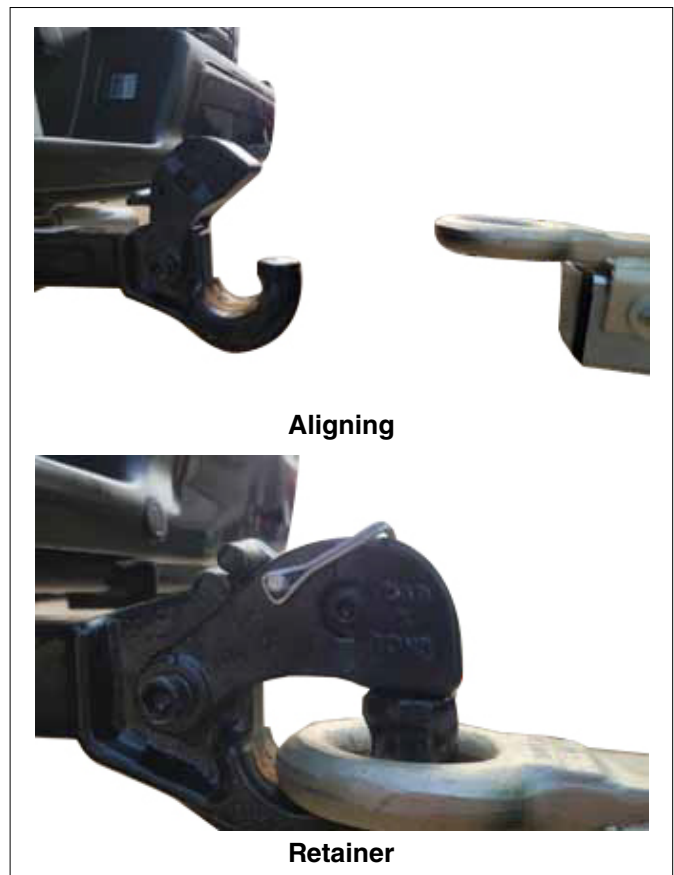


FIG. 23 PINTLE HITCH

- d. Attach safety chains while crossing them under the hitch.



Safety Chain - Attached

- e. Attach wiring harness terminal.



Wiring Harness - Connected

- f. Raise the hitch jack into its fully UP position.
- g. Rotate jack and pin in its horizontal position.
- h. Secure jack handle with its retainer.
- i. Reverse this procedure when unhooking.



Jack Rotated/Handle Secured

- Check that all required lights are clean and no bulbs are burned out.
- Do not drink or use drugs and drive.
- Do not allow riders on machine.
- Do not exceed a safe travel speed. Slow down for corners or rough surfaces.



Hooked Up

FIG. 24 TRANSPORTING

5 SERVICE AND MAINTENANCE



MAINTENANCE SAFETY

- Read and understand all the information contained in the Operator's Manual regarding operating, servicing, adjusting, maintaining and repairing.
- **Turn machine OFF, shut down and lock out power supply, relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.**
- Exercise extreme caution when working around, or with, high-pressure hydraulic systems. Depressurize the system before working on it.
- Follow good shop practices:
 - Keep service area clean and dry.
 - Be sure electrical outlets and tools are properly grounded.
 - Use adequate light for the job at hand.
- Wear heavy gloves and eye protection when searching for suspected hydraulic leaks. Use a piece of wood or cardboard as a backstop instead of hand to isolate and identify a leak. A high pressure concentrated stream of hydraulic fluid can pierce the skin. If such happens, seek immediate medical attention as infection and toxic reaction could develop.
- Make sure all guards and doors are in place and properly secured when operating the light tower.
- Do not work on light tower electrical system unless the power cord is unplugged or the power supply is locked out. Lock-out tag-out power source before performing any maintenance work.
- A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
- Disconnect lamps from power supply and wait for them to cool before performing any service or maintenance or replacing them.
- Do not touch engine, manifold, pipes and muffler while engine is running. Allow engine to cool before performing any service work on it.
- Always replace guards and shields and close doors when service and repair work has been completed.
- Do not remove radiator cap when engine is running or still hot to prevent leaks and scalding burns.

5.1 SERVICE

5.1.1 FLUIDS AND LUBRICANTS

1. **Grease:**
Use an SAE multipurpose high temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multipurpose lithium base grease.
2. **Engine Oil:**
Refer to engine manual for oil specifications to use with this engine. Consult the engine manual for unusual operating conditions. Do not mix oil types or viscosities.

Refer to engine manual for engine specifications
3. **Diesel Fuel:**
Refer to engine manual for fuel specifications. Special fuel and additives required for cold ambients.
4. **Hydraulic Oil:**
Refer to hydraulic pump manual for oil specifications.
5. **Storing Lubricants:**
Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

5.1.2 GREASING

Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.

1. Use a hand-held grease gun for all greasing.
2. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

5.1.3 SERVICING INTERVALS

8 Hours or Daily

1. Check engine fluid levels:
 - a. Fuel
 - b. Crankcase oil
 - c. Coolant

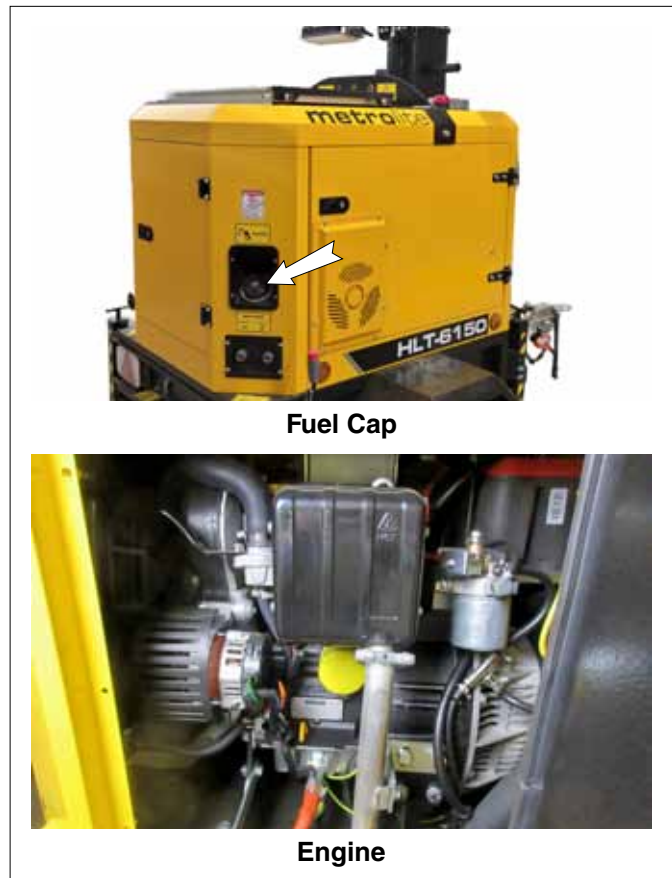


FIG. 25 FLUID LEVELS

75 Hours

1. Change break-in engine oil and oil filter. This service item only must be done once when unit is new. Then follow the service schedule outlined in the engine manufacturer's manual.

500 hours

1. Change engine oil.
2. Change engine oil filter.
3. Change fuel filter.

As Required

1. Remove the air cleaner filter and shake it out. Replace filter after cleaning 5 times.

2000 Hours or Bi-Annually

1. Change hydraulic system oil.



Engine



Drain

FIG. 26 BREAK-IN OIL

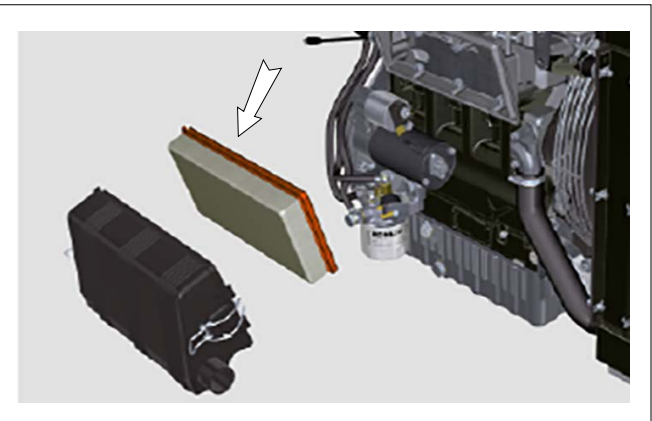


FIG. 27 AIR CLEANER (TYPICAL)



FIG. 28 HYDRAULIC PUMP

5.1.4 SERVICE RECORD

See Lubrication and Maintenance sections for details of service. Copy this page to continue record.

ACTION CODE: CL CLEAN CK CHECK G GREASE R REPACK CH CHANGE

Maintenance

Hours																								
Serviced by																								
8 Hours or Daily																								
CK Engine Fluid Levels																								
75 Hours																								
CH Break-In Engine Oil and Filter																								
500 Hours																								
CH Engine Oil																								
CH Engine Oil Filter																								
CH Fuel Filter																								
As Required																								
CL Engine Air Cleaner																								
2000 Hours or Bi-Annually																								
CH Hydraulic System Oil																								
1000 Hours																								
CH Engine Oil																								
CH Engine Oil Filter																								
CH Fuel Filter																								
CH Air Filter																								

5.2 MAINTENANCE

By following a careful service and maintenance program on your machine, you will enjoy many years of trouble-free use.

5.2.1 HYDRAULIC MAINTENANCE

A hydraulic system provides power to raise the mast. The system consists of an electrically powered pump, reservoir, lines, hoses, solenoid valves, directional valves, motors and cylinders. To maintain the integrity of the system and provide a safe working environment for the operator, it is important that a daily inspection be done to make sure that the entire system and all components are in good working condition.

When inspecting the hydraulic system and components, follow this procedure:

1. Place all controls in the OFF or neutral position.
2. Turn master electric switch OFF and lockout before starting the inspection.
3. Inspect all hydraulic components looking for:
 - a. Leaks.
 - b. Damaged hoses or lines.
 - c. Damaged or leaking cylinders.
 - d. Leaking motors or fittings.
 - e. Damaged or leaking solenoid and directional valves.
 - f. Leaking pump or fittings.
4. Tighten any leaking fittings and replace any damaged components.
5. Change the hydraulic oil every 2000 hours or bi-annually per the Service schedule. Change more frequently if operating in harsh conditions such as extreme heat or cold, extreme dust or dirt, and/or extreme humidity.

5.2.2 ELECTRIC SYSTEM INSPECTION

Electricity provides power to all systems on the light tower. To maintain the integrity of each system and provide a safe working environment for the operator, it is important that a daily inspection be done to make sure that all systems and components are in good working condition.

When inspecting the electrical system and components, follow this procedure:

1. Place all controls in the OFF or neutral position.
2. Turn master electric switch OFF and lockout before starting the inspection.
3. Inspect all electrical components looking for:
 - a. Damaged plugs.
 - b. Frayed or loose wires.
 - c. Cut or cracked insulation.
4. Replace any damaged components immediately.
5. Be sure all components are grounded.
6. Be sure there is not water or moisture in any junction box or enclosure. Dry the components before turning power on. Be sure that all compartments seal properly when closed.

5.2.3 CLEANING AIR CLEANER

1. Review the operator's manual for the engine.
2. Place all controls in the OFF or neutral position.
3. Turn OFF battery disconnect.
4. Open engine door.
5. Remove cover over air cleaner.
6. Remove the filter from the air cleaner.
7. Shake out the filter and use a damp cloth to wipe out the canister.
8. Install filter.
9. Install and secure cover.
10. Close and secure engine door.

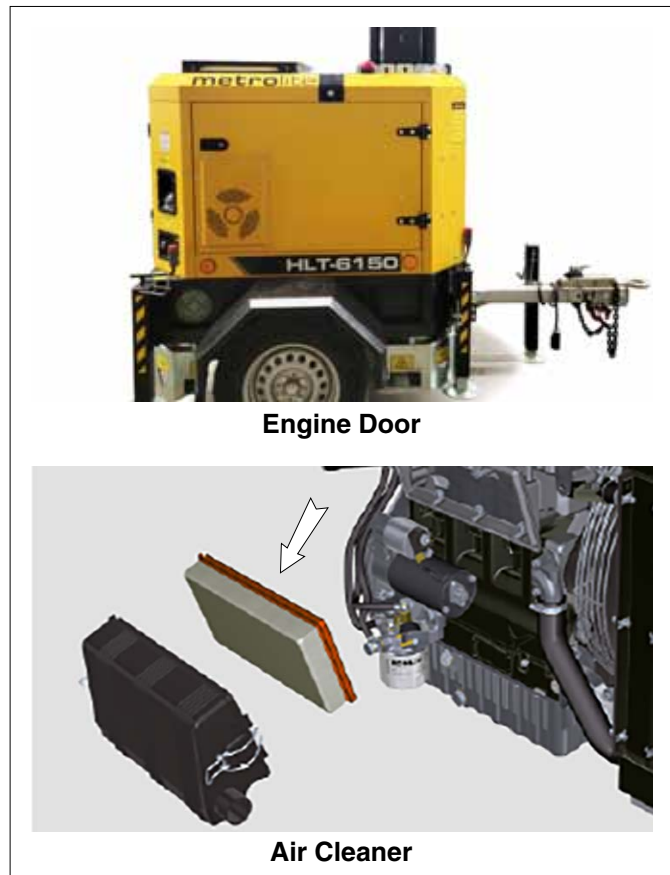


FIG. 29 AIR CLEANER

5.2.4 CHANGING ENGINE OIL AND FILTER

1. Review the operator's manual for the engine.
2. Place all controls in the OFF or neutral position.
3. Turn OFF battery disconnect.
4. Open engine door.
5. Allow the engine to cool before changing the oil. Hot oil can cause burns if it contacts exposed skin. It is best to change oil while the engine is warm to keep any contaminants in suspension.
6. Place a pan under the oil discharge plug.
7. Remove the plug and allow the oil to drain.
8. Remove the engine oil filter.
9. Apply a light coat of oil to the 'O' ring and install the replacement filter. Snug up by hand and then tighten by 1/2 turn.
10. Tighten the drain plug.
11. Dispose of the used oil in an approved container at a disposal site.
12. Fill the crankcase with specified oil.
13. Run the engine for 1 - 2 minutes and check for oil leaks.
14. If leaks are found around the drain plug or filter, tighten slightly.
15. Check engine oil level. Top up as required.
16. Close and secure engine access door.



FIG. 30 ENGINE

6 TROUBLE SHOOTING

The Metrolite HLT-6150 light tower is a machine with a hydraulically raised mast with LED lights mounted on the top to illuminate. A diesel engine, batteries or a power cord provide power for machine functions.

In the following section, we have listed many of the problems, causes and solutions to the problems that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please contact your local Metrolite dealer or the factory. Before you call, please have this Operator's Manual from your machine ready.

PROBLEM	CAUSE	SOLUTION
No start (engine).	Battery discharged.	Charge battery.
	Battery connections corroded.	Clean battery connections.
	Blown fuse.	Replace fuse.
	Defective starter.	Replace starter.
Start and stop (engine).	No fuel.	Fill fuel tank. Bleed fuel lines.
	Clogged fuel filter.	Replace fuel filter.
	Fuel circuit failure.	Check fuel lines.
No generator output.	Main circuit breaker open.	Close main circuit breaker.
	Voltage regulator malfunction.	Call Metrolite for service.
Low oil pressure.	Low oil level.	Fill engine sump with oil.
	Clogged oil filter.	Replace oil filter.
	Oil pump failure.	Call Metrolite for service.
High coolant temperature.	Electrical overload.	Reduce load.
	Low coolant level.	Fill with coolant.
	Low oil level.	Fill sump with oil.
	Clogged oil filter.	Call Metrolite for service.

PROBLEM	CAUSE	SOLUTION
No light (lamp).	Faulty lamp connection.	Check that lamp is tight in socket. Check connections inside junction boxes on light fixtures and tower.
	Plug connection at fixture is loose or damaged.	Repair or replace the plug connection.
	LED light not working.	Replace failed or broken LED light.
	Circuit breaker turned off.	Turn circuit breaker on.
	Generator output incorrect.	Check incoming voltage (Voltage should be $120\text{ V} \pm 5\text{ V}$. If voltage is incorrect, engine speed may need to be adjusted or generator may require service.
	Check Victron Controller/charge.	<ul style="list-style-type: none"> • Ensure the Victron Controller/charger is in the correct mode. • Battery disconnect turned off.
Low light output.	Lamp degraded.	Replace lamp due to normal lamp life.
	Low battery.	Check battery for correct voltage output.
	Fixture or lens dirty.	Clean reflective surface inside fixture and both inside and outside surface of glass lens.

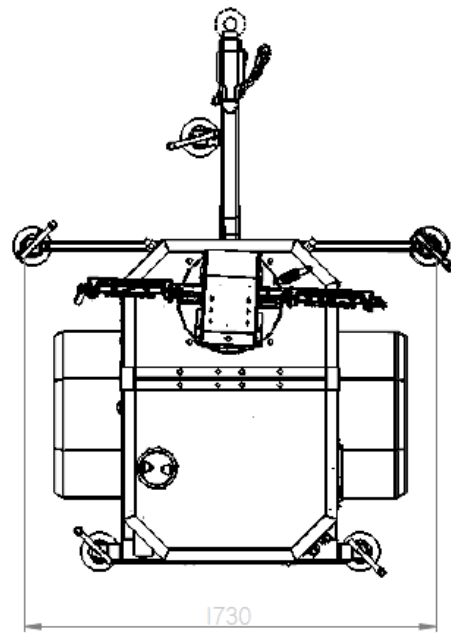
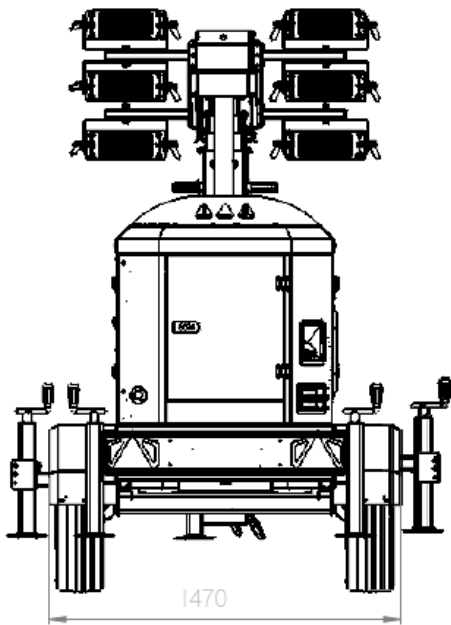
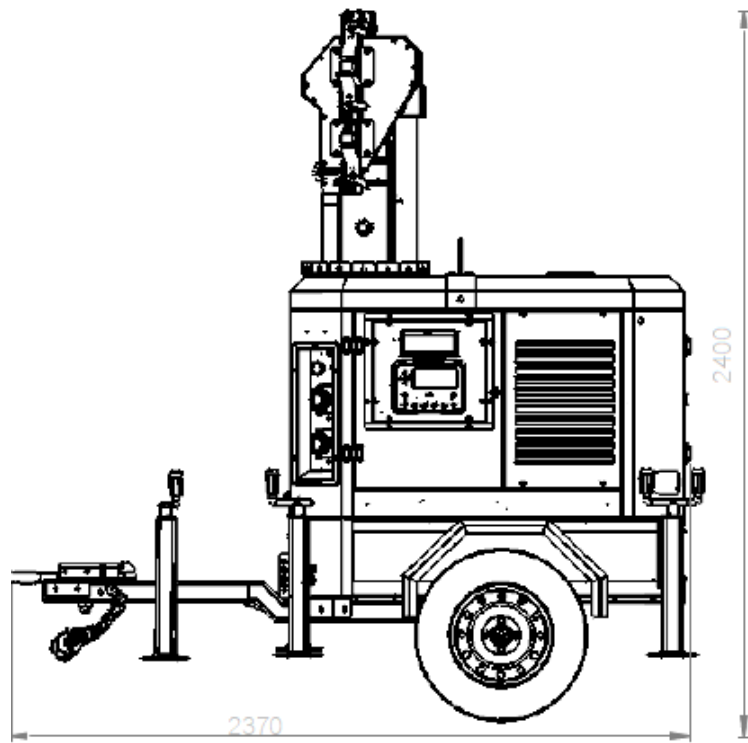
7 SPECIFICATIONS

7.1 MECHANICAL

HLT-6150 is a lighting tower for heavy duty application, please see data sheet below and dimensional as well:

Technical	
Frequency	60 Hz
Voltage	110 V
Power	4 kVA
Operating Temperature	-25° - +50° C
Sound Level	61 dB
Control	DSE 7320MKii
Autostart	Dusk to dawn sensor as standard
Auxiliary Power	2.5 kVA (Available with engine on)
L x W x H	93 in x 58 in x 94.5 in
Total Weight	2,205 lbs
Mast Height	28 ft
Rotation	350°
Sound Level at 7m	61 dB
Control	DSE 7320MKii
Autostart	Dusk to dawn sensor as standard
Power	2.5 (Available with engine on)
Voltage	110 V
Floodlights	6 x 150 W
Total Lumen	120,000 lm
Light Coverage	4,200 sqm
Max Wind Rating	110 kph (68 mph)
Electrical Receptacles	1 x 110V 15A Outlet
Generator End	Linz Alumen 60 hZ
Engine	Kohler KDW702
Battery Type	4 x Crystal Batteries
Battery Pack	24 V / 200 A
Expected Battery Cycle	3,100 (at 25°C)
Expected Battery Lifetime	8-11 years
Fuel	Diesel
Fuel Tank Capacity	120 litres
Fuel Consumption During Recharging	1L/h (LED lights Always On)
Run Time Hybrid Mode (lights only)	360 hours
Secondary Fluid Containment	110%

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



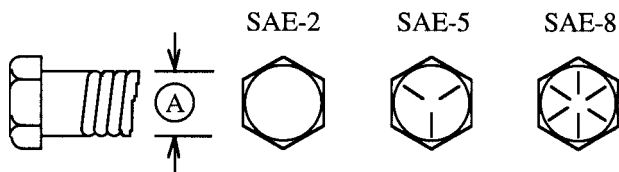
7.2 BOLT TORQUE

CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

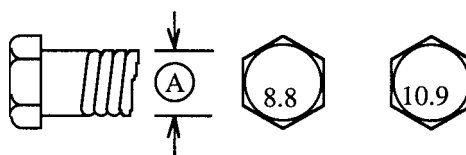
ENGLISH TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque*					
	SAE 2 (N.m) (lb-ft)		SAE 5 (N.m) (lb-ft)		SAE 8 (N.m) (lb-ft)	
1/4"	8	6	12	9	17	12
5/16"	13	10	25	19	36	27
3/8"	27	20	45	33	63	45
7/16"	41	30	72	53	100	75
1/2"	61	45	110	80	155	115
9/16"	95	60	155	115	220	165
5/8"	128	95	215	160	305	220
3/4"	225	165	390	290	540	400
7/8"	230	170	570	420	880	650
1"	345	225	850	630	1320	970



METRIC TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque*			
	8.8 (N.m) (lb-ft)		10.9 (N.m) (lb-ft)	
M3	.5	.4	1.8	1.3
M4	3	2.2	4.5	3.3
M5	6	4	9	7
M6	10	7	15	11
M8	25	18	35	26
M10	50	37	70	52
M12	90	66	125	92
M14	140	103	200	148
M16	225	166	310	229
M20	435	321	610	450
M24	750	553	1050	774
M30	1495	1103	575	1550
M36	2600	1917	3675	2710



Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

* Torque value for bolts and capscrews are identified by their head markings.

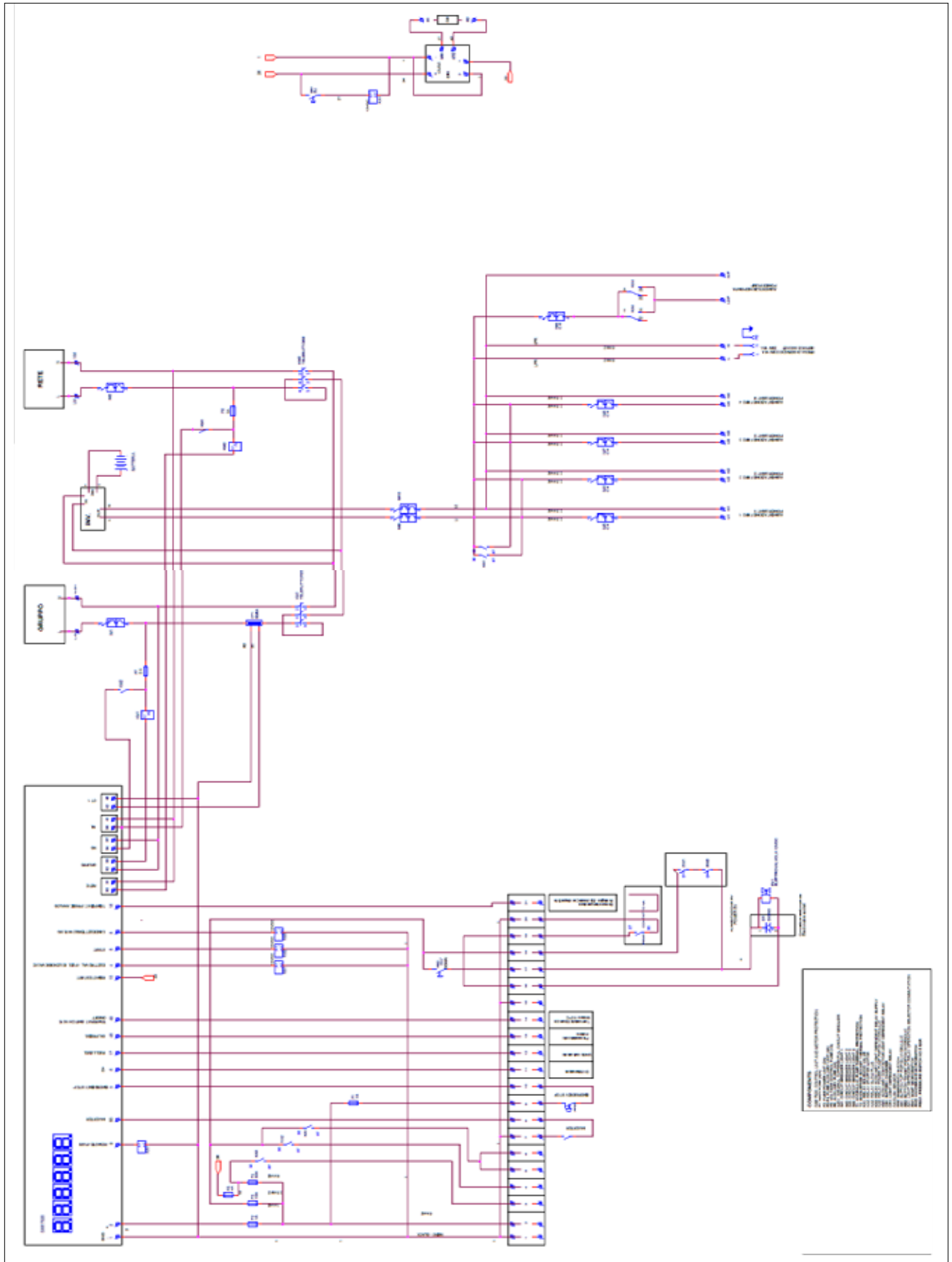
7.3 HYDRAULIC FITTING TORQUE

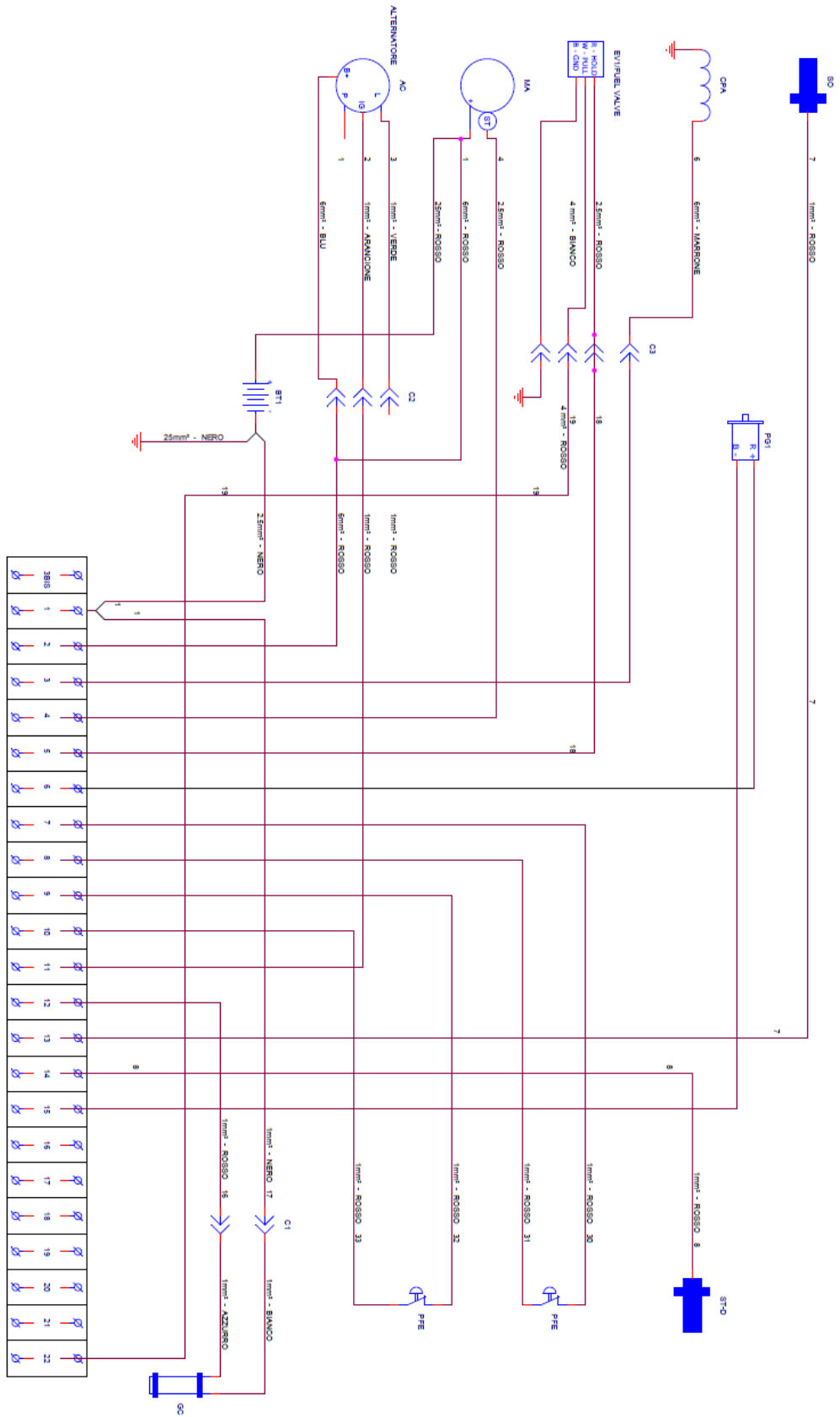
TIGHTENING O-RING FITTINGS *

1. Inspect O-ring and seat for dirt or obvious defects.
 2. On angle fittings, back the lock nut off until washer bottoms out at top of groove.
 3. Hand tighten fitting until back-up washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
 4. Position angle fittings by unscrewing no more than one turn.
 5. Tighten straight fittings to torque shown.
 6. Tighten while holding body of fitting with a wrench.
- * The torque values shown are based on lubricated connections as in reassembly.

	Tube Size OD	Nut Size Across Flats	Torque Value*		Recommended Turns To Tighten (After Finger Tightening)	
	(in.)	(in.)	(N.m)	(lb-ft)	(Flats)	(Turn)
	3/8	1/2	8	6	2	1/3
	7/16	9/16	12	9	2	1/3
	1/2	5/8	16	12	2	1/3
	9/16	11/16	24	18	2	1/3
	3/4	7/8	46	34	2	1/3
	7/8	1	62	46	1-1/2	1/4
	1-1/16	1-1/4	102	75	1	1/6
	1-3/16	1-3/8	122	90	1	1/6
	1-5/16	1-1/2	142	105	3/4	1/8
	1-5/8	1-7/8	190	140	3/4	1/8
	1-7/8	2-1/8	217	160	1/2	1/12

74 ELECTRICAL SCHEMATIC

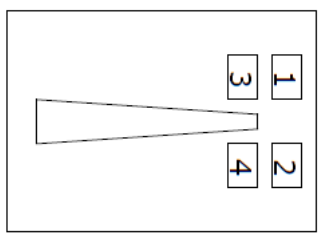
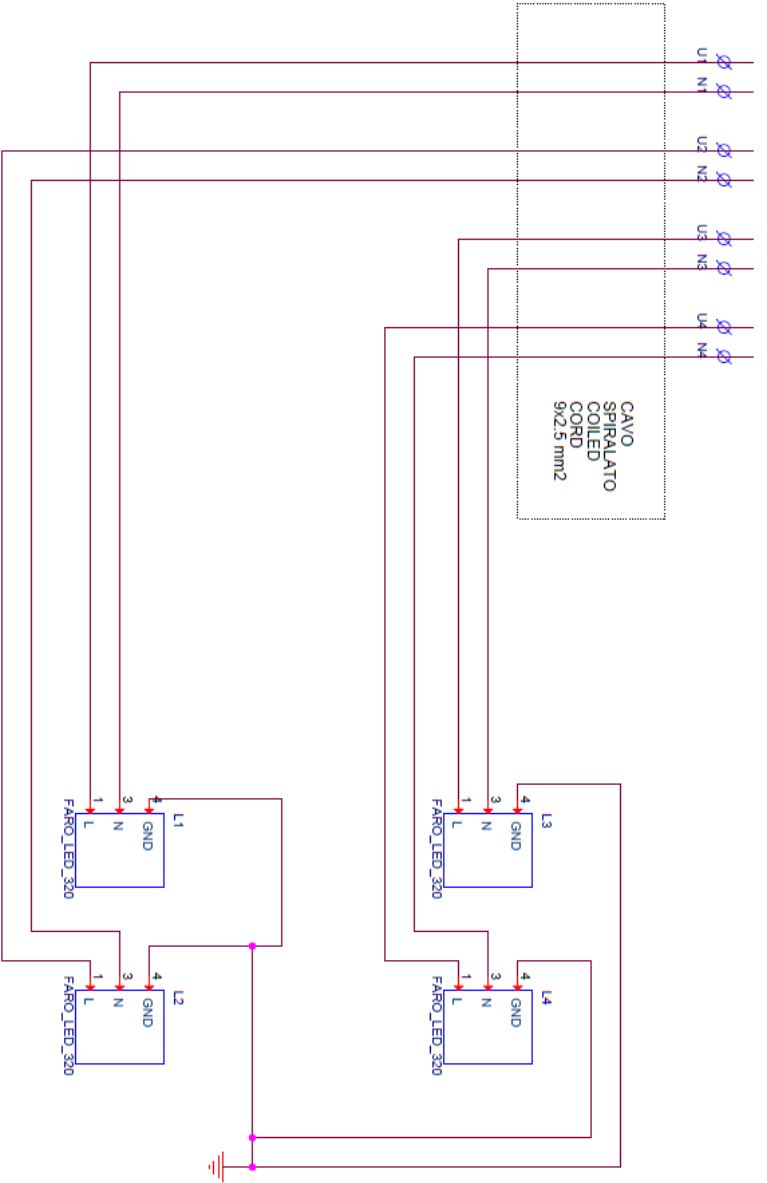




COMPONENTS

AC	ALTERNATOR CHARGING
BT1	BATTERY
EV	FUEL VALVE
EX	EXHAUST VALVE
SO	SENSOR OIL
SI	SENSOR TEMPERATURE
OC	FUEL FLOW
ME	STARTER MOTOR
SE	SENSOR TEMPERATURE
OC	CONNECTORS

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COMPONENTS
 J1: EXTERNAL JUNCTION BOX

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Rev	00
Page	1 of 3

metrolite

Phone: 1 (866) 918-6976

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