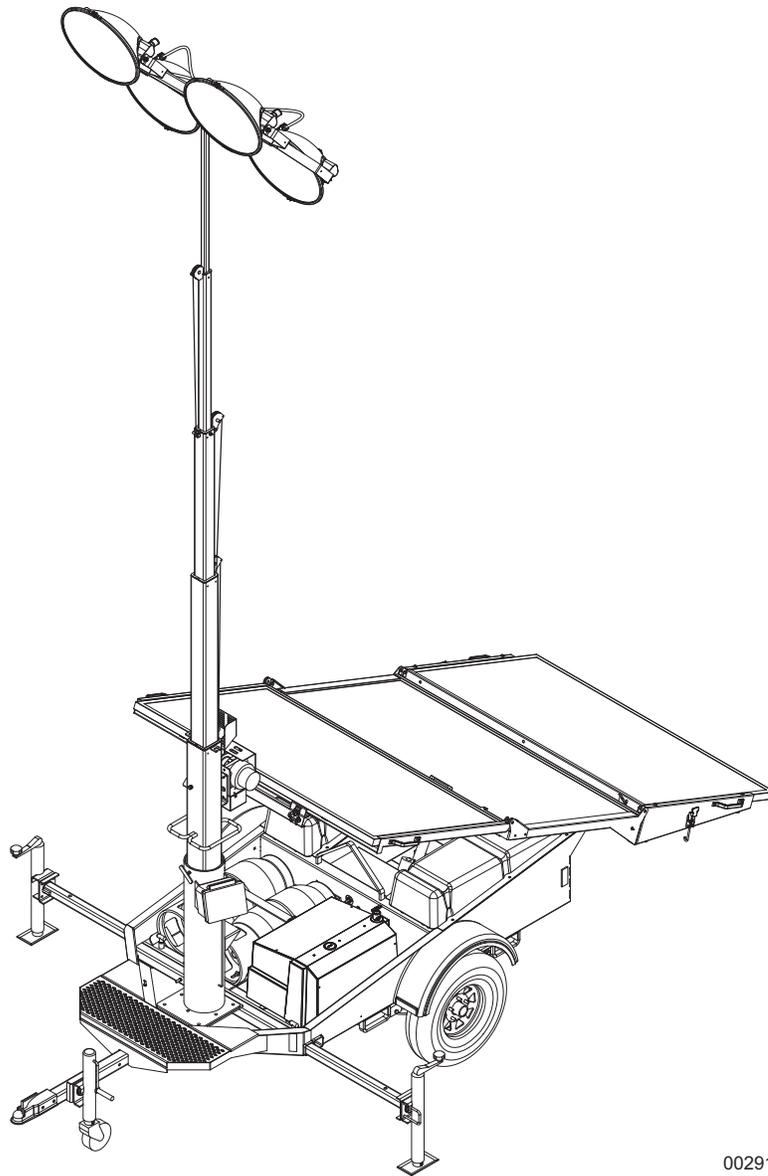




LIGHT TOWER  
MLT4000S



00291

OPERATING MANUAL

*Parts manuals available online! [www.m-p-llc.com](http://www.m-p-llc.com)*

## INTRODUCTION

This manual provides information and procedures to safely operate and maintain the Magnum Power Products LLC unit. For your own safety and protection from physical injury, carefully read, understand, and observe the safety instructions described in this manual. Keep a copy of this manual with the unit at all times. Additional copies are available from Magnum Power Products LLC or can be found at [www.m-p-llc.com](http://www.m-p-llc.com). *The information contained in this manual was based on machines in production at the time of publication. Magnum Power Products LLC reserves the right to change any portion of this information without notice.*

Read all of the manuals included with the unit. Each manual details specific information regarding items such as setup, use and service requirements. An engine operator's manual provides detailed operation and operating procedures for the engine. Additional copies of the engine operator's manual are available from the engine manufacturer.

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

Magnum Power Products LLC recommends that a trained and licensed professional perform all electrical wiring and testing functions. Any wiring should be in compliance with National Electric Code (NEC), state and local codes and Occupational Safety and Health Association (OSHA) guidelines.

## MAGNUM POWER PRODUCTS LLC

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U.S.A.

Phone: 920-361-4442

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[www.m-p-llc.com](http://www.m-p-llc.com)

For technical or parts **QUESTIONS**, please contact the Magnum Power Products LLC Customer Support or Technical Support team at 1-800-926-9768. Please have your serial number available.

To **ORDER SERVICE PARTS**, please contact the dealer from which you purchased the unit, or call Magnum Power Products LLC to locate a dealer in your area.

Engine Make: \_\_\_\_\_

Engine Serial Number: \_\_\_\_\_

Engine Model Number: \_\_\_\_\_

Generator Make: \_\_\_\_\_

Generator Model Number: \_\_\_\_\_

Generator Serial Number: \_\_\_\_\_

Unit Model Number: \_\_\_\_\_

Unit Serial Number: \_\_\_\_\_

### **▲ WARNING**

**CALIFORNIA PROPOSITION 65 WARNING:** Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects and other reproductive harm.

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# SAFETY

Study these SAFETY RULES carefully before set-up, operation or service of the unit. Become familiar with this operating manual and the unit itself. The unit can operate safely, efficiently and reliably only if it is properly setup, operated and maintained. Many accidents are caused by failure to follow simple and fundamental rules or precautions.

## SAFETY SYMBOLS



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

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

### **▲ DANGER**

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

### **▲ WARNING**

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

### **▲ CAUTION**

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

### **NOTICE**

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

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

## OPERATING SAFETY



Before using the light tower be sure you read and understand all of the instructions provided with the unit. This equipment was designed for specific applications; **DO NOT** modify or use this equipment for any application other than which it was designed for. Equipment operated improperly or by untrained personnel can be dangerous.

Read the operating instructions and familiarize yourself with the location and proper use of all instruments and controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate or set up the light tower. The following points should be practiced at all times:

- The area immediately surrounding the light tower should be dry, clean, and free of debris.
- Position and operate the light tower on a firm, level, non-combustible surface.
- **NEVER** start a unit in need of repair.
- **ALWAYS** lower the mast when not in use, or if high winds or electrical storms are expected in the area.
- Make certain the unit is well grounded and securely fastened to a good earthen ground. Follow any local, state or National Electric Code (NEC) guidelines.
- The mast extends up to 25 ft (7.6 m). **ALWAYS** make sure area above the unit is open and clear of overhead wires and obstructions.
- Keep the area near the mast clear of people while raising and lowering the mast.

- Light heads become very hot during use. Allow the LED and light fixture to cool 10-15 minutes before handling.
- Keep all body parts, clothing and other loose items clear of the winch, cables and pulleys during operation.
- **ALWAYS** extend the outriggers and level the unit before raising the mast. **DO NOT** retract the outriggers while the tower is up.
- If for any reason any part of mast hangs up or winch cable develops slack while raising or lowering the mast, **STOP** immediately and contact an authorized service representative.
- **NEVER** use the light tower if insulation on electrical cord is cut or worn through.
- **NEVER** operate lights without protective lens covers in place or with a lens cover that is cracked or damaged.
- Only use mild soap and water to clean the lens covers. Other chemicals may have an adverse effect on the glass.
- **NEVER** operate a unit while tired, distracted, or under the influence of drugs or alcohol.

## ENGINE SAFETY



Internal combustion engines present special hazards during operation and fueling. Failure to follow the safety guidelines described below could result in severe injury or death. Also read and follow all safety warnings described in the engine operator's manual. A copy of this manual was supplied with the unit when it was shipped from the factory.

- **DO NOT** run engine indoors or in an area with poor ventilation unless exhaust hoses are used. Generator exhaust contains carbon monoxide, a deadly, odorless and colorless gas which, if inhaled, can cause nausea, fainting or death. Make sure engine exhaust cannot seep into closed rooms or ventilation equipment.
- **DO NOT** operate the unit on a combustible surface.
- **DO NOT** disconnect or open the fuel valve on either LP tank near an open flame or while smoking.
- **DO NOT** touch or lean against a hot exhaust pipe, engine cylinder or gen-set enclosure.
- **DO NOT** clean air filter with gasoline or other types of low flash point solvents.
- **DO NOT** operate the unit without a functional exhaust system. Prolonged exposure to sound levels in excess of 85 dB(A) can cause permanent hearing loss. Wear hearing protection when working around a running engine.
- Keep area around exhaust pipe and air ducts free of debris to reduce the chance of an accidental fire.
- Batteries contain sulfuric acid which can cause severe injury or death. Sulfuric acid can cause eye damage, burn flesh or eat holes in clothing. Protective eye wear and clothing are necessary when working on or around the battery. Always remove the solar panels from direct sunlight, disconnect the solar panels connectors and disconnect the negative (-) battery cable from the corresponding terminal on **BOTH** rear batteries before performing any service on the engine or other components.
- Shut the engine down if any of the following conditions exist during operation:
  1. Noticeable change in engine speed.
  2. Loss of electrical output.
  3. Sparking occurs.
  4. Engine misfires or there is excessive engine/generator vibration.
  5. Protective covers are loose or missing.
  6. If the ambient air temperature is below 15°F (-10°C) or above 120°F (50°C).

## SERVICE SAFETY



This unit uses high voltage circuits capable of causing serious injury or death. Only a qualified electrician should troubleshoot or repair electrical problems occurring in this equipment.

- **NEVER** perform service with the solar panels deployed and in direct sunlight.
- **NEVER** disconnect the solar panels from each other or the unit while deployed and in direct sunlight.
- Before servicing the light tower, make sure the GEN switch and Timer Control are turned Off. Disconnect the negative (-) battery cables from the corresponding terminal on **BOTH** rear batteries. Remove the solar panels from direct sunlight and disconnect them. **NEVER** perform even routine service (oil/filter changes, cleaning, etc.) unless all electrical components are shut down. Refer to *“Electrical System Lockout” on page 30* for more information.
- **NEVER** allow water to accumulate around the base of the light tower. If water is present, **DO NOT** service.
- **NEVER** service electrical components if clothing or skin is wet. If the unit is stored outside, check the engine and generator for any moisture and dry the unit before use.
- **NEVER** wash the unit with a power washer or high pressure hose.
- **NEVER** service the unit without the actuator service pin in place. Lockout the actuator in the 90° service lockout position whenever service of interior components is necessary.
- **ALWAYS** remove the solar panels from direct sunlight and disconnect them before disconnecting the battery cables.
- Keep hands, feet, and loose clothing away from moving parts on generator and engine.
- Wear heavy leather gloves when handling winch cables. Never let cables slip through bare hands.
- Make sure slings, chains, hooks, ramps, jacks, and other types of lifting devices are attached securely and have enough weight-bearing capacity to lift or hold the equipment safely. Always remain aware of the position of other people around you when lifting the equipment.

## TOWING SAFETY



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

- **ALWAYS** close **BOTH** LP tank valves before transporting the unit.
- Check that the hitch and coupling on the towing vehicle are rated equal to, or greater than, the trailer's Gross Vehicle Weight Rating (GVWR).
- Check tires on trailer for tread wear, inflation, and condition.
- **DO NOT** tow trailer using defective parts. Inspect the hitch and coupling for wear or damage.
- Make sure the trailer hitch and the coupling are compatible. Make sure the coupling is securely fastened to the vehicle.
- Connect safety chains in a crossing pattern under the tongue and **ATTACH THE BREAKAWAY CABLE TO THE REAR BUMPER OF THE TOWING VEHICLE**. Do not attach the cable to the trailer hitch.
- Make sure directional and brake lights on the trailer are connected and working properly.
- Check that all lug nuts holding wheels on are tight and that none are missing.
- Maximum recommended speed for highway towing is 45 mph (72 km/h). Recommended off-road towing speed is not to exceed 10 mph (16 km/h) or less, depending on terrain.

When towing, maintain extra space between vehicles and avoid soft shoulders, curbs and sudden lane changes. If you have not pulled a trailer before, practice turning, stopping, and backing up in an area away from heavy traffic. A film of grease on the coupler will extend coupler life and eliminate squeaking. Wipe the coupler clean and apply fresh grease each time the trailer is towed.

## **REPORTING TRAILER SAFETY DEFECTS**

If you believe your trailer has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Magnum Power Products LLC.

If NHTSA receives similar complaints, it may open an investigation; and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in an individual problem between you, your dealer, or Magnum Power Products LLC.

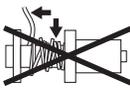
To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-888-327-4236 (TTY:1-800-424-9153), go to <http://www.safercar.gov>; or write to:

Administrator  
NHTSA  
1200 New Jersey Avenue S.E.  
Washington, DC 20590

You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

## SAFETY SYMBOL SUMMARY

This equipment has been supplied with numerous safety and operating decals. These decals provide important operating instructions and warn of dangers and hazards. Replace any missing or hard-to-read decals and use care when washing or cleaning the unit. Decal placement and part numbers can be found in the parts manual. Below is a summary of the intended meanings for the symbols used on the decals.

|                                                                                     |                                                                                       |                                                                                     |                                                                                    |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|    | Safety alert symbol; used to alert you to potential personal injury hazards.          |    | No open flames.                                                                    |
|    | Crush Hazard; stay clear of this area.                                                |    | No smoking.                                                                        |
|    | Asphyxiation hazard; operate in well ventilated area.                                 |    | Do not operate winch if cable develops slack or is not spooling correctly.         |
|    | Belt/entanglement hazard; keep body parts clear of this area.                         |    | Lift here only.                                                                    |
|   | Hot surface(s). Do not touch.                                                         |   | Anchor/tie down point.                                                             |
|  | Explosion hazard.                                                                     |  | Forklift here only.                                                                |
|  | Fire hazard.                                                                          |  | Use clean liquid propane gas only.                                                 |
|  | Explosive gases can cause blindness or injury. Shield eyes when servicing batteries.  |  | Lockout/tagout - mechanical. Secure safety pin before operating or servicing unit. |
|  | Dangerous voltage may be present.                                                     |  | Lockout/tagout - electrical. Secure power sources before servicing unit.           |
|  | Hazardous voltage. Follow lockout tagout before servicing.                            |  | Read and understand the supplied operator's manual before operating unit.          |
|  | Do not operate unit near powerlines; Contact with powerlines can cause electrocution. |                                                                                     |                                                                                    |

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# SPECIFICATIONS

## MAGNUM MODEL

## MLT4000S

### Engine

|                                              |               |
|----------------------------------------------|---------------|
| Make/Brand.....                              | Generac       |
| Engine Model.....                            | GN-220        |
| EPA Tier .....                               | Phase 3       |
| Type .....                                   | LP, 4-stroke  |
| Operating Speed <b>rpm</b> .....             | 2850          |
| Displacement <b>in<sup>3</sup> (L)</b> ..... | 13.18 (0.216) |
| Cylinders - <b>qty</b> .....                 | 1             |

### Generator

|                 |                |
|-----------------|----------------|
| Make/Brand..... | American Power |
| Model .....     | MAG-75INT-28H  |

### Electrical System

|                                          |                 |
|------------------------------------------|-----------------|
| Solar Panels <b>Watts (Qty)</b> .....    | 260 (3)         |
| Solar Panel Type.....                    | Monocrystalline |
| Battery Type - <b>Group Number</b> ..... | AGM-L16         |
| Battery <b>Voltage (Qty)</b> .....       | 6V (8)          |
| Battery Rating <b>AH</b> .....           | 415             |

### Lighting System

|                    |        |
|--------------------|--------|
| Lighting Type..... | LED    |
| Lumens .....       | 12,000 |

### Weights

|                                              |             |
|----------------------------------------------|-------------|
| Dry Weight - w/o Tanks <b>lbs (kg)</b> ..... | 2607 (1183) |
| Dry Weight <b>lbs (kg)</b> .....             | 2670 (1211) |
| Operating Weight <b>lbs (kg)</b> .....       | 2720 (1234) |

### Fluids

|                                                       |            |
|-------------------------------------------------------|------------|
| Oil grade .....                                       | 5W-30      |
| Oil capacity - w/ filter change <b>oz (mL)</b> .....  | 24 (710)   |
| Oil capacity - w/o filter change <b>oz (mL)</b> ..... | 14 (414)   |
| Fuel tank capacity <b>lbs (kg)</b> .....              | 7.9 (29.9) |

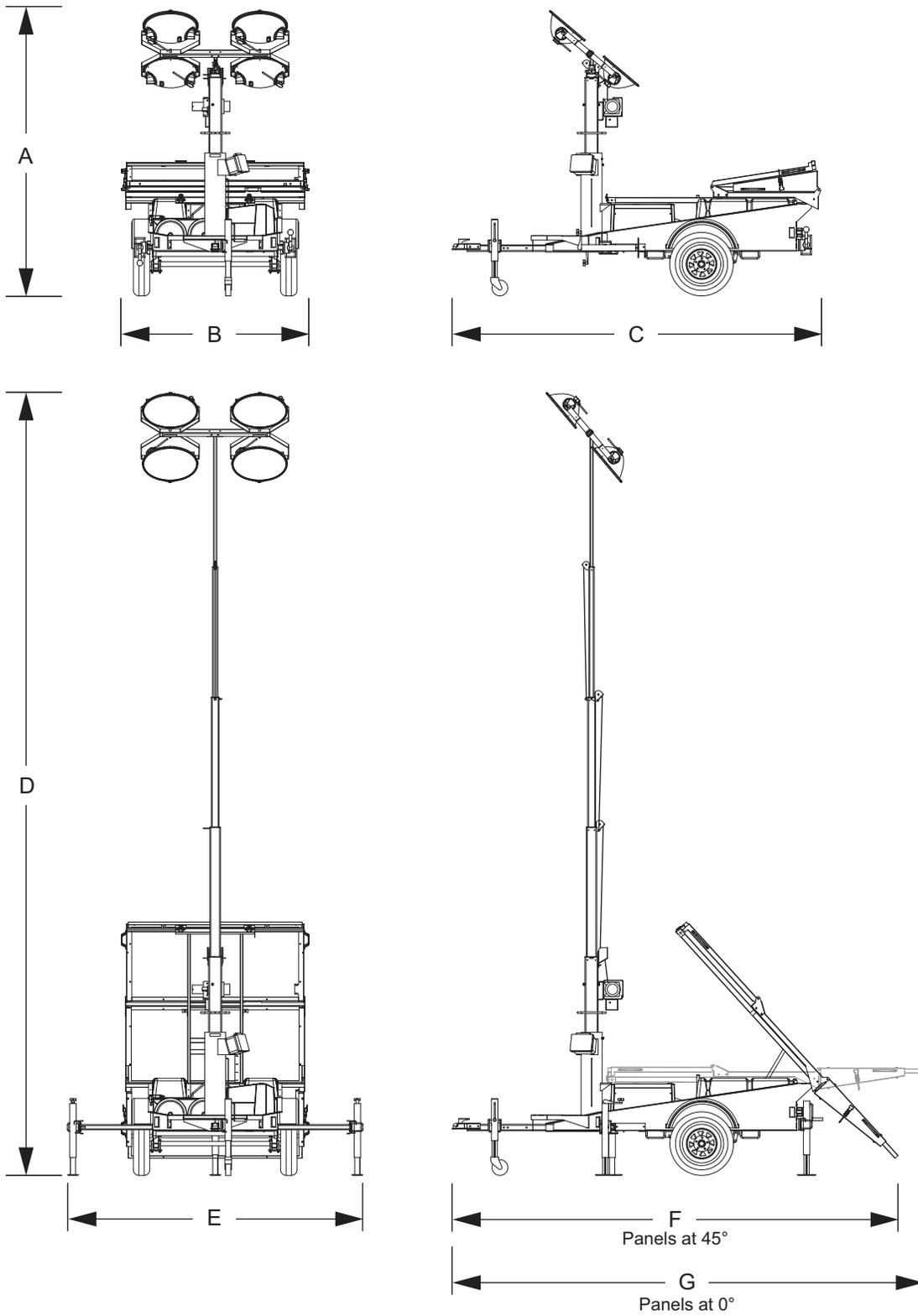
### Trailer

|                                              |                |
|----------------------------------------------|----------------|
| Number of Axles .....                        | 1              |
| Capacity - Axle Rating <b>lbs (kg)</b> ..... | 3000 (1360.78) |
| Tire Size <b>in</b> .....                    | 13             |
| Hitch - Standard .....                       | 2" Ball        |
| Maximum Tire Pressure <b>psi</b> .....       | 65             |

**Note:** Reliable Smart mode operational temperature ranges from 15°F (-10°C) to 120°F (50°C).

Specifications are subject to change without notice.

# UNIT DIMENSIONS



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| Unit     | A                  | B                 | C                  | D                | E                  | F                  | G                  |
|----------|--------------------|-------------------|--------------------|------------------|--------------------|--------------------|--------------------|
| MLT4000S | 109 in<br>(2.77 m) | 72 in<br>(1.83 m) | 141 in<br>(3.58 m) | 25 ft<br>(7.6 m) | 113 in<br>(2.87 m) | 171 in<br>(4.34 m) | 180 in<br>(4.57 m) |

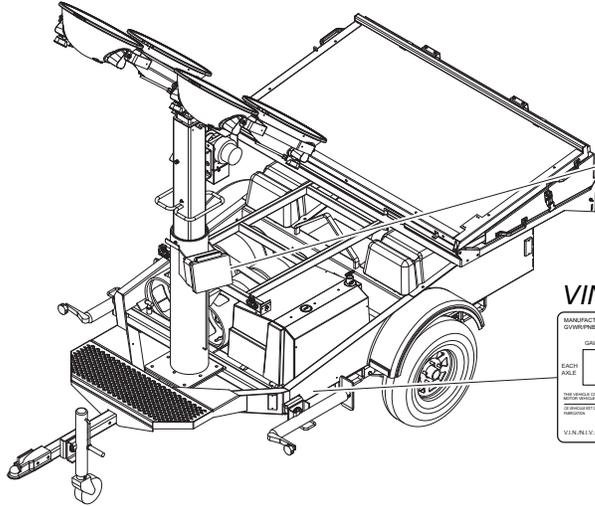
Specifications are subject to change without notice.

# UNIT SERIAL NUMBER LOCATIONS

Refer to the illustration to locate the unit ID tag, and Vehicle Identification Number (VIN) tag on your unit. Important information, such as the unit serial number, model number, VIN and tire loading information are found on these tags. Record the information from these tags so it is available if the tags are lost or damaged. When ordering parts or requesting assistance, you may be asked to provide this information.

## Unit ID Tag

Located on side of control box



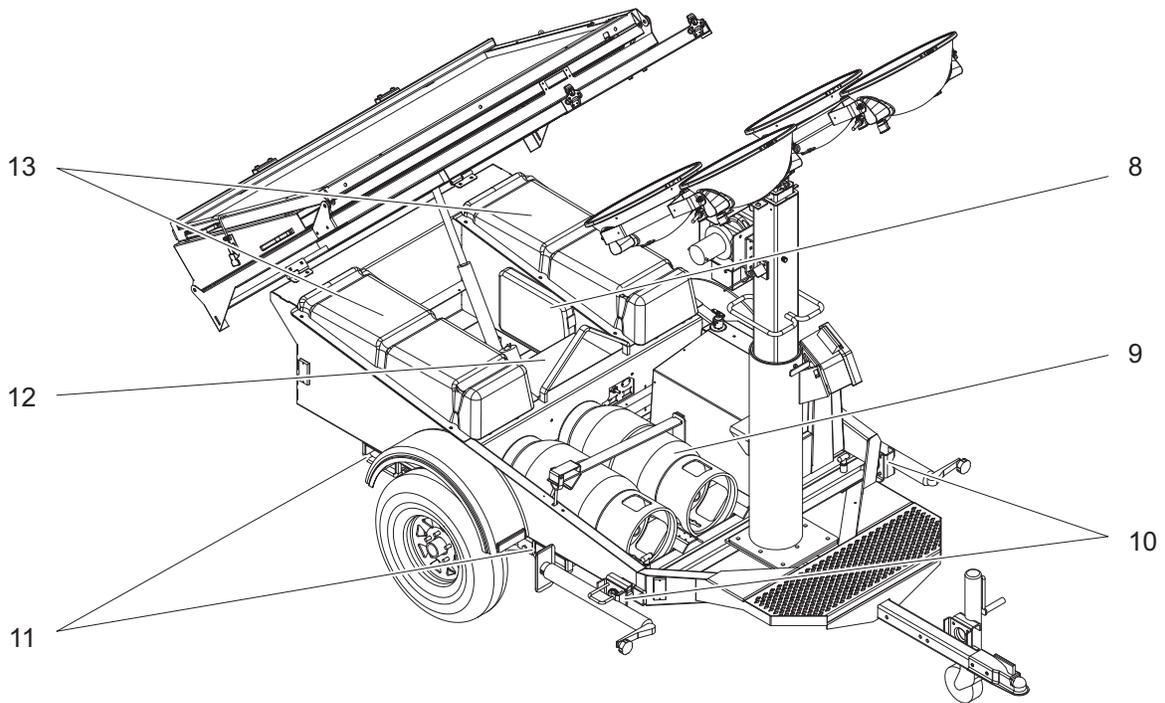
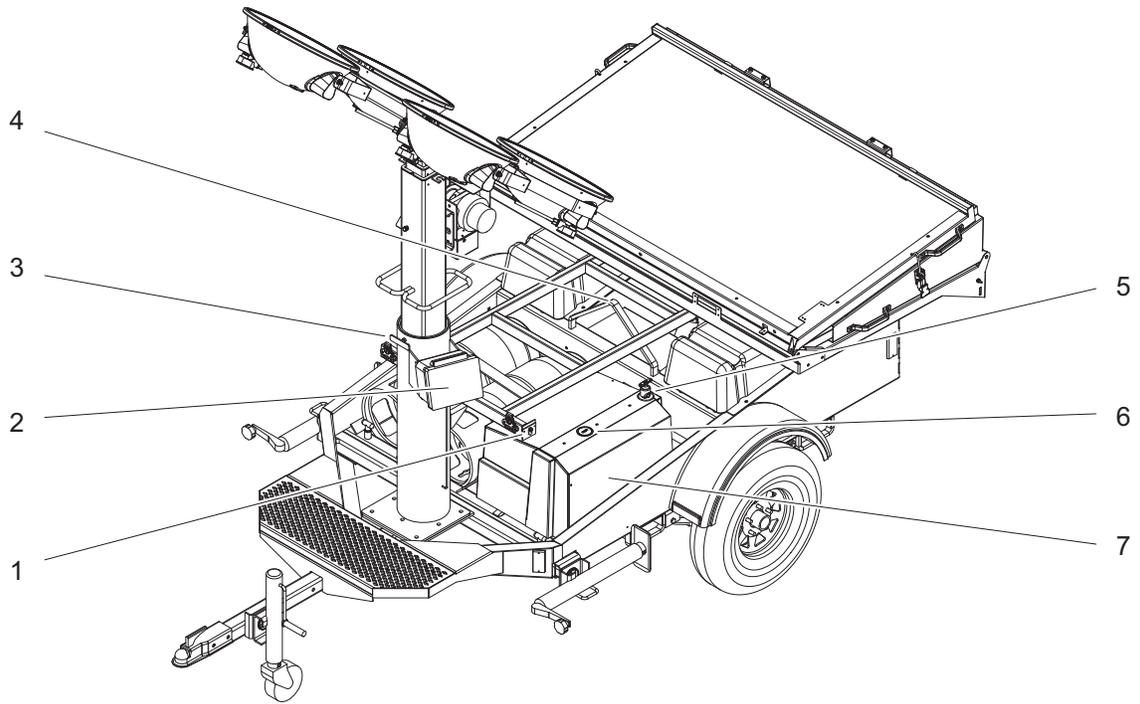
|                                                                                                                                                                             |               |              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------|
| Manufactured by<br><b>MAGNUM POWER PRODUCTS LLC</b><br>A wholly owned subsidiary of<br>Genesee Power Systems, Inc.<br>210 Power Drive - Buffalo, NY 14203<br>1-800-465-0769 |               |              |
| Model                                                                                                                                                                       | Serial Number |              |
| MA Code                                                                                                                                                                     |               |              |
| Control (V) (Back)                                                                                                                                                          | Position      |              |
| 1. Sp. 1.000'                                                                                                                                                               | 2. Sp. 0.00'  | 3. Sp. 1.00' |
| KW                                                                                                                                                                          |               |              |
| VIN                                                                                                                                                                         |               |              |
| A                                                                                                                                                                           |               |              |
|                                                                                                                                                                             |               |              |

## VIN Tag

|                                                                                                                                                                                        |             |                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MANUFACTURED BY / FABRICATEUR / FINE: Magnum Power Products LLC                                                                                                                        |             | DATE: 00/0000                                                                                                                                                                                                                                          |
| GVWR/Poids: 000KG (000LBS)                                                                                                                                                             |             | COLD INF. PRESS.: PRESS. DC                                                                                                                                                                                                                            |
| CAVITY / PRINTE                                                                                                                                                                        | TIRE / PNEU | RM / JANTE                                                                                                                                                                                                                                             |
| EACH AXLE:                                                                                                                                                                             |             |                                                                                                                                                                                                                                                        |
| <small>THIS VEHICLE COMPLIES WITH ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS AND CANADIAN MOTOR VEHICLE SAFETY STANDARDS GOVERNED BY THE CANADIAN REGULATORY BOARD.</small> |             | <b>TIRE AND LOADING INFORMATION</b><br><b>RENSEIGNEMENTS SUR LES PNEUS ET LE CHARGEMENT</b><br><small>The weight of cargo should never exceed 0000KG (000LBS)</small><br><small>Le poids de chargement ne doit jamais dépasser 0000KG (000LBS)</small> |
| VIN (N.I.V.): <b>0000000000000000</b>                                                                                                                                                  |             | <small>SEE OWNER'S MANUAL FOR TECHNICAL INFORMATION</small><br><small>VOIR LE MANUEL DU PROPRIÉTAIRE POUR LES RENSEIGNEMENTS</small>                                                                                                                   |
| MODEL: <b>XXX000</b>                                                                                                                                                                   |             |                                                                                                                                                                                                                                                        |
| TYPE: <b>TRAILER</b>                                                                                                                                                                   |             |                                                                                                                                                                                                                                                        |

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# COMPONENT LOCATIONS



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1. Tilt Angle Indicator
2. Control Panel
3. Mast Rotation Knob
4. Central Lift Point
5. Engine Oil Dipstick
6. Engine Hour Meter
7. Engine Compartment
8. Manual Holder
9. Propane Tank Storage
10. Outriggers
11. Forklift Pockets
12. Electrical Compartment
13. Battery Compartments

# SETUP

Setup for the MLT4000S requires preparation in order to increase the effectiveness of the solar panels. Use the following guide to properly implement and optimize the performance of the unit.

## LIGHT TOWER SET UP

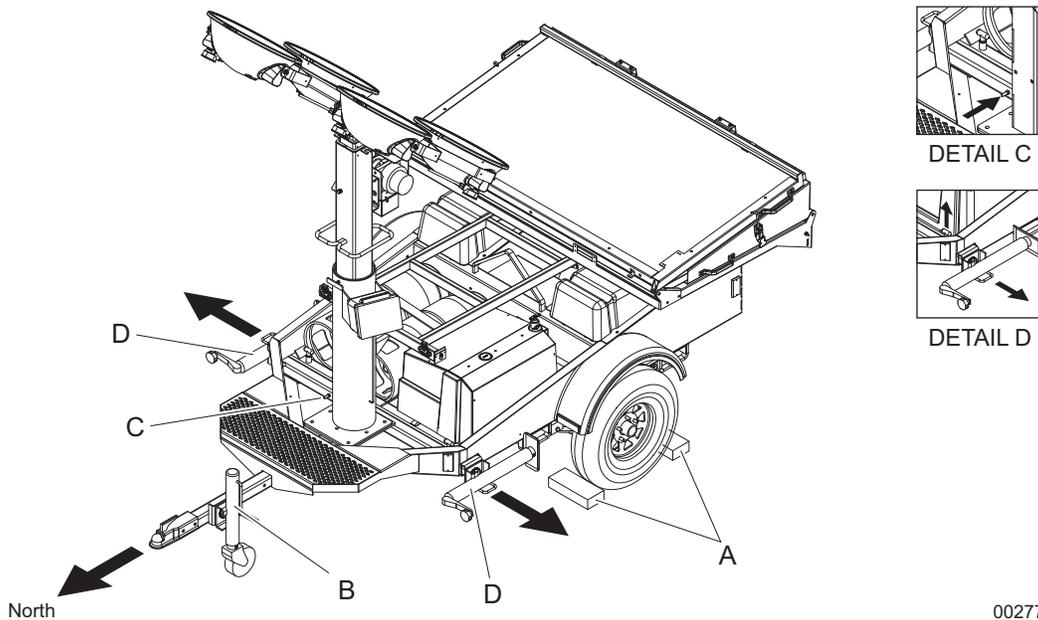
To set up the light tower, use the following procedure.

1. For maximum light coverage locate the tower at ground level or in a spot higher than the area being illuminated by the lamps.

### ⚠ WARNING

**The tower extends up to 25 ft (7.6 m). Make sure area above the trailer is open and clear of overhead wires and obstructions.**

2. Position the unit on a firm, non-combustible surface that is relatively flat, free of overhead obstructions and has a clear southerly view. This will make it easier to level the unit and give the solar panels the greatest potential for energy production.



3. Orient the unit with the trailer hitch facing north and block the wheels (A) on the trailer to keep it from moving.
4. Pull the locking pin on the tongue jack (B) and rotate it 90° until the pin snaps back into place. Turn the jack handle clockwise to raise the trailer tongue off the towing vehicle.
5. If necessary, connect a good earthen ground to the grounding stud on the frame of the trailer near the trailer tongue (C).

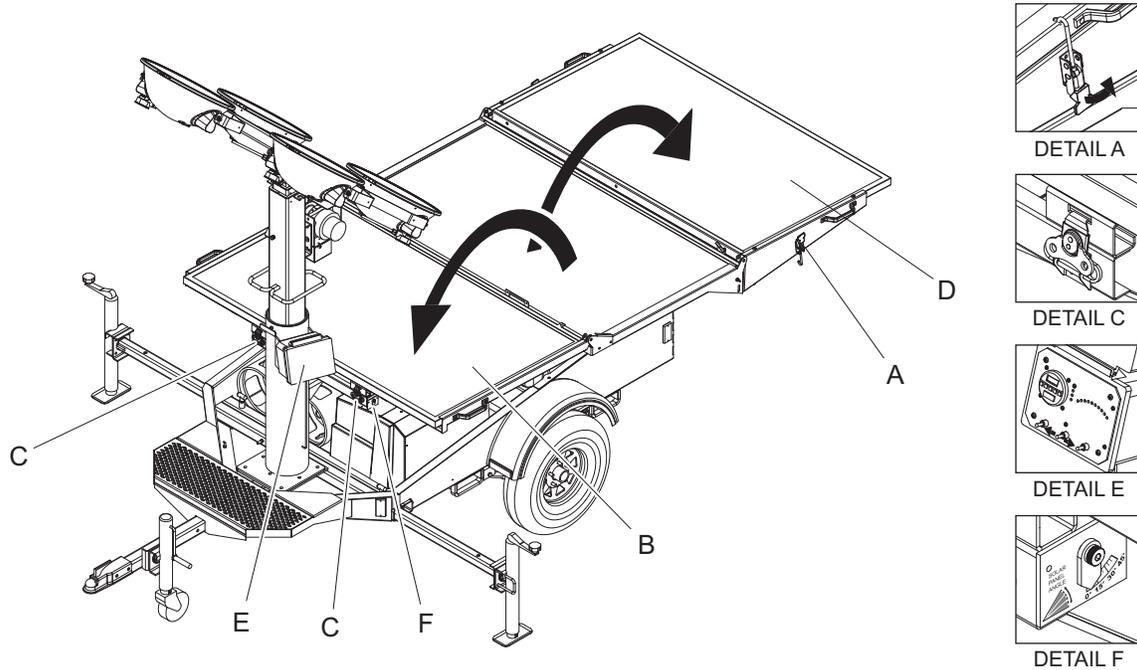
**Note:** Consult local codes for proper grounding requirements.

6. Pull the locking pin on the outriggers (D) and extend them until the pin snaps back in place. Pull the locking pin on the outrigger jacks and rotate them 90° until the pin snaps back in place. Rotate the jack handle clockwise to extend the jack to the ground.
7. Pull the locking pin on the rear jack and rotate it 90° until the pin snaps back into place. Turn the jack handle clockwise to start leveling the trailer. Adjust all four jacks by turning their handles clockwise until they are firmly in contact with the ground and the trailer is as level as possible.

## DEPLOYING THE SOLAR PANELS

To deploy the solar panels, use the following procedure.

1. Setup the unit as described in *“Light Tower Set Up” on page 16.*
2. Release the two hook clamps (A) securing the solar panels together on both sides of the unit.



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3. Rotate the top/front solar panel (B) forward to the tilt frame. Secure the panel using the twist lock clamps on both sides of the tilt frame (C).

### NOTICE

Always support the solar panels down to their resting position completely. Allowing the solar panels to drop or fall may damage the solar panels and/or tilt frame.

4. Rotate the bottom/rear solar panel (D) backward to the horizontal position until the rubber bumpers contact the center panel.
5. Use the solar alignment guide described in *“Solar Panel Alignment” on page 18,* or the setup decal located on the engine compartment to calculate the optimal panel angle
6. Raise the solar panels using the Panel Angle switch on the control panel (E). Press and hold the switch left or right until the desired angle is reached. Use the Angle Indicator (F) located on the tilt frame to determine the angle of the panels.

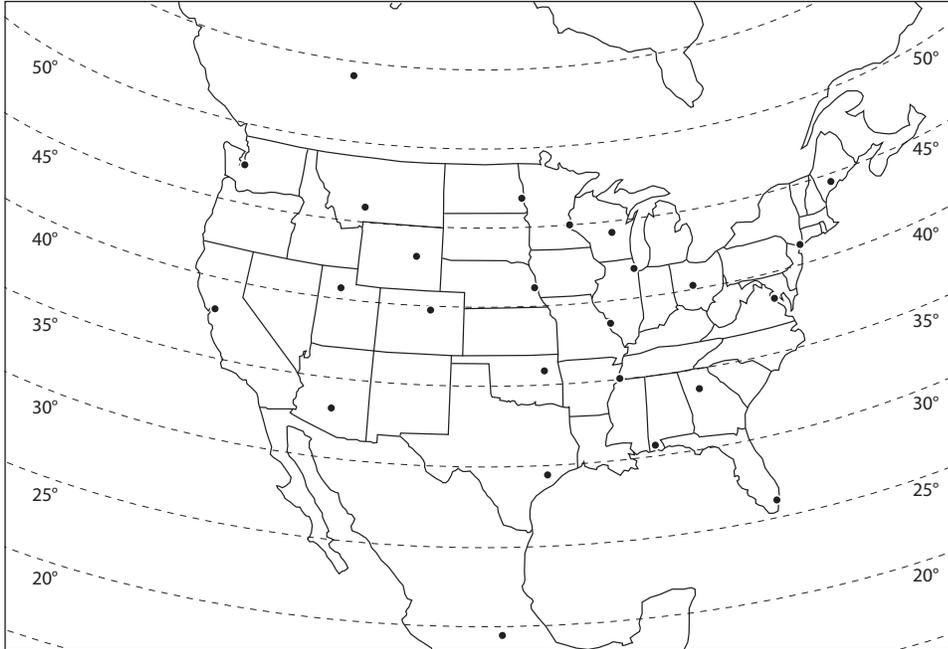
## SOLAR PANEL ALIGNMENT

This unit utilizes solar panels to charge the battery system during the day. Proper alignment of the solar panels is crucial to the charging performance of the system. The two variables that determine the optimal alignment of the solar panels are latitude and time of year.

The following figures provide the basic information necessary to properly align the solar panels. The alignment should be configured upon every set up, or at least every 45 days if unit is stationary.

To determine the optimal angle for the panels, use the provided map or a Global Positioning System (GPS) to find the latitude of the deployment location. Reference the latitude of the unit location in the table below to determine the correct angle for the time of year.

**Note:** Averaging values for intermediate latitudes and time of year is acceptable.



| Location            | Latitude |
|---------------------|----------|
| Berlin, WI          | 44°      |
| Seattle, WA         | 48°      |
| Fargo, ND           | 47°      |
| Boezman, MT         | 46°      |
| Minneapolis, MN     | 45°      |
| Augusta, ME         | 44°      |
| Chicago, IL         | 42°      |
| Salt Lake City, UT  | 41°      |
| New York, NY        | 41°      |
| Denver, CO          | 40°      |
| Columbus, OH        | 40°      |
| Washington D.C.     | 39°      |
| St Louis, MO        | 39°      |
| San Francisco, CA   | 38°      |
| Tulsa, OK           | 36°      |
| Memphis, TN         | 35°      |
| Atlanta, GA         | 34°      |
| Phoenix, AZ         | 33°      |
| Mobile, AL          | 31°      |
| Houston, TX         | 30°      |
| Miami, FL           | 26°      |
| Mexico City, Mexico | 19°      |
| Edmonton, Canada    | 54°      |

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| Latitude | Optimal Solar Panel Angle |               |        |
|----------|---------------------------|---------------|--------|
|          | Summer                    | Spring/Autumn | Winter |
| 25°      | 5                         | 25            | 45     |
| 30°      | 10                        | 30            | 45     |
| 35°      | 15                        | 35            | 45     |
| 40°      | 20                        | 40            | 45     |
| 45°      | 25                        | 45            | 45     |
| 50°      | 30                        | 45            | 45     |

**Note:** Average values for intermediate latitudes and times.

## RAISING THE MAST

To raise the mast, use the following procedure:

1. Setup and level the unit as described in *"Light Tower Set Up" on page 16.*

### ⚠ WARNING

The tower extends up to 25 ft (7.6 m). Make sure area above the trailer is open and clear of overhead wires and obstructions.

2. Configure the light heads on the mast to the desired orientation. Loosen the wing nuts on the trunnion (A) and aim. Tighten hardware completely and make sure the lamps are connected to the junction box.

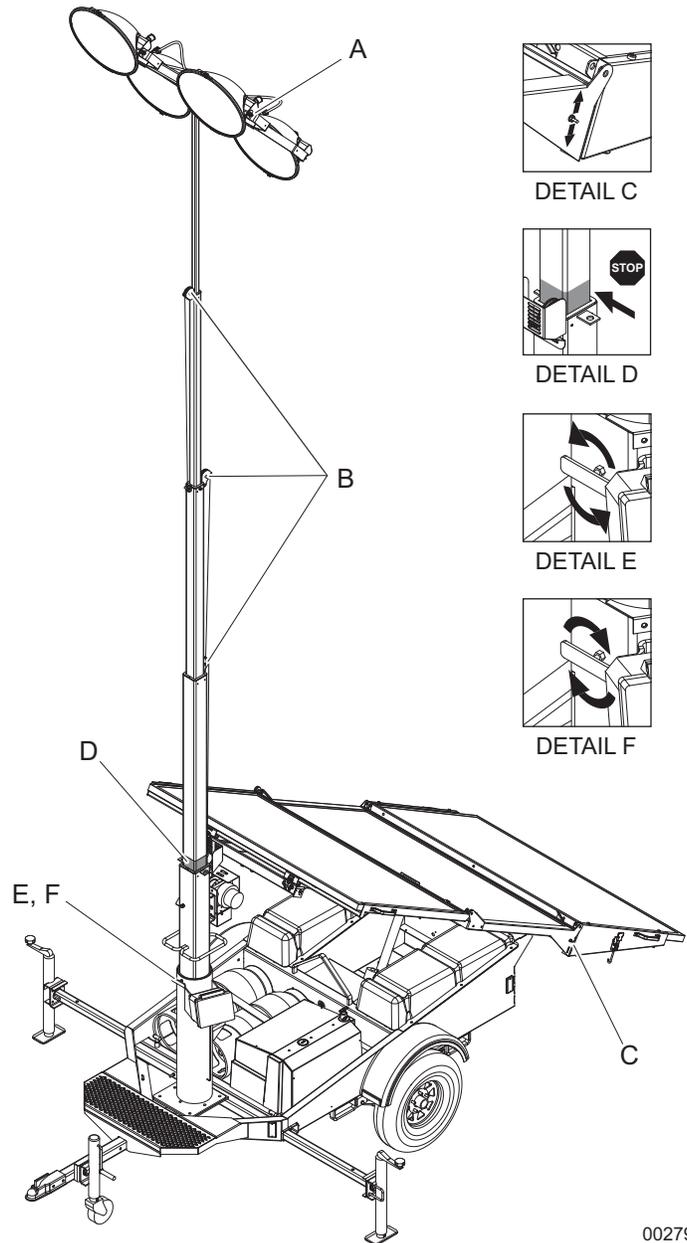
### ⚠ WARNING

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

3. Check all mast cables and pulleys (B) for excessive wear or damage. Make sure the cables are properly centered in each pulley. Check the electrical cord for damage.
4. Press and hold the winch control toggle switch (C) upward to telescope the mast to the desired height. Extend the mast cautiously, making sure that the electrical cord is extending at the top sections of the mast. If for any reason, the winch cable begins to develop slack or any of the mast sections get stuck, **STOP IMMEDIATELY** and contact an authorized service center.

### ⚠ CAUTION

Do not extend the mast beyond the colored mark on the lowest telescoping mast tube (D). A limit switch on the mast tube will disconnect power to the electric winch to prevent deadheading the winch.



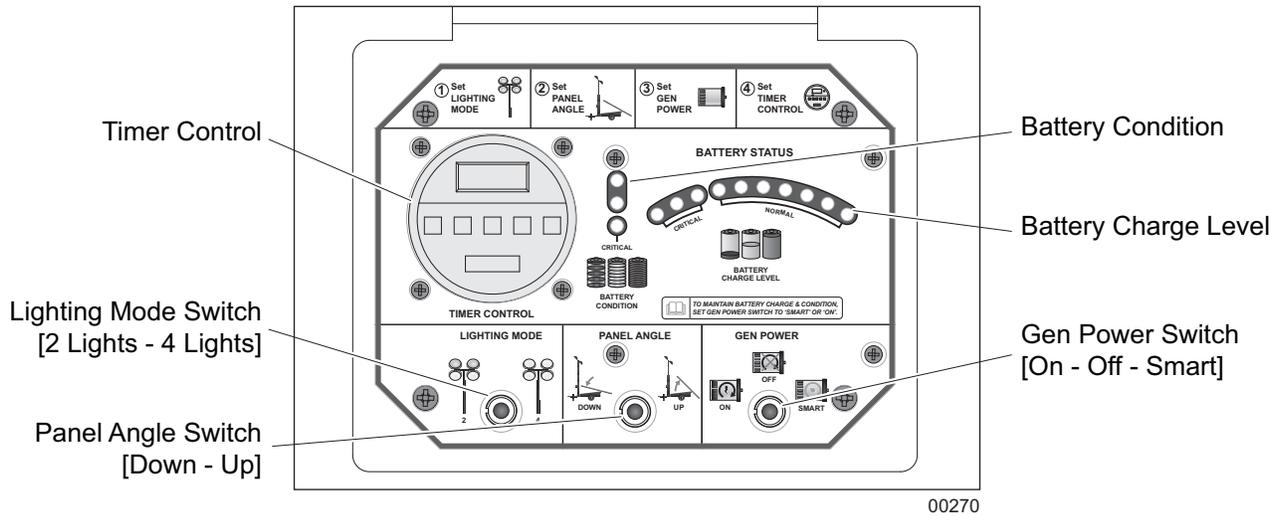
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5. Rotate the mast by loosening the knob (E) and manually turning the mast. When it is at the correct angle, tighten the knob (F) to secure the mast in position.

# OPERATION

The MLT4000S uses automated control systems to supply power to the lights. The generator can be operated manually for maintenance procedures, or to power the lights when the battery charge level is insufficient.

## CONTROL PANEL



**TIMER CONTROL:** The Timer Control module is used to power the lights on demand, or using a programmable scheduled.

**BATTERY CONDITION:** Three LED lights indicate the condition of the charge currently in the batteries.

- Green - Batteries have received a full charge within the last week
- Amber - Batteries have not received a full charge in more than one week.
- Red - Batteries have not received a full charge in more than two weeks.

**BATTERY CHARGE LEVEL:** Ten LED lights indicate the current state of charge in the batteries.

**LIGHTING MODE:** Toggle switch selects either a two or four light configuration [2 Lights, 4 Lights]

**PANEL ANGLE:** Momentary toggle switch controls the angle of the solar panels. [Down, Up]

**GEN POWER:** Three-position switch controls the power mode of the generator [On, Off, Smart].

## GENERATOR STARTING AND OPERATION

The generator on this unit is capable of charging the battery system and powering the lights. When in Smart mode the generator will only run if the batteries approach a critical level, charging them until the batteries have sufficient charge. On mode will start the generator on demand, which is useful for maintenance procedures.

### SMART MODE

Smart mode allows the generator to run and charge the batteries when the charge level is low. Use the following steps to operate the unit in Smart mode:

**Note:** Smart mode operation may be adversely affected in ambient temperatures below 15°F (-10°C) or above 120°F (50°C).

1. Set the Gen Power switch to the Off position.
2. Check engine oil level.
3. Check for sufficient fuel supply in the LP tanks.

4. Open the cylinder valves on both LP tanks.
5. Set the Gen Power switch to the Smart position.
6. Set the Timer Control to the On or Auto mode.

#### ON MODE

On mode starts the generator immediately and begins charging the batteries and powering the lights if they are switched on. Use the following steps to operate the unit in On mode:

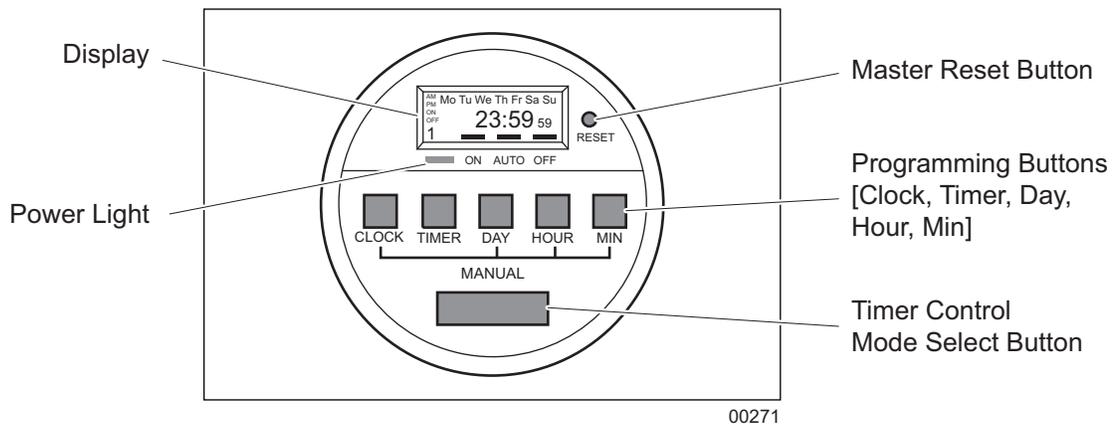
1. Set the Gen Power switch to the Off position.
2. Check engine oil level.
3. Check for sufficient fuel supply in the LP tanks.
4. Open the cylinder valves on both LP tanks.
5. Set the Gen Power switch to the On position.
6. Set the Timer Control to the On or Auto mode.

#### AUTOMATIC SHUTDOWN

This unit is equipped with a low oil pressure and high temperature auto shutdown system. The system will automatically shut off the fuel supply to stop the engine if oil pressure drops too low or the engine exceeds normal operating temperature. Return the Gen Power switch to the Off position to reset the unit after you have determined the cause of the shutdown.

### TIMER CONTROL SETUP AND OPERATION

The Timer Control module powers the lights manually or with a programmable Auto mode. There are eight programmable time slots for Auto mode with each having an independent start and stop time and day.



#### TIMER CONTROL MODE SELECT

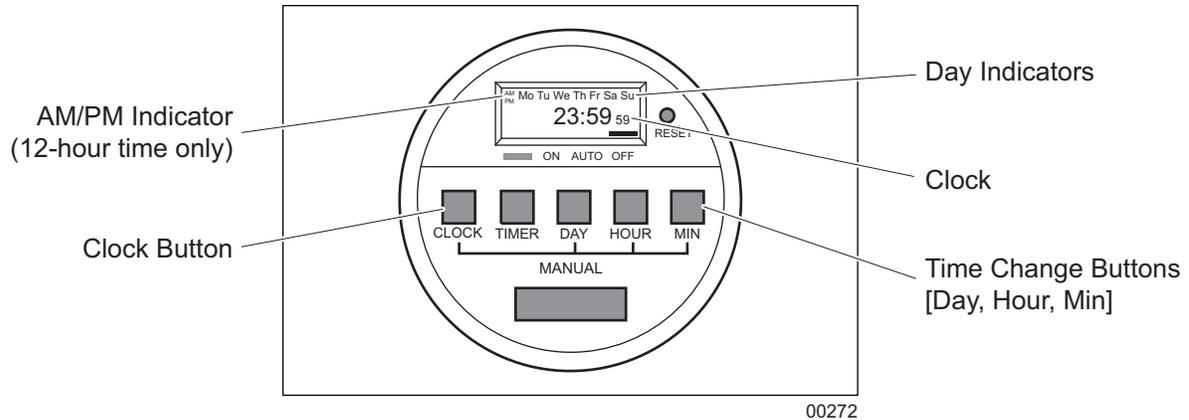
The Timer Control mode can be changed from On, Auto and Off modes by pressing the Timer Control Mode Select button at the bottom of the Timer Control module. This is the largest button on the controller.

- **ON:** Lights power on immediately provided there is enough battery power, or in the case of insufficient battery power, will trigger the generator provided the Gen Power switch is set to Smart mode.
- **AUTO:** The lights will be triggered on or off at the times specified in any completed time slot. Refer to [“Setting the Timer” on page 22.](#)
- **OFF:** No power will be supplied to the lights, even during scheduled time slots.

**Note:** When the Timer Control module is switched to Auto mode from either On or Off modes, the current state of the lights (on or off) will remain the same until the next timer event occurs that is different from the current state. In other words, if moving from On to Auto, the lights will remain on until an Off event occurs.

## SETTING THE CLOCK

It is necessary to set the clock to the current local time in order for any scheduled programs to run properly. Use the following procedure to set the clock time and day:

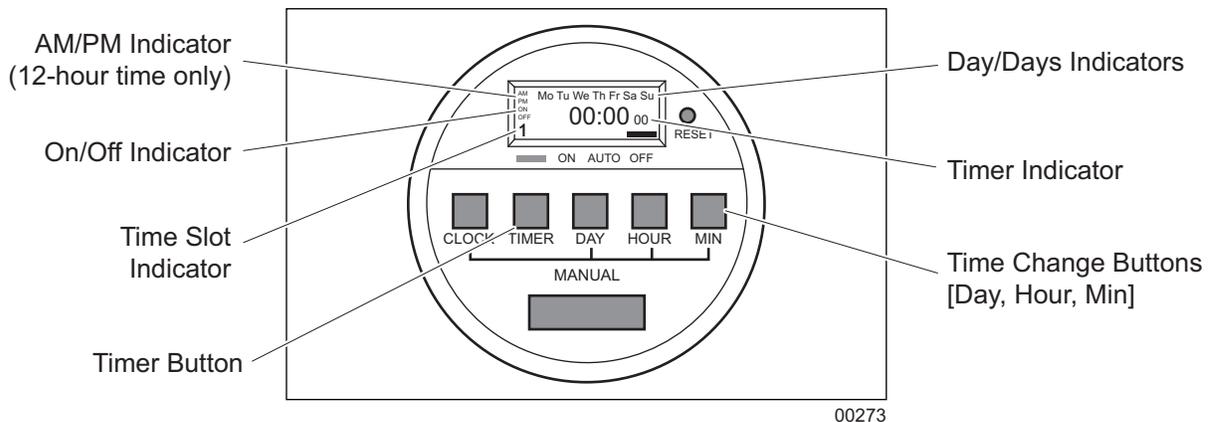


1. Press and hold the Clock button to enable clock changes and press any of the following:
  - A. Press Day to change the day of the week. The day of the week is shown at the top of the display.
  - B. Press Hour to change the hour of the day.
  - C. Press Min to change the minutes of the hour.
2. Release the Clock button to set the time.

**Note:** If the Clock button is held for 5 seconds before the Day, Hour or Min buttons are pressed, the clock will switch between 12 hour and 24 hour time conventions.

## SETTING THE TIMER

The module is capable of storing eight programmed time slots for automatic operation of the lights. Each time slot must contain a start and end time and take place on a specific day or series of days. One or more timers must be set in order for the unit to operate in Auto mode.



Use the following steps to program the time slots:

1. Press the Timer button once to enter the time slot programs. Time slot "1 - ON" is indicated on the display in the lower left corner.

**Note:** To access any of the eight time slots, press the Timer button subsequent times until the desired time slot is displayed in the lower left corner. A new time slot is selected with every second push of the Timer button.

2. Press Day to alter the day or series of days the time slot will start (On). The day or series of days selected is shown at the top of the display. The following is a breakdown of the selectable options:
  - **All Week:** Monday - Sunday
  - **Individual Day:** Monday, Tuesday, Wednesday, Thursday, Friday, Saturday or Sunday
  - **Weekdays:** Monday - Friday
  - **Weekend:** Saturday, Sunday
  - **Weekdays & Saturday:** Monday - Saturday
  - **Alternating Days:** Monday, Wednesday, Friday; Tuesday, Thursday, Saturday
  - **Three-Day Series:** Monday, Tuesday, Wednesday; Thursday, Friday, Saturday
  - **No Days:** Use this selection to deactivate a program from running.

3. Press the Hour and Min buttons to alter the time of the day.

**Note:** Hours may be tracked in either 12 hour or 24 hour time conventions. Refer to [“Setting the Clock” on page 22](#) for more information.

4. Press the Timer button again to enter the Off time for the current time slot.
5. Repeat steps 2-3 to set the Off time.
6. Press the Timer button to select the next time slot and repeat steps 2-5 to program additional time slots.
7. Press the Clock button to exit from programming the timer.

#### MASTER RESET

The Timer Control module is equipped with a master reset that clears all programmable slots and resets the clock to 00:00:00. To initiate the reset, press the Reset button on the Timer Control module with a ball point pen.

## LIGHT OPERATION

The lighting system on this unit can be powered either by the battery system, or the generator. When the generator is running, electrical power is supplied by the generator and the batteries are charged.

Properly set up the unit using the steps described in [“Light Tower Set Up” on page 16](#) and [“Deploying the Solar Panels” on page 17](#) before operating the lights. For more information on using the Timer Control, refer to [“Timer Control Setup and Operation” on page 21](#).

### NOTICE

Never operate the lights without the protective lens cover or with a lens cover that is cracked or damaged. Electrical systems could become damaged by inclement weather.

#### BATTERY POWER WITH GENERATOR BACKUP - ON DEMAND

1. Set the Lighting Mode switch to either 2 or 4 lights.
2. Set the Gen Power switch to Smart.
3. Set the Timer Control to On.

#### BATTERY POWER WITH GENERATOR BACKUP - SCHEDULED

1. Set the Lighting Mode switch to either 2 or 4 lights.
2. Set the Gen Power switch Smart.

3. Set the Timer Control to Auto.

**Note:** When the Timer Control module is switched to Auto mode from either On or Off modes, the current state of the lights (on or off) will remain the same until the next timer event occurs that is different from the current state. In other words, if moving from On to Auto, the lights will remain on until an Off event occurs.

#### GENERATOR POWER ONLY

1. Set the Lighting Mode switch to either 2 or 4 lights.
2. Set the Gen Power switch to On.
3. Set the Timer Control to On.

### SHUTTING DOWN

When you have finished using the light tower, proceed with shutdown as follows:

1. Set the Gen Power switch to the Off position.
2. Set the Timer Control mode to Off.
3. Close the cylinder valves on **BOTH** LP tanks.

#### ▲ CAUTION

Always transport the unit with **BOTH CYLINDER VALVES CLOSED**. Not doing so increases the risk of fire or explosion due to damage from road debris or an accident.

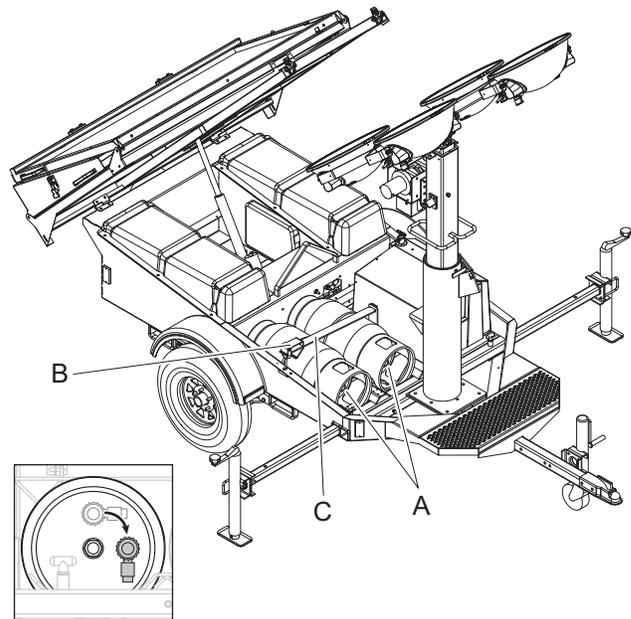
### REPLACING THE LP TANKS

Use the following procedure when replacing one or both LP tanks:

#### ▲ CAUTION

Always wear heavy leather gloves and eye protection when replacing LP fuel tanks. A small amount of LP vapor or liquid may escape.

1. Close the cylinder valves on **BOTH** LP fuel tanks (A) and remove the supply line fitting from the tank(s) to be replaced.
2. Release the latch (B) on the fuel tank strap and remove the strap (C).
3. Replace the LP fuel tank(s). Always position the cylinder valve (A) to the right of center, in the 3 o'clock position.
4. Secure the fuel tank in place with the strap (C) and engage the latch (B).
5. Secure the supply lines to the new tank(s).



Detail A

00280

## LOWERING THE MAST

1. Set the Timer Control mode to Off and the Gen Power switch to Off.
2. Loosen the mast rotation knob and rotate the mast so the white arrows on the front of the mast are aligned. Tighten the knob.
3. Press and hold the winch control toggle switch downward to collapse the mast to its lowest level. Make sure the coiled electrical cord on the top sections of the mast does not get tangled on the mast sections, and that the solar panels will not interfere with any of the light heads.

### ⚠ WARNING

**If the mast hangs up or the winch cable begins to develop slack, STOP IMMEDIATELY. Excess slack in the cable could cause the mast to collapse should it free up without warning. Contact an authorized service center.**

### ⚠ CAUTION

The light heads and heat sink can be very hot. Allow them to cool for 10-15 minutes before handling.

**Note:** The electric winch is equipped with an anti-backlash safety limit switch. This switch will disconnect power to the winch if excess cable slack is detected, preventing accidental lowering of the mast.

4. Aim the light heads backwards and in a position as to not interfere with retracting the solar panels.

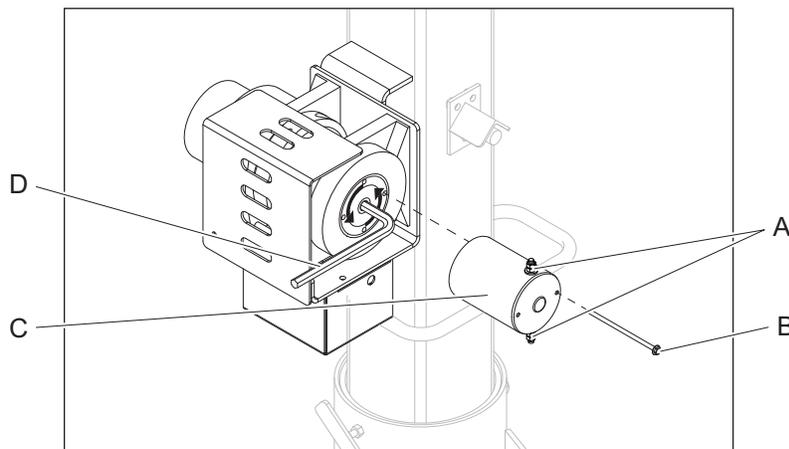
## MANUALLY LOWERING THE MAST

If the generator is not operational and the batteries do not have enough power to lower the mast, it may be necessary to lower the mast manually.

### NOTICE

Do not use this procedure unless it is absolutely necessary. Continuous use of this procedure could damage the planetary gear brake of the winch. This procedure will not work if the planetary gear brake is damaged.

1. Remove the power cables from the terminals on the winch motor assembly (A).
2. Remove the two flange head screws (B) securing the winch motor assembly to the winch. Retain the screws for reassembly.
3. Carefully remove the motor assembly (C), making sure the two pieces do not separate.
4. Insert a 3/8" allen head wrench (D) into the sleeve bearing.
5. Rotate the wrench counter-clockwise to lower the mast. If any slack is observed in the cable, stop immediately and remove the slack.
6. When the mast is completely down, reinstall the winch motor assembly, securing it with the screws retained in step 2.

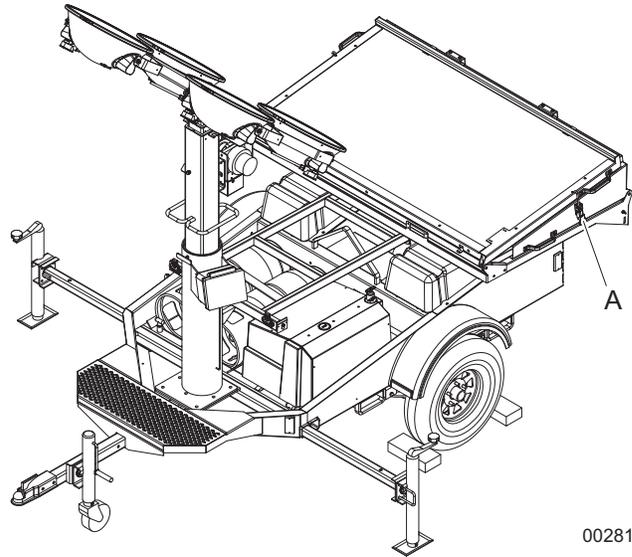


00274

## STOWING THE SOLAR PANELS

The solar panels must be properly stowed before towing, lifting, or shipping the unit. Use the following procedure to properly set the solar panels in the stowed position:

1. Lower the solar panels to the horizontal position by pressing and holding the Panel Angle switch on the control panel to the left.
2. Rotate the rear panel forward until it sets onto the center solar panel.
3. Release the two twist lock clamps securing the front solar panel to the tilt table and rotate it backwards until it sets onto the rear solar panel.
4. Latch the two hook clamps (A) to the top (front) panel on both sides of the unit.



00281

## TOWING THE TRAILER

Once the engine is shut down and the mast, lights and solar panels are properly stowed, the trailer can be made ready for transport.

1. Close the cylinder valves on **BOTH** LP tanks.

### ▲ CAUTION

Always transport the unit with **BOTH CYLINDER VALVES CLOSED**. Not doing so increases the risk of fire or explosion due to damage from road debris or an accident.

2. Raise the rear jack and the outrigger jacks completely and release the locking pins to rotate them up into the travel position. Make sure the locking pin snaps into place.
3. Release the outrigger locking pins and slide the outriggers into the trailer frame until the locking pins snap into place.
4. Use the tongue jack to raise or lower the trailer onto the hitch of the towing vehicle. Lock the hitch coupling and attach the safety chains or cables to the vehicle. Release the jack locking pin and rotate the jack into the travel position. Make sure the locking pin snaps into place.
5. To ensure proper operation of the jacks, lube the grease fittings located on the leveling jacks. Refer to [“Jack Maintenance” on page 30](#). For maintenance interval information refer to the chart on [page 28](#).
6. Connect any trailer wiring to the tow vehicle. Check for proper operation of the stop and signal lights.
7. Check for proper inflation of the trailer tires. Refer to [“Specifications” on page 11](#) for the appropriate tire pressure.
8. Maximum recommended speed for highway towing is 45 mph (72 km/h). Recommended off-road towing speed is not to exceed 10 mph (16 km/h) or less, depending on terrain.

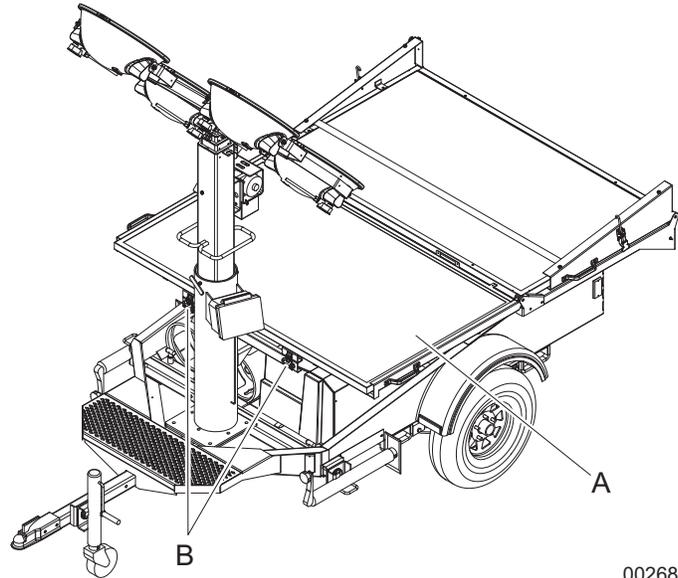
## EXTENDED STORAGE

If the unit is to be stored for an extended period of time outdoors, configure the unit as follows:

1. Locate the unit in an area that receives the maximum amount of sunlight, away from trees and structures that may obscure sunlight.
2. Deploy the top solar panel (A) to the tilt frame, securing it using the two twist lock clamps (B) on the tilt frame.

### **NOTICE**

Leave the solar panel tilt frame in the horizontal position to prevent unintended deployment of the lower panel.



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## LIFTING THE TRAILER

The MLT4000S can be lifted via forklift points or the central lift point. Always follow these guidelines when lifting the unit:

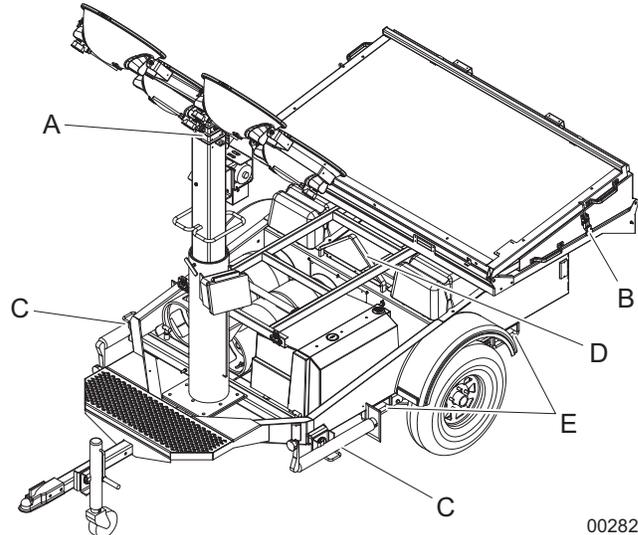
1. Make sure the equipment being used to lift the solar light tower has sufficient capacity. Refer to [“Specifications” on page 11](#) for approximate weights.

### **NOTICE**

Always remain aware of the position of other people and objects around you as you move the unit.

### **NOTICE**

Variable fuel levels on the unit can shift the center of gravity. Always raise the unit slowly to determine the balance of the unit.



00282

2. Lower the mast to the lowest position (A), and properly secure it in the stowed position as described in [“Lowering The Mast” on page 25](#).
3. Properly configure the solar panels (B) in the stowed position using the steps described in [“Stowing the Solar Panels” on page 26](#).
4. Retract the side outriggers (C) to their stowed position.
5. If lifting the unit with a hoist, attach any slings, chains or hooks directly to the central lift point (D), located between the solar panels.
6. If lifting the unit with a forklift, always use the forklift pockets (E) with care. Approach the unit as perpendicular as possible to avoid any damage to the unit.

# MAINTENANCE

## SERVICING THE UNIT

Poorly maintained equipment can become a safety hazard. In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary. **NEVER** perform even routine service (oil/filter changes, cleaning, etc.) unless all electrical components are shut down. When servicing this equipment, always follow the instructions listed below.

1. Before servicing the unit, make sure the Gen Power switch is turned to the Off position.
2. Attach a “DO NOT START” sign to the control panel. This will notify everyone that the unit is being serviced and will reduce the chance of someone inadvertently trying to start the unit.
3. Never wash the unit with a high pressure hose or with any kind of power washer. Never wash the engine block or fuel tank with a power washer or steam cleaner. Water may enter the cabinet and collect in the generator windings or other electrical parts, causing damage. If the unit is stored outside, check for water inside the cabinet and generator and dry the unit thoroughly before starting.

## DAILY MAINTENANCE CHECKS

Level the unit and check the engine oil level daily before starting the engine. **DO NOT** start the unit if the oil level is below the Add mark on the dipstick. The normal operating level for the engine oil is anywhere in the crosshatch pattern between the Full and Add markings. Add oil to the engine only if the level is below the Add mark on the bottom of the crosshatch pattern. **DO NOT OVERFILL** the crankcase. Refer to “*Specifications*” on page 11 for the proper oil grade.

## BREAK-IN PERIOD

It is important to inspect and perform maintenance on the engine after the initial break-in period to ensure the engine is operating properly. Review the “*Basic Maintenance Schedule*” for break-in maintenance procedures and timing.

## BASIC MAINTENANCE SCHEDULE

### NOTICE

Failure to comply with the maintenance procedures described in the this manual will nullify the warranty, decrease performance and cause equipment damage or premature equipment failure. Maintenance records may be required to complete a warranty request.

Use the schedule in the following table as a guide for regular maintenance intervals. For additional or replacement copies of this manual, contact an authorized dealer in your area.

**Note:** Engine run time is displayed on the hour meter located on top of the engine compartment.

| Item                                     | Daily | 25 Hours | 50 Hours | 100 Hours | 400 Hours | 500 Hours | 1 Year |
|------------------------------------------|-------|----------|----------|-----------|-----------|-----------|--------|
| Check oil level                          | ◆     |          |          |           |           |           |        |
| Check fuel level                         | ◆     |          |          |           |           |           |        |
| Check tire pressure                      | ◆     |          |          |           |           |           |        |
| Check all electrical connections         | ◆     |          |          |           |           |           |        |
| Inspect battery posts, clean as required | ◆     |          |          |           |           |           |        |
| Inspect solar panels, clean as required  | ◆     |          |          |           |           |           |        |
| Check fuel lines and clamp bands         |       |          | ◆        |           |           |           |        |
| Change engine oil (5W-30)                |       | †        |          | ◆         |           |           |        |

◆ Recurring service interval.

† Break-in period, one time.

| Item                                                 | Daily | 25 Hours | 50 Hours | 100 Hours | 400 Hours | 500 Hours | 1 Year |
|------------------------------------------------------|-------|----------|----------|-----------|-----------|-----------|--------|
| Change engine oil filter                             |       |          |          | ◆         |           |           |        |
| Clean air intake                                     |       |          |          | ◆         |           |           |        |
| Check paper air filter, clean or replace as required |       |          |          | ◆         |           |           |        |
| Check drive belt tightness                           |       |          |          | ◆         |           |           |        |
| Check spark plug, clean and adjust as required       |       |          | †        | ◆         |           |           |        |
| Replace the spark plug                               |       |          |          |           |           | ◆         |        |
| Adjust engine valve clearance                        |       |          | †        |           |           | ◆         |        |
| Lubricate leveling jacks                             |       |          |          |           |           | ◆         |        |
| Replace air filter element                           |       |          |          |           |           |           | ◆      |

◆ Recurring service interval.

† Break-in period, one time.

## WINCH USE, OPERATION & MAINTENANCE

- Keep winch free of dirt, oil, grease, water and other substances.
- Check all mounting bolts and make sure they are tightened to the recommended torque values. Replace any damaged fasteners.
- Periodically check all connections to be sure they are tight and free of corrosion.
- Check cable for visible damage every time the winch is operated. Examples of damage are: cuts, knots, mashed or frayed portions, and broken strands. Replace cable immediately if damaged. Failure to replace a damaged cable could result in breakage.
- Regularly check the brake for slippage or drift. This is detected visually when winch is under load. If winch drum continues to turn after controls are released, the brake may need to be replaced.
- Periodically clean and grease the brake assembly. This will ensure proper performance and extend the life of the winch. If the winch seems to labor or get excessively hot during the lowering of loads, the brake will need to be serviced or replaced.
- Check the motor brushes periodically and replace when necessary.

**Note:** Only the motor brushes and brake assembly require periodic replacement.

## PREVENTIVE MAINTENANCE SCHEDULE

| Maintenance activity              | After first operation | Before each use | Semi-annually or after each 25 hours of operation |
|-----------------------------------|-----------------------|-----------------|---------------------------------------------------|
| Check fasteners                   | ◆                     |                 | ◆                                                 |
| Check electrical connections      | ◆                     |                 | ◆                                                 |
| Clean and grease brake assembly   |                       |                 | ◆                                                 |
| Check motor brushes               |                       |                 | ◆                                                 |
| Visual check of winch and control | ◆                     | ◆               | ◆                                                 |

## MECHANICAL BRAKE

The mechanical brake generates heat when loads are lowered and the wire cable is powered out. Care must be taken to avoid overheating the mechanical brake.

Overheating the mechanical brake may result in permanent damage to, or failure of, the brake. Replace any damaged brake components before resuming use of the winch.

Whine or chatter associated with a new mechanical brake is normal and typically disappears with use.

## JACK MAINTENANCE

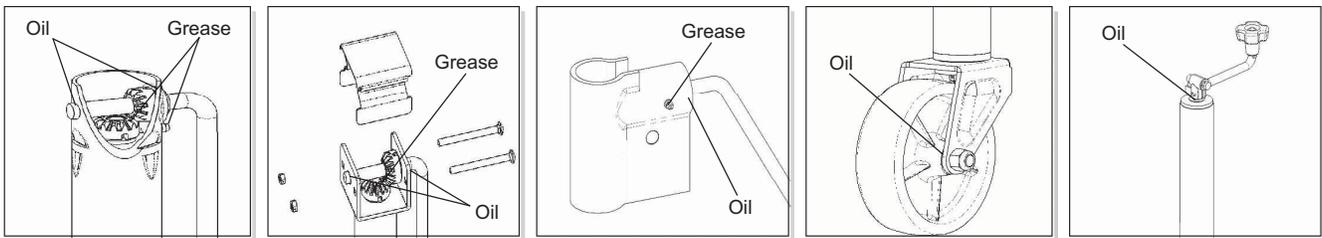
The following procedures should be performed at least annually.

### SIDE-WIND MODELS

- The internal gearing and bushings of the jack must be kept lubricated. Apply a small amount of automotive grease to the internal gearing by removing the jack cover, or if equipped, use a needle nose applicator or standard grease gun on the lubrication point found on the side of the jack near the crank. Rotate the jack handle to distribute the grease evenly.
- A lightweight oil must be applied to the handle unit at both sides of the tube.
- If equipped, the axle bolt and nut assembly of the caster wheel must also be lubricated with the same lightweight oil.

### TOP-WIND MODELS

- Apply a lightweight oil to the screw stem.



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## TRAILER WHEEL BEARINGS

The trailer axles are equipped with a grease zerk fitting to allow lubrication of the wheel bearings without the need to disassemble the axle hub. To lubricate the axle bearings, remove the small rubber plug on the grease cap, attach a standard grease gun fitting to the grease zerk fitting and pump grease into the fitting until new grease is visible around the nozzle of the grease gun. Use only a high quality grease made specifically for lubrication of wheel bearings. Wipe any excess grease from the hub with a clean cloth and replace the rubber plug when finished. The minimum recommended lubrication is every 12 months or 12,000 miles (19,312 km). More frequent lubrication may be required under extremely dusty or damp operating conditions.

## ELECTRICAL SYSTEM LOCKOUT

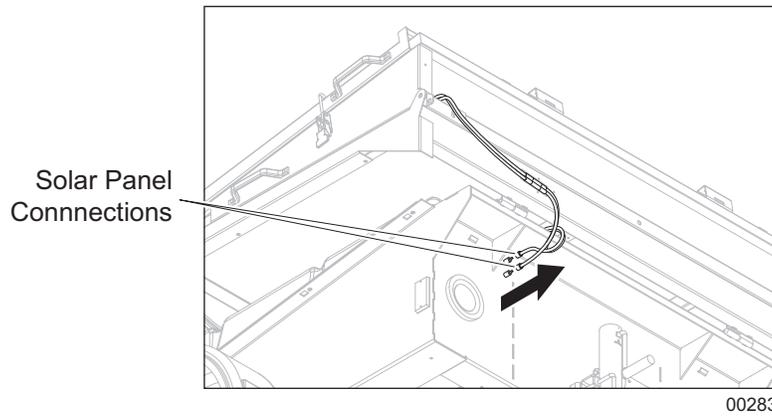
The electrical compartment contains several components that may require periodic maintenance. Use the following procedures to properly lock-out the electrical system before performing maintenance inside the electrical compartment.

### ⚠ DANGER

**Solar panel electrical connections can carry an electrical charge during daylight, even when disconnected. Do not disconnect the solar panels from the chassis if the solar panels are exposed to direct sunlight. Severe arcing or electrocution could occur.**

1. With all four jacks properly deployed, level the unit. Refer to [“Light Tower Set Up” on page 16](#) for unit leveling procedures.
2. Properly configure the solar panels in the stowed position. Refer to [“Stowing the Solar Panels” on page 26](#) for stowing procedures.
3. Set the timer control module to Off and the Gen Power switch to Off.

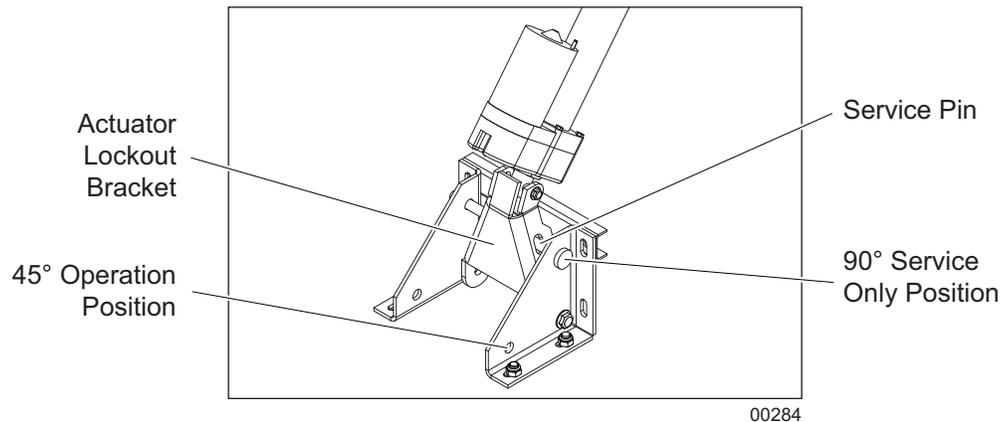
4. Remove the two solar panel electrical connections from the plugs on the rear side of the chassis.



**⚠ WARNING**

**Wait 30 seconds after disconnecting solar panels before continuing service. Residual electrical charge may still be present in system.**

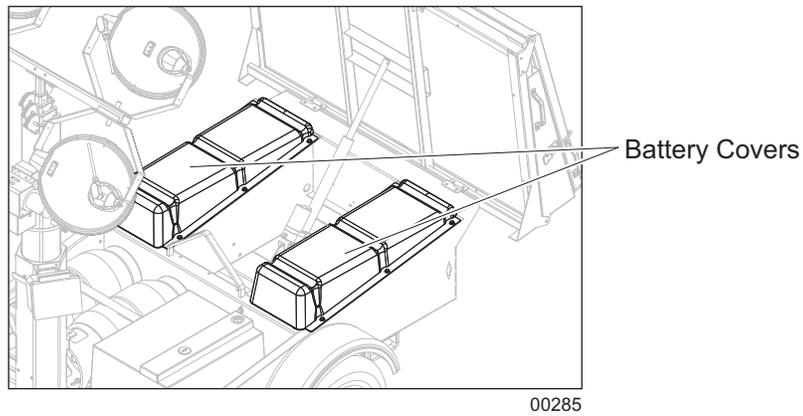
5. Raise the solar panel tilt frame to 45° by pressing the Panel Angle switch on the control panel to the right.
6. Remove the service pin from the 45° Operation position on the actuator lockout bracket.
7. Raise the solar panel tilt frame to the 90° position by hand.
8. With the solar panels braced in the vertical position, insert the service pin in the 90° Service Only position.



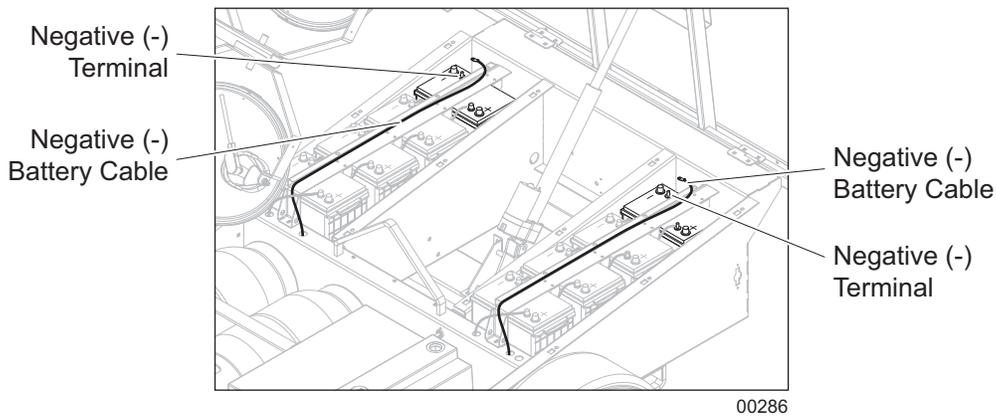
**⚠ WARNING**

**Do not remove the battery covers near an open flame or other ignition source. Batteries that have become damaged or are improperly charging can produce hydrogen gas creating a potentially explosive environment.**

9. Remove the six screws securing both of the battery bank covers to the frame and remove the covers.

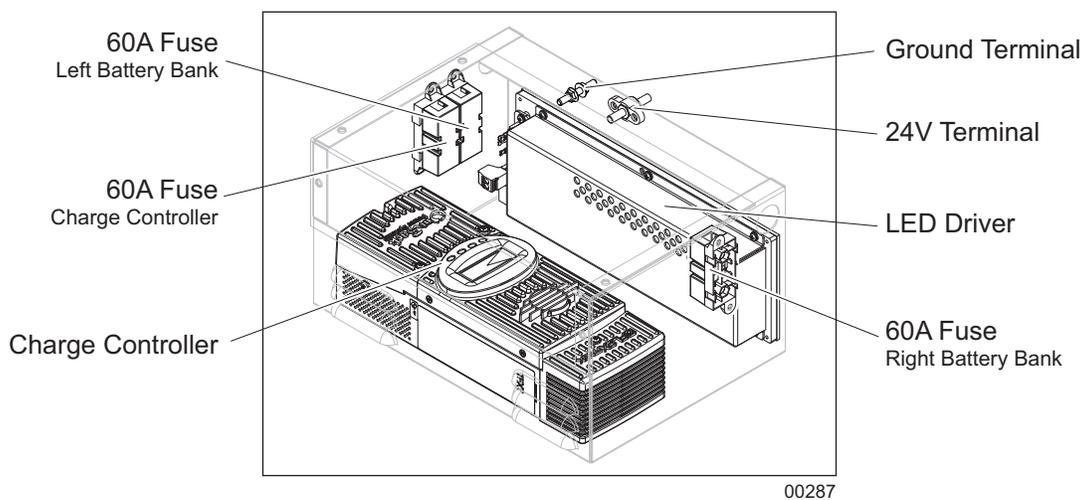


10. Disconnect the negative (-) battery cable from the corresponding terminal on **BOTH** rear batteries. Place the loose battery cables in a secure place so they cannot recontact the battery terminals or chassis.



## ELECTRICAL COMPARTMENT COMPONENTS

The electrical compartment contains several high voltage electrical components. Lockout all electrical current by following the procedure in ["Electrical System Lockout" on page 30](#) before servicing any electrical components.

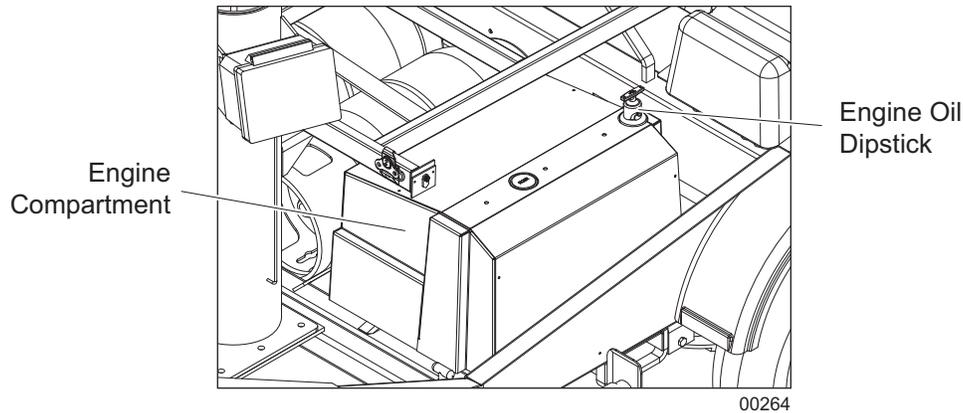


## LIGHTING SYSTEM LOCKOUT

The LED lighting system on this unit is supplied with very high voltages of up to 250V from the LED driver. Before servicing any electrical components of the light heads, junction box or coil cord, follow the lockout procedure in ["Electrical System Lockout" on page 30](#).

## CHECKING THE ENGINE OIL LEVEL

Check the engine crankcase oil at least every eight hours of operation, or before each use. To check the engine oil level, use the following procedure:



1. Ensure the unit is as level as possible.
2. Remove the dipstick and wipe it dry with a clean, lint-free cloth.
3. Install and tighten the dipstick cap; then, remove it again. The oil level should be at the dipstick Full mark - the top of the crosshatch pattern at the end of the dipstick.
4. If necessary, remove the oil fill cap and slowly add oil until it reaches the dipstick Full mark. **DO NOT** fill above the Full mark.

### ⚠ CAUTION

Never operate the engine with the oil level below the bottom of the crosshatch area on the end of the dipstick. Major engine damage could occur.

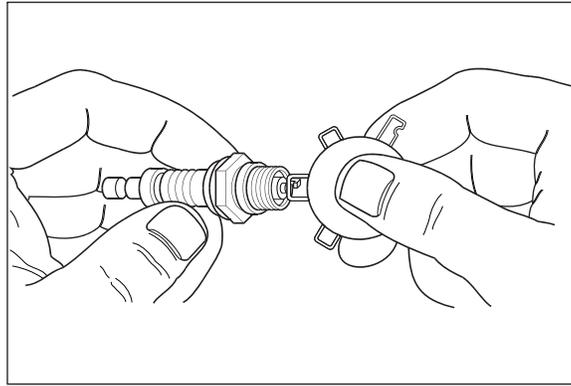
5. Install and tighten the oil fill cap and the dipstick before operating the engine.

## CHANGING THE ENGINE OIL

1. Remove the three sets of hardware securing the engine cover to the engine.
2. Remove the brass oil drain set screw located on the bottom of the engine compartment and drain the oil into an approved container.
3. Remove the oil filter, located on the front side of the engine compartment.
4. Apply a light amount of new oil to the rubber gasket of the new oil filter.
5. Tighten the oil filter until the rubber gasket makes contact with the engine, then tighten 3/4 to 1 full turn more.
6. Remove the oil fill cap and slowly add oil. Refer to *"Specifications" on page 11* for oil grade and amounts.
7. Replace the engine cover and tighten the three sets of hardware removed in step 1.
8. Run the engine by setting the Gen Power switch on the control panel to the On position. Run the engine for approximately five minutes and turn it off. Allow the oil to settle and check the dipstick to verify proper oil levels.

## CHECKING THE ENGINE SPARK PLUG

Clean the spark plug and reset the spark plug gap every 100 hours of operation. To check the spark plug gap, use the following procedure:



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1. Clean the area around the base of the spark plug to keep dirt and debris out of the engine. Remove the spark plug and check the condition. Replace the spark plug every 500 hours, or if reuse is questionable.
2. Clean spark plug by scraping or washing using a wire brush and commercial solvent. Do not blast the spark plug to clean.
3. Check the spark plug gap using a wire feeler gauge. Adjust the gap to 0.030 inch (0.76 mm) by carefully bending the ground electrode.

## CLEAN THE AIR INTAKE

Clean all foreign material from the air intake at least once every 100 hours of operation. Clean more often if necessary.

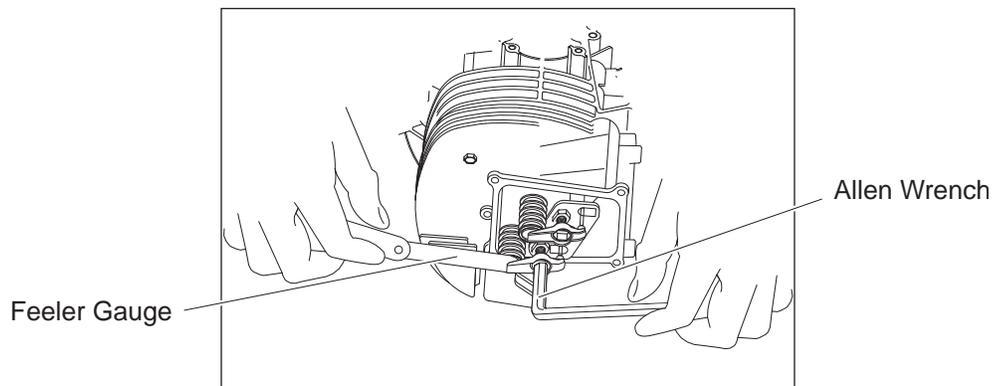
Inspect the area around the generator exhaust muffler periodically and remove all grass, leaves, dirt, etc., from this area.

## ADJUSTING THE VALVE CLEARANCE

After the first 50 hours of operation, adjust the valve clearance in the engine.

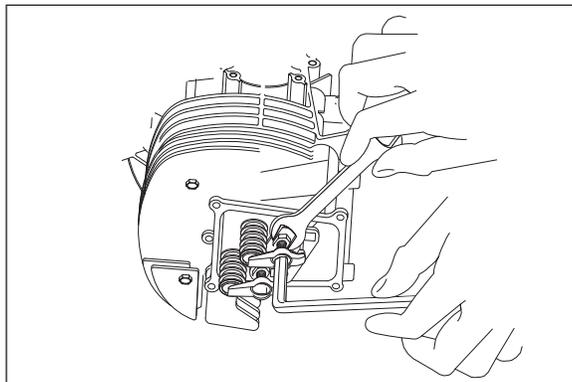
When adjusting valve clearance, the engine should be at room temperature and the piston should be at Top Dead Center (TDC) of its compression stroke (both valves closed). Correct clearance is 0.001-0.003 inch (0.03-0.07 mm). To adjust valve clearance, use the following procedure:

1. Loosen the rocker arm jam nut. Use an allen wrench to turn the pivot ball stub while checking clearance between the rocker arm and the valve stem with a feeler gauge.



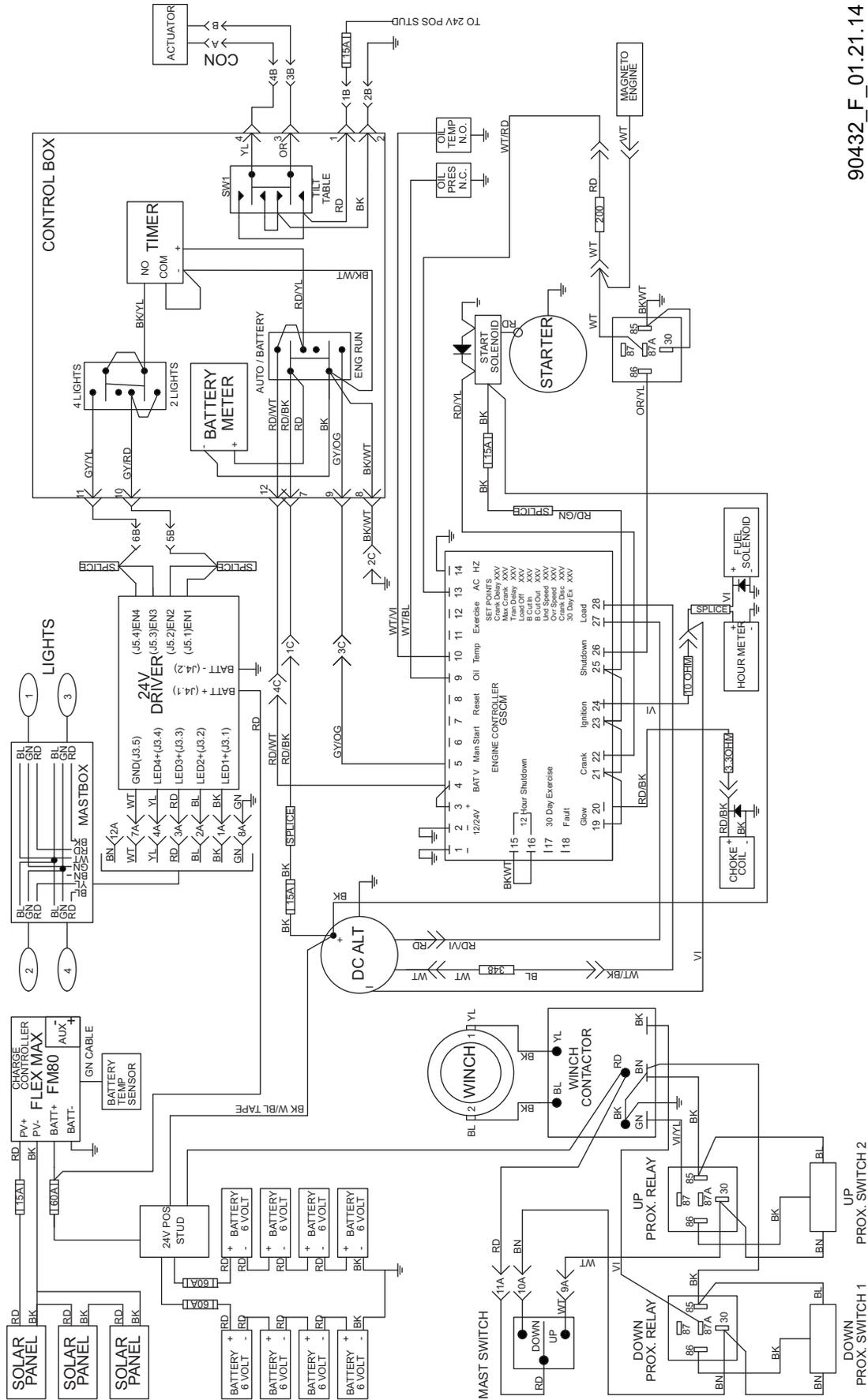
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- When the valve clearance is correct, hold the pivot ball stud with the allen wrench and tighten the rocker arm jam nut with a crows foot. Tighten the jam nut to 65-85 in-lbs (7-10 Nm). After tightening the jam nut, recheck valve clearance to make sure it did not change.



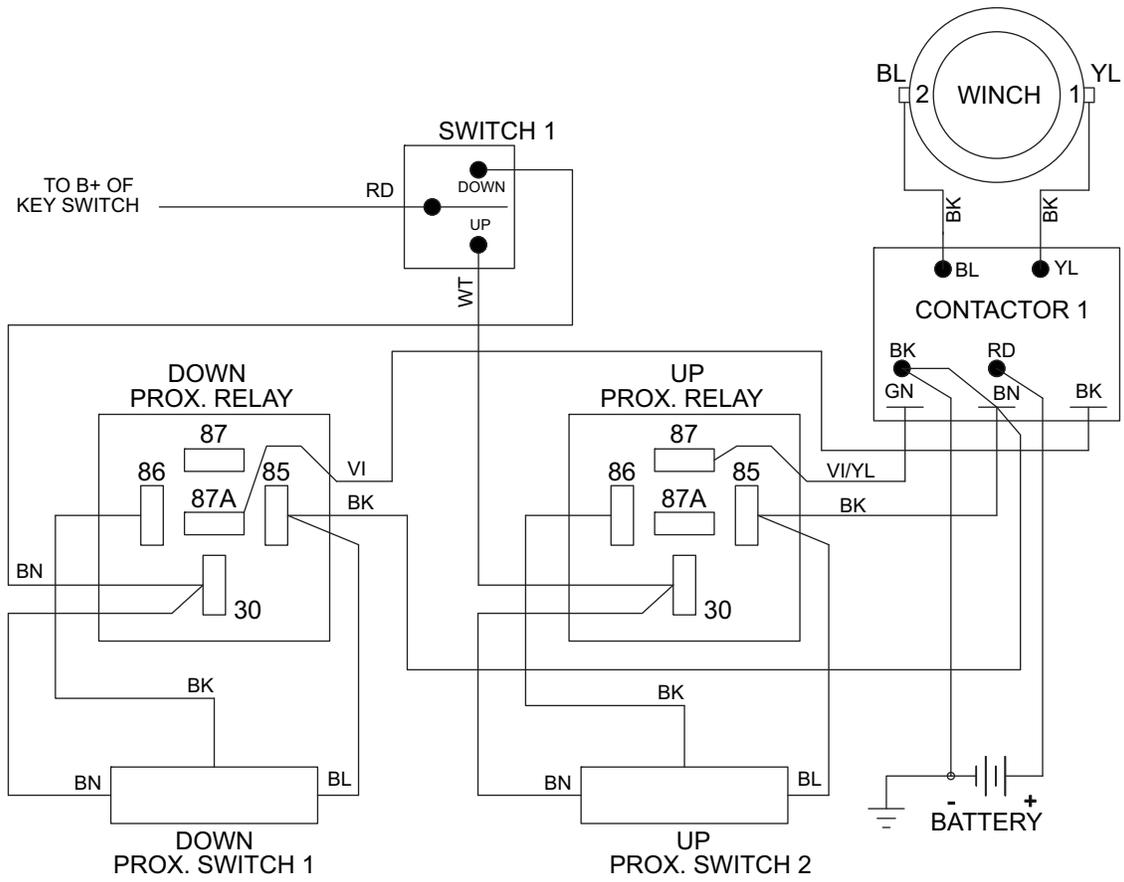
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# DC WIRING DIAGRAM



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# WINCH WIRING DIAGRAM



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REV: F  
PART NO: 33002  
01.24.14