

# Operator's Manual

## Light Tower, Wide Body

### LTW 20Z-1 LTW 20Z-3



EN

|            |    |      |
|------------|----|------|
| 5000187543 | 05 | 1111 |
|------------|----|------|



**Copyright notice**

© Copyright 2011 by Wacker Neuson Production Americas LLC

All rights, including copying and distribution rights, are reserved.

This publication may be photocopied by the original purchaser of the machine. Any other type of reproduction is prohibited without express written permission from Wacker Neuson Production Americas LLC.

Any type of reproduction or distribution not authorized by Wacker Neuson Production Americas LLC represents an infringement of valid copyrights. Violators will be prosecuted.

---

**Trademarks**

All trademarks referenced in this manual are the property of their respective owners.

---

**Manufacturer**

Wacker Neuson Production Americas LLC

N92W15000 Anthony Avenue

Menomonee Falls, WI 53051 U.S.A.

Tel: (262) 255-0500 · Fax: (262) 255-0550 · Tel: (800) 770-0957

[www.wackerneuson.com](http://www.wackerneuson.com)

---

**Original instructions**

This Operator's Manual presents the original instructions. The original language of this Operator's Manual is American English.

---

## Foreword

**SAVE THESE INSTRUCTIONS**—This manual contains important instructions for the machine models below. These instructions have been written expressly by Wacker Neuson Production Americas LLC and must be followed during installation, operation, and maintenance of the machines.

Machines covered in this Manual

| Machine   | Item Number      |
|-----------|------------------|
| LTW 20Z-1 | 0620375, 0620842 |
| LTW 20Z-3 | 0620376, 0620843 |

### Machine documentation

- From this point forward in this documentation, Wacker Neuson Production Americas LLC will be referred to as Wacker Neuson.
- Keep a copy of the Operator’s Manual with the machine at all times.
- Use the separate Parts Book supplied with the machine to order replacement parts.
- Refer to the separate Repair Manual for detailed instructions on servicing and repairing the machine.
- If you are missing any of these documents, please contact Wacker Neuson to order a replacement or visit [www.wackerneuson.com](http://www.wackerneuson.com).
- When ordering parts or requesting service information, be prepared to provide the machine model number, item number, revision number, and serial number.

### Expectations for information in this manual

- This manual provides information and procedures to safely operate and maintain the above Wacker Neuson model(s). For your own safety and to reduce the risk of injury, carefully read, understand, and observe all instructions described in this manual.
- Wacker Neuson expressly reserves the right to make technical modifications, even without notice, which improve the performance or safety standards of its machines.
- The information contained in this manual is based on machines manufactured up until the time of publication. Wacker Neuson reserves the right to change any portion of this information without notice.

### CALIFORNIA Proposition 65 Warning

Engine exhaust, some of its constituents, and certain vehicle components, contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

### Laws pertaining to spark arresters

**NOTICE:** State Health Safety Codes and Public Resources Codes specify that in certain locations spark arresters be used on internal combustion engines that use hydrocarbon fuels. A spark arrester is a device designed to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose. In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

# Foreword

## Manufacturer's approval

This manual contains references to *approved* parts, attachments, and modifications. The following definitions apply:

- **Approved parts or attachments** are those either manufactured or provided by Wacker Neuson.
- **Approved modifications** are those performed by an authorized Wacker Neuson service center according to written instructions published by Wacker Neuson.
- **Unapproved parts, attachments, and modifications** are those that do not meet the approved criteria.

Unapproved parts, attachments, or modifications may have the following consequences:

- Serious injury hazards to the operator and persons in the work area
- Permanent damage to the machine which will not be covered under warranty

Contact your Wacker Neuson dealer immediately if you have questions about approved or unapproved parts, attachments, or modifications.



|  |           |
|--|-----------|
| <b>Foreword</b>  | <b>3</b>  |
| <b>1 Safety Information</b>  | <b>9</b>  |
| 1.1 Signal Words Used in this Manual .....   | 9         |
| 1.2 This manual contains DANGER, WARNING, CAUTION, NOTICE, and NOTE signal words which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service. .... | 9         |
| 1.3 Machine Description and Intended Use .....   | 9         |
| 1.4 Safety Guidelines for Operating the Machine .....  | 11        |
| 1.5 Lamp Safety .....  | 12        |
| 1.6 Operator Safety while Using Internal Combustion Engines .....  | 13        |
| 1.7 Towing Safety .....  | 14        |
| 1.8 Service Safety .....   | 15        |
| <b>2 Labels</b>  | <b>17</b> |
| 2.1 Label Locations .....  | 17        |
| 2.2 Label Meanings .....   | 19        |
| <b>3 Operation</b>   | <b>32</b> |
| 3.1 Preparing the Machine for First Use .....  | 32        |
| 3.2 Preparing Trailer for Towing or Lifting .....  | 33        |
| 3.3 Locating the Trailer .....   | 34        |
| 3.4 Ground Connection .....  | 34        |
| 3.5 Leveling Trailer .....   | 35        |
| 3.6 Refueling the Machine .....  | 36        |
| 3.7 Adjusting the Lights .....   | 37        |
| 3.8 Control Panel (Manual Winch System) .....  | 38        |
| 3.9 Raising the Tower (Manual Winch System) .....  | 39        |
| 3.10 Lowering the Tower (Manual Winch System) .....  | 42        |
| 3.11 Control Panel (Power Winch System) .....  | 44        |
| 3.12 Raising the Tower (Power Winch System) .....  | 45        |
| 3.13 Lowering the Tower (Power Winch System) .....   | 48        |
| 3.14 Manually Starting the Machine .....   | 50        |
| 3.15 Stopping the Machine .....  | 51        |
| 3.16 Auto Mode (Remote Run) .....  | 51        |
| 3.17 Troubleshooting Automatic Shutdown .....  | 52        |
| 3.18 Generator Derating .....  | 53        |
| 3.19 Receptacle Panel .....  | 54        |
| 3.20 Load Balancing .....  | 56        |

|          |   |           |
|----------|---|-----------|
| 3.21     | Electronic Governor .....                         | 56        |
| 3.22     | Emergency Stop Switch .....                       | 57        |
| <b>4</b> | <b>Maintenance</b>                                | <b>58</b> |
| 4.1      | Periodic Maintenance Schedule .....               | 58        |
| 4.2      | Installing / Removing Light Fixtures .....        | 60        |
| 4.3      | Removing / Replacing Lamps .....                  | 61        |
| 4.4      | Performing Daily Inspection .....                 | 62        |
| 4.5      | Checking Engine Coolant .....                     | 63        |
| 4.6      | Replacing Air Cleaner .....                       | 64        |
| 4.7      | Changing Engine Oil .....                         | 65        |
| 4.8      | Maintaining the Fuel/Water Separator .....        | 67        |
| 4.9      | Maintaining the Trailer .....                     | 67        |
| 4.10     | Long-Term Storage .....                           | 68        |
| 4.11     | Troubleshooting .....                             | 69        |
| <b>5</b> | <b>Factory-Installed Options</b>                  | <b>70</b> |
| 5.1      | General Options .....                             | 70        |
| 5.2      | Cold Weather Options .....                        | 75        |
| 5.3      | North Slope Options .....                         | 75        |
| <b>6</b> | <b>Technical Data</b>                             | <b>78</b> |
| 6.1      | Engine .....                                      | 78        |
| 6.2      | Generator .....                                   | 79        |
| 6.3      | Machine .....                                     | 80        |
| 6.4      | Dimensions .....                                  | 81        |
| 6.5      | Radiation Compliance .....                        | 81        |
| <b>7</b> | <b>Schematics</b>                                 | <b>83</b> |
| 7.1      | LTW 20Z-1—Electrical Schematic .....              | 84        |
| 7.2      | LTW 20Z-1—Electrical Schematic Components .....   | 85        |
| 7.3      | LTW 20Z-3—Electrical Schematic .....              | 86        |
| 7.4      | LTW 20Z-3—Electrical Schematic Components .....   | 87        |
| 7.5      | Engine Wiring .....                               | 88        |
| 7.6      | Engine Wiring Components .....                    | 89        |
| 7.7      | Trailer Wiring (Electric Brakes) .....            | 90        |
| 7.8      | Trailer Wiring Components (Electric Brakes) ..... | 90        |

7.9 Trailer Wiring (Surge Brakes / No Brakes) ..... 91





# 1 Safety Information

## 1.1 Signal Words Used in this Manual

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




---

This is the safety alert symbol. It is used to alert you to potential personal hazards.

- ▶ Obey all safety messages that follow this symbol.

---




---

### **DANGER**

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

- ▶ To avoid death or serious injury from this type of hazard, obey all safety messages that follow this signal word.
- 




---

### **WARNING**

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

- ▶ To avoid possible death or serious injury from this type of hazard, obey all safety messages that follow this signal word.
- 




---

### **CAUTION!**

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

- ▶ To avoid possible minor or moderate injury from this type of hazard, obey all safety messages that follow this signal word.
- 

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

**Note:** *A Note contains additional information important to a procedure.*

## 1.3 Machine Description and Intended Use

This machine is a mobile, trailer-mounted light tower. The Wacker Neuson Light Tower consists of a trailer with a cabinet containing a diesel engine, a fuel tank, a control panel, and an electric alternator. A telescoping tower with four metal halide lights is mounted to the top of the cabinet. Dual winches tilt, raise, and lower the telescoping tower. As the engine runs, the generator converts mechanical energy into electric power. The metal halide lights run off this power. Receptacle(s) are also present to power auxiliary loads. The operator uses the control panel to operate and monitor the machine.

---

This machine is intended for the illumination of outdoor areas. This machine is also intended for the purpose of supplying electrical power to connected loads. Refer to the product specifications for the output voltage and frequency of this Light Tower, and for the maximum output power limit of this Light Tower.

---

This machine has been designed and built strictly for the intended use described above. Using the machine for any other purpose could permanently damage the machine or seriously injure the operator or other persons in the area. Machine damage caused by misuse is not covered under warranty.

- The following are some examples of misuse:
  - Connecting a load that has voltage and frequency requirements that are incompatible with the machine output
  - Overloading the machine with a device that draws excessive power during either continuous running or start-up
  - Operating the machine in a manner that is inconsistent with all federal, state and local codes and regulations
  - Using the machine as a ladder, support, or work surface
  - Using the machine to carry or transport passengers or equipment
  - Using the machine to tow other machines (unless factory equipped)
  - Using the machine as a hoist or hanging items from the tower
  - Operating the machine outside of factory specifications
  - Operating the machine in a manner inconsistent with all warnings found on the machine and in the Operator's Manual
- 

This machine has been designed and built in accordance with the latest global safety standards. It has been carefully engineered to eliminate hazards as far as practicable and to increase operator safety through protective guards and labeling. However, some risks may remain even after protective measures have been taken. They are called residual risks. On this machine, they may include exposure to:

- Heat, noise, exhaust, and carbon monoxide from the engine
- Heat from the lights
- Ultraviolet radiation from the lights
- Fire hazards from improper refueling techniques
- Fuel and its fumes
- Electric shock and arc flash
- Personal injury from improper lifting the trailer tongue
- Glare from lights (lights may blind drivers of nearby motor vehicles if the lights are incorrectly positioned)
- Typical hazards related to towing a trailer on roads and highways

To protect yourself and others, make sure you thoroughly read and understand the safety information presented in this manual before operating the machine.

## 1.4 Safety Guidelines for Operating the Machine

- Operator training** Before operating the machine:
- Read and understand the operating instructions contained in all manuals delivered with the machine.
  - Familiarize yourself with the location and proper use of all controls and safety devices.
  - Contact Wacker Neuson for additional training if necessary.
- When operating this machine:
- Do not allow improperly trained people to operate the machine. People operating the machine must be familiar with the potential risks and hazards associated with it.
- 
- Personal Protective Equipment (PPE)** Wear the following Personal Protective Equipment (PPE) while operating this machine:
- Close-fitting work clothes that do not hinder movement
  - Safety glasses with side shields
  - Hearing protection
  - Safety-toed footwear
- 
- Work area**
- Make sure the area immediately surrounding the Light Tower is clean, neat, and free of debris.
  - The tower extends up to 9 m (30 ft). Make sure the area above the trailer is open and clear of overhead wires and obstructions.
- 
- Machine setup**
- Make sure the machine is on a firm, level surface and will not tip, roll, slide, or fall while operating.
  - Make sure the machine is well-grounded and securely fastened to a good earthen ground per national and local regulations.
  - The trailer must be leveled and the outriggers extended before raising the tower. The outriggers must be extended while the tower is up.
  - Never connect the machine to other power sources, such as supply mains of power companies.
- 
- Machine integrity**
- Do not start a machine in need of repair.
  - Do not use the machine if the insulation on any electrical cord is cut or worn through.
  - Do not operate the lights without the protective lens cover in place or with a lens cover that is cracked or damaged.
  - Replace or repair electrical components with components that are identical in rating and performance to the originals.
- 
- While operating the machine**
- Keep the area behind the trailer clear of people and obstructions while raising and lowering the tower.
  - Do not raise the tower or operate the machine in high winds. Lower the tower immediately if high winds or electrical storms are expected in the area.

- Do not raise, lower, or turn the tower while the unit is operating.
- If any part of the tower hangs up, or the winch cable develops slack while raising or lowering the tower, STOP immediately! Contact an authorized Wacker Neuson service representative.
- Do not disengage the tower locking pin while the tower is up.
- Lamps become extremely hot in use! Allow the lamps and fixtures to cool 10–15 minutes before handling.
- Lower the tower when not in use.

## 1.5 Lamp Safety

**Description** The lamps provided with your Light Tower are electric discharge lamps. They are designed for use with metal halide ballasts only, and require time to reach full brightness on initial startup and after a power interruption. These lamps comply with FDA regulation performance standards 21 CFR 1040-30.



---

### WARNING

Personal injury hazard. Lamps can cause serious skin burns and eye inflammation from shortwave ultraviolet radiation if outer envelope of the lamp is broken or punctured.

- ▶ Do not operate the Light Tower if a lamp is damaged.
- 

**Operating safety**

- Do not operate the lamps where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used.
- Replace damaged lamps according to the instructions in section *Removing / Replacing Lamps*.
- Lamps that automatically extinguish when the outer envelope is broken or punctured are commercially available.

## 1.6 Operator Safety while Using Internal Combustion Engines



### WARNING

Internal combustion engines present special hazards during operation and fueling. Failure to follow the warnings and safety standards could result in severe injury or death.

- ▶ Read and follow the warning instructions in the engine owner's manual and the safety guidelines below.



### DANGER

Exhaust gas from the engine contains carbon monoxide, a deadly poison. Exposure to carbon monoxide can kill you in minutes.

- ▶ NEVER operate the machine inside an enclosed area, such as a tunnel, unless adequate ventilation is provided through such items as exhaust fans or hoses.

### Operating safety

When running the engine:

- Keep the area around exhaust pipe free of flammable materials.
- Check the fuel lines and the fuel tank for leaks and cracks before starting the engine. Do not run the machine if fuel leaks are present or the fuel lines are loose.

When running the engine:

- Do not smoke while operating the machine.
- Do not run the engine near sparks or open flames.
- Do not touch the engine or muffler while the engine is running or immediately after it has been turned off.
- Do not operate a machine when its fuel cap is loose or missing.
- Do not start the engine if fuel has spilled or a fuel odor is present. Move the machine away from the spill and wipe the machine dry before starting.

### Refueling safety

When refueling the engine:

- Clean up any spilled fuel immediately.
- Refill the fuel tank in a well-ventilated area.
- Replace the fuel tank cap after refueling.
- Do not smoke.
- Do not refuel a hot or running engine.
- Do not refuel the engine near sparks or open flames.

## 1.7 Towing Safety



### WARNING

Possibility of personal injury or equipment damage. Towing a large trailer can be hazardous without careful preparation, appropriate equipment, and/or observance of maximum towing speeds.

- ▶ Refer to the applicable Department of Transportation regulations before towing.

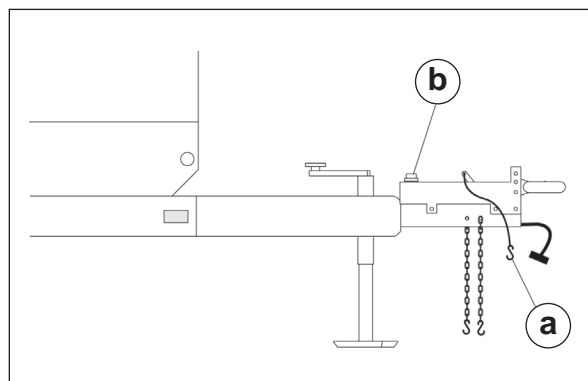
### Equipment integrity

Read and follow the information below:

- Both the trailer and vehicle must be in serviceable condition and securely fastened together.
- Ensure that the hitch and coupling on the towing vehicle are rated equal to, or greater than, the trailer's Gross Vehicle Weight Rating (GVWR).
- Inspect the hitch and coupling for wear or damage. Do not tow the trailer using defective parts.
- Always connect the safety chains.
- Make sure all directional and trailer lights are connected and working properly.
- Check the tires on the trailer for tread wear, inflation, and condition. Replace worn tires.
- Verify that all lug nuts holding the wheels are tight and none are missing.

### Checking brakes

- On trailers with surge or electric brakes, connect the breakaway cable (**a**) on the trailer coupler to the rear bumper or frame of the vehicle. This cable will actuate the brake system on the trailer if both the coupling and safety chains have failed. The breakaway cable is not a parking brake and should not be used as one.



wc\_gr006973

- Check the operation of the brakes by braking the vehicle at a slow speed before entering traffic. Both the vehicle and the trailer should brake smoothly. If the trailer seems to be pushing, check the fluid level (**b**) in the surge brakes or the operation of the electric brakes.

### Towing speed

- The maximum recommended speed for highway towing is 88 km/hour (55 mph). Recommended off-road towing speed is not to exceed 16 km/hour (10 mph) or less depending on terrain.

1.8 Service Safety



**WARNING**

High voltage! This machine produces high voltage capable of causing serious injury or death.

- ▶ Only a qualified electrician should troubleshoot or repair electrical problems occurring with this machine.

**Precautions**

- To reduce the risk of personal injury, read and understand the service procedures before performing any service to the machine.
- All adjustments and repairs **MUST** be completed before operation. Do not operate the machine with a known problem or deficiency! All repairs and adjustments should be completed by a qualified technician.
- Do not service the machine if your clothing or skin is wet.

**Personal Protective Equipment (PPE)**

Wear the following Personal Protective Equipment (PPE) while servicing or maintaining this machine:

- Close-fitting work clothes that do not hinder movement
- Safety glasses with side shields
- Hearing protection
- Safety-toed footwear

In addition, before servicing or maintaining the machine:

- Tie back long hair.
- Remove all jewelry (including rings).

**Before servicing the machine**

- Turn the engine off before performing maintenance or making repairs.
- Make sure the engine start switch is turned to OFF.
- Make sure the circuit breakers are open (off).
- Make sure the negative terminal on the battery is disconnected.
- Do not perform even routine service (oil / oil filter changes, cleaning, etc.) unless all electrical components are shut down.
- Make sure water has not accumulated around the base of the machine. If water is present, move the machine and allow it to dry before servicing.
- If the machine must be started while servicing, keep hands, feet, and loose clothing away from moving parts on the generator and engine.

**Safety devices and modifications**

- Replace all safety devices and guards after repair and maintenance.
- Do not modify the machine without the express written approval of the manufacturer.

**Replacing parts and labels**

- Replace worn or damaged components.
- Use only spare parts recommended by Wacker Neuson.
- Replace all missing and hard-to-read labels.
- Check all external fasteners at regular intervals.



## Lifting and transporting

When lifting the machine:

- Make sure slings, chains, hooks, ramps, jacks and other types of lifting devices are attached securely and have enough weight-bearing capacity to lift or hold the machine safely.
- Remain aware of the location of other people when lifting the machine.

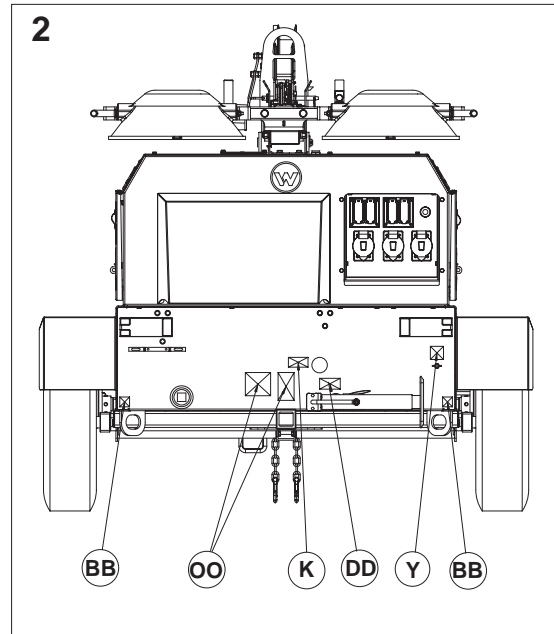
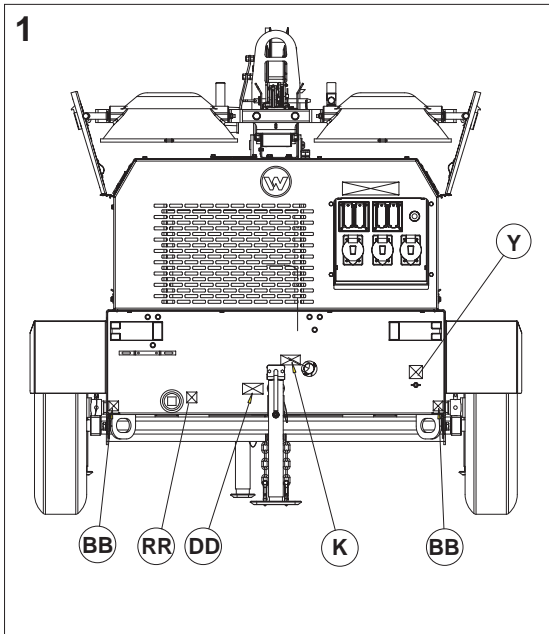
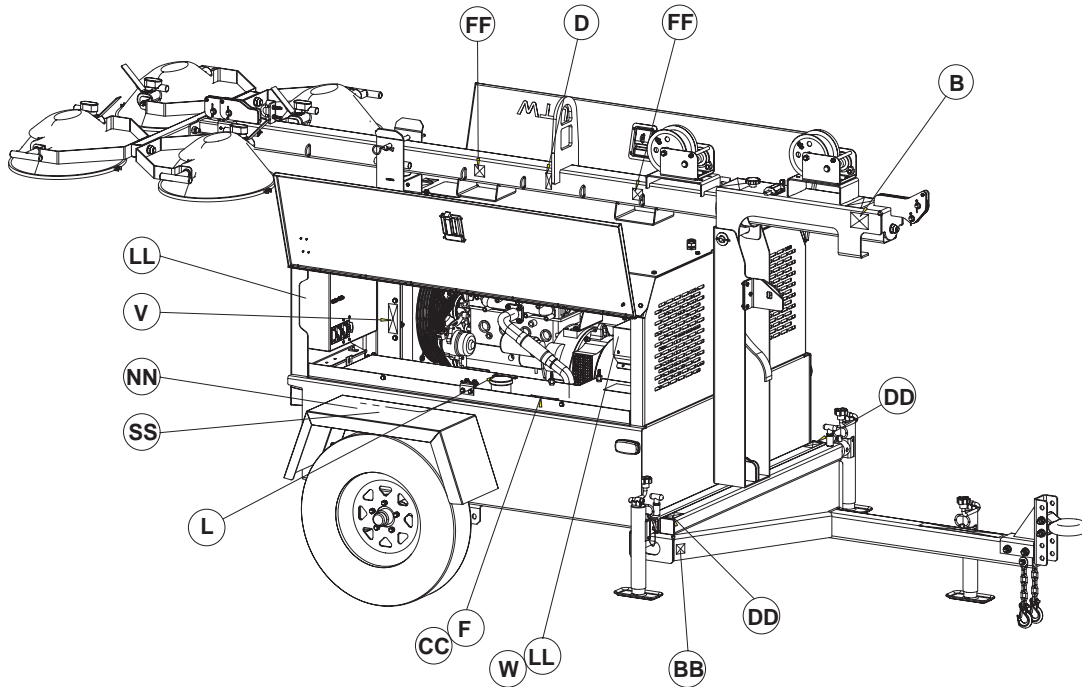
To reduce the possibility of injury:

- Do not stand under the machine while it is being hoisted or moved.
- Do not get onto the machine while it is being hoisted or moved.

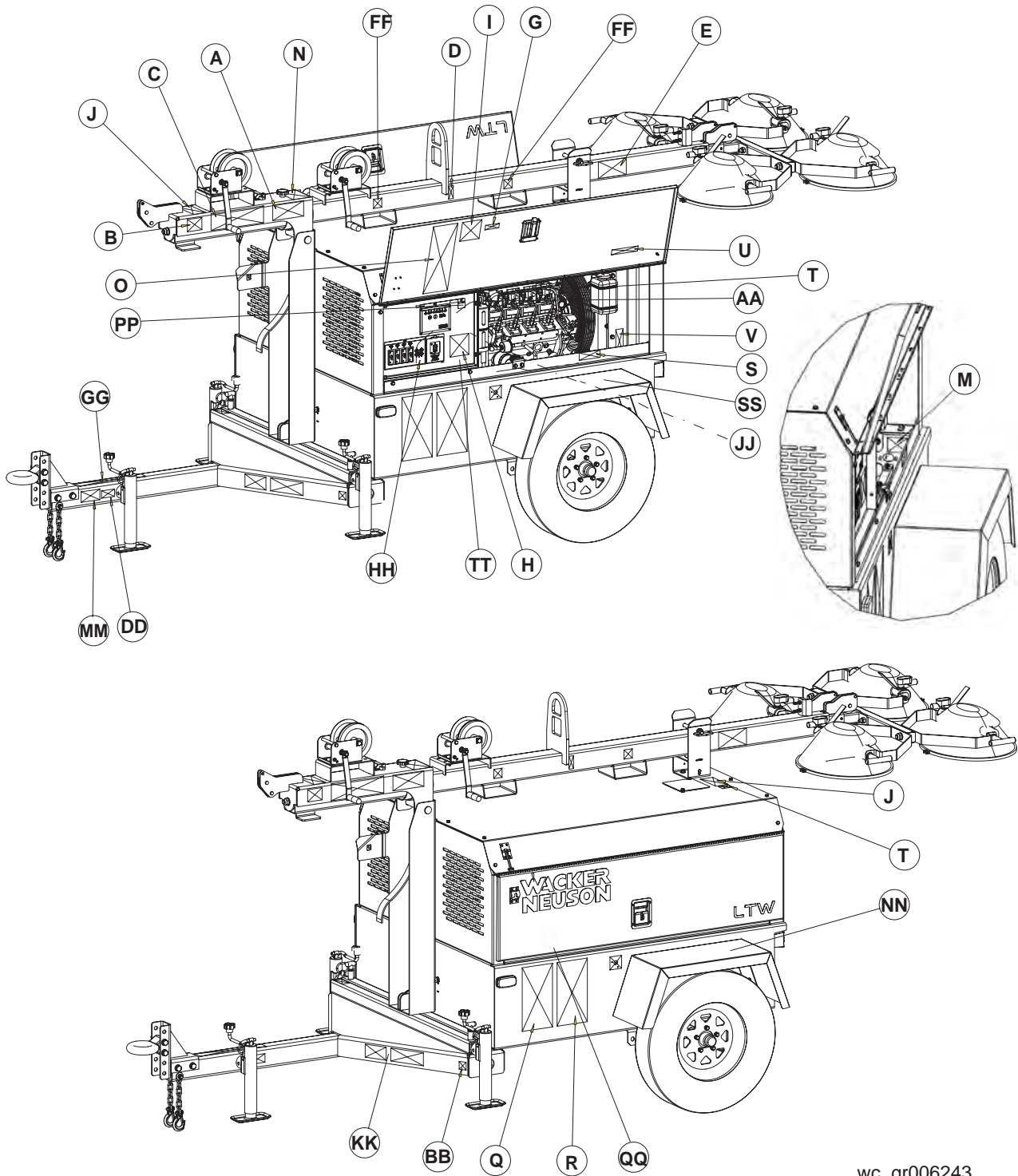


2 Labels

2.1 Label Locations



wc\_gr006242





wc\_gr006243

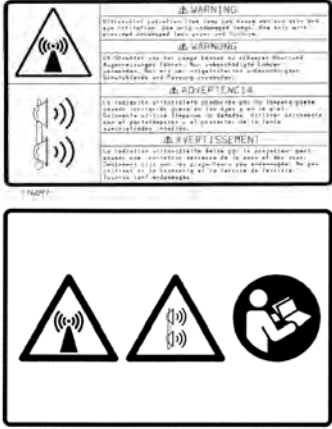
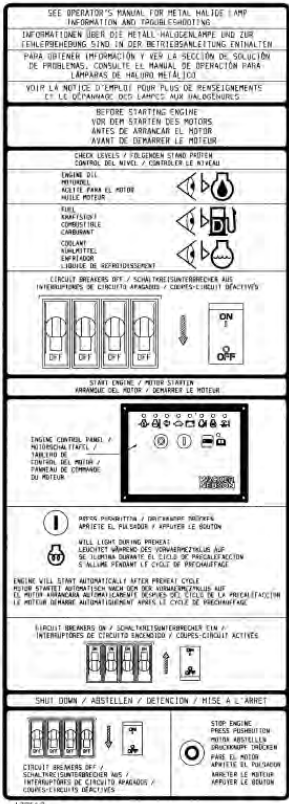
2.2 Label Meanings

|                 |  |  |
|-----------------|--|--|
| <p><b>A</b></p> |  | <p><b>WARNING</b><br/>Automatic locking pin.<br/>A non-secured, falling tower can cause serious injury or death if a person is hit. To secure tower, verify automatic locking pin has been engaged.</p>  |
| <p><b>B</b></p> |  | <p><b>WARNING!</b><br/>Avoid crushing area.</p>  |
| <p><b>C</b></p> |  | <p><b>DANGER!</b><br/>Contact with overhead electrical power lines will cause serious injury or death. Do not position Light Tower under electrical power lines.<br/><b>WARNING!</b><br/>Completely lower tower BEFORE tilting tower. Tilting an extended tower can cause serious injury or death.</p> |
| <p><b>D</b></p> |  | <p><b>NOTICE</b><br/>Lifting point.</p>  |

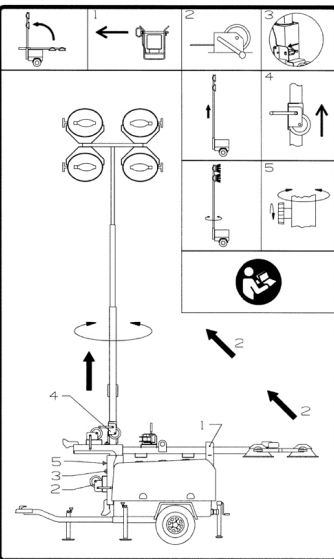
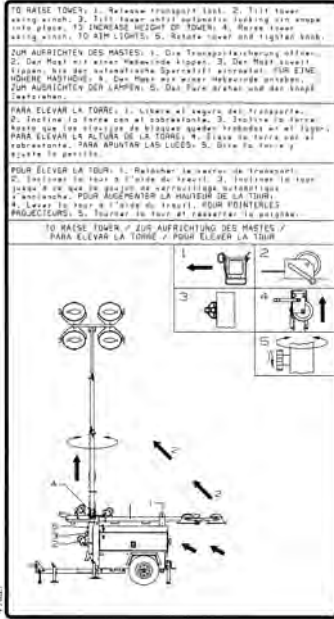
|                 |                             |   |
|-----------------|-----------------------------|---|
| <p><b>E</b></p> | <p>176099</p> <p>181256</p> | <p><b>WARNING!</b><br/>Secure tower in transport lock before lifting or towing. A loose swinging tower could cause personal injury or machine damage.</p>   |
| <p><b>F</b></p> | <p>183802</p> <p>183803</p> | <p><b>DANGER</b></p> <p>Using a light tower indoors <b>CAN KILL YOU IN MINUTES</b>. Light tower exhaust contains carbon monoxide. This is a poison you cannot see or smell.</p> <p><b>NEVER</b> use inside a home or garage, <b>EVEN IF</b> doors and windows are open.</p> <p>Only use <b>OUTSIDE</b> and far away from windows, doors, and vents.</p>   |
| <p><b>G</b></p> | <p>114474</p> <p>178736</p> | <p><b>DANGER!</b><br/>Asphyxiation hazard.</p> <ul style="list-style-type: none"> <li>Engines emit carbon monoxide.</li> <li>Do not run the machine indoors or in an enclosed area unless adequate ventilation, through such items as exhaust fans or hoses, is provided.</li> <li>Read the Operator's Manual.</li> <li>No sparks, flames, or burning objects near the machine.</li> <li>Stop the engine before refueling.</li> </ul> |

|          |  |  |
|----------|--|--|
| <p>H</p> |  <p>17608D</p> <p>181485</p>  | <p><b>WARNING!</b><br/>                 Electric shock and arc flash can cause serious injury or death. Electrical storage device within. Contact a qualified electrician for service or to open electrical box.</p> |
| <p>I</p> |  <p>176103</p> <p>178714</p> | <p><b>WARNING!</b><br/>                 Read and understand the supplied Operator's Manual before operating the machine. Failure to do so increases the risk of injury to yourself and others.</p>                   |

|                 |  |   |
|-----------------|--|---|
| <p><b>J</b></p> |  | <p><b>WARNING!</b><br/>Stand clear of front and rear of machine when tower is being tilted up or down.</p>  |
| <p><b>K</b></p> |  | <p><b>WARNING!</b><br/>Hot surface</p>  |
| <p><b>L</b></p> |  | <p><b>WARNING!</b><br/>Hot surface</p>  |
| <p><b>M</b></p> |  | <p>A nameplate listing the model number, item number, revision number, and serial number is attached to each unit. Please record the information found on this nameplate so it will be available should the nameplate become lost or damaged. When ordering parts or requesting service information, you will always be asked to specify the model number, item number, revision number, and serial number of the unit.</p> |

|          |  |  |
|----------|--|--|
| <p>N</p> |   | <p><b>WARNING!</b><br/>Ultraviolet radiation from lamp can cause serious skin and eye irritation. Use only with undamaged lamps. Use only with provided undamaged lens cover and fixture.</p>  |
| <p>O</p> |  | <p>See Operator's Manual for metal halide lamp information and troubleshooting.</p> <p>Before starting engine</p> <p>Check levels<br/>Engine oil<br/>Fuel<br/>Coolant</p> <p>Circuit breakers off</p> <p>Start engine</p> <p>Engine control panel</p> <p>Press pushbutton</p> <p>Will light during preheat</p> <p>Engine will start automatically after preheat cycle</p> <p>Circuit breakers on</p> <p>Shut down<br/>Circuit breakers off<br/>Stop engine</p> |

Q



Manual Winch System

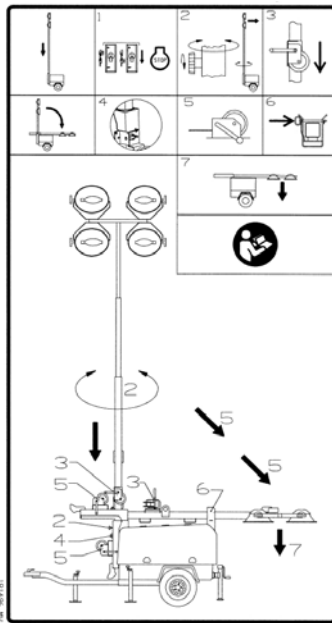
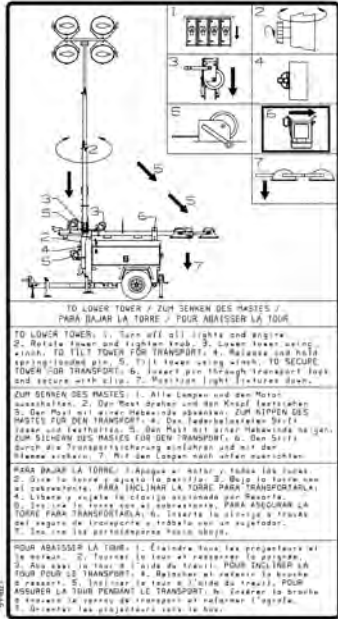
- To raise tower:
1. Release transport lock.
  2. Tilt tower using winch.
  3. Tilt tower until automatic locking pin snaps into place.

- To increase height of tower:
4. Raise tower using winch.

- To aim lights:
5. Rotate tower and tighten knob.



R



Manual Winch System

To lower tower:

1. Turn off all lights and engine.
2. Rotate tower and tighten knob.
3. Lower tower using winch.






To tilt tower for transport:





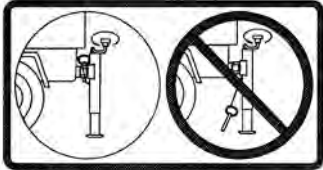

4. Release and hold spring-loaded pin.
5. Tilt tower using winch.

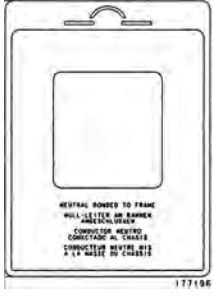
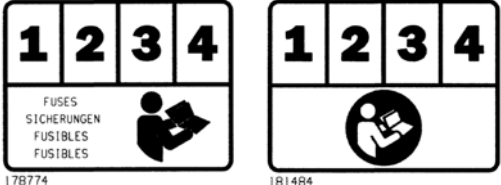


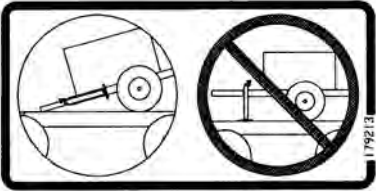

To secure tower for transport:




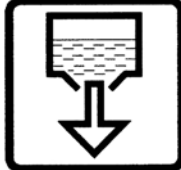
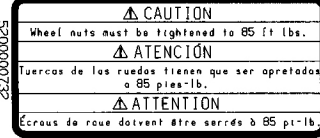

6. Insert pin through transport lock and secure with pin.
7. Position light fixtures down.

|                 |  |   |
|-----------------|--|---|
| <p><b>Q</b></p> | <p>TO RAISE TOWER: 1. Release transport lock. 2. Tilt tower using winch. 3. Tilt tower until automatic locking pin snaps into place. TO INCREASE HEIGHT OF TOWER: 4. Raise tower using winch. TO AIM LIGHTS: 5. Rotate tower and tighten knob.</p> <p>ZUM AUFRICHTEN DES MASTES: 1. Die Transportverriegelung öffnen. 2. Den Mast mit einer Hebevorrichtung kippen. 3. Den Mast soweit kippen, bis der automatische Sperrstift einrastet. FÜR EINE HÖHERE MASTHÖHE: 4. Den Mast mit einer Hebevorrichtung anheben. ZUM AUSRICHTEN DER LAMPEN: 5. Den Turm drehen und den Knopf festziehen.</p> <p>PARA ELEVAR LA TORRE: 1. Libere el seguro del transporte. 2. Inclina la torre con el cabrestante. 3. Inclina la torre hasta que los clavijas de bloqueo queden trabadas en el lugar. PARA ELEVAR LA ALTURA DE LA TORRE: 4. Eleva la torre con el cabrestante. PARA APUNTAR LAS LUCES: 5. Gira la torre y aprieta la perilla.</p> <p>POUR ÉLEVER LA TOUR: 1. Relâcher le verrou de transport. 2. Incliner la tour à l'aide du treuil. 3. Incliner la tour jusqu'à ce que les goupilles de verrouillage automatique s'enganchent. POUR AUGMENTER LA HAUTEUR DE LA TOUR: 4. Lever la tour à l'aide du treuil. POUR POINTER LES PROJECTEURS: 5. Tourner la tour et resserrer la poignée.</p> <p>TO RAISE TOWER / ZUM AUFRICHTEN DES MASTES / PARA ELEVAR LA TORRE / POUR ÉLEVER LA TOUR</p>  | <p><b>Power Winch System</b></p> <p>To raise tower:</p> <ol style="list-style-type: none"> <li>1. Release transport lock.</li> <li>2. Tilt tower using winch.</li> <li>3. Tilt tower until automatic locking pin snaps into place.</li> </ol> <p>To increase height of tower:</p> <ol style="list-style-type: none"> <li>4. Raise tower using winch.</li> </ol> <p>To aim lights:</p> <ol style="list-style-type: none"> <li>5. Rotate tower and tighten knob.</li> </ol>   |
| <p><b>R</b></p> | <p>TO LOWER TOWER: 1. Turn off all lights and engine. 2. Rotate tower and tighten knob. 3. Lower tower using winch. TO TILT TOWER FOR TRANSPORT: 4. Release and hold spring-loaded pin. 5. Tilt tower using winch. TO SECURE TOWER FOR TRANSPORT: 6. Insert pin through transport lock and secure with clip. 7. Position light fixtures down.</p> <p>ZUM SENKEN DES MASTES: 1. Alle Lampen und den Motor ausschalten. 2. Den Mast drehen und den Knopf festziehen. 3. Den Mast mit einer Hebevorrichtung absenken. ZUM KIPPEN DES MASTES FÜR DEN TRANSPORT: 4. Die Federbelasteten Stift lösen und festhalten. 5. Den Mast mit einer Hebevorrichtung neigen. ZUM SICHERN DES MASTES FÜR DEN TRANSPORT: 6. Den Stift durch die Transportverriegelung einführen und mit dem Klammer sichern. 7. Mit den Lampen nach unten ausrichten.</p> <p>PARA BAJAR LA TORRE: 1. Apague el motor y todas las luces. 2. Gira la torre y aprieta la perilla. 3. Baja la torre con el cabrestante. PARA INCLINAR LA TORRE PARA TRANSPORTARLA: 4. Libere y sujete la alfilerja resorteada por resorte. 5. Inclina la torre con el cabrestante. PARA ASEGURAR LA TORRE PARA TRANSPORTARLA: 6. Inserte la alfilerja a través del seguro de transporte y fíjela con un sujetador. 7. Inclina los proyectores hacia abajo.</p> <p>POUR ABASSER LA TOUR: 1. Éteignez tous les projecteurs et le moteur. 2. Tournez la tour et resserrer le bouton. 3. Abaissez la tour à l'aide du treuil. POUR INCLINER LA TOUR POUR LE TRANSPORT: 4. Relâchez et retenez le bouton à ressort. 5. Inclinez la tour à l'aide du treuil. POUR ASSURER LA TOUR PENDANT LE TRANSPORT: 6. Insérer le crochet à travers le verrou de transport et refermer l'anneau. 7. Orienter les projecteurs vers le bas.</p> <p>TO LOWER TOWER / ZUM SENKEN DES MASTES / PARA BAJAR LA TORRE / POUR ABASSER LA TOUR</p> | <p><b>Power Winch System</b></p> <p>To lower tower:</p> <ol style="list-style-type: none"> <li>1. Turn off all lights and engine.</li> <li>2. Rotate tower and tighten knob.</li> <li>3. Lower tower using winch.</li> </ol> <p>To tilt tower for transport:</p> <ol style="list-style-type: none"> <li>4. Release and hold spring-loaded pin.</li> <li>5. Tilt tower using winch.</li> </ol> <p>To secure tower for transport:</p> <ol style="list-style-type: none"> <li>6. Insert pin through transport lock and secure with pin.</li> <li>7. Position light fixtures down.</li> </ol> |

|          |  |  |
|----------|--|--|
| <p>S</p> |  <p>114691</p> <p>178730</p>  | <p>WARNING!<br/>Disconnect battery before servicing.<br/>Read the Operator's Manual.</p> |
| <p>T</p> |  <p>178711</p>  | <p>WARNING!<br/>Pressurized contents. Do not open when hot!</p>                          |
| <p>U</p> | <p>Coolant overflow bottle only, not a return system.<br/>Botella de rebosa del enfriador solamente -- no es un sistema de retorno.<br/>Nur Kühlmittelüberlaufflasche -- kein Rückholssystem!<br/>Bouteille de trop-plein de l'agent réfrigérant seulement: ce n'est pas un système de retour.</p> <p>176105</p>  <p>180577</p> | <p>Coolant overflow bottle only, not a return system.</p>                                |
| <p>V</p> |  <p>178775</p> <p>181483</p>  | <p>WARNING!<br/>Pinching hazard. Rotating machinery.</p>                                 |
| <p>W</p> |  <p>176284</p> <p>181504</p>  | <p>WARNING!<br/>Electric shock and arc flash can cause serious injury or death.</p>      |

| <p>Y</p>  |  <p>176059</p>  | <p>Electrical ground</p>  |  |                           |                            |   |  |   |  |   |
|---|--|---|--|---------------------------|----------------------------|---|--|---|--|---|
| <p>AA</p>   |  <p>0158787a</p>  | <p>Operator's Manual must be stored on machine.<br/>Replacement Operator's Manual can be ordered through your local Wacker Neuson distributor.</p>  |  |                           |                            |   |  |   |  |   |
| <p>BB</p>   |  <p>113726</p>  | <p>Tie-down point</p>   |  |                           |                            |   |  |   |  |   |
| <p>CC</p>   | <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>ULTRA LOW SULFUR FUEL ONLY.<br/>NUR ULTRANEIDRIGEN SCHWELFKRAFTSTOFF.<br/>SOLAMENTE COMBUSTIBLE DE ULTRABAJA CONTENIDO DE AZUFRE.<br/>SEULEMENT CARBURANT DE SOUFRE ULTRA BAS.</p> </div>  <p>0180563</p>  | <p>Ultra low sulfur fuel only.</p>  |  |                           |                            |   |  |   |  |   |
| <p>DD</p>   |  <p>177123</p>  | <p>Insert jack locking pin before extending jack.</p>   |  |                           |                            |   |  |   |  |   |
| <p>FF</p>   |  <p>177124</p>  | <p>Fork lift pocket</p>   |  |                           |                            |   |  |   |  |   |
| <p>GG</p>   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: 8px;">TOWING INSTRUCTIONS</th> <th style="font-size: 8px;">ABSCHLEPPINSTRUKTIONEN</th> <th style="font-size: 8px;">INSTRUCCIONES DE REMOLQUE</th> <th style="font-size: 8px;">INSTRUCTIONS DE REMORQUAGE</th> </tr> </thead> <tbody> <tr> <td style="font-size: 8px;">                     1. READ OPERATOR'S MANUAL.<br/>                     2. USE TOW HOOKS FOR TRAILER'S<br/>                     3. VERIFY VEHICLE WEIGHT RATING.<br/>                     4. SECURELY ATTACH HITCHES TO THE VEHICLE.<br/>                     5. ATTACH SAFETY CHAINS USING CROSS<br/>                     PATTERN.<br/>                     6. CHECK TRAILER LIGHTS.                 </td> <td style="font-size: 8px;">                     1. ABLESENDRUCKEN LESEN.<br/>                     2. ANWENDENDEN HÖCKER FÜR ANHÄNGER.<br/>                     3. ÜBERPRÜFE FÜR WEGE DER TRAILER<br/>                     4. SICHER ANSCHLIEßEN AN DIE WAGEN.<br/>                     5. VERBODEN VERWENDEN KREUZ<br/>                     MUSTER.<br/>                     6. ÜBERPRÜFE LUCHTLEUCHTEN.                 </td> <td style="font-size: 8px;">                     1. LEA EL MANUAL DEL OPERARIO.<br/>                     2. ÚSELE EN SU VEHÍCULO CON UN<br/>                     GANCHO DE TIRÓN PARA EL TRACTOR.<br/>                     3. VERIFIQUE EL PESAJE DEL VEHÍCULO DEL REMOLQUE.<br/>                     4. CONECTE LOS ANCHOS CORRECTAMENTE EN<br/>                     EL VEHÍCULO AL REMOLQUE.<br/>                     5. ATÁMELOS EN EL VEHÍCULO CON UN<br/>                     PATRÓN EN CRUZ.<br/>                     6. VERIFIQUE LAS LUCES DEL REMOLQUE.                 </td> <td style="font-size: 8px;">                     1. LIRE LA NOTICE D'EMPLOI.<br/>                     2. EMPLOYER UN HOOKET À TRACTEUR CORRECTEMENT<br/>                     AU TRACTEUR. 3. VÉRIFIER LE PONDUS DU<br/>                     VEHICULE À REMORQUER.<br/>                     4. RATTACHER LES ANCHES CORRECTEMENT AU<br/>                     VEHICULE À REMORQUER.<br/>                     5. ATTACHER LES CHAINES EN CRUCEZ EN<br/>                     PATTERNE EN X.<br/>                     6. VÉRIFIER LES LAMPES DE LA REMORQUE.                 </td> </tr> </tbody> </table> <p>11498</p> | TOWING INSTRUCTIONS   | ABSCHLEPPINSTRUKTIONEN   | INSTRUCCIONES DE REMOLQUE | INSTRUCTIONS DE REMORQUAGE | 1. READ OPERATOR'S MANUAL.<br>2. USE TOW HOOKS FOR TRAILER'S<br>3. VERIFY VEHICLE WEIGHT RATING.<br>4. SECURELY ATTACH HITCHES TO THE VEHICLE.<br>5. ATTACH SAFETY CHAINS USING CROSS<br>PATTERN.<br>6. CHECK TRAILER LIGHTS. | 1. ABLESENDRUCKEN LESEN.<br>2. ANWENDENDEN HÖCKER FÜR ANHÄNGER.<br>3. ÜBERPRÜFE FÜR WEGE DER TRAILER<br>4. SICHER ANSCHLIEßEN AN DIE WAGEN.<br>5. VERBODEN VERWENDEN KREUZ<br>MUSTER.<br>6. ÜBERPRÜFE LUCHTLEUCHTEN. | 1. LEA EL MANUAL DEL OPERARIO.<br>2. ÚSELE EN SU VEHÍCULO CON UN<br>GANCHO DE TIRÓN PARA EL TRACTOR.<br>3. VERIFIQUE EL PESAJE DEL VEHÍCULO DEL REMOLQUE.<br>4. CONECTE LOS ANCHOS CORRECTAMENTE EN<br>EL VEHÍCULO AL REMOLQUE.<br>5. ATÁMELOS EN EL VEHÍCULO CON UN<br>PATRÓN EN CRUZ.<br>6. VERIFIQUE LAS LUCES DEL REMOLQUE. | 1. LIRE LA NOTICE D'EMPLOI.<br>2. EMPLOYER UN HOOKET À TRACTEUR CORRECTEMENT<br>AU TRACTEUR. 3. VÉRIFIER LE PONDUS DU<br>VEHICULE À REMORQUER.<br>4. RATTACHER LES ANCHES CORRECTEMENT AU<br>VEHICULE À REMORQUER.<br>5. ATTACHER LES CHAINES EN CRUCEZ EN<br>PATTERNE EN X.<br>6. VÉRIFIER LES LAMPES DE LA REMORQUE. | <p>Read Operator's Manual.<br/>Use hitch rated from trailer's "Gross Vehicle Weight Rating".<br/>Securely attach trailer to tow vehicle.<br/>Attach safety chains using cross pattern.<br/>Attach breakdown chain to vehicle.<br/>Check trailer lights.</p> |
| TOWING INSTRUCTIONS   | ABSCHLEPPINSTRUKTIONEN   | INSTRUCCIONES DE REMOLQUE   | INSTRUCTIONS DE REMORQUAGE   |                           |                            |   |  |   |  |   |
| 1. READ OPERATOR'S MANUAL.<br>2. USE TOW HOOKS FOR TRAILER'S<br>3. VERIFY VEHICLE WEIGHT RATING.<br>4. SECURELY ATTACH HITCHES TO THE VEHICLE.<br>5. ATTACH SAFETY CHAINS USING CROSS<br>PATTERN.<br>6. CHECK TRAILER LIGHTS. | 1. ABLESENDRUCKEN LESEN.<br>2. ANWENDENDEN HÖCKER FÜR ANHÄNGER.<br>3. ÜBERPRÜFE FÜR WEGE DER TRAILER<br>4. SICHER ANSCHLIEßEN AN DIE WAGEN.<br>5. VERBODEN VERWENDEN KREUZ<br>MUSTER.<br>6. ÜBERPRÜFE LUCHTLEUCHTEN.   | 1. LEA EL MANUAL DEL OPERARIO.<br>2. ÚSELE EN SU VEHÍCULO CON UN<br>GANCHO DE TIRÓN PARA EL TRACTOR.<br>3. VERIFIQUE EL PESAJE DEL VEHÍCULO DEL REMOLQUE.<br>4. CONECTE LOS ANCHOS CORRECTAMENTE EN<br>EL VEHÍCULO AL REMOLQUE.<br>5. ATÁMELOS EN EL VEHÍCULO CON UN<br>PATRÓN EN CRUZ.<br>6. VERIFIQUE LAS LUCES DEL REMOLQUE. | 1. LIRE LA NOTICE D'EMPLOI.<br>2. EMPLOYER UN HOOKET À TRACTEUR CORRECTEMENT<br>AU TRACTEUR. 3. VÉRIFIER LE PONDUS DU<br>VEHICULE À REMORQUER.<br>4. RATTACHER LES ANCHES CORRECTEMENT AU<br>VEHICULE À REMORQUER.<br>5. ATTACHER LES CHAINES EN CRUCEZ EN<br>PATTERNE EN X.<br>6. VÉRIFIER LES LAMPES DE LA REMORQUE. |                           |                            |   |  |   |  |   |

|           |   |  |
|-----------|---|--|
| <p>HH</p> |    | <p>Neutral bonded to frame</p>   |
| <p>JJ</p> |    | <p>Fuses</p> <ol style="list-style-type: none"> <li>1. Not used</li> <li>2. Controller</li> <li>3. Fuel pump / solenoid</li> <li>4. Alternator</li> </ol>  |
| <p>KK</p> |   | <p>Certification Label (VIN Number)<br/>Also attached to each unit is a Certification Label. This label specifies that the trailer conforms with all Federal Motor Vehicle Standards in effect at the time of manufacture. The label includes the Vehicle Identification Number (VIN) for the trailer.</p> |
| <p>LL</p> |  | <p>WARNING!<br/>Electric shock and arc flash can cause serious injury or death. Electrical storage device within. Contact a qualified electrician for service or to open electrical box.</p>   |
| <p>MM</p> |  | <p>Transport position of the jack</p>  |
| <p>NN</p> |  | <p>Not a step</p>  |

|           |   |   |
|-----------|---|---|
| <p>OO</p> |  <p>181117</p>       | <p>WARNING</p> <p>When towing in tandem:<br/>Do not tow on highway<br/>Do not tow more than two units<br/>Do not exceed 35 mph (55 kph)</p> <p>Maximum Gross Vehicle Weight Rating (GVWR)</p> <p>Maximum Tongue Weight</p>  |
| <p>PP</p> |  <p>177197</p>       | <p>Engine controls<br/>Hour meter</p>   |
| <p>QQ</p> |                      | <p>Protecting Our Environment<br/>Fluid containment system<br/>(if equipped)</p>  |
| <p>RR</p> |  <p>160604</p>      | <p>Skid drain access point</p>  |
| <p>SS</p> |  <p>5200000732</p> | <p>CAUTION<br/>Wheel nuts must be tightened to 85 ft.lbs.</p>   |
| <p>TT</p> |  <p>530001673</p>  | <p>WARNING</p> <p>Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.</p> |

|  |   |  |
|--|---|--|
|  | <p>U.S.PAT.Nos.: 6012285, 6471476,<br/>D416858, D454357 OTHER U.S. AND<br/>FOREIGN PATENTS PENDING<br/>UTILITY 159116</p> | <p>This machine may be covered by one or more patents.</p> |
|--|---|--|

### 3 Operation

#### 3.1 Preparing the Machine for First Use

**Preparing for first use**

To prepare your machine for first use:

1. Make sure all loose packaging materials have been removed from the machine.
2. Check the machine and its components for damage. If there is visible damage, do not operate the machine! Contact your Wacker Neuson dealer immediately for assistance.
3. Take inventory of all items included with the machine and verify that all loose components and fasteners are accounted for.
4. Attach component parts not already attached.
5. Add fluids as needed and applicable, including fuel, engine oil, and battery acid.
6. Move the machine to its operating location.

**CO Alarms**

Because this machine produces carbon monoxide (CO), Wacker Neuson recommends that CO alarms be installed in all structures in close proximity to the machine. CO alarms provide an extra measure of protection against this poison that you cannot see or smell.

Install battery-operated CO alarms or plug-in CO alarms with battery backup, according to the manufacturer's instructions. CO alarms should be certified to the requirements of the latest safety standards (UL 2034, IAS 6-96, or CSA 6.19.01). Test the CO alarm batteries monthly.



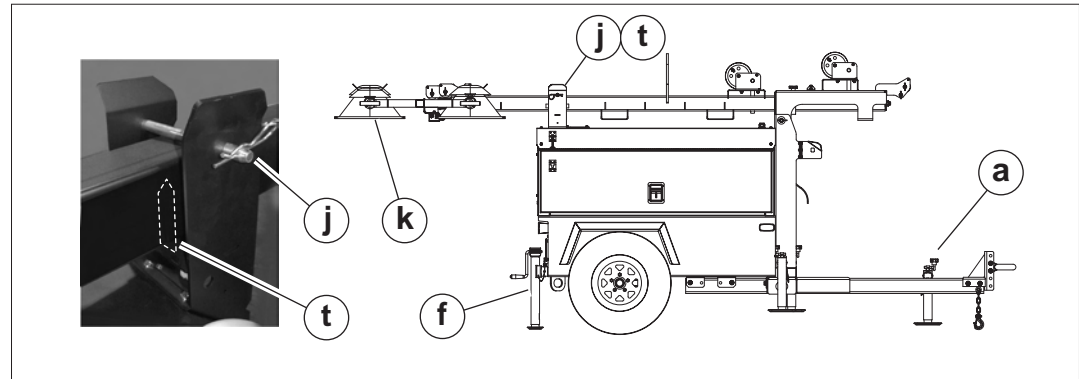
### 3.2 Preparing Trailer for Towing or Lifting

**NOTICE:** Allow the lights to cool 10–15 minutes before lifting or moving the trailer. Moving the trailer while the lights are still hot could cause the lamps to break.

#### Preparing the trailer for lifting

Follow the procedure below to prepare the trailer for lifting.

1. Ensure that the tower is completely nested inside the transport cradle and the pin (**t**) is secure.



wc\_gr006223

2. Check that the tower cradle lock pin (**j**) is in place and secured with the safety pin
3. Make sure the doors are properly latched.
4. Return the outriggers to their travel position. Check that the outrigger bars and jacks are locked in place.
5. Crank the rear jack (**f**) all the way in and rotate it 90°.

The Light Tower is now ready to lift. Use the designated lift points.

#### Preparing the trailer for towing

Follow the procedure below to prepare the trailer for towing.

1. Prepare the trailer for lifting as described above.
2. Use the tongue jack (**a**) to raise the trailer tongue up and then lower it over hitch on towing vehicle.
3. Lock the hitch to coupling and attach the safety chains.
4. Swivel the tongue jack 90° and lock it in place.
5. Connect the trailer wiring to the towing vehicle. Check the brake, turn, and tail lights for proper operation.
6. Position the light fixtures down (**k**). For rough, off-road transportation remove lamps from fixtures to avoid damage.
7. Check the tire inflation.

#### Towing speed

The maximum recommended speed for highway towing is 88 km/hour (55 mph). Recommended off-road towing speed is not to exceed 16 km/hour (10 mph) or less depending on terrain.

## 3.3 Locating the Trailer

### Positioning the machine

- For maximum light coverage, locate the Light Tower at ground level or in a spot higher than the area being lighted.



### WARNING

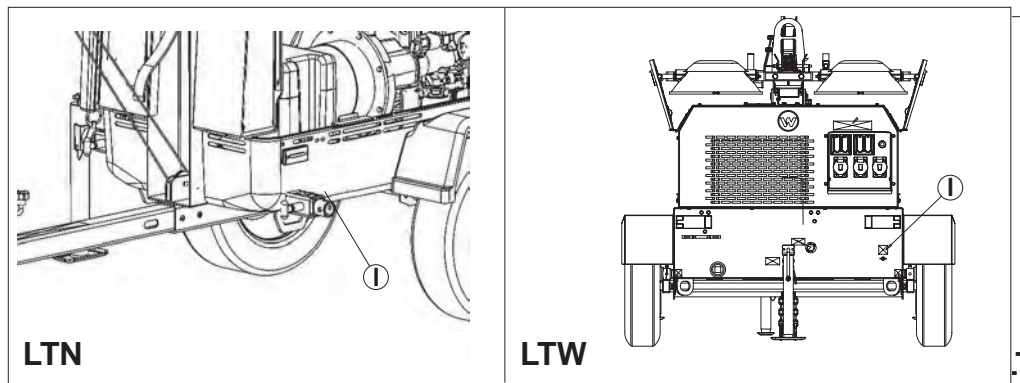
Electric shock or equipment damage hazards. The tower extends up to 9 m (30 ft.) and could interfere with overhead wires and obstructions.

- ▶ Position the trailer on a firm, flat surface clear of overhead wires and obstructions.

- Make sure that there is enough area for outrigger extensions to be fully extended.

## 3.4 Ground Connection

A ground connection (I) is located on the trailer frame.



wc\_gr005225

### Function

This ground connection is used for electrically grounding the Light Tower when necessary to comply with the National Electrical Code and other federal, state, and local regulations. For grounding requirements in your area, consult with a qualified electrician, electrical inspector, or local agency having jurisdiction over electrical compliance.

- If the Light Tower is used at a construction site, there may be additional regulations which must be observed.

### 3.5 Leveling Trailer



**WARNING**

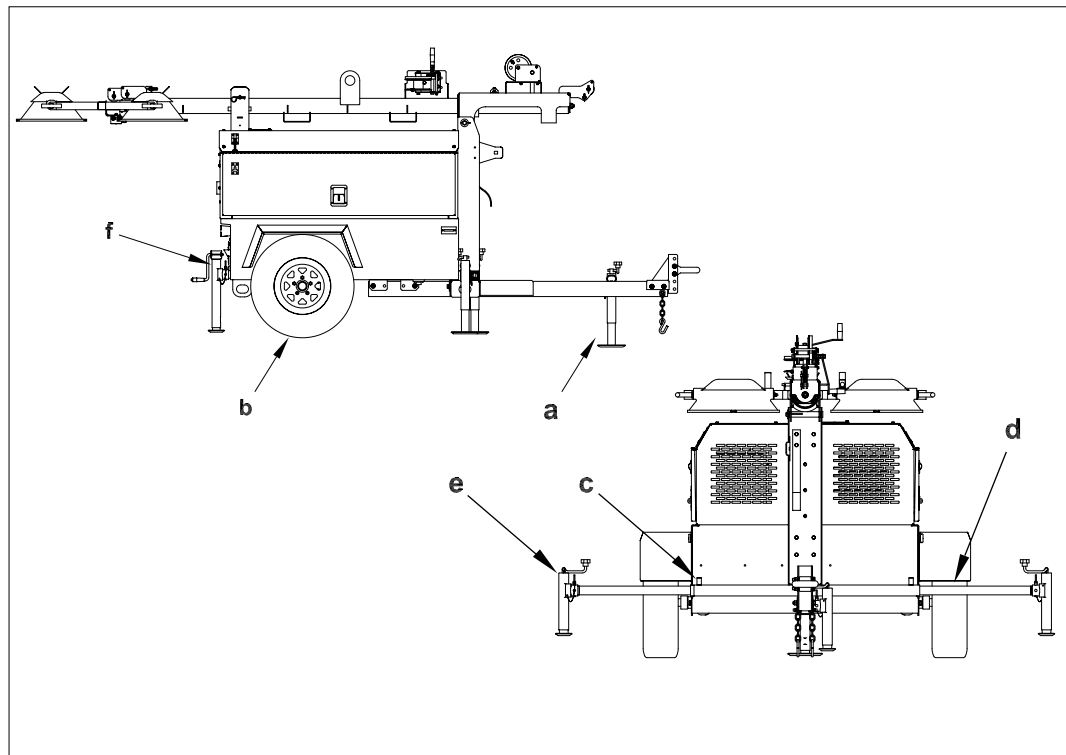
Tipping / falling hazard. Failure to level the trailer or extend the outriggers will severely reduce the stability of the unit.

- ▶ Level the trailer and extend the outriggers before raising the tower. The outriggers must remain extended while the tower is up.

**Procedure**

Follow the procedure below to level the trailer.

1. Pull the locking pin on the tongue jack (a) and rotate the tongue jack down 90° as shown. Reinsert the pin once the jack is in position.



wc\_gr005874

2. Block or chock the trailer wheels (b). Crank the tongue jack down to raise the trailer tongue off the vehicle.
3. Pull the outrigger lock pin (c) to release the outrigger. Pull both outrigger extensions (d) out until you feel outrigger lock pin lock back into place.
4. Pull the locking pins on the outrigger jacks (e). Rotate the jacks 90° down. Reinsert the pins once the jacks are in position.
5. Pull the locking pin on the rear jack (f) and rotate the rear jack down 90° as shown. Reinsert the pin once the jack is in position.
6. Extend the jack(s) on the highest side(s) of the trailer until they rest firmly on the ground. Extend the remaining jacks until the trailer is level.

## 3.6 Refueling the Machine

- Requirements**
- Machine shut down
  - Engine cool
  - Machine/fuel tank level with the ground
  - Fresh, clean fuel supply

**Procedure** Perform the procedure below to refuel the machine.

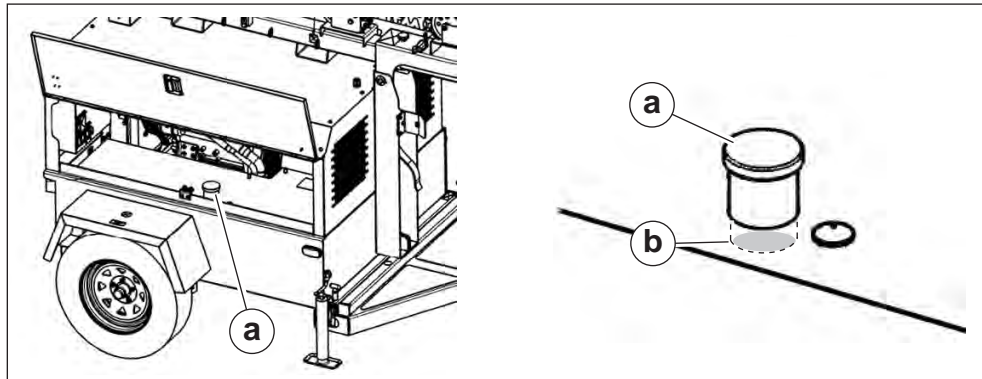
**WARNING**

Fire hazard. Fuel and its vapors are extremely flammable. Burning fuel can cause severe burns.



- ▶ Keep all sources of ignition away from the machine while refueling.
- ▶ Refuel only when the machine is outdoors.
- ▶ Clean up spilled fuel immediately.

1. Remove the fuel cap (a).



wc\_gr008817

2. Fill the fuel tank to the bottom of the fuel tank neck (b).

**CAUTION**

Fire and health hazard. Fuel expands when heated. Expanding fuel in an over-filled tank can lead to spills and leaks.



- ▶ Do not overfill the fuel tank.

3. Reinstall the fuel cap.

**Result** The procedure to refuel the machine is now complete.

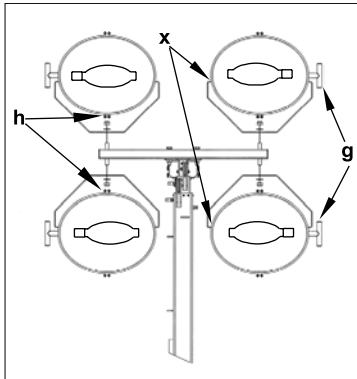
### 3.7 Adjusting the Lights

**Background** Each light fixture can be aimed up, down, left, or right.

---

**Procedure** Follow the procedure below to adjust the lights.

1. Loosen the toolless light adjusters (**g**).



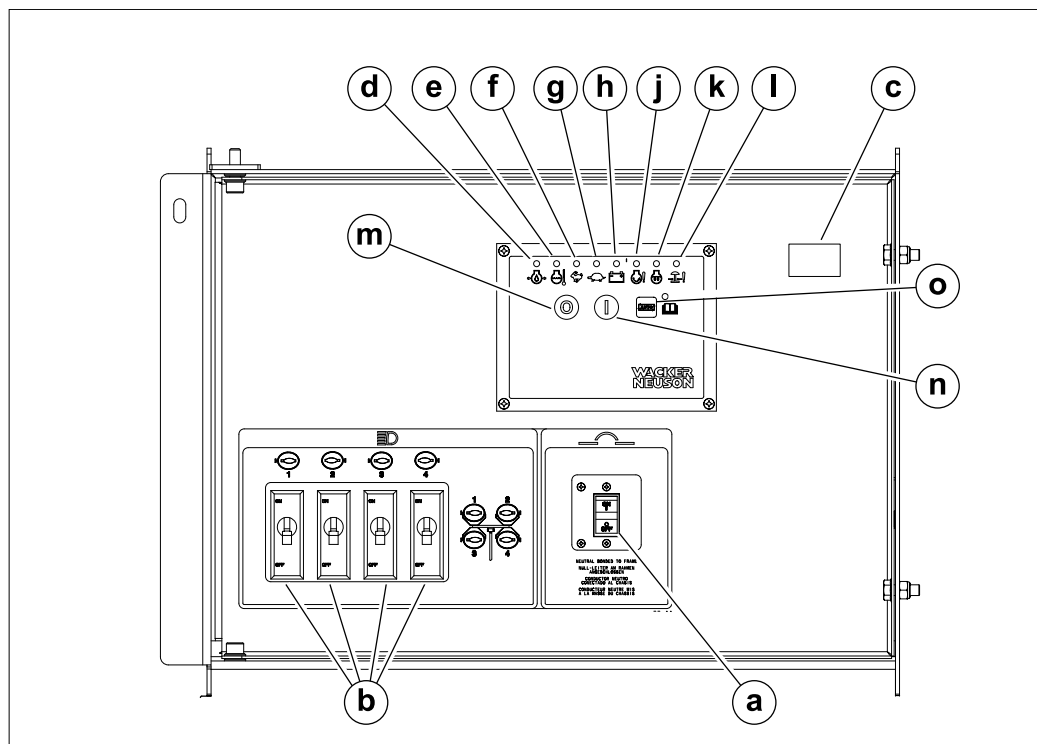
wc\_gr005226

2. Aim the light fixtures up or down.
  3. Loosen the nuts (**h**).
  4. Turn the light fixtures left or right.
  5. Tighten adjusters and nuts after positioning the lights.
- 

**NOTICE:** Do not loosen the inside nut (**x**). Loosening this nut could damage the light fixture.

---

3.8 Control Panel (Manual Winch System)



wc\_gr005228

| Ref. | Description                         | Ref. | Description                        |
|------|-------------------------------------|------|------------------------------------|
| a    | Main circuit breaker                | h    | Charge failure indicator           |
| b    | 15 Amp lights circuit breaker       | j    | Overcrank shutdown fault indicator |
| c    | Hour meter                          | k    | Glow plug indicator                |
| d    | Low oil pressure shutdown indicator | l    | Safety shutdown indicator          |
| e    | High coolant temperature shutdown   | m    | Stop switch                        |
| f    | Overspeed shutdown fault indicator  | n    | Start switch                       |
| g    | Underspeed shutdown fault indicator | o    | Auto                               |

### 3.9 Raising the Tower (Manual Winch System)

**Background** The Light Tower includes two separate winches—one for lifting the tower to the vertical position, the other for raising the tower. Each winch is an automatic brake-type winch that automatically brakes when the handle is released. The handle must be rotated to wind in the cable as well as to unwind the cable.

- Prerequisites**
- Machine is shut down
  - Light Tower is located on a firm, flat surface clear of overhead wires and obstructions
  - Winch cables are in serviceable condition and resting properly in pulleys
  - Light tower has been leveled, with all outriggers extended and locked



**WARNING**

Electric shock hazard! Do not use the Light Tower if insulation on any of the electrical cords is cut or worn through. Bare wires in contact with the metal frame of the trailer or tower can cause electrocution.

- ▶ Repair or replace the cord before using the machine.



**WARNING**

Electrocution hazard.

- ▶ Do not position the Light Tower under electrical power lines.



**WARNING**

Tipping/falling hazards. Certain actions may cause the tower to fall or the Light Tower to tip over.

- ▶ Do not extend the tower beyond the red marking on the tower shaft.
- ▶ Do not raise the tower or operate the Light Tower in high winds.
- ▶ Do not touch the winch pawl while the tower is raised!
- ▶ Do not pull the vertical tower locking pin while the tower is raised.



**WARNING**

Personal injury hazard. Bystanders can be struck by the tower as it is being raised or lowered.

- ▶ Do not allow anyone to stand near the rear of the machine while raising or lowering the tower.

*This procedure continues on the next page.*

**Procedure** Follow the procedure below to raise the tower.

**Lifting the tower to the vertical position**

1. Remove the cradle locking pin **(j)** from the cradle.
2. Check the operation of the tilt winch **(o)** by rotating the winch handle 1/4 turn clockwise ("cable in" direction). The winch pawl must engage the winch gear teeth. When operating properly, the winch pawl will make a "clicking" sound when the winch handle is rotated clockwise.

---

**NOTICE:** Do not attempt to lift the tower if the winch is damaged or not operating properly, or if the winch cables are worn or damaged.

---

3. Continue to rotate the winch handle and lift the tower to the vertical position until the vertical tower locking pin **(p)** locks the tower in place. Be certain the vertical tower locking pin is fully engaged in the locking position before raising the tower.

**Raising the tower**

4. After the tower is vertical, check the operation of the telescoping winch **(q)** by rotating the winch handle 1/4 turn clockwise ("cable in" direction). The winch pawl must engage the winch gear teeth. When operating properly, the winch pawl will make a "clicking" sound when the winch handle is rotated clockwise.

---

**NOTICE:** Do not attempt to raise the tower if the winch is damaged or not operating properly, or if the winch cables are worn or damaged.

---

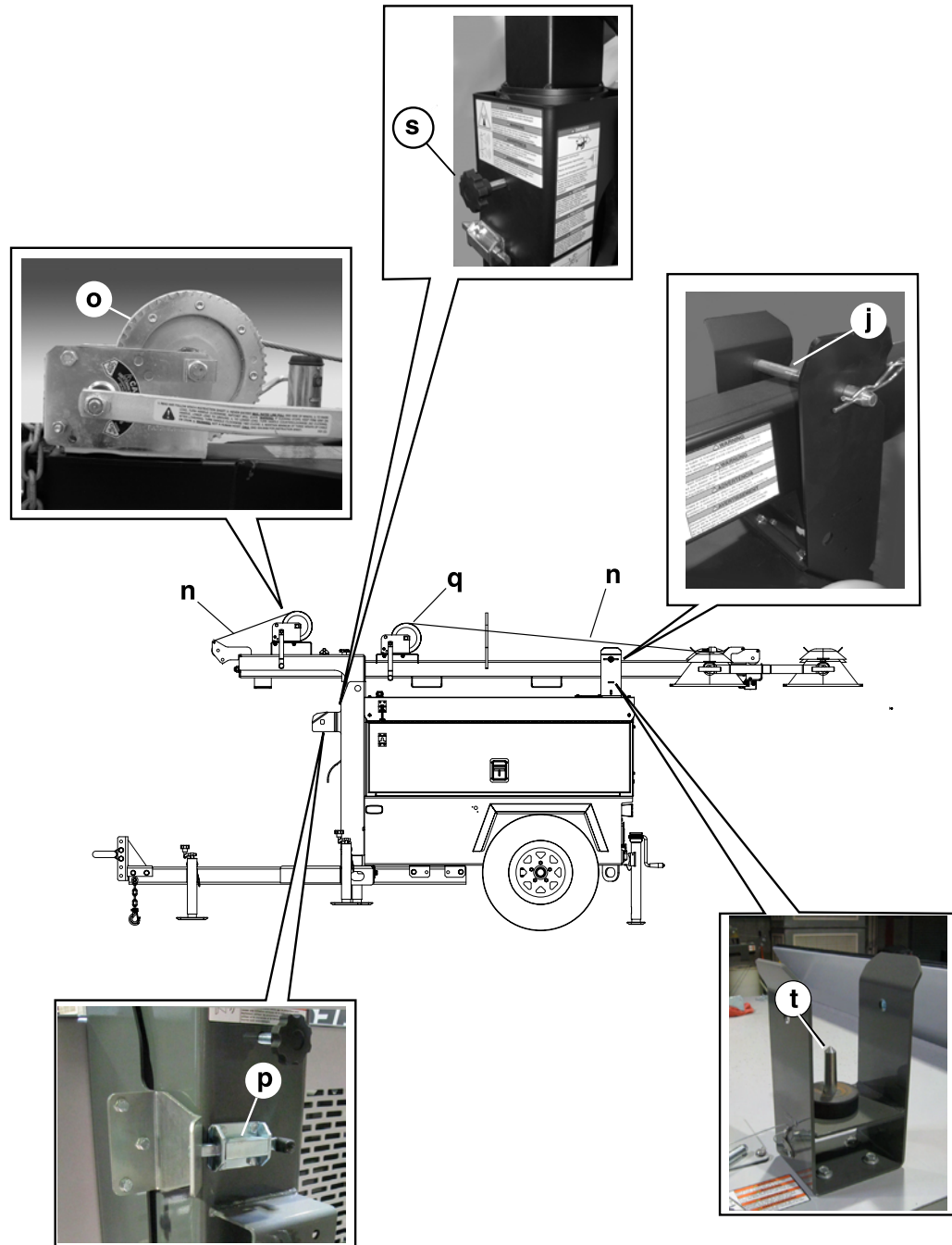
5. Continue rotating the winch handle until the tower is at the desired height. Do not overcrank the winch when the tower is fully extended.

**Rotating the tower**

Once the tower is at the desired height, rotate the tower to the desired direction.

1. Loosen the rotation locking knob **(s)**.
2. Rotate the tower until the lights face the desired direction.
3. Retighten the rotation locking knob.





wc\_gr006231

### 3.10 Lowering the Tower (Manual Winch System)

- Prerequisites**
- Operating instructions have been read and understood
  - Lights are turned off
  - Engine is shut down
  - Winch cables are in serviceable condition and resting properly in pulleys
- 

**WARNING**

Tipping/falling hazards. Certain actions may cause the tower to fall or the machine to tip over.

- ▶ Do not extend the tower beyond the red marking on the tower shaft.
  - ▶ Do not raise the tower or operate the Light Tower in high winds.
  - ▶ Do not touch the winch pawl while the tower is raised!
  - ▶ Do not pull the vertical tower locking pin while the tower is raised.
- 

**WARNING**

Personal injury hazard. Bystanders can be struck by the tower as it is being raised or lowered.

- ▶ Do not allow anyone to stand near the rear of the machine while raising or lowering the tower.
- 

**Procedure**

Follow the procedure below to lower the tower.

1. Turn the handle on the telescoping winch (**q**) counterclockwise (“cable out” direction).
  2. Loosen the rotation locking knob (**s**) and rotate the tower so the lights face the rear of the trailer and the telescoping winches are facing toward the trailer tongue.
  3. Pull and hold the tower locking pin (**p**). Rotate the handle on the tilt winch (**o**) counterclockwise (“cable out” direction) until the tower spring begins to pivot the tower down.
- 

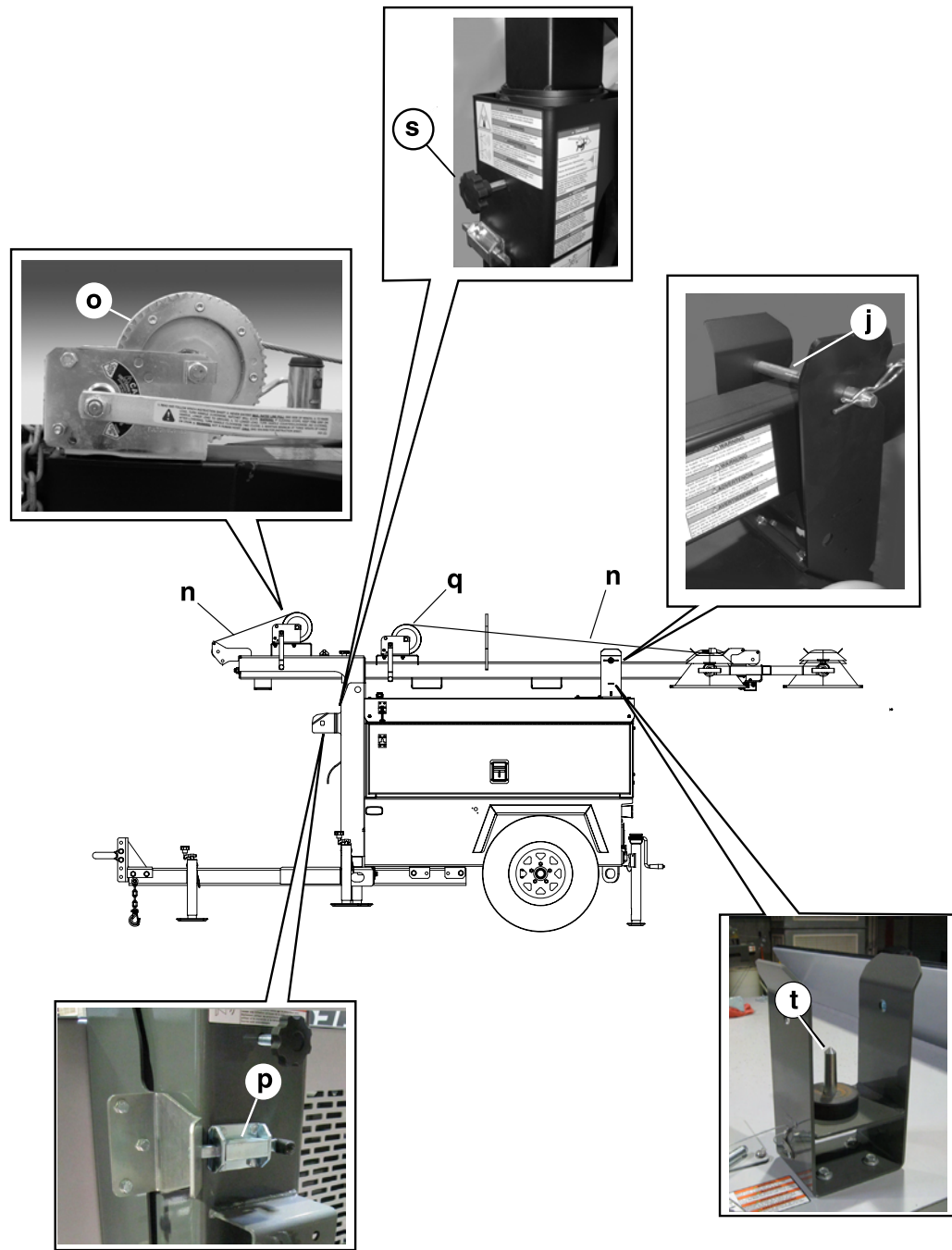
**WARNING**

Personal injury hazard. Tower could collapse if the winch cable develops slack.

- ▶ Stop turning the winch immediately if part of the tower hangs up, or if a winch cable develops slack before the tower is fully lowered.
- 

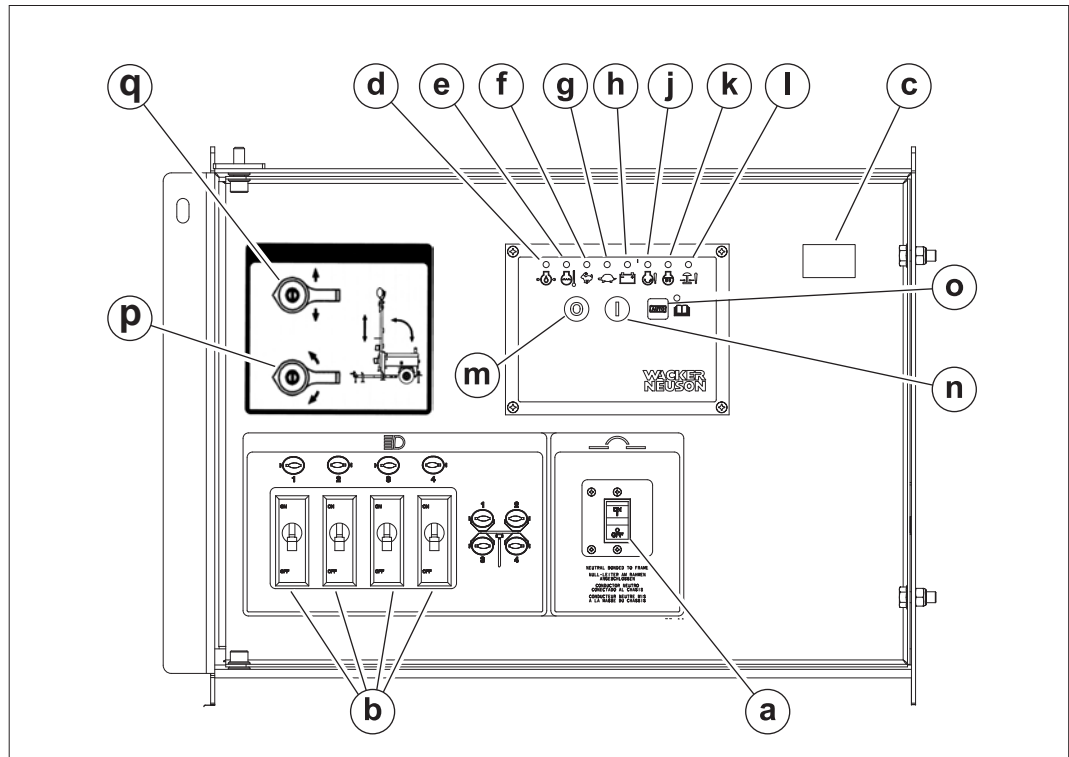
**NOTICE:** If the tower hangs up, level the trailer, and slightly shake or twist the tower assembly to free the bind. Contact an authorized Wacker Neuson service center immediately if this procedure does not correct the problem.

4. Release the tower locking pin and continue to rotate the handle until the tower is resting in the transport cradle. Make sure that the secondary locking pin (**t**) penetrates all sections of the tower.
5. After the tower is down, secure it in the cradle by inserting the cradle lock pin (**j**). Insert the clip through the pin to lock it in place.
6. Position the light fixtures to aim at the ground.



wc\_gr006231

3.11 Control Panel (Power Winch System)



wc\_gr006906

| Ref. | Description                         | Ref. | Description                        |
|------|-------------------------------------|------|------------------------------------|
| a    | Main circuit breaker                | j    | Overcrank shutdown fault indicator |
| b    | 15 Amp lights circuit breaker       | k    | Glow plug indicator                |
| c    | Hour meter                          | l    | Safety shutdown indicator          |
| d    | Low oil pressure shutdown indicator | m    | Stop switch                        |
| e    | High coolant temperature shutdown   | n    | Start switch                       |
| f    | Overspeed shutdown fault indicator  | o    | Auto                               |
| g    | Underspeed shutdown fault indicator | p    | Tilt rotary switch                 |
| h    | Charge failure indicator            | q    | Telescope rotary switch            |

### 3.12 Raising the Tower (Power Winch System)

**Background** The Light Tower includes two separate winches—one for lifting the tower to the vertical position, the other for raising the tower.

- Prerequisites**
- Machine is shut down
  - Light Tower is located on a firm, flat surface clear of overhead wires and obstructions
  - Winch cables are in serviceable condition and resting properly in pulleys
  - Light Tower has been leveled, with all outriggers extended and locked



**WARNING**

Electric shock hazard! Do not use the Light Tower if insulation on any of the electrical cords is cut or worn through. Bare wires in contact with the metal frame of the trailer or tower can cause electrocution.

- ▶ Repair or replace the cord before using the machine.



**WARNING**

Electrocution hazard.

- ▶ Do not position the Light Tower under electrical power lines.



**WARNING**

Tipping/falling hazards. Certain actions may cause the tower to fall or the Light Tower to tip over.

- ▶ Do not extend the tower beyond the red marking on the tower shaft.
- ▶ Do not raise the tower or operate the Light Tower in high winds.
- ▶ Do not touch the winch pawl while the tower is raised!
- ▶ Do not pull the vertical tower locking pin while the tower is raised.



**WARNING**

Personal injury hazard. Bystanders can be struck by the tower as it is being raised.

- ▶ Do not allow anyone to stand near the rear of the machine while raising the tower.

**Procedure** Follow the procedure below to raise the tower.

**Lifting the tower to the vertical position**

1. Remove the cradle locking pin **(j)** from the cradle.
2. Check the operation of the tilt winch **(r)**. Turn the tilt rotary switch **(p)** on the control panel to the up position. The tower should begin to tilt.

**Note:** *It is normal for smoke to be produced during the first few operations of a new power winch.*

---

**NOTICE:** Do not attempt to lift or raise the tower if the winch is damaged or not operating properly, or if the winch cables are worn or damaged. Continuous running of the winch in excess of 4 minutes will damage the winch motor.

---

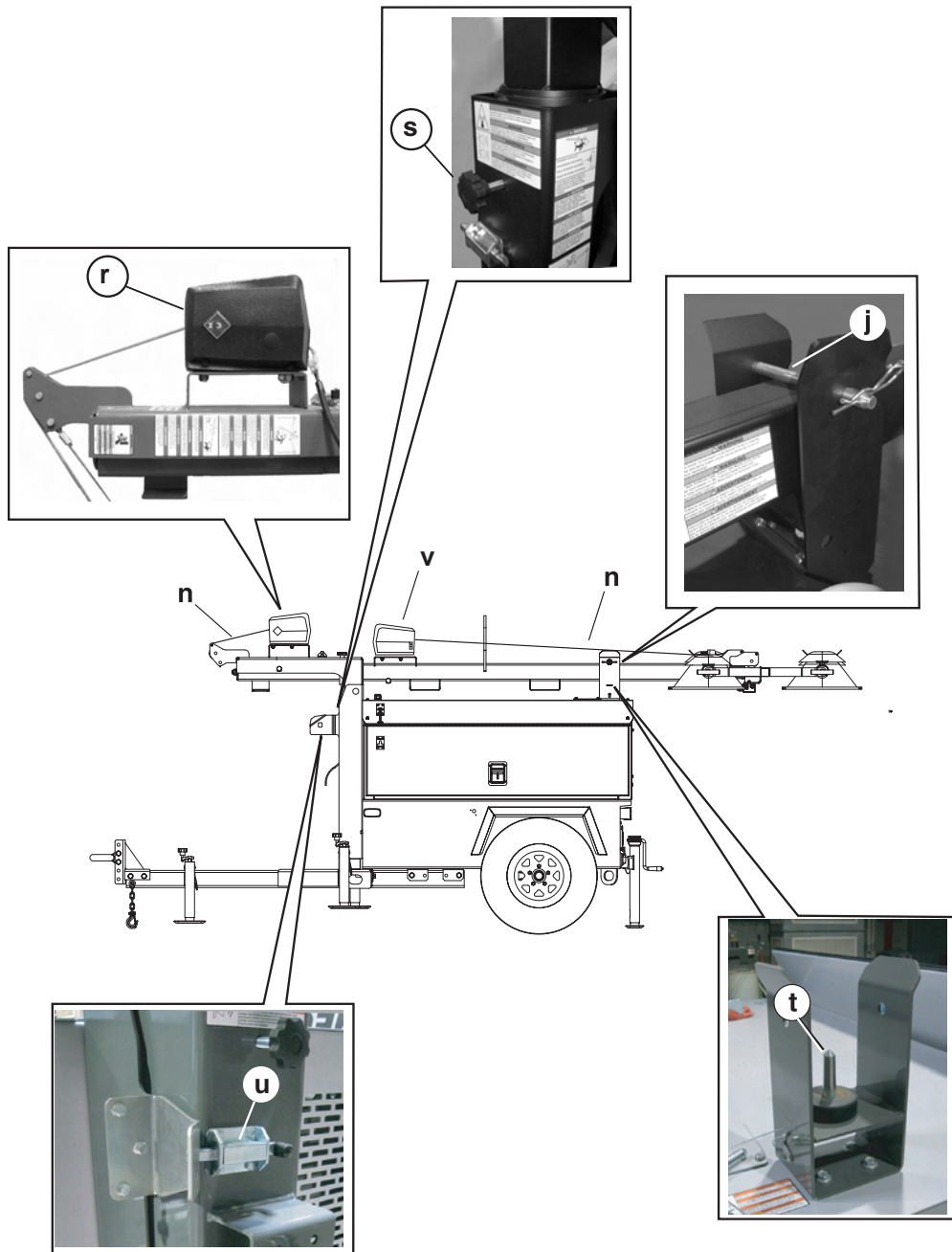
3. Hold the tilt rotary switch in the up position and raise the tower to the vertical position until the vertical tower locking pin **(u)** locks the tower in place. Be certain the vertical tower locking pin is fully engaged in the locking position before raising the tower.

**Raising the tower**

4. After the tower is vertical, check the operation of the telescoping winch **(v)**. Turn the telescope rotary switch **(q)** on the control panel to the up position.
5. Continue to hold the telescope rotary switch until the tower is at the desired height. Release the switch when the tower is fully extended.

**Rotating the tower**

- Once the tower is at the desired height, rotate the tower to the desired direction.
1. Loosen the rotation locking knob **(s)**.
  2. Rotate the tower until the lights face the desired direction.
  3. Retighten the rotation locking knob.



wc\_gr006972

### 3.13 Lowering the Tower (Power Winch System)

- Prerequisites**
- Operating instructions have been read and understood
  - Lights are turned off
  - Engine is shut down
  - Winch cables are in serviceable condition

**WARNING**

Tipping/falling hazards. Certain actions may cause the tower to fall or the machine to tip over.

- ▶ Do not extend the tower beyond the red marking on the tower shaft.
- ▶ Do not raise the tower or operate the Light Tower in high winds.
- ▶ Do not touch the winch pawl while the tower is raised!
- ▶ Do not pull the vertical tower locking pin while the tower is raised.

**WARNING**

Personal injury hazard. Bystanders can be struck by the tower as it is being lowered.

- ▶ Do not allow anyone to stand near the rear of the machine while lowering the tower.

**Procedure** Follow the procedure below to lower the tower.

4. Lower the tower by turning and holding the telescope rotary switch **(q)** in the down position.

**NOTICE:** Continuous running of the winch in excess of 4 minutes will damage the winch motor.

**Note:** *It is normal for smoke to be produced during the first few operations of a new power winch.*

5. Loosen the rotation locking knob **(s)** and rotate the tower so the lights face the rear of the trailer and the telescoping winch faces the trailer tongue.
6. Pull and hold the tower locking pin **(u)**. Turn and hold the tilt rotary switch **(p)** on the control panel in the down position until the tower is resting in the transport cradle. Make sure that the secondary locking pin **(t)** penetrates all sections of the tower.

**WARNING**

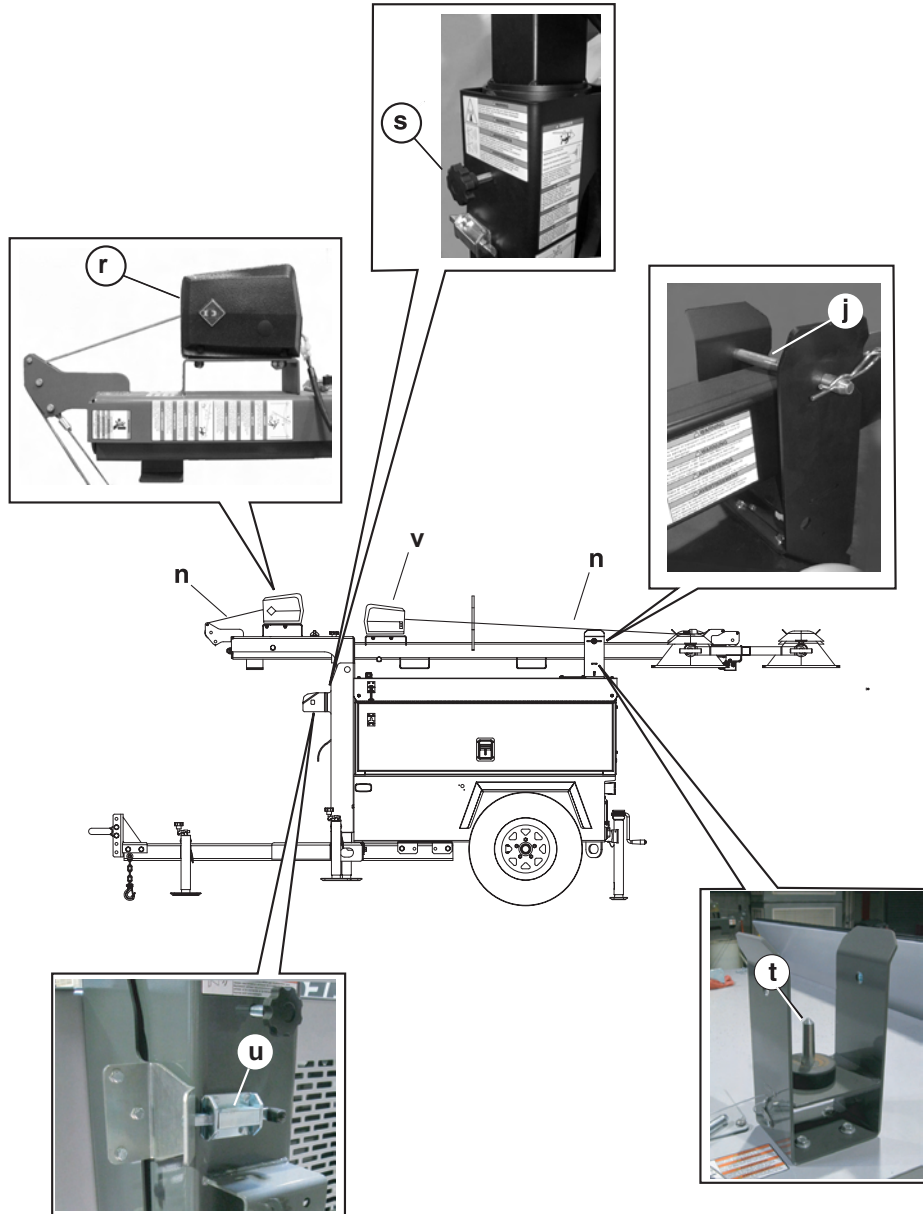
Personal injury hazard. Tower could collapse if the winch cable develops slack.

- ▶ Stop turning the winch immediately if part of the tower hangs up, or if a winch cable develops slack before the tower is fully lowered.

**NOTICE:** If the tower hangs up, level the trailer, and slightly shake or twist the tower assembly to free the bind. Contact an authorized Wacker Neuson service center immediately if this procedure does not correct the problem.

7. After the tower is down, secure it in the cradle by inserting the cradle lock pin **(j)**. Insert the clip through the pin to lock it in place.
8. Position the light fixtures to aim at the ground.





wc\_gr006972

### 3.14 Manually Starting the Machine

**Prerequisites**

- Engine oil, fuel, and coolant are at the proper levels

**Note:** *If fuel tank was drained or run dry it may be necessary to bleed fuel lines. Refer to engine operator's manual.*

- Electrical cable on the tower is in serviceable condition
- Circuit breakers **(a,b)** are in their OFF positions



---

**WARNING**

Electric shock hazard.

- ▶ Do not start the generator if the insulation on the tower electrical cable is cut or worn through.
- 

**NOTICE:** Starting the engine under load will damage the machine.

**Procedure**

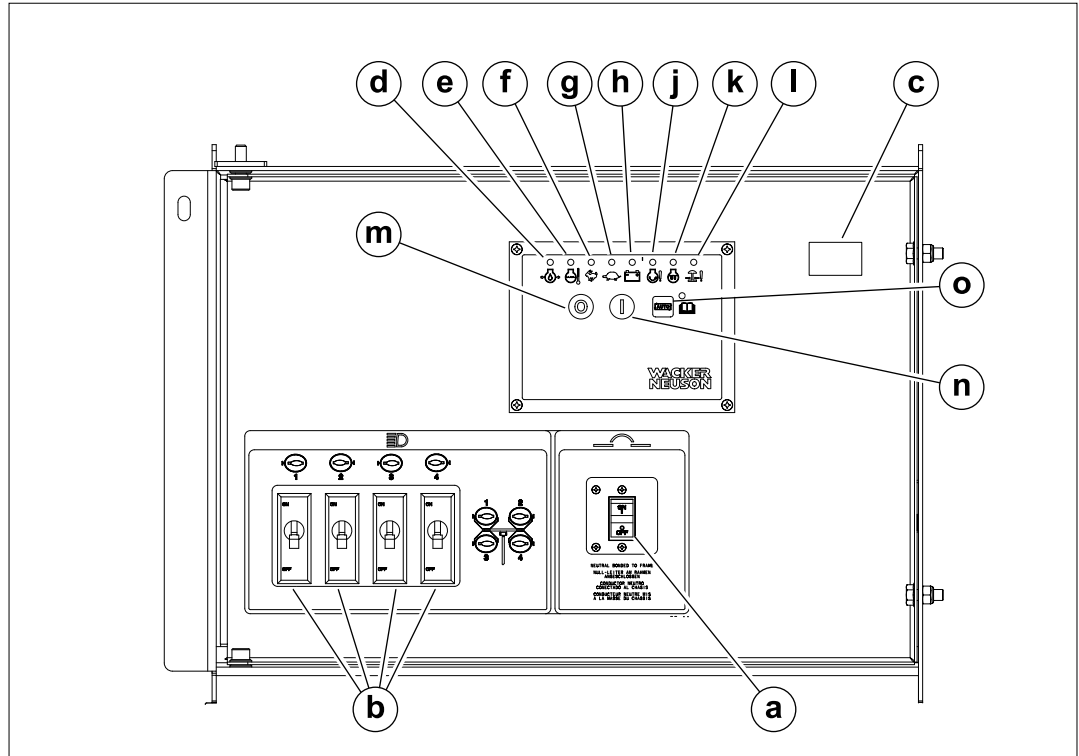
Follow the procedure below to manually start the machine.

1. Press the START switch **(n)**. This initiates the pre-heat timer, energizes the fuel solenoid, and energizes the starter motor.
2. The engine will crank for 10 seconds, and then rest for 10 seconds. If the engine does not start immediately, the cycle will repeat three (3) times.
3. If the engine does not start after three attempts, the starting sequence will be terminated and the Overcrank shutdown indicator **(j)** will light. See section *Troubleshooting Automatic Shutdown* for help.
4. When the engine starts, the starter motor is disengaged.

**Note:** *After the starter motor has disengaged, the Safety On Timer is activated. This timer is pre-set for a 12 second delay and allows oil pressure, high engine temperature, underspeed, and charge failure to stabilize without triggering the fault.*

5. If a fault occurs after the 12 second delay, see section *Troubleshooting Automatic Shutdown*.
6. Allow engine to warm up before operating lights.

**NOTICE:** Do not use starting fluids to aid in starting of engine.



wc\_gr005228

### 3.15 Stopping the Machine

**Prerequisite** ■ Lights are turned off.

---

**NOTICE:** Generator will be damaged if the engine is shut down before turning off the lights.

---

**Stopping the machine** Push the STOP button (**m**) to de-energize the fuel solenoid.

### 3.16 Auto Mode (Remote Run)

The engine controller is capable of automatically starting the engine. Contact Wacker Neuson Product Support for more information.

### 3.17 Troubleshooting Automatic Shutdown

**Background** There are five automatic shutdown conditions:

- low oil pressure
- high coolant temperature
- engine overspeed
- engine underspeed
- engine overcrank

When these occur, the operator can perform certain diagnostic tests to help identify the problem. Most of these diagnostics deal with the engine.

When a fault occurs, the fault must be removed and the shutdown alarm must be cleared to reset the Engine Control Module (ECM).

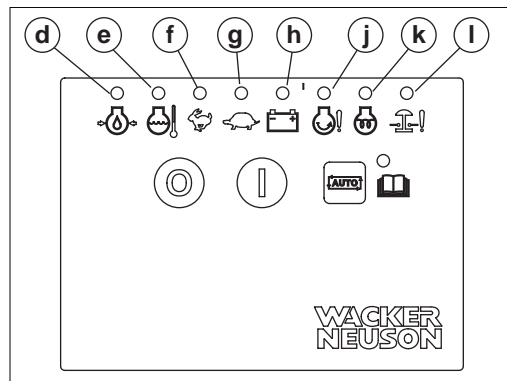
The generator, however, can also cause problems. Consult a qualified electrician or your nearest Wacker Neuson dealer for possible causes of generator problems.

**WARNING**



Possibility of personal injury or equipment damage. A machine down for service must be secured so that no one is allowed to run it until repairs are made.

- ▶ Close and lock all doors.
- ▶ Hang a “Do Not Run” sign on the metering panel.



wc\_gr005244

**Low Oil Pressure (d)**

If the module detects that the engine oil pressure has fallen below the low oil pressure switch after the **Safety On** timer has expired, a shutdown will occur.

1. Check engine oil level using dipstick. Add oil if required.
2. Carefully inspect engine for oil leaks.
3. If oil level is good, start engine and verify loss of oil pressure. Shut down engine immediately if oil pressure value does not read at least 1 bar (15 psi) within 5 seconds.
4. Check the oil pressure shutdown switch and connecting wiring on the engine block. Check for continuity between switch and engine control module. See *wiring diagrams*.
5. If oil level, oil pressure switch and connecting wiring are good, the fault could be caused by an engine failure.

**Note:** An engine failure caused by something other than one of the five shutdown conditions discussed may cause a low oil fault condition to be displayed.

**High Coolant Temperature Shutdown (e)**

If the module detects that the engine coolant temperature has exceeded the setting of the high engine temperature switch after the **Safety On** timer has expired, a shutdown will occur. In such a case:

1. Allow engine to cool to a safe temperature and inspect coolant level in radiator. Add coolant as needed.
2. Carefully inspect coolant hoses and engine block for leaks.
3. Check that fan belt for water pump is tight.
4. Check the high temperature shutdown switch and connecting wiring on engine block. Check for continuity between switch on engine block and engine control module. See wiring diagrams.
5. If switch and wiring are good, consult engine manufacturer's operator's manual or service manual for possible causes of engine overheating.

**Overspeed or Underspeed Shutdown (f, g)**

If the engine speed exceeds or falls below the pre-set trip after the **Safety On** timer has expired, a shutdown will occur. In such a case:

- Restart engine and read the AC frequency using a meter. Meter should read approximately 61.5 Hz under no-load condition.

**Overcrank Shutdown (j)**

If the engine does not start after three attempts, the starting sequence will be terminated. In such a case:

1. Check fuel level.
2. Check for proper operation of fuel pump.
3. If engine still does not start, refer to engine manufacturer's operator's manual or service manual for possible engine problems.

### 3.18 Generator Derating

**Background**

All generator sets are subject to derating for altitude and temperature. Although derating should not affect operation of the lights, it will reduce the available reserve power to the receptacles.

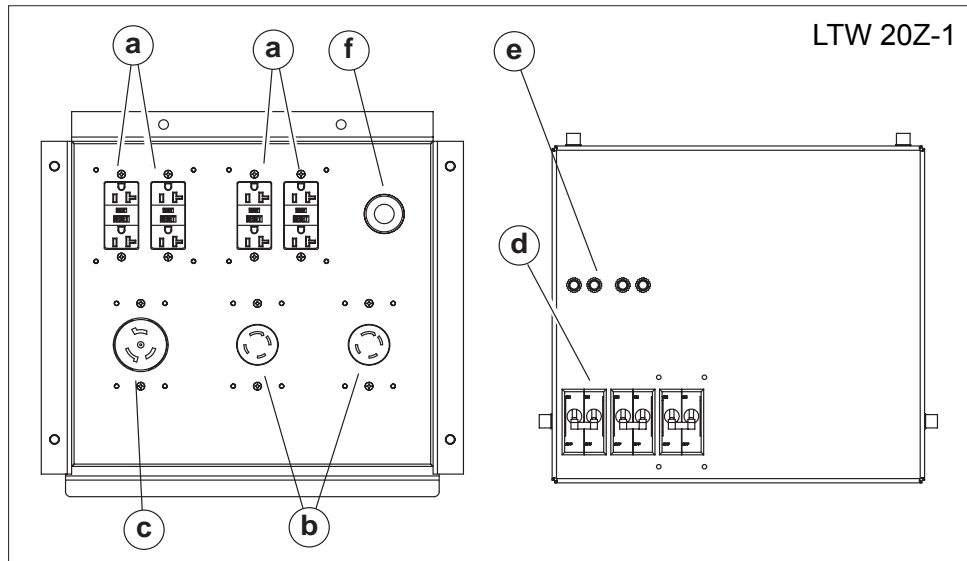
**Derating percentages**

Ratings are typically reduced 3% per 300 m (1000 ft.) elevation above sea level, and 2% per 5.5°C (10°F) increase in ambient temperature above 25°C (78°F).

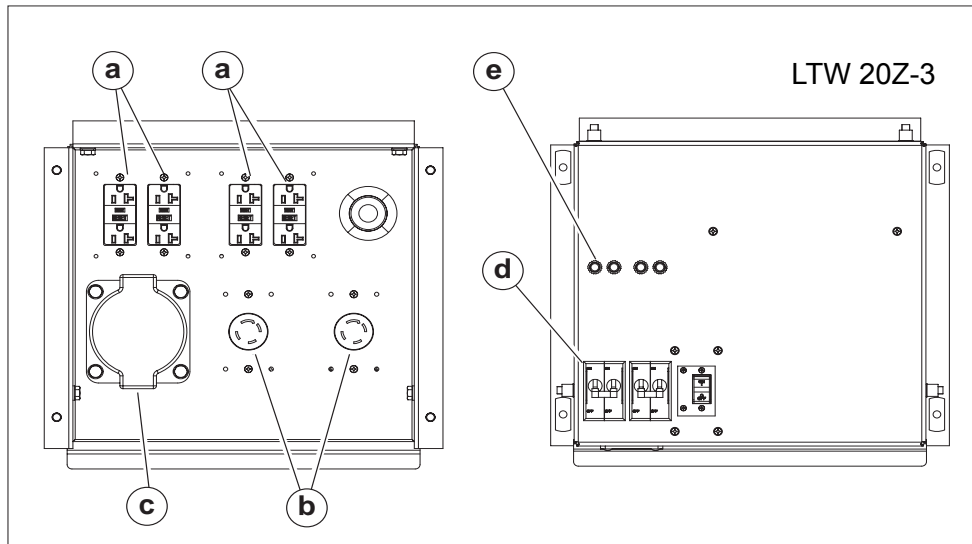
### 3.19 Receptacle Panel

**Overview** The Light Tower is equipped with receptacles for running accessories and tools from the generator. Power to these receptacles is available any time the engine is running and the circuit breakers are “ON”.

**Receptacles** The receptacle panels are equipped as follows:



wc\_gr005238



wc\_gr005239

| Model    | Callout | Quantity | Description  |
|----------|---------|----------|--|
| LTW20Z-1 | a       | 4        | 120V Ground Fault Interrupt (GFI) convenience receptacle                                 |
|          | b       | 2        | 120/240V single phase receptacle   |
|          | c       | 1        | 120/240V single phase receptacle   |
|          | d       | 3        | Circuit breaker for 120/240V and 240V single phase receptacle                            |
|          | e       | 4        | Circuit breaker for 120V GFI receptacle  |
| LTW20Z-3 | a       | 4        | 120V Ground Fault Interrupt (GFI) convenience receptacle                                 |
|          | b       | 2        | 120/208V single phase receptacle   |
|          | c       | 1        | 120/208V three phase 4-pole receptacle   |
|          | d       | 3        | Circuit breaker for 120/208V single phase receptacle and 120/208V three phase receptacle |
|          | e       | 4        | Circuit breaker for 120V GFI receptacle  |

**Note:** Do not draw more than 15,000 watts from the receptacles with all of the lights on or the lights will turn off. Load to at least 50% of the rated load to prevent wet stacking.

**Circuit breakers**

Circuit breakers **(e)** on the back of the receptacle panel protect the GFI receptacles. The GFI receptacles should be tested for proper operation each time they are used.

**Testing a GFI**

To test a GFI:

1. Push the test button in. The reset button should pop out. Power to the receptacle is now off.
2. To restore power to the receptacle, push the reset button.

**NOTICE:** If the reset button does not pop out, the GFI is defective. **Do not** use the receptacle until the problem can be corrected.

If the reset button pops out during use, check the generator and attachments for defects.

### 3.20 Load Balancing

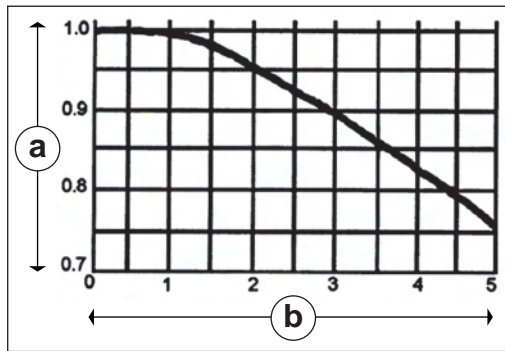
**Overview**

To help in balancing loads, each outlet on the LTW20Z3 is marked with the phase(s) to which it is connected.

When connecting single phase loads to the LTW20Z3, it is important to balance the loads, especially if the machine is also powering three phase loads. Unbalanced single phase loads cause unequal three phase line voltages.

Unequal line voltages applied to a three-phase induction motor produce unbalanced currents. This condition increases the motor temperature compared to a motor operating with balanced line voltages.

**NOTICE:** If line voltages are unbalanced, the motor horsepower rating will be derated in accordance with NEMA MG 1 Part 14.

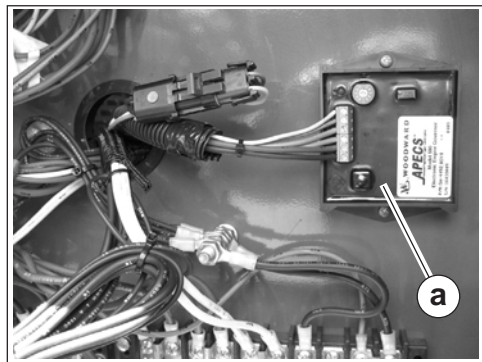


wc\_gr007964

|          |                              |
|----------|------------------------------|
| <b>a</b> | Derating factor              |
| <b>b</b> | Percent of voltage unbalance |

### 3.21 Electronic Governor

The electronic governor consists of an electronic module (**a**) and an electronic actuator. The module senses rotation of the flywheel, then sends a signal to the electronic actuator that governs the fuel injection system. The system is designed to precisely regulate engine rpm, and thus frequency, to within approximately 0.25%. See electronic governor manufacturer's literature for detailed information.



wc\_gr006974

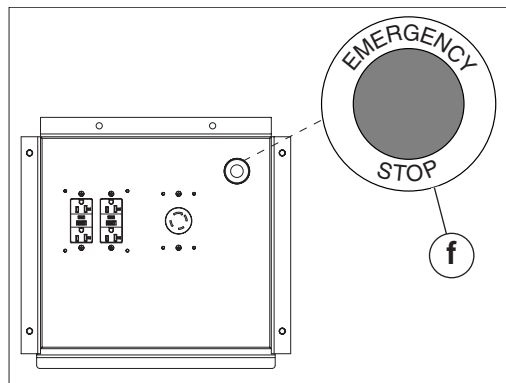


### 3.22 Emergency Stop Switch

**Location** The emergency stop switch (**f**) is the red button located on the receptacle panel at the rear of the Light Tower cabinet.

- Operation**
- Activate the emergency stop switch by pushing the red button in.
  - Pushing the emergency stop switch opens the main circuit breaker and the fuel solenoid and results in the engine shutting down and an indicator to illuminate.
  - The switch will remain in until the button is pulled out.

**NOTICE:** Press the emergency stop button only in the case of an actual emergency where the generator must be stopped immediately! In all other instances, open the main line circuit breaker and then press the engine controller Off “O” button.



wc\_gr006234

4 Maintenance

4.1 Periodic Maintenance Schedule

The table below lists basic machine and engine maintenance. Tasks designated with check marks may be performed by the operator. Tasks designated with square bullet points require special training and equipment.

Refer to the engine owner’s manual for additional information.

| Item                | Task                                    | Before each use | Interval (hours of service)                        |     |     |     |     |                           |                 |
|---------------------|---|-----------------|--|-----|-----|-----|-----|---------------------------|-----------------|
|                     |   |                 | 100  | 200 | 400 | 500 | 800 | Every year or 6x cleaning | Every two years |
| Fluids              | Check for leaks.                        | ✓               |  |     |     |     |     |                           |                 |
| Engine oil          | Check level.                            | ✓               |  |     |     |     |     |                           |                 |
| Fuel                | Check level.                            | ✓               |  |     |     |     |     |                           |                 |
| Coolant             | Check level.                            | ✓               |  |     |     |     |     |                           |                 |
| Air filter dust cup | Empty dust.                             | ✓               |  |     |     |     |     |                           |                 |
| Battery electrolyte | Check level.                            |                 | ✓  |     |     |     |     |                           |                 |
| Fan belt            | Check condition and tension.            |                 | ✓  |     |     |     |     |                           |                 |
| Air filter element  | Clean.                                  |                 | ■  |     |     |     |     |                           |                 |
| Radiator hoses      | Check condition.                        |                 |  | ✓   |     |     |     |                           |                 |
| Intake air hose     | Check condition and clear obstructions. |                 |  | ✓   |     |     |     |                           |                 |
| Fuel filter         | Replace.                                |                 | <i>Replace after every 250 hours of operation.</i> |     |     |     |     |                           |                 |
| Engine oil          | Change.*                                |                 |  | ■   |     |     |     |                           |                 |
| Oil filter          | Replace.                                |                 |  |     | ■   |     |     |                           |                 |
| Radiator            | Flush.                                  |                 |  |     | ■   |     |     |                           |                 |
| Fan belt            | Replace.                                |                 |  |     | ■   |     |     |                           |                 |
| Fuel tank           | Remove sediment.                        |                 |  |     | ■   |     |     |                           |                 |
| Valve clearance     | Check and adjust as needed.             |                 |  |     |     |     | ■   |                           |                 |
| Air filter element  | Replace.                                |                 |  |     |     |     |     | ■                         |                 |
| Radiator coolant    | Change.                                 |                 |  |     |     |     |     |                           | ■               |
| Battery             | Replace.                                |                 |  |     |     |     |     |                           | ■               |

| Item                      | Task     | Interval (hours of service) |     |     |     |     |     |                           |                 |
|---------------------------|----------|-----------------------------|-----|-----|-----|-----|-----|---------------------------|-----------------|
|                           |          | Before each use             | 100 | 200 | 400 | 500 | 800 | Every year or 6x cleaning | Every two years |
| Radiator hoses and clamps | Replace. |                             |     |     |     |     |     |                           | ■               |
| Fuel pipes and clamps     | Replace. |                             |     |     |     |     |     |                           | ■               |

*\* Change engine oil and filter after first 50 hours of operation.*

## 4.2 Installing / Removing Light Fixtures

- Prerequisite**
- Circuit breakers are turned OFF
  - Engine is shut down



**WARNING**

Electric shock hazard.

- ▶ Turn off all light circuit breakers and shut down engine before disconnecting light fixtures or changing lamps.



**WARNING**

Burn hazard. Lamps and fixtures become extremely hot in use.

- ▶ Allow lamps and fixtures to cool 10–15 minutes before handling.

**NOTICE:** Only a trained technician should be allowed to install and remove fixture wiring.

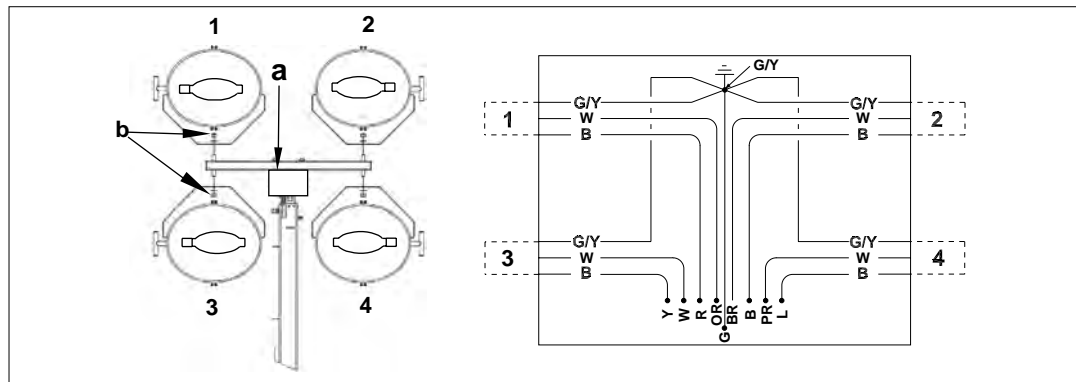
**Procedure**

Follow the procedure below to remove the light fixtures.

1. Disconnect the electrical cords at the junction box **(a)**.
2. Remove the nuts **(b)** from the fixture mounting brackets.
3. Remove both the fixtures and the brackets from the mounting studs.

**Numbering sequence of lights**

**Junction box wiring for lights**



wc\_gr005245

| Wire Colors |       |     |        |    |        |    |            |
|-------------|-------|-----|--------|----|--------|----|------------|
| BK          | Black | RD  | Red    | YL | Yellow | OR | Orange     |
| GN          | Green | TN  | Tan    | BR | Brown  | PU | Purple     |
| BU          | Blue  | VIO | Violet | CL | Clear  | SH | Shield     |
| PK          | Pink  | WH  | White  | GY | Gray   | LB | Light blue |

### 4.3 Removing / Replacing Lamps

- Prerequisites**
- Engine shut down
  - Light circuit breakers turned OFF
  - Lamps and fixtures cool to the touch
  - Eye protection and gloves



**WARNING**

Burn hazard. Lamps become extremely hot in use.  
 ► Allow lamps and fixtures to cool 10–15 minutes before handling.



**WARNING**

Personal injury hazard. Ultraviolet radiation from the lamps can cause serious skin and eye irritation.  
 ► Use only undamaged lamps.  
 ► Use the lamps only with undamaged original equipment lenses and fixtures.



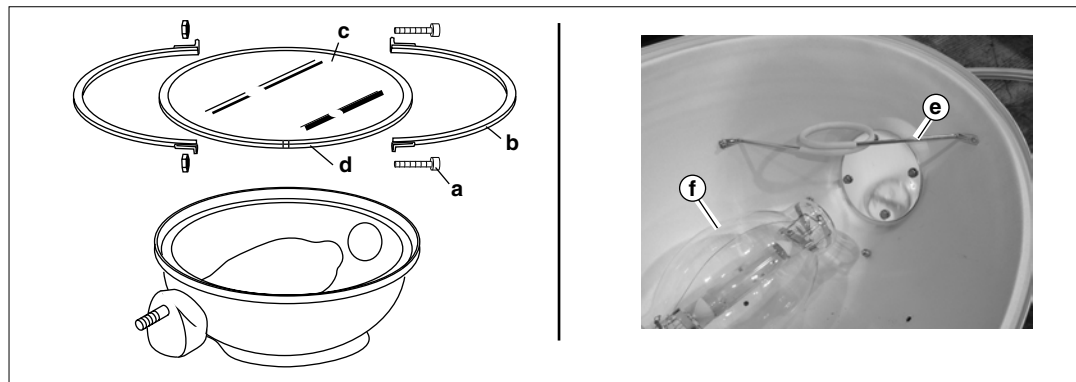
**WARNING**

Explosion hazard. Grease or oil residue on the lamp can cause the outer jacket to burst or shatter. Hot flying glass particles can cause personal injury, property damage, burns, or fire.  
 ► Do not operate the lights with a lens that is cracked, damaged, or missing.  
 ► Do not scratch the lamp or subject the lamp to excess pressure.  
 ► Wear eye protection and gloves when removing or replacing lamps.

Follow the procedures below to remove and install the lamp.

**Removing the lamp**

1. Remove the screws (a) securing the flange rings (b) and remove the flange rings.



wc\_gr005881

2. Remove the lens (c) with the gasket (d) attached.
3. Remove the hardware securing one side of the lamp stabilizer (e). Once removed, swing the lamp stabilizer to the side and unscrew the lamp (f).

**Installing the lamp**

1. Screw the lamp in firmly, but not forcibly, to minimize loosening due to vibration. Secure it with the lamp stabilizer.
2. Install the gasket around the lens and secure the lens to the reflector with the flange rings and screws.

## 4.4 Performing Daily Inspection

- Procedure**      Inspect the following items daily.
- Check for fluid leaks.
  - Check fluid levels.
  - Inspect condition of electrical cords.
  - Check that winch cables are in good condition.
  - Check that the vertical mast locking pin and its spring are secured, aligned, and operating properly.
- 

**Changing engine oil**      Change engine oil after first 50 hours of operation and every 250 hours thereafter. See *Changing Engine Oil* and refer to the engine manufacturer's operator's manual for lubrication specifications.

---



### CAUTION

Personal injury or equipment damage hazards.

- ▶ Do not use Light Tower if electrical cord insulation is cut or worn through.
  - ▶ Do not use a winch cable that is kinked or starting to unravel.
  - ▶ Do not operate engine if oil level is below ADD mark on dipstick. Keep the oil level within the crosshatch pattern or FULL mark on the dipstick.
-

## 4.5 Checking Engine Coolant

**When** After initial filling of radiator, maintain proper level in overflow bottle daily.

---

**Prerequisites**

- Engine is cold
- Engine is shut off
- Radiator cap is cool enough to touch with bare hands.

---



**WARNING**

Burn hazard. Pressurized coolant can cause serious burns.

► Only remove radiator cap when it is cool enough to touch with bare hands.

---

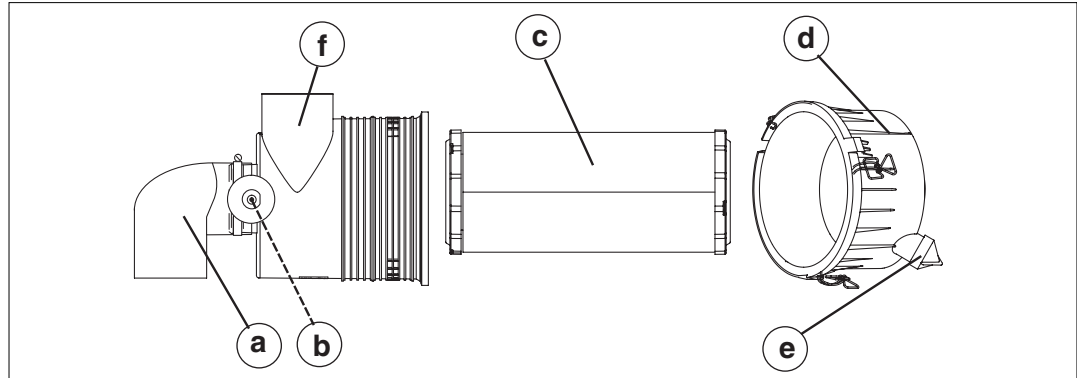
**Procedure** Follow the procedure below to check the engine coolant.

1. Slowly loosen radiator cap to relieve pressure in the system.
2. Remove radiator cap.
3. Check coolant level and add coolant as needed to 19mm (3/4 in). below bottom of filler neck.
4. Replace radiator cap.

## 4.6 Replacing Air Cleaner

**When** Replace the air filter cartridge when the yellow indicator of the engine air filter gauge reaches the red line.

**Procedure** The air cleaner assembly contains a one-piece single element air filter cartridge (c). Follow the procedure below to replace the air filter cartridge.



wc\_gr005884

1. Remove the end cover (d), then discard the entire air filter cartridge.
2. Insert a new air filter cartridge.
3. Re-install the end cover, making sure that the dust cap (e) is clean and is pointing downward.

### Routine inspection

- Periodically, make sure the inlet pipe (f) is free from obstructions.
- Check all connections and make sure they are snug. An air leak at the neck clamp, gauge connection, or intake pipe can quickly lead to expensive engine repairs.
- Make sure that the intake piping (a) is fully engaged over the neck of the filter to ensure a good seal.
- If the filter housing, gauge connection (b), neck, or inlet pipe are crushed or damaged, replace them immediately.



### 4.7 Changing Engine Oil

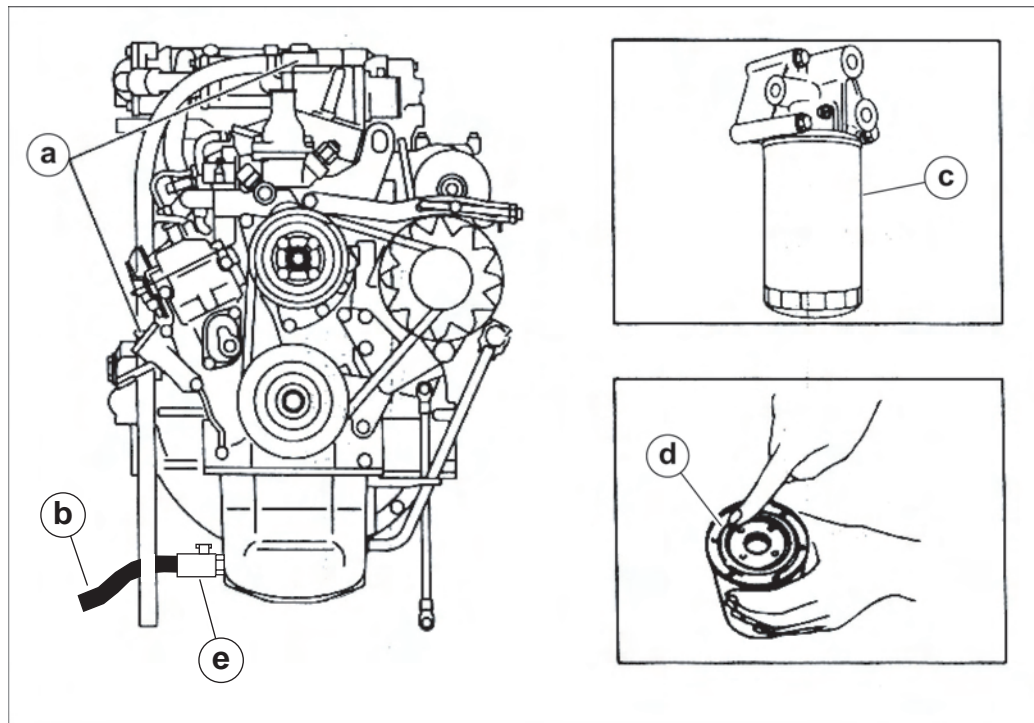
**When** Replace the engine oil and oil filter element every 500 operating hours.

- Prerequisites**
- Warm engine
  - Plastic sheet and container of suitable size to collect drained oil
  - Replacement oil (see *Technical Data* for oil quantity and type)

**NOTICE:** Check engine oil daily before starting engine. Do not operate engine if oil level is below ADD mark on dipstick. Always keep oil level within the crosshatch pattern or “full” mark on dipstick.

**Note:** In the interests of environmental protection, place a plastic sheet and a container under the machine to collect any liquid which drains off. Dispose of this liquid in accordance with environmental protection legislation.

**Procedure** Follow the procedure below to change the engine oil.



wc\_gr005288

1. Wipe the area around the oil filler cap (a) clean, and remove the cap.
2. Locate the oil drain hose (b) and feed it through the opening at the rear of the Light Tower cabinet.
3. Remove the cap from the end of the oil drain hose. Open the valve (e) at the hose connection and allow the oil to drain into a suitable container.
4. After the oil has been drained completely, close the valve at the hose connection and replace the cap at the end of the hose. Return the hose to its storage location.

5. Fill the engine crankcase through the oil filler opening to the upper mark on the dipstick. See *Technical Data* for oil quantity and type.
6. Re-install the oil filter cap.

**Replacing the oil filter element**

Follow the procedure below to replace the oil filter element.

1. Use a filter wrench to remove the oil filter element **(c)**. Discard the used element.
2. Apply a thin coat of oil to the O-ring on the new element **(d)**.
3. Hand-tighten the element until its sealed face comes in contact with the O-ring.
4. Use a filter wrench to tighten the new element. Torque to 14.7–20.6 Nm (10.8–15.2 ft.lbs).



---

**WARNING**

Most used oil contains small amounts of materials that can cause cancer and other health problems if inhaled, ingested, or left in contact with skin for prolonged periods of time.

- ▶ Take steps to avoid inhaling or ingesting used engine oil.
  - ▶ Wash skin thoroughly after exposure to used engine oil.
-

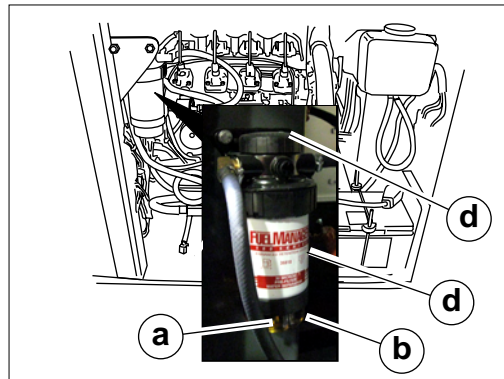
### 4.8 Maintaining the Fuel/Water Separator

- When**
- Empty the separator water bowl as needed.
  - Change the separator element each time the fuel filter is changed—approximately every 250 hours of operation.

- Prerequisites**
- Container of suitable size to drain water from the separator element
  - Replacement separator element

**Emptying the separator bowl** Follow the procedure below to empty the separator bowl (a).

1. Open the water bowl drain (b).



wc\_gr006235

2. Allow the water to drain into a suitable container.
3. Close the water bowl drain.

**Changing the separator element** Follow the procedure below to change the separator element.

1. Loosen the element retainer (d).
2. Remove the element retainer and element (c) from the separator head.
3. Unscrew the separator bowl from the element.
4. Screw the separator bowl onto the replacement element.
5. Insert the retainer and replacement element into the separator head.
6. Tighten the element retainer.

The procedure is now complete.

### 4.9 Maintaining the Trailer

- Tires**
- Keep tires inflated to the proper pressure as shown on the tire sidewall.
  - Check tread periodically for wear.
  - Replace tires as required.

- Wheels**
- Check that lug nuts holding wheels are tight.
  - Replace any missing lug nuts immediately.

## 4.10 Long-Term Storage

- Introduction** Extended storage of equipment requires preventative maintenance. Performing these steps helps to preserve machine components and ensures the machine will be ready for future use. While not all of these steps necessarily apply to this machine, the basic procedures remain the same.
- 
- When** Prepare your machine for extended storage if it will not be operated for 30 days or more.
- 
- Preparing for storage** Follow the procedures below to prepare your machine for storage.
- Complete any needed repairs.
  - Replenish or change oils (engine, exciter, hydraulic & gear-case) per the intervals specified in the Scheduled Maintenance table.
  - Grease all fittings and, if applicable, repack bearings.
  - Inspect engine coolant. Replace coolant if it appears cloudy, is more than two seasons old, or does not meet the average lowest temperature for your area.
  - If your machine has an engine equipped with a fuel valve, start the engine, close the fuel valve, and run the engine until it stops.
  - Consult the engine owner's manual for instructions on preparing the engine for storage.
- 
- Stabilizing the fuel** After completing the procedures listed above, fill the fuel tank completely and add a high-quality stabilizer to the fuel.
- Choose a stabilizer that includes cleaning agents and additives designed to coat/protect the cylinder walls.
  - Make sure the stabilizer you use is compatible with the fuel in your area, fuel type, grade and temperature range. Do not add extra alcohol to fuels which already contain it (for example, E10).
  - For engines with diesel fuel, use a stabilizer with a biocide to restrict or prevent bacteria and fungus growth.
  - Add the correct amount of stabilizer per the manufacturer's recommendations.
- 
- Storing the machine** Perform these remaining steps to store your machine.
- Wash the machine and allow it to dry.
  - Move the machine to a clean, dry, secure storage location. Block or chock wheels to prevent machine movement.
  - Use touch-up paint as needed to protect exposed metal against rust.
  - If the machine has a battery, either remove or disconnect it.
- NOTICE:** Allowing the battery to freeze or completely discharge is likely to cause permanent damage. Periodically charge the battery while the machine is not in use. In cold climates, store and charge the battery indoors or in a warm location.
- Cover the machine. Tires and other exposed rubber items should be protected from the weather. Either cover them or use a readily available protectant.

4.11 Troubleshooting



**DANGER**

High voltage! This machine 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.

| Problem / Symptom   | Reason                             | Remedy   |
|---------------------|------------------------------------|--|
| Lamp will not light | Lamp is too hot                    | Allow lamp to cool 10–15 minutes before restarting.  |
|                     | Faulty lamp connection             | Check that lamp is tight in socket. Check connections inside connection boxes on light fixtures and tower.   |
|                     | Lamp broken or burned out          | Check for: <ul style="list-style-type: none"> <li>■ broken arc tube or outer lamp jacket</li> <li>■ broken or loose components in lamp envelope</li> <li>■ blackening or deposits inside lamp tube.</li> </ul>   |
|                     | Circuit breaker turned on          | Turn off circuit breaker.  |
|                     | Circuit breaker loose or defective | Have a licensed electrician repair or replace the circuit breaker.   |
|                     | Generator output incorrect         | Check incoming voltage to ballast. Incoming voltage should be 120V ± 5V. If voltage is incorrect, engine speed may need to be adjusted or generator may require service.   |
|                     | Low or no ballast output           | With the fixture cord removed from its receptacle, the voltage should measure 400 to 445 VAC. If proper voltage is not achieved, perform capacitor check to determine if capacitor or coil needs to be replaced. |
| Low light output    | Lamp degraded                      | Replace lamp due to normal lamp life.  |
|                     | Low ballast output                 | Check ballast for proper voltage output.   |
|                     | Fixture or lens dirty              | Clean reflective surface inside fixture and both inside and outside surface of glass lens.   |



**5 Factory-Installed Options**

This machine may be equipped with one or more of the following factory-installed options. To verify if any of these options are installed on your machine, contact Wacker Neuson Corporation at 1-800-770-0957. A nameplate listing the Model Number, Item Number, Revision, and Serial Number is attached to each unit. Please have this information available when contacting Wacker Neuson Corporation.

*The illustrations shown in this chapter represent typical installations. The factory-installed options on your machine may look different.*

**5.1 General Options**

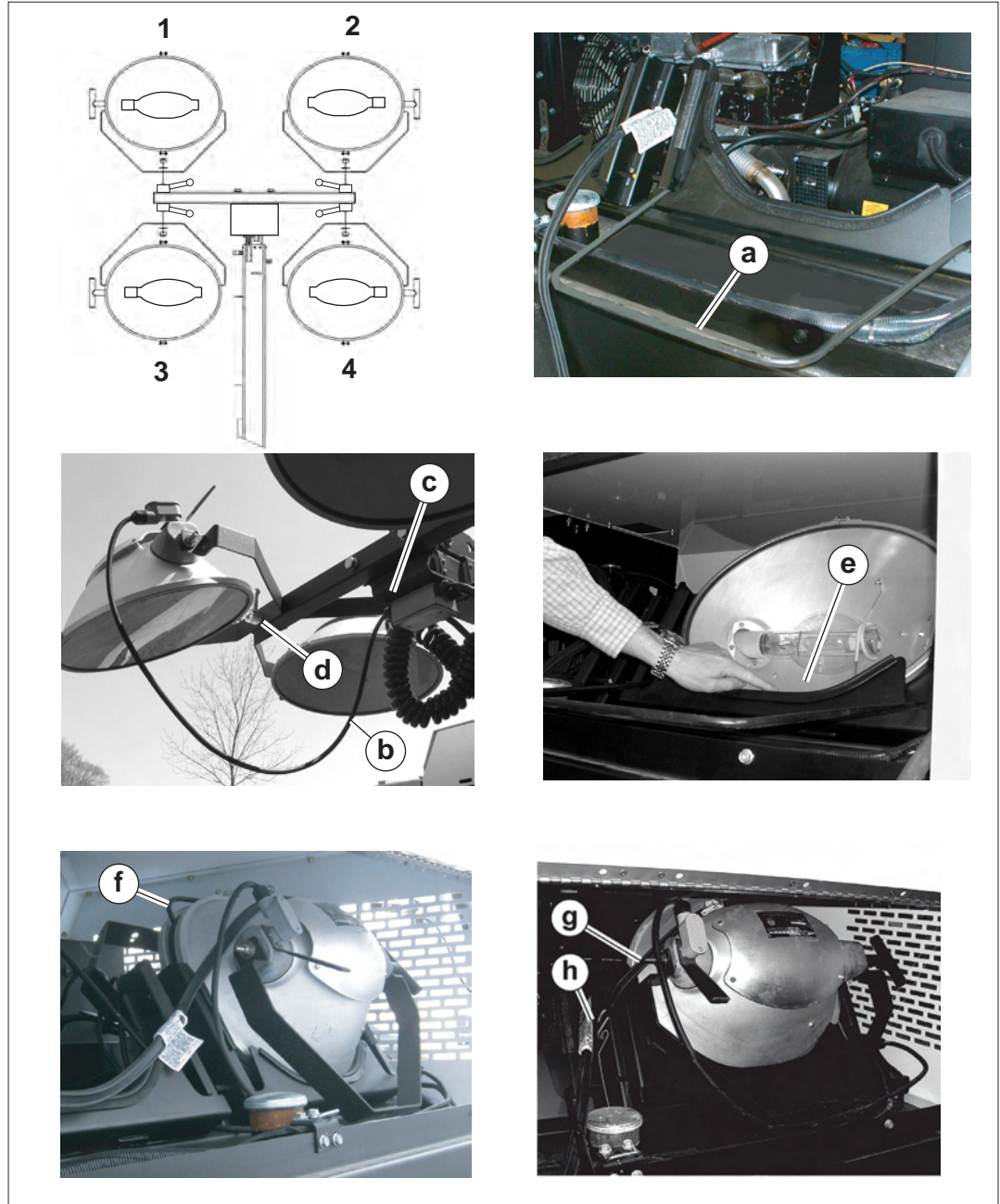
**About Brakes** Your machine may be equipped with electric brakes or surge brakes. See *Towing Safety* for more information about connecting and checking the brakes.

**Electric Brakes** Machines equipped with electric brakes draw power from the tow vehicle. An electrical wiring harness connects the tow vehicle’s brake pedal to the brake actuators on the trailer. Pressing the brake pedal applies the brakes to both the tow vehicle and the trailer.

**Surge Brakes** Machines equipped with hydraulic surge brakes do not require any electrical connection to the tow vehicle. The braking system is completely self-contained, using momentum to actuate the trailer’s brake master cylinder and apply the brakes when the tow vehicle slows or stops.

**Internal Light Storage** This option allows the light fixtures to be detached from the tower and stored inside the Light Tower cabinet. Internal storage protects the fixtures from damage on the job site, during transport, or during long-term storage.

- Prerequisites**
- Machine is shut down
  - Left side of Light Tower cabinet is open



wc\_gr005287

**Procedure** Follow the procedure below to store the light fixtures.

1. Rotate the two retaining wires **(a)** forward so that they lie flat in an open position.
2. Disconnect the electrical cables **(b)** from the junction box **(c)**.
3. Detach light fixture #2 from the tower by removing the swivel handle **(d)** from the threaded stud and lifting the fixture off the tower.

**Note:** *Reinstall the swivel handle on the threaded stud after detaching the fixture.*

4. Orient light fixture #2 so that the lens is facing you and the mounting bracket is on the top side. Place the fixture behind the left-hand divider **(e)** inside the light tower cabinet.
- 

**NOTICE:** Avoid pinching the electrical cables beneath the fixtures or between the fixtures and dividers.

---

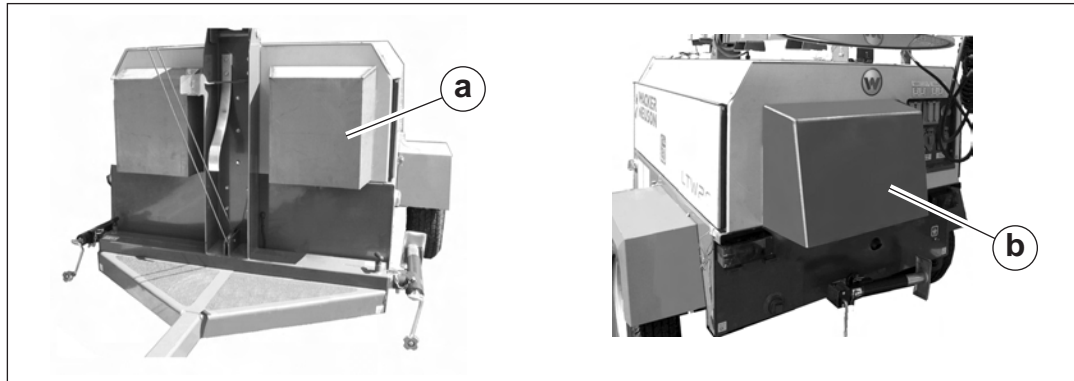
5. Repeat this procedure with light fixture #4, placing it behind the right-hand divider inside the light tower cabinet.
6. Rotate the retaining wires upward so that they rest against the lens frames.
7. Detach and remove light fixture #1.
8. Orient light fixture #1 so that the lens is facing away from you and the mounting bracket is on the bottom side. Place the fixture in front of the right-hand divider, resting it against the retaining wire **(f)**.
9. Repeat this procedure with light fixture #3, placing it in the left-hand divider.
10. Use the tie-down straps **(g)** to secure the fixtures in place. Each pair of fixtures is secured with one strap. Tighten the strap across the top surface of the outer fixture and close the buckle to fasten the strap in place.

**Note:** *Make sure to hook the tie-down straps in the cutouts provided for this purpose **(h)**.*



**Cold Weather Shrouds**

Machines equipped with cold weather shrouds (a, b) are designed to operate optimally in cold weather environments.

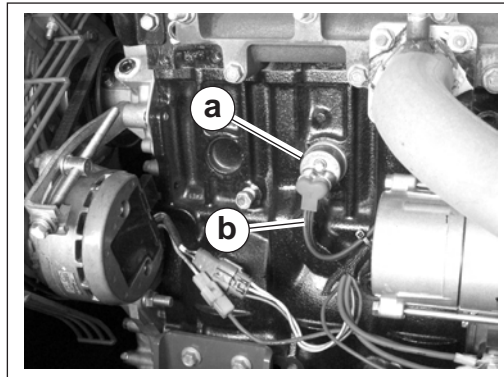


wc\_gr006978

- Machines equipped with cold weather shrouds can be operated at full load in ambient temperatures up to 35°C (95°F).
- At ambient temperatures above 35°C (95°F), machines must be derated accordingly.

**Engine Block Heater Option**

The engine block heater option includes a block heater (a) with a cord (b). The function of the block heater is to heat the engine coolant/ engine block to improve cold-weather engine starting. Plug the cord into a 120V power supply.



wc\_gr006975

**Containment System**

Overspills and leaks are captured in the containment system. The containment system holds over 110% of the fluid contained in the machine.

The containment system should be checked every 50 hours or 2 weeks and drained when necessary. If fluid is found in the containment tank, trace the cause of the leak and correct.

**Note:** *In the interests of environmental protection, place impermeable sheeting and a container under the machine to collect the liquid which drains off. Dispose of this liquid in accordance with environmental protection legislation.*

## Lockable Battery Disconnect

A lockable ON/OFF switch is available which disconnects the battery. A padlock (not included) securely locks the switch in the OFF position. If equipped, the battery disconnect switch is mounted to the skid beneath the access door on the right side of the machine.

**NOTICE:** Do not use the battery disconnect switch while the engine is running. Damage to electrical components may occur.

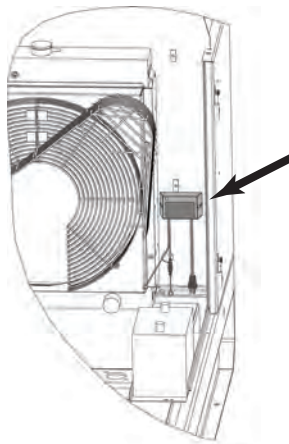


SWITCH

wc\_gr004338

## Battery Charger

An optional battery charger maintains the battery at peak power while the machine is turned off. Use of a battery charger is recommended when the generator is not operated on a regular basis. The battery charger prevents voltage drain and reduces the possibility of having to jump-start the engine after long periods of inactivity. Plug the cord into a 120V power supply.



wc\_gr005779

### 5.2 Cold Weather Options

Cold Weather machines include the following options:

- Containment system
- Cold weather shrouds
- Electric brakes
- Electronic governor
- Engine block heater
- Battery disconnect
- Internal light storage
- Battery charger

### 5.3 North Slope Options

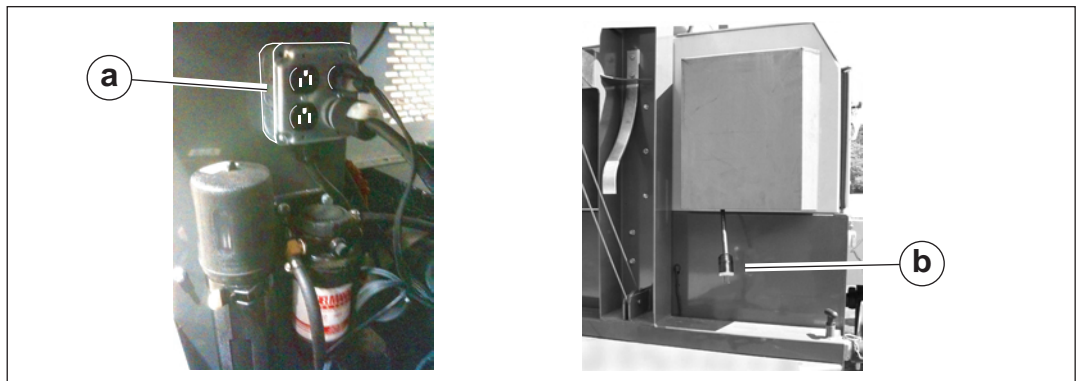
North Slope machines include the following options:

- Containment system
- Electric brakes or surge brakes
- Manual winch or power winch
- Electronic governor
- Engine block heater
- Battery charger

Additional options included with North Slope machines:

#### Quad Outlet Box

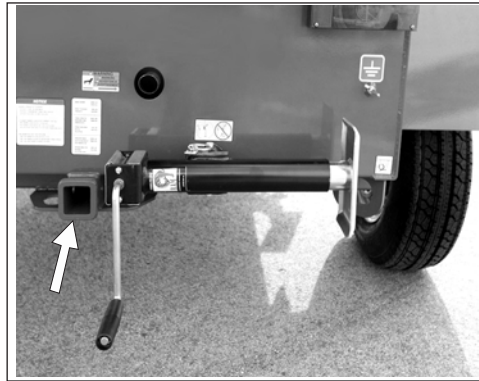
North Slope machines are equipped with an internal 4" receptacle box **(a)**. This box functions as a central location to plug in cold weather accessories such as an engine block heater, oil pan heater, battery blanket, and battery charger. An electrical cord **(b)** allows the receptacle box to be directly connected to an external power source.



wc\_gr006977

## Rear Hitch with Containment System

Certain models of the LTW are equipped with a 2" hitch receiver at the rear of the containment skid. This option enables the operator to tow auxiliary equipment behind the LTW.



wc\_gr006976



### WARNING

Possibility of personal injury or equipment damage from improper towing. Towing equipment, especially in tandem, requires careful preparation, appropriate equipment, and observance of maximum weights and towing speeds.

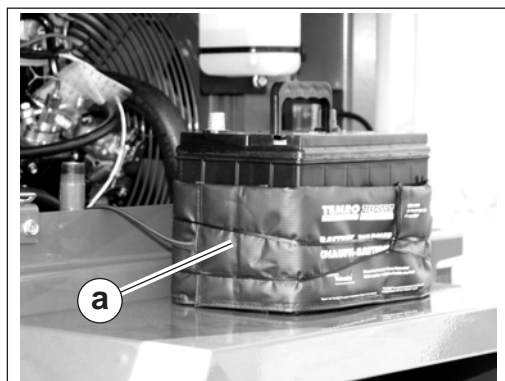
- ▶ Follow the instructions below when towing auxiliary equipment behind the LTW.

When using the 2" hitch receiver to tow auxiliary equipment:

- Review topic *Towing Safety* for information on safe towing techniques.
- Do not tow more than two units.
- Do not tow on the highway.
- Do not exceed 55 kph (35 mph).
- Do not exceed the maximum Gross Vehicle Weight Rating (GVWR) of 1588 kg (3500 lbs).
- Do not exceed the maximum tongue weight of 240 kg (404 lbs).

## Battery Blanket

An electrically powered blanket (**a**) warms the battery while the machine is not in use. The blanket eliminates engine starting difficulties caused by a cold, frozen, or discharged battery. Plug the cord into a 120V power supply.

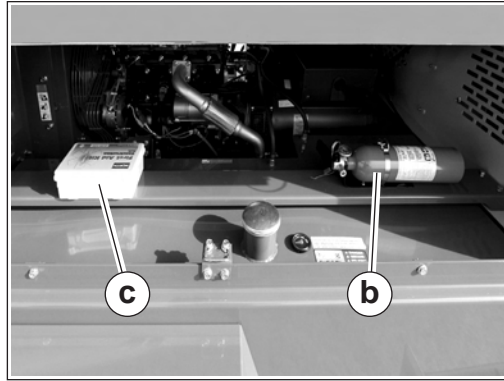


wc\_gr007422

**Oil Pan Heater** Cold, thick engine oil does not flow freely and may cause engine starting difficulties. An oil pan heater installed on the engine oil pan keeps the oil warm and flowing. Heat from this electrical device warms the supply of engine oil contained in the pan while the machine is not in use. Plug the cord into a 120V power supply.

**Fire Extinguisher and First Aid Kit**

The North Slope machine is equipped with a fire extinguisher **(b)** and a first aid kit **(c)** for operator convenience and safety in the field.



wc\_gr007423



**WARNING**

Machine damage or burn hazards.

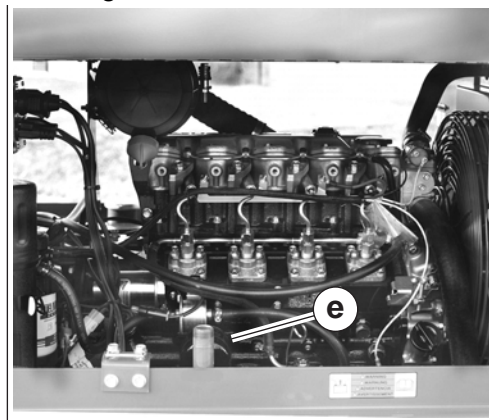
- ▶ Before each machine startup, always make sure the fire extinguisher is fully charged, accessible, and undamaged.
- ▶ Train machine operators in the proper use of the fire extinguisher.

**Quick Connect Oil Drain System**

The oil drain hose is located inside the Light Tower cabinet. North Slope machines are equipped with a quick connect fitting at the end of the hose.

**Containment Suction Access Point**

A vertical pipe **(e)** with a 3/4" NPT thread is provided next to the battery on the control panel side of the machine. The pipe extends into the containment skid tank, enabling suction cleanout of the tank.



wc\_gr007424

**6 Technical Data**

**6.1 Engine**

Engine Power Rating

Gross standby power rating per ISO 8528-1 and SAE J1995. Actual power output may vary due to conditions of specific use.

| Machine                           |                                     | LTW 20Z-1              | LTW 20Z-3 |
|-----------------------------------|-------------------------------------|------------------------|-----------|
| Engine                            |                                     |                        |           |
| Engine make / type                |                                     | Isuzu                  |           |
| Model                             |                                     | 4LE2-NYGV02, Tier IVi  |           |
| Number of cylinders               |                                     | 4                      |           |
| Displacement                      | cm <sup>3</sup> (in <sup>3</sup> )  | 2179 (133)             |           |
| Operating speed                   | rpm                                 | 1800                   |           |
| Rated standby power @ rated speed | kW(Hp)                              | 25.6 (34.3) @ 1800 rpm |           |
| Coolant capacity                  | l (qts.)                            | 11.3 (11.9)            |           |
| Oil capacity                      | l (qts.)                            | 8.0 (8.5)              |           |
| Battery                           | Volts/CCa<br>(standard)<br>(custom) | 12/750<br>12/950       |           |
| Fuel type                         |                                     | Diesel                 |           |
| Fuel tank capacity                | l (gal.)                            | 215.8 (57)             |           |
| Fuel consumption, prime load      | l/hr (gal./hr)                      | 5.97 (1.58)            |           |
| Running time, prime load          | Hours                               | 34.8                   |           |

**6.2 Generator**

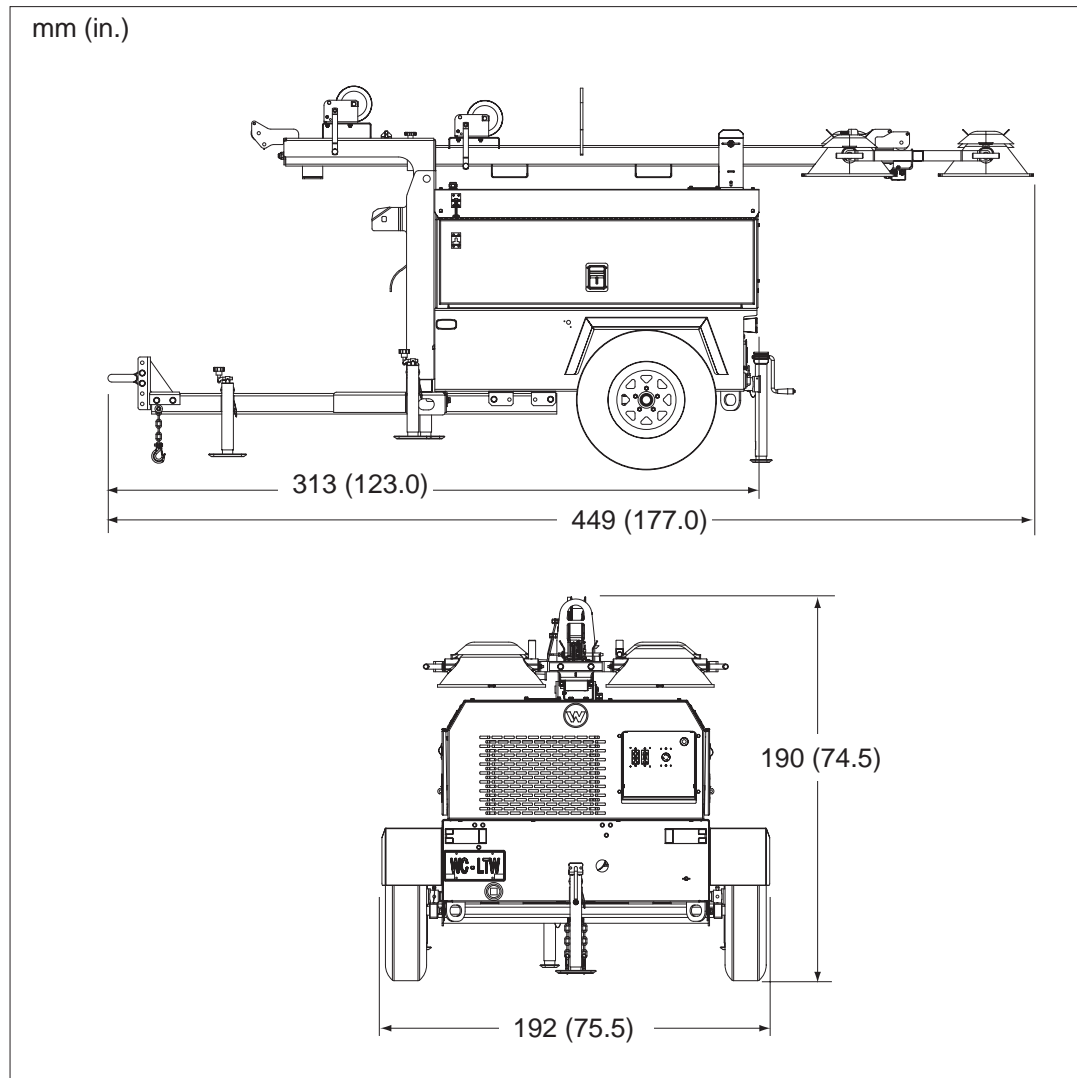
| Machine            |             | LTW 20Z-1             | LTW 20Z-3          |
|--------------------|-------------|-----------------------|--------------------|
| Generator          |             |                       |                    |
| Make/Type          |             | Mecc Alte / Brushless |                    |
| Model              |             | ECO 28-VL/4           |                    |
| Frequency          |             | 60 Hz                 |                    |
| Generator speed    | rpm         | 1800                  |                    |
| Prime Output       | kW<br>(kVA) | 18.6<br>(23.3)        | 19.5<br>(24.4)     |
| AC voltage output  | V/phase     | 120/240, 1Ø           | 120, 1Ø<br>208, 3Ø |
| Amps               | A           | 155/78                | 68 (x3)<br>68      |
| Excitation type    |             | AVR                   |                    |
| Power factor       |             | 1.0                   | 1Ø—1.0<br>3Ø—0.8   |
| Voltage regulation |             | ±1.00%                |                    |
| Insulation class   |             | H                     |                    |

6.3 Machine

| Machine  |                                      | LTW 20Z-1<br>0620375                     | LTW 20Z-1<br>0620842       | LTW 20Z-3<br>0620376                | LTW 20Z-3<br>0620843       |
|--|--------------------------------------|--|----------------------------|-------------------------------------|----------------------------|
| Machine  |                                      |  |                            |                                     |                            |
| Operating weight                                   | kg<br>(lbs)                          | 1442<br>(3179)                           | 1503<br>(3313)             | 1442<br>(3179)                      | 1503<br>(3313)             |
| Dry weight (surge brakes)<br>(electric brakes)     | kg<br>(lbs)                          | —<br>1256 (2769)                         | 1317 (2903)<br>1303 (2873) | —<br>1256 (2769)                    | 1317 (2903)<br>1303 (2873) |
| Travel Dimensions<br>(l x w x h)                   | cm<br>(in.)                          | 449 x 192 x 190<br>(177.0 x 75.5 x 74.5) |                            |                                     |                            |
| Height—tower extended                              | m (ft.)                              | 9 (30)                                   |                            |                                     |                            |
| Lighting system                                    |                                      | 4—1000W                                  |                            |                                     |                            |
| Ballast  |                                      | Coil and core                            |                            |                                     |                            |
| Max. lighting coverage<br>@ 5 ft. candles (54 lux) | m <sup>2</sup><br>(ft <sup>2</sup> ) | 12, 960 (1204)                           |                            |                                     |                            |
| Sound level at 7 m (23 ft.)                        | dB(A)                                | 71.2                                     |                            |                                     |                            |
| AC receptacles                                     |                                      | 4 duplex, 3 twist-lock                   |                            | 4 duplex, 2 twist-lock,<br>1 4-pole |                            |
| 120V GFI duplex                                    |                                      | 4—20A                                    |                            |                                     |                            |
| 120/240 V twist lock                               |                                      | 2—30A<br>1—50A                           |                            | 2—30A<br>120/208V                   |                            |
| 120/208 V 3Ø 4-pole                                |                                      | —  |                            | 1—60A                               |                            |
| Surge brakes<br>(if equipped)                      | Fluid<br>type                        | DOT3                                     |                            |                                     |                            |
| Tires  | size                                 | ST205 / 75D15(C)                         |                            |                                     |                            |



6.4 Dimensions



wc\_gr006326

6.5 Radiation Compliance

This machine meets the radio interference radiated emission requirements of European Standard EN 13309 for Construction Machinery.

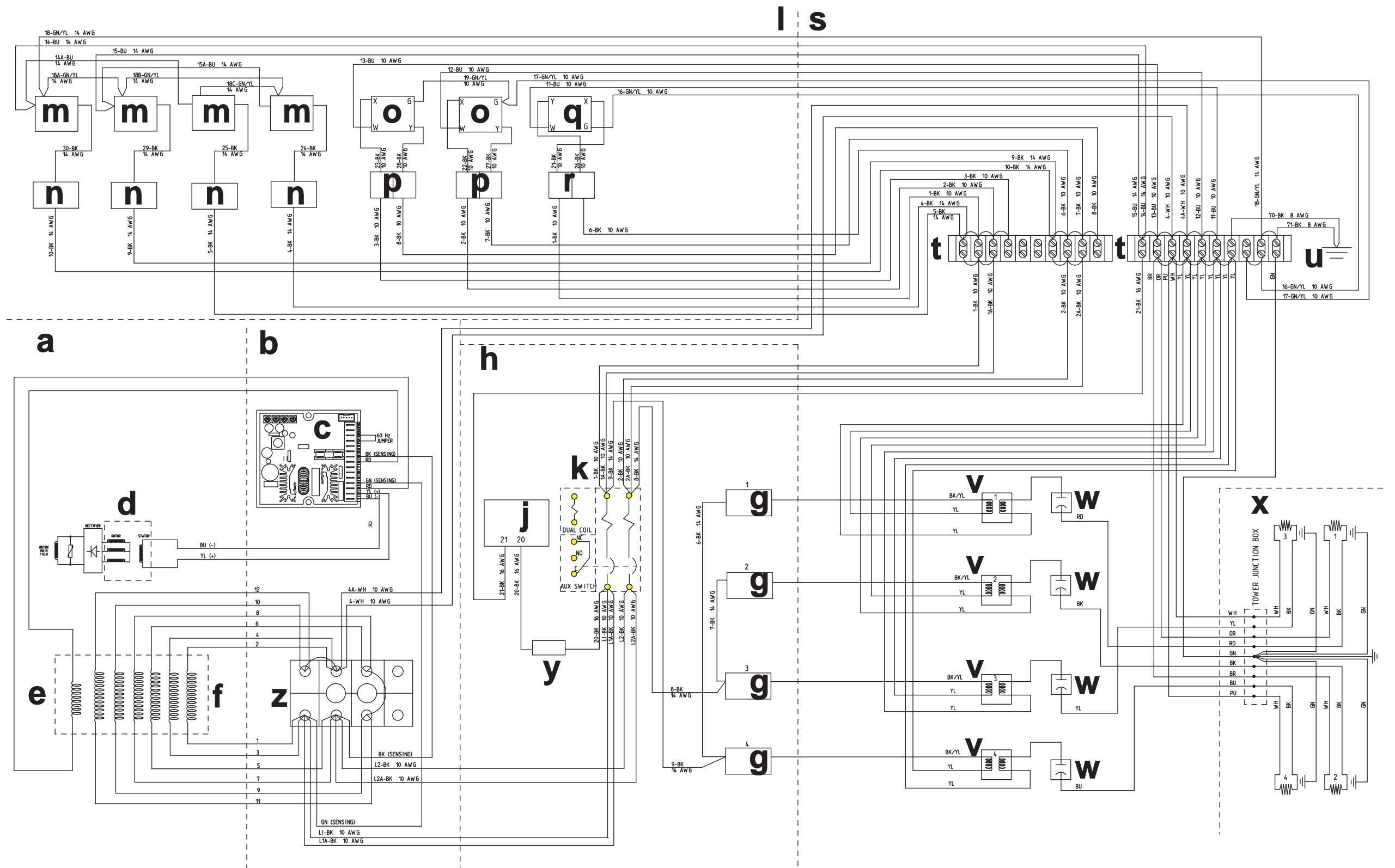
The lamps provided with this machine are electric discharge lamps. They are designed for use with metal halide ballasts only, and require time to reach full brightness on initial startup and after a power interruption. These lamps comply with FDA regulation performance standards 21 CFR 1040-30

Notes:



This page is intentionally left blank.

7.1 LTW 20Z-1—Electrical Schematic

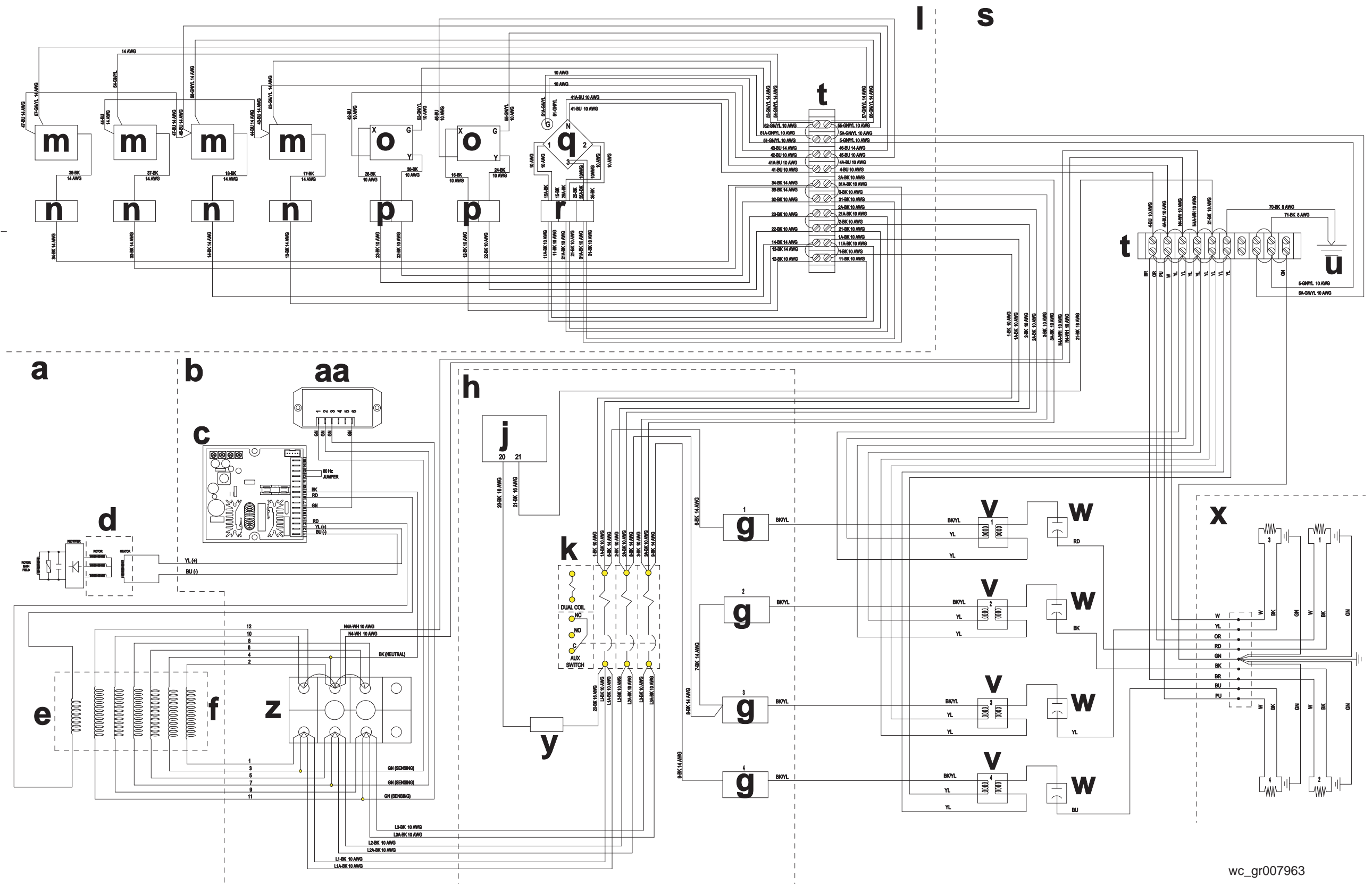


7.2 LTW 20Z-1—Electrical Schematic Components

| Ref. | Description                  | Ref. | Description                  |
|------|------------------------------|------|------------------------------|
| a    | Generator                    | o    | Receptacle, 120/240V 30 Amp  |
| b    | Generator junction box       | p    | Circuit breaker, 240V 30 Amp |
| c    | Voltage regulator            | q    | Receptacle, 120/240V 50 Amp  |
| d    | Exciter                      | r    | Circuit breaker, 240V 50 Amp |
| e    | Stator (aux winding)         | s    | Control box                  |
| f    | Stator (main winding)        | t    | Terminal strip               |
| g    | Circuit breaker, 120V 15 Amp | u    | Control box ground           |
| h    | Control box front panel      | v    | Transformer                  |
| j    | Engine controller            | w    | Capacitor                    |
| k    | Main breaker, 80 Amp         | x    | Lights                       |
| l    | Receptacle box               | y    | Fuse, 120V 2 Amp             |
| m    | Receptacle, 120V 20 Amp GFCI | z    | Generator connection block   |
| n    | Circuit breaker, 120V 20 Amp | —    | —                            |

| Wire Colors |       |     |        |    |        |    |          |
|-------------|-------|-----|--------|----|--------|----|----------|
| BK          | Black | RD  | Red    | YL | Yellow | OR | Orange   |
| GN          | Green | TN  | Tan    | BR | Brown  | PU | Purple   |
| BU          | Blue  | VIO | Violet | CL | Clear  | SH | Shield   |
| PK          | Pink  | WH  | White  | GY | Gray   | LB | Lt. blue |

7.3 LTW 20Z-3—Electrical Schematic



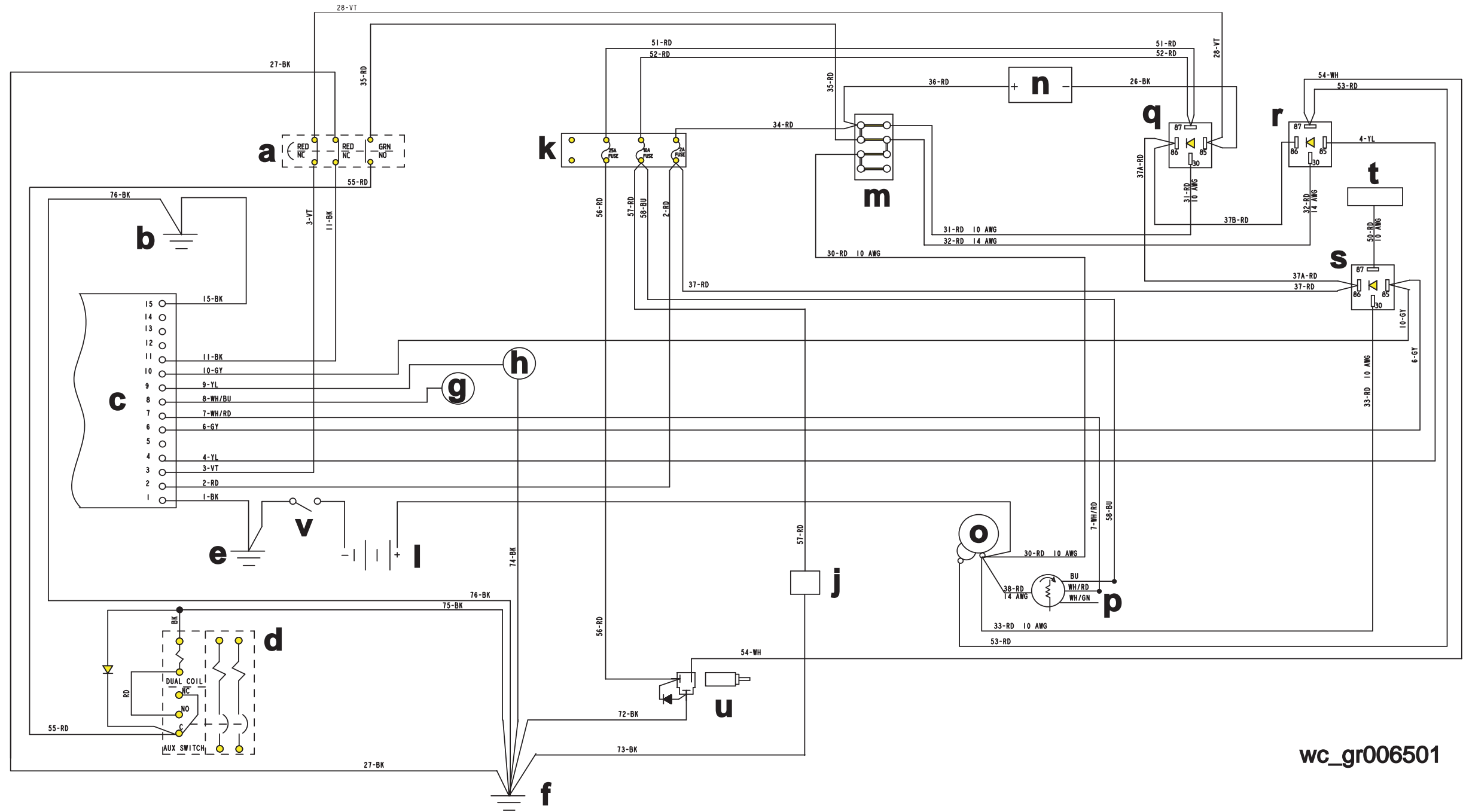
wc\_gr007963

7.4 LTW 20Z-3—Electrical Schematic Components

| Ref. | Description                  | Ref. | Description                      |
|------|------------------------------|------|----------------------------------|
| a    | Generator                    | o    | Receptacle, 120/208V 30 Amp      |
| b    | Generator junction box       | p    | Circuit breaker, 120/208V 30 Amp |
| c    | Voltage regulator            | q    | Receptacle, 120/208 60A 3Ø       |
| d    | Exciter                      | r    | Circuit breaker, 120/208V 60A 3Ø |
| e    | Stator (aux winding)         | s    | Control box                      |
| f    | Stator (main winding)        | t    | Terminal strip                   |
| g    | Circuit breaker, 120V 15 Amp | u    | Control box ground               |
| h    | Control box front panel      | v    | Transformer                      |
| j    | Engine controller            | w    | Capacitor                        |
| k    | Main breaker, 80 Amp         | x    | Lights                           |
| l    | Receptacle box               | y    | Fuse, 120V 2 Amp                 |
| m    | Receptacle, 120V 20 Amp GFCI | z    | Generator connection block       |
| n    | Circuit breaker, 120V 20 Amp | aa   | Sensing module                   |

| Wire Colors |       |     |        |    |        |    |          |
|-------------|-------|-----|--------|----|--------|----|----------|
| BK          | Black | RD  | Red    | YL | Yellow | OR | Orange   |
| GN          | Green | TN  | Tan    | BR | Brown  | PU | Purple   |
| BU          | Blue  | VIO | Violet | CL | Clear  | SH | Shield   |
| PK          | Pink  | WH  | White  | GY | Gray   | LB | Lt. blue |

7.5 Engine Wiring



wc\_gr006501

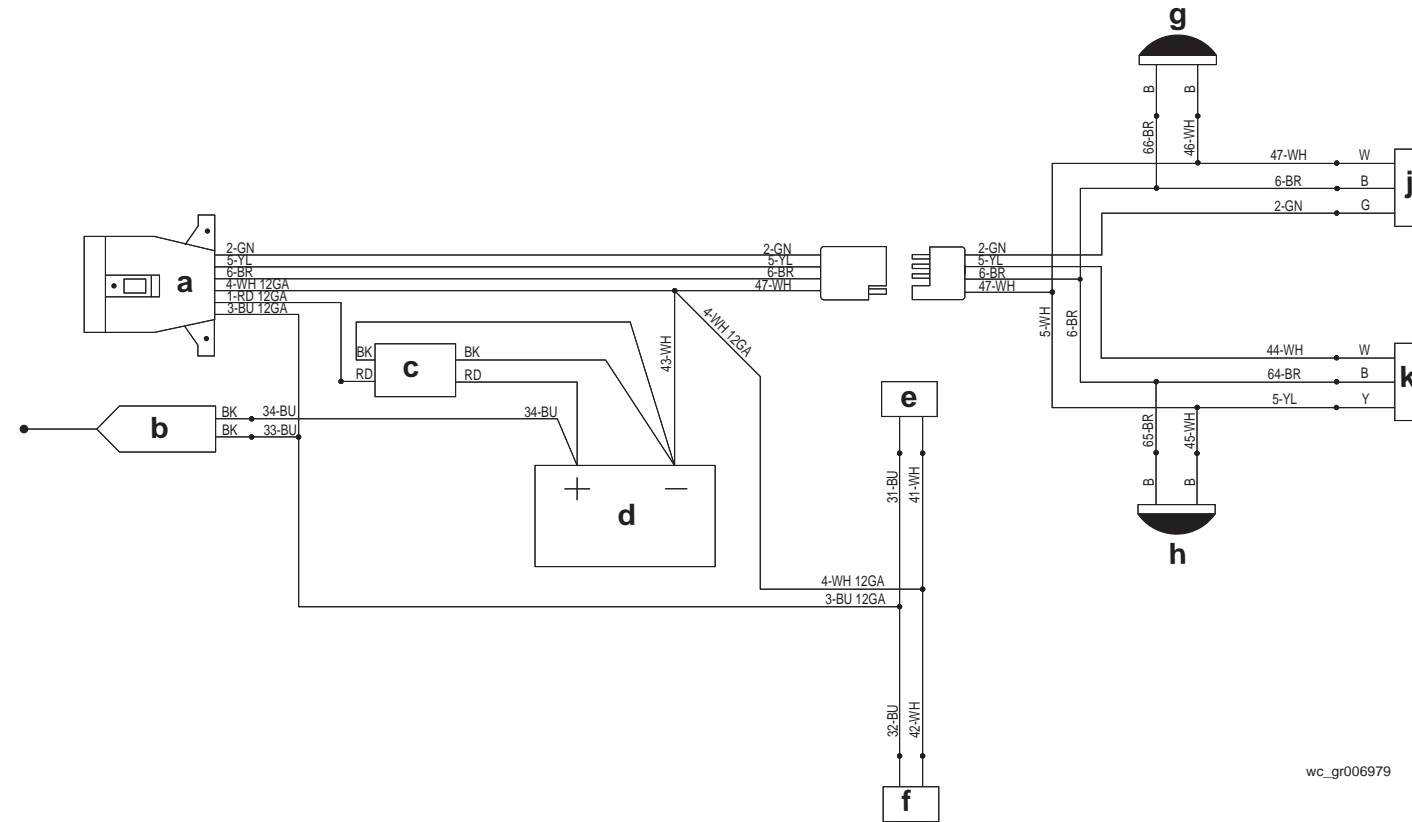


7.6 Engine Wiring Components

| Ref. | Description              | Ref. | Description                      |
|------|--------------------------|------|----------------------------------|
| a    | Emergency stop switch    | m    | Terminal block                   |
| b    | Control panel ground     | n    | Hour meter                       |
| c    | Engine controller        | o    | Starter motor                    |
| d    | Main breaker             | p    | Alternator                       |
| e    | Engine ground            | q    | Fuel pump relay                  |
| f    | Control box ground       | r    | Starter relay                    |
| g    | Oil pressure sensor      | s    | Glow plug relay                  |
| h    | Water temperature sensor | t    | Glow plugs                       |
| j    | Fuel pump                | u    | Fuel solenoid                    |
| k    | Fuse box                 | v    | Battery disconnect (if equipped) |
| l    | Battery                  |      |                                  |

| Wire Colors |       |     |        |    |        |    |          |
|-------------|-------|-----|--------|----|--------|----|----------|
| BK          | Black | RD  | Red    | YL | Yellow | OR | Orange   |
| GN          | Green | TN  | Tan    | BR | Brown  | PU | Purple   |
| BU          | Blue  | VIO | Violet | CL | Clear  | SH | Shield   |
| PK          | Pink  | WH  | White  | GY | Gray   | LB | Lt. blue |

7.7 Trailer Wiring (Electric Brakes)



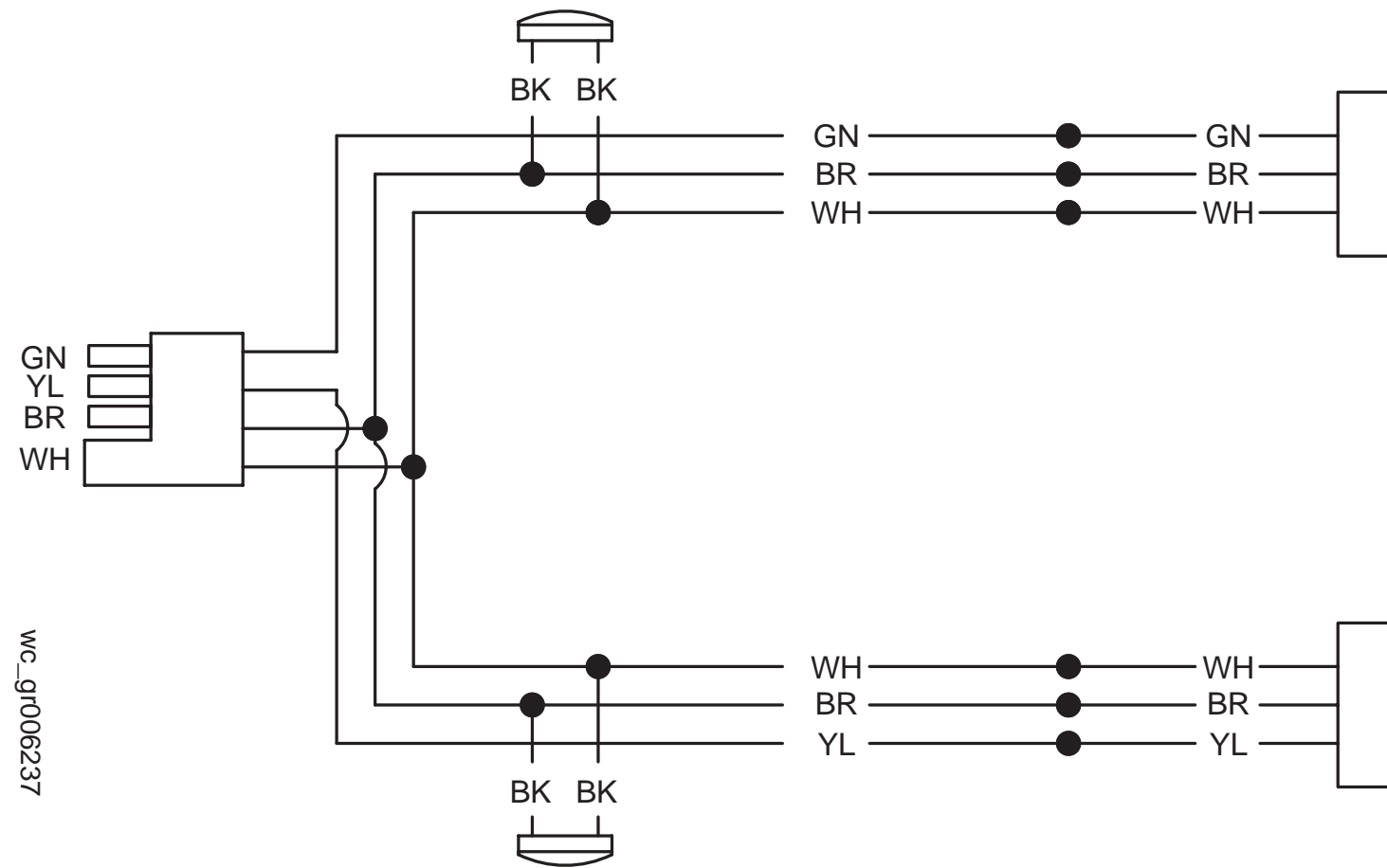
wc\_gr006979

7.8 Trailer Wiring Components (Electric Brakes)

| Ref. | Description       | Ref. | Description            |
|------|-------------------|------|------------------------|
| a    | Main trailer plug | f    | Left brake             |
| b    | Breakaway switch  | g    | Front right side light |
| c    | Battery charger   | h    | Front left side light  |
| d    | Breakaway battery | j    | Rear right tail light  |
| e    | Right brake       | k    | Rear left tail light   |

| Wire Colors |       |     |        |    |        |    |          |
|-------------|-------|-----|--------|----|--------|----|----------|
| BK          | Black | RD  | Red    | YL | Yellow | OR | Orange   |
| GN          | Green | TN  | Tan    | BR | Brown  | PU | Purple   |
| BU          | Blue  | VIO | Violet | CL | Clear  | SH | Shield   |
| PK          | Pink  | WH  | White  | GY | Gray   | LB | Lt. blue |

7.9 Trailer Wiring (Surge Brakes / No Brakes)



wc\_gr006237

| Wire Colors |       |     |        |    |        |    |          |
|-------------|-------|-----|--------|----|--------|----|----------|
| BK          | Black | RD  | Red    | YL | Yellow | OR | Orange   |
| GN          | Green | TN  | Tan    | BR | Brown  | PU | Purple   |
| BU          | Blue  | VIO | Violet | CL | Clear  | SH | Shield   |
| PK          | Pink  | WH  | White  | GY | Gray   | LB | Lt. blue |





