# Operation & Safety Manual

Original Instructions -
Keep this manual with the machine at all times.

## E450AJ

**PVC 2607**

**3122577200**

**July 13, 2026 - Rev A**

**ANSI** **AS/NZS MOL70**

**English (en-US)**

# ⚠ WARNING

Operating, servicing and maintaining this vehicle or equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle or equipment in a well-ventilated area and wear gloves or wash your hands frequently when servicing. For more information go to www.P65Warnings.ca.gov.

# FOREWORD

The Mobile Elevating Work Platform (MEWP) models covered in this manual are designed and tested to meet or exceed various compliance standards. Please refer to the manufacturer's nameplate affixed to the subject MEWP for specific standard compliance information.

This manual is a very important tool! Keep it with the machine at all times.

The purpose of this manual is to provide owners, users, operators, lessors, and lessees with the precautions and operating procedures essential for the safe and proper machine operation for its intended purpose.

Due to continuous product improvements, JLG Industries, Inc. reserves the right to make specification changes without prior notification. Contact JLG Industries, Inc. for updated information.

Refer to www. JLG. com for Warranty, Product Registration, and other machine-related documentation.

This manual is originally written in English.

**SAFETY ALERT SYMBOLS AND SAFETY SIGNAL WORDS**



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

## ⚠ DANGER

Indicates an imminently hazardous situation. If not avoided, will result in serious injury or death. This decal will have a red background.

## ⚠ WARNING

Indicates a potentially hazardous situation. If not avoided, could result in serious injury or death. This decal will have an orange background.

## ⚠ CAUTION

Indicates a potentially hazardous situation. If not avoided, may result in minor or moderate injury. It may also alert against unsafe practices. This decal will have a yellow background.

## *NOTICE*

Indicates information or a company policy that relates directly or indirectly to the safety of personnel or protection of property.

# ⚠ WARNING

This product must comply with all safety related bulletins. Contact JLG Industries, Inc. or the local authorized JLG representative for information regarding safety related bulletins which may have been issued for this product.

# *NOTICE*

JLG Industries, Inc. sends safety related bulletins to the owner of record of this machine. Contact JLG Industries, Inc. to ensure that the current owner records are updated and accurate.

# *NOTICE*

JLG Industries, Inc. must be notified immediately in all instances where JLG products have been involved in an accident involving bodily injury or death or when substantial damage has occurred to personal property or the JLG product.

**For:**

- Accident Reporting
- Product Safety Publications
- Current Owner Updates
- Questions Regarding Product Safety
- Standards and Regulations Compliance Information
- Questions Regarding Special Product Applications
- Questions Regarding Product Modifications

**Contact:**

Product Safety and Reliability Department
JLG Industries, Inc.
13224 Fountainhead Plaza
Hagerstown, MD 21742
USA
or Visit www.jlg.com to find your local JLG office.

**In USA:**

Toll Free: 877-JLG-SAFE (877-554-7233)

**Outside USA:**

Phone: 240-420-2661
Fax: 301-745-3713
E-mail: ProductSafety@JLG.com

# REVISION LOG

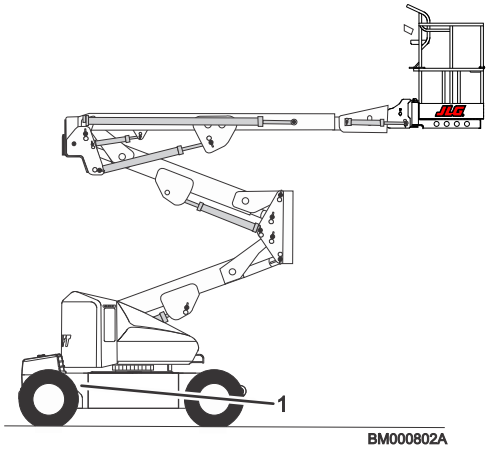
| DATE | REVISION | DESCRIPTION |
|---|---|---|
| July 13, 2026 | A | Original Issue |

## Other Publications Available

| Publication | Publication Number |
|---|---|
| Service & Maintenance Manual | 3122577300 |
| Illustrated Parts Manual | 3122577400 |

## Serial Number Location

For machine identification, a serial number plate **(1)** is affixed to the left rear of frame, in front of left rear wheel. If the serial number plate is damaged or missing, the machine serial number is stamped on the top left side of the frame and the top left side of the turntable. In addition, the serial number is stamped on top of the end of the upper boom, mid boom, and lower boom at the left rear of the booms.



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# SECTION 1
# Safety Precautions

## 1.1 GENERAL

This section outlines the necessary precautions for proper and safe machine usage and maintenance. It is mandatory that a daily routine is established based on the content of this manual to promote proper machine usage. A maintenance program, using the information provided in this manual and the Service & Maintenance Manual, must also be established by a qualified person and must be followed to ensure that the machine is safe to operate.

The owner/user/operator/lessor/lessee of the machine must not accept operating responsibility until this manual has been read, training is accomplished, and operation of the machine has been completed under the supervision of an experienced and qualified operator.

This section contains the responsibilities of the owner, user, operator, lessor, and lessee concerning safety, training, inspection, maintenance, application, and operation. If there are any questions with regard to safety, training, inspection, maintenance, application, and operation, please contact JLG Industries, Inc. (“JLG”).

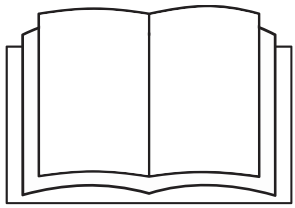
**⚠ WARNING**

Failure to comply with the safety precautions listed in this manual could result in machine damage, property damage, personal injury or death.

## 1.2 PRE-OPERATION

### 1.2.1 Operator Training and Knowledge

- Read, understand, and study the Operation and Safety Manual in its entirety before operating the machine. For clarification, questions, or additional information regarding any portions of this manual, contact JLG Industries, Inc.



- Only personnel who have received proper training regarding the inspection, application and operation of MEWPs (including recognizing and avoiding hazards associated with their operation) shall be authorized to operate a MEWP.

- Only properly trained personnel who have received unit-specific familiarization shall operate a MEWP. The user shall determine if personnel are qualified to operate the MEWP prior to operation.
- Read, understand, and obey all DANGERS, WARNINGS, CAUTIONS, and operating instructions on the machine and in this manual.
- Ensure that the machine is to be used in a manner which is within the scope of its intended application as determined by JLG.
- All operating personnel must have a thorough understanding of the intended purpose and function of the MEWP controls, including platform, ground and emergency descent controls.
- Read, understand, and obey all applicable employer, local, and governmental regulations as they pertain to your utilization and application of the machine.

### 1.2.2 Workplace Inspection

- Precautions to avoid all hazards in the work area must be taken by the user before and during operation of the machine.
- Do not operate or raise the platform from a position on trucks, trailers, railway cars, floating vessels, scaffolds or other equipment unless the application is approved in writing by JLG.
- Before operation, check work area for overhead hazards such as electric lines, bridge cranes, and other potential overhead obstructions.
- Check operating surfaces for holes, bumps, drop-offs, obstructions, debris, concealed holes, and other potential hazards.
- Check the work area for hazardous locations. Do not operate the machine in hazardous environments unless approved for that purpose by JLG.
- Ensure that the ground conditions are adequate to support the maximum tire load indicated on the tire load decals located on the chassis adjacent to each wheel. Do not travel on unsupported surfaces.
- When operating an internal combustion engine at high altitudes, a decrease in machine performance may occur due to a decrease in air density depending on engine aspiration type, temperature, and humidity, therefore JLG recommends not operating the machine higher than 6000 m above sea level without consultation with the engine suppliers. For electric machines, performance may diminish higher than 6000 m above sea level.

### 1.2.3 Machine Inspection

- Do not operate this machine until the inspections and functional checks as specified in the User Responsibilities, Machine Preparation, and Inspection Section of this manual have been performed.
- Do not operate this machine until it has been serviced and maintained according to the maintenance and inspection requirements as specified in the machine's Service Manual.

- Ensure all safety devices are operating properly. Modification of these devices is a safety violation.

**⚠ WARNING**

Modification or major alteration of a MEWP shall be made only with the prior written permission from the manufacturer. Modification is defined as change(s) to a MEWP that affect the operation, stability, safety factors, rated load, or safety of the MEWP in any way.

- Do not operate any machine on which the safety or instruction placards or decals are missing or illegible.
- Check the machine for modifications to original components. Ensure that any modifications have been approved by JLG.
- Avoid accumulation of debris on platform floor. Keep mud, oil, grease, and other slippery substances from footwear and platform floor.

## 1.3 OPERATION

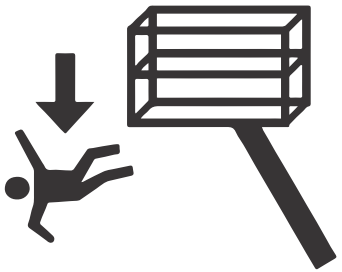
### 1.3.1 General

- Machine operation requires your full attention. Bring the machine to a full stop before using any device, i.e. cell phones, two-way radios, etc. that will distract your attention from safely operating the machine.
- Do not use the machine for any purpose other than positioning personnel, their tools, and equipment.
- Before operation, the user must be familiar with the machine capabilities and operating characteristics of all functions.
- Never operate a malfunctioning machine. If a malfunction occurs, shut down the machine. Remove the unit from service and notify the proper authorities.
- Do not remove, modify, or disable any safety devices.
- Never slam a control switch or lever through neutral to an opposite direction. Always return switch to neutral and stop before moving the switch to the next function. Operate controls with slow and even pressure.
- Do not allow personnel to tamper with or operate the machine from the ground with personnel in the platform, except in an emergency.
- Do not carry materials directly on platform railing unless approved by JLG.
- When two or more persons are in the platform, the operator shall be responsible for all machine operations.
- Always ensure that power tools are properly stowed and never left hanging by their cord from the platform work area.

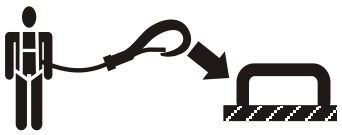
- When driving, always position boom over rear axle in line with the direction of travel. Remember, if boom is over the front axle, steer and drive functions will be reversed.
- Do not assist a stuck or disabled machine by pushing or pulling except by pulling at the chassis tie-down lugs.
- Fully lower platform and shut off all power before leaving machine.
- Remove all rings, watches, and jewelry when operating machine. Do not wear loose fitting clothing or long hair unrestrained which may become caught or entangled in equipment.
- Persons under the influence of drugs or alcohol or who are subject to seizures, dizziness or loss of physical control must not operate this machine.
- Hydraulic cylinders are subject to thermal expansion and contraction. This may result in changes to the platform position while the machine is stationary. Factors affecting thermal movement can include the length of time the machine will remain stationary, hydraulic oil temperature, ambient air temperature, and platform position.

### 1.3.2 Trip and Fall Hazards

- Before operating the machine, ensure all gates are closed and fastened in their proper position.



- During operation, occupants in the platform must wear a full body harness with a lanyard attached to an authorized lanyard anchorage point. Attach only one (1) lanyard per lanyard anchorage point.



**Note:** For machines covered under CE/UKCA certifications, the utilization of fall protection systems is limited to fall restraint devices.

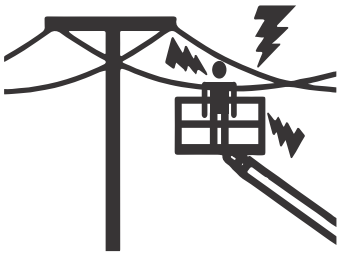
- Enter and exit only through gate area. Use extreme caution when entering or leaving platform. Ensure that the platform assembly is fully lowered. Face the platform when entering or leaving the platform. Always maintain “three point

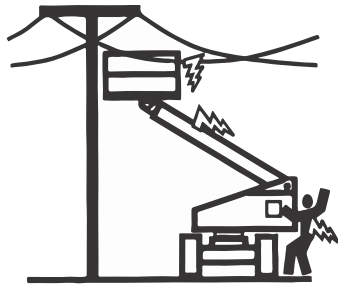
contact" with the machine, using two hands and one foot or two feet and one hand at all times during entry and exit.

- Keep both feet firmly positioned on the platform floor at all times. Never position ladders, boxes, steps, planks, or similar items on unit to provide additional reach for any purpose.
- Keep oil, mud, and slippery substances cleaned from footwear and the platform floor.

### 1.3.3 Electrocution Hazards

- This machine is not insulated and does not provide protection from contact with or proximity to electrical current.
- It is not recommended to use the machine during lightning. To prevent injury or machine damage if lightning occurs during operation, lower the boom and shut down the machine in a safe and secure location.





- Maintain distance from electrical lines, apparatus, or any energized (exposed or insulated) parts according to the Minimum Approach Distance (MAD) as shown in *Table — Minimum Approach Distances (MAD), page 17*.
- Allow for machine movement and electrical line swaying.

**Table 1. Minimum Approach Distances (MAD)**

| Voltage Range (Phase to Phase) | Minimum Approach Distance in Feet (Meters) |
|---|---|
| 0 to 50 KV | 10 (3) |
| Over 50K V to 200 KV | 15 (5) |
| Over 200 KV to 350 KV | 20 (6) |
| Over 350 KV to 500 KV | 25 (8) |
| Over 500 KV to 750 KV | 35 (11) |
| Over 750 KV to 1000 KV | 45 (14) |

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

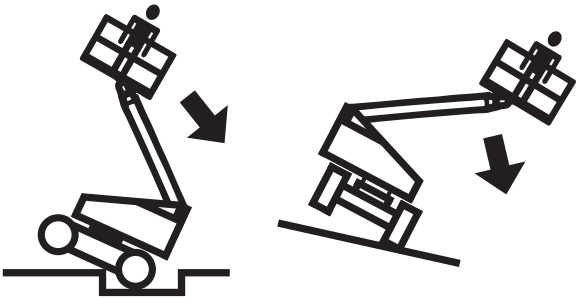
- Maintain a clearance of at least 10 ft (3m) between any part of the machine and its occupants, their tools, and their equipment from any electrical line or apparatus carrying up to 50,000 volts. One foot additional clearance is required for every additional 30,000 volts or less.
- The MAD may be reduced if insulating barriers are installed to prevent contact, and the barriers are rated for the voltage of the line being guarded. These barriers shall not be part of (or attached to) the machine.
- The MAD shall be reduced to a distance within the designed working dimensions of the insulating barrier. This determination shall be made by a qualified person with respect to electrical transmission and distribution in accordance with the employer, local, or governmental requirements for work practices near energized equipment.

**⚠ DANGER**

Do not maneuver machine or personnel inside prohibited zone (MAD). Assume all electrical parts and wiring are energized unless known otherwise.

### 1.3.4 Tipping Hazards

- Ensure that the ground conditions are adequate to support the maximum tire load indicated on the tire load decals located on the chassis adjacent to each wheel. Do not travel on unsupported surfaces.
- The user must be familiar with the operating surface before driving. Do not exceed the allowable side slope and grade while driving.



- Do not elevate platform or drive with platform elevated while on or near a sloping, uneven, or soft surface.
- Ensure machine is positioned on a smooth, firm surface within the limits of the maximum operating slope before elevating platform or driving with the platform in the elevated position.
- Before driving on floors, bridges, trucks, and other surfaces, check allowable capacity of the surfaces.
- Never exceed the maximum platform capacity as specified on the platform. Keep all loads within the confines of the platform, unless authorized by JLG.

- Keep the chassis of the machine a minimum of 2 ft (0.6m) from holes, bumps, drop-offs, obstructions, debris, concealed holes, and other potential hazards at the ground level.
- Do not push or pull any object with the boom.
- Never attempt to use the machine as a crane. Do not tie-off machine to any adjacent structure. Never attach wire, cable, or any similar items to platform.
- If boom assembly or platform is in a position that one or more wheels are off the ground, all persons must be removed before attempting to stabilize the machine. Use cranes, forklift trucks, or other appropriate equipment to stabilize machine.
- Do not operate the machine when wind conditions, including gusts, exceed 28 mph (12.5 m/s). Refer to *Table — Beaufort Scale (For Reference Only), page 19*. Factors affecting wind speed are; platform elevation, surrounding structures, local weather events, and approaching storms.
- Wind speed can be significantly greater at height than at ground level.
- Wind speed can change rapidly. Always consider approaching weather events, the time required to lower the platform, and methods to monitor current and potential wind conditions.
- Do not cover or increase surface area of the platform or the load. Do not carry large surface area items in the platform when operating outdoors. The addition of such items increases the exposed wind area of the machine. Increased areas exposed to wind will decrease stability.
- Do not increase the platform size with unauthorized modifications or attachments.

**⚠ WARNING**

Do not operate the machine when wind conditions exceed specifications shown in the General Specifications section of this manual or as shown on the capacity placard on the platform billboard.

**Table 2. Beaufort Scale (For Reference Only)**

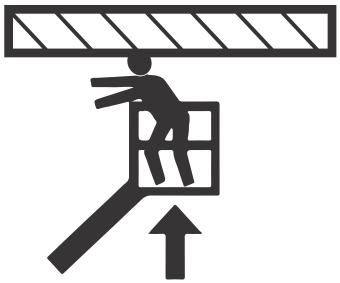
| Beaufort Number | Wind Speed | | Description | Land Conditions |
|---|---|---|---|---|
| | mph | m/s | | |
| 0 | 0 | 0-0.2 | Calm | Calm. Smoke rises vertically |
| 1 | 1-3 | 0.3-1.5 | Light air | Wind motion visible in smoke |
| 2 | 4-7 | 1.6-3.3 | Light breeze | Wind felt on exposed skin. Leaves rustle |
| 3 | 8-12 | 3.4-5.4 | Gentle breeze | Leaves and smaller twigs in constant motion |
| 4 | 13-18 | 5.5-7.9 | Moderate breeze | Dust and loose paper raised. Small branches begin to move. |

**Table 2. Beaufort Scale (For Reference Only) (continued)**

| Beaufort Number | Wind Speed | | Description | Land Conditions |
|---|---|---|---|---|
| | mph | m/s | | |
| 5 | 19-24 | 8.0-10.7 | Fresh breeze | Smaller trees sway. |
| 6 | 25-31 | 10.8-13.8 | Strong breeze | Large branches in motion. Flags waving near horizontal. Umbrella use becomes difficult. |
| 7 | 32-38 | 13.9-17.1 | Near Gale/ Moderate Gale | Whole trees in motion. Effort needed to walk against the wind. |
| 8 | 39-46 | 17.2-20.7 | Fresh Gale | Twigs broken from trees. Cars veer on road. |
| 9 | 47-54 | 20.8-24.4 | Strong Gale | Light structure damage. |

### 1.3.5 Crushing and Collision Hazards

- Approved head gear must be worn by all operating and ground personnel.
- Watch for obstructions around machine and overhead when driving. Check clearances above, on sides, and bottom of platform during all operations.



- During operation, keep all body parts inside platform railing.
- Use the boom functions, not the drive function, to position the platform close to obstacles.
- Always post a lookout when driving in areas where vision is obstructed.
- Keep non-operating personnel at least 6 ft (1.8 m) away from machine during all operations.
- Under all travel conditions, the operator must limit travel speed according to conditions of ground surface, congestion, visibility, slope, location of personnel, and other factors.
- Be aware of stopping distances in all drive speeds. When driving in high speed, reduce drive speed before stopping. Travel grades in low speed only.

- Do not use high speed drive in restricted or close quarters or when driving in reverse.
- Exercise extreme caution at all times to prevent obstacles from striking or interfering with operating controls and persons in the platform.
- Ensure that operators of other overhead and floor level machines are aware of the MEWP's presence. Disconnect power to overhead cranes. Barricade floor area if necessary.
- Do not operate over ground personnel. Warn personnel not to work, stand, or walk under a raised boom or platform. Position barricades on floor if necessary.

## 1.4 TOWING, LIFTING, AND HAULING

- Never allow personnel in platform while towing, lifting, or hauling.
- This machine should not be towed, except in the event of emergency, malfunction, power failure, or loading/unloading. Refer to the Emergency Procedures section of this manual for emergency towing procedures.
- Ensure boom is in the stowed position and, if equipped, the turntable locked prior to towing, lifting or hauling. The platform must be completely empty of tools.
- When lifting machine, lift only at designated areas of the machine. Lift the unit with equipment of adequate capacity.
- Refer to the Machine Operation section of this manual for lifting information.

## 1.5 MAINTENANCE

This sub-section contains general safety precautions which must be observed during maintenance of this machine. Additional precautions to be observed during machine maintenance are inserted at the appropriate points in this manual and in the Service and Maintenance Manual. It is of utmost importance that maintenance personnel pay strict attention to these precautions to avoid possible injury to personnel or damage to the machine or property. A maintenance program must be established by a qualified person and must be followed to ensure that the machine is safe.

### 1.5.1 Maintenance Hazards

- Shut off power to all controls and remove the key to ensure that all moving parts are secured from inadvertent motion prior to performing any adjustments or repairs.
- Never work under an elevated platform until it has been fully lowered to the full down position, if possible, or otherwise supported and restrained from movement with appropriate safety props, blocking, or overhead supports.
- DO NOT attempt to repair or tighten any hydraulic hoses or fittings while the machine is powered on or when the hydraulic system is under pressure.

- Always relieve hydraulic pressure from all hydraulic circuits before loosening or removing hydraulic components.
- DO NOT use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks. Wear gloves to help protect hands from spraying fluid.



- Use only replacement parts or components that are approved by JLG. To be considered approved, replacement parts or components must be identical or equivalent to original parts or components.
- Never attempt to move heavy parts without the aid of a mechanical device. Do not allow heavy objects to rest in an unstable position. Ensure adequate support is provided when raising components of the machine.
- Do not use machine as a ground for welding.
- When performing welding or metal cutting operations, precautions must be taken to protect the chassis from direct exposure to weld and metal cutting spatter.
- Do not refuel combustion engine-powered machines with the engine running.
- Use only approved non-flammable cleaning solvents.
- Do not replace items critical to stability, such as batteries or solid tires, with items of different weight or specification. Do not modify the MEWP in any way to affect stability.
- Refer to the Service & Maintenance Manual for the weights of critical stability items.

**⚠ WARNING**

Modification or major alteration of a MEWP shall be made only with the prior written permission from the manufacturer. Modification is defined as change(s) to a MEWP that affect the operation, stability, safety factors, rated load, or safety of the MEWP in any way.

### 1.5.2 Battery Hazards

- Always disconnect batteries when servicing electrical components or when performing welding on the machine.
- Do not allow smoking, open flame, or sparks near battery during charging or servicing.
- Do not contact tools or other metal objects across the battery terminals.
- Always wear hand, eye, and face protection when servicing batteries. Ensure that battery acid does not come in contact with skin or clothing.

**⚠ CAUTION**

Battery fluid is highly corrosive. Avoid contact with skin and clothing at all times. Immediately rinse any contacted area with clean water and seek medical attention.

- Charge batteries only in a well ventilated area.
- Avoid overfilling the battery fluid level. Add distilled water to batteries only after the batteries are fully charged.

## 1.6 LONG-TERM STORAGE

- Prior to long-term storage of machines (placed into storage for periods greater than 3 months) with an internal combustion engine, refer to the engine manufacturer's guidance regarding fuel degradation.
- For long-term storage of battery-electric machines, store machines in a cool, dry place away from direct sunlight and heat sources. Avoid storing batteries in a fully discharged or fully charged state.

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# SECTION 2
# User Responsibilities, Machine Preparation, and Inspection

## 2.1 PERSONNEL TRAINING

The Mobile Elevating Work Platform (MEWP) is a personnel handling device, so it is necessary that it be operated and maintained only by trained personnel.

### 2.1.1 Operator Training

Operator training must cover:

1. Reading and understanding the Operation and Safety Manual.
2. Thorough understanding of the intended purpose and function of the MEWP controls, including platform, ground, and emergency descent controls.
3. Control labels, instructions, and warnings on the machine.
4. Applicable regulations, standards, and safety rules.
5. Use of approved fall protection equipment.
6. Enough knowledge of the mechanical operation of the machine to recognize a malfunction or potential malfunction.
7. The safest means to operate the machine where overhead obstructions, other moving equipment, and obstacles, depressions, holes, and drop-offs exist.
8. Means to avoid the hazards of unprotected electrical conductors.
9. Selection of the appropriate MEWP and available options for the work to be performed considering specific job requirements, with involvement from the MEWP owner, user, and/ or supervisor.
10. The responsibility of the operator to ensure all platform occupants have a basic level of knowledge to work safely on the MEWP, and to inform them of applicable regulations, standards, and safety rules.
11. The requirement for familiarization in addition to training.

### 2.1.2 Training Supervision

Training must be delivered by a qualified person in an open area free of hazards until the trainee has demonstrated the ability to safely control and operate the machine.

### 2.1.3 Operator Responsibility

The operator must be instructed that they have the responsibility and authority to shut down the machine in case of a malfunction or other unsafe condition of either the machine or the job site.

### 2.1.4 Machine Familiarization

**Note:** Responsibilities for familiarization may vary by region.

Only properly trained personnel who have received unit-specific familiarization shall operate a MEWP. The user shall determine if personnel are qualified to operate the MEWP prior to operation. The user shall ensure that after familiarization, the operator operates the MEWP for a sufficient period of time to achieve proficiency. When authorized by the user, self-familiarization can be achieved, if authorized, by a properly trained operator reading, understanding and following the manufacturer's operator's manual.

Prior to user's authorization of an operator to use a specific model of MEWP, the user shall ensure the operator is familiarized on the following:

1. Location of the manual storage compartment and the requirement to ensure the required manual(s) are present on the MEWP;
2. Purpose and function of the machine controls and indicators at the platform and ground control stations;
3. Purpose, location, and function of the emergency controls;
4. Operating characteristics and limitations;
5. Features and devices;
6. Accessories and optional equipment.

## 2.2 PREPARATION, INSPECTION, AND MAINTENANCE

The following table covers machine inspections and maintenance required by JLG Industries, Inc. Consult local regulations for further requirements for MEWPs. The frequency of inspections and maintenance must be increased as necessary when the machine is used in a harsh or hostile environment, if the machine is used with increased frequency, or if the machine is used in a severe manner.

**Table 3. Inspection and Maintenance Table**

| Type | Frequency | Primary Responsibility | Service Qualification | Reference |
|---|---|---|---|---|
| Pre-Start Inspection | Before using each day; or whenever there is an Operator change | User or Operator | User or Operator | Operation & Safety Manual |
| Pre-Delivery Inspection (See Note) | Before each sale, lease, or rental delivery | Owner, Dealer, or User | Qualified JLG Mechanic | Service & Maintenance Manual and applicable JLG inspection form |

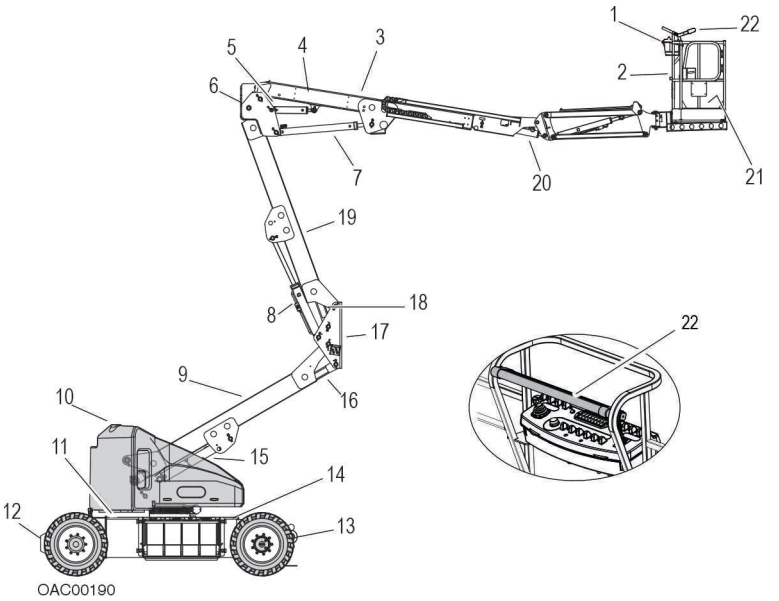
**Table 3. Inspection and Maintenance Table (continued)**

| Type | Frequency | Primary Responsibility | Service Qualification | Reference |
|---|---|---|---|---|
| Frequent Inspection (See Note) | In service for 3 months or 150 hours, whichever comes first<br>or<br>Out of service for a period of more than 3 months<br>or<br>Purchased used | Owner, Dealer, or User | Qualified JLG Mechanic | Service & Maintenance Manual and applicable JLG inspection form |
| Annual Machine Inspection (See Note) | Annually, no later than 13 months from the date of prior inspection | Owner, Dealer, or User | Factory-Trained Service Technician (Recommended) | Service & Maintenance Manual and applicable JLG inspection form |
| Preventive Maintenance | At intervals as specified in the Service & Maintenance Manual | Owner, Dealer, or User | Qualified JLG Mechanic | Service & Maintenance Manual |
| **Note:** Inspection forms are available from JLG. Use the Service & Maintenance Manual to perform inspections. | | | | |

## *NOTICE*

JLG Industries, Inc. recognizes a factory-trained service technician as a person who has successfully completed the JLG Service Training School for the specified JLG product model.

## 2.3 MACHINE COMPONENTS




| | | |
|---|---|---|
| 1. Platform Control Console | 9. Lower Boom | 17. Lower Upright |
| 2. Platform | 10. Turntable | 18. Upper Link |
| 3. Upper Boom | 11. Frame | 19. Mid Boom |
| 4. Telescope Cylinder (inside) | 12. Steer Wheels | 20. Slave Cylinder |
| 5. Master Cylinder | 13. Drive Wheels | 21. Footswitch |
| 6. Upper Upright | 14. Battery Box | 22. SkyGuard |
| 7. Upper Lift Cylinder | 15. Lower Lift Cylinder | |
| 8. Mid Lift Cylinder | 16. Lower Link | |

## 2.4 PRE-START INSPECTION

The Pre-Start Inspection should include each of the following:

1. **Cleanliness** — Check all surfaces for leakage (oil or battery fluid) or foreign objects. Report any leakage to the proper maintenance personnel.

2. **Structure** — Inspect the machine structure for dents, damage, weld or parent metal cracks or other discrepancies.

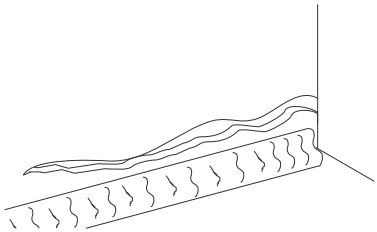


**Figure 1. Parent Metal Crack**

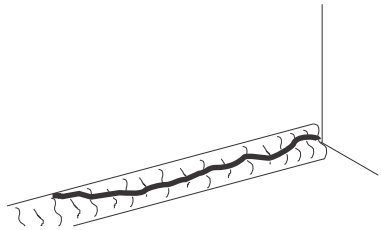


**Figure 2. Weld Crack**

3. **Decals and Placards** — Check all for cleanliness and legibility. Make sure none of the decals and placards are missing. Make sure all illegible decals and placards are cleaned or replaced.

4. **Operation and Safety Manuals** — Make sure a copy of the Operation and Safety Manual, AEM Safety Manual (ANSI markets only), and ANSI Manual of Responsibilities (ANSI markets only) is enclosed in the weather resistant storage container.

5. **Walk-Around Inspection** — Perform as instructed.

6. **Battery** — Charge as required.

7. **Hydraulic Oil** — Check the hydraulic oil level. Ensure hydraulic oil is added as required.

8. **Accessories/Attachments** — Refer to the Accessories section in this manual or accessory installed upon the machine for specific inspection, operation, and maintenance instructions.

9. **Function Check** — Once the Walk-Around Inspection is complete, perform a functional check of all systems in an area free of overhead and ground level obstructions. Refer to Section 4, Machine Operation for more specific instructions.

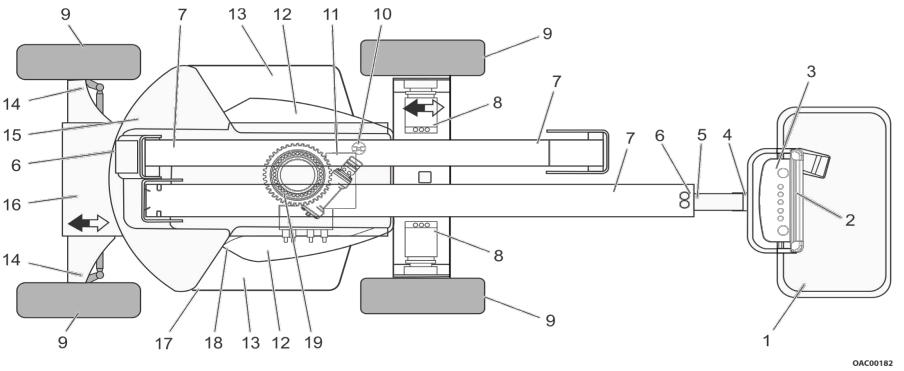
10. **Platform Gate** — Keep gate and surrounding area clean and unobstructed. Verify the gate closes properly and is not bent or damaged. Keep gate closed at all times except when entering/exiting the platform and loading/unloading materials.

11. **Lanyard Attach Points** — During operation, occupants in the platform must wear a full body harness with a lanyard attached to an authorized lanyard anchorage point. Attach only one (1) lanyard per lanyard anchorage point.

## ⚠ WARNING

If the machine does not operate properly, turn off the machine immediately! Report the problem to the proper maintenance personnel. Do not operate the machine until it is declared safe for operation.

## 2.5 WALK-AROUND INSPECTION




Begin the Walk-Around Inspection at Item 1, as noted on the diagram. Continue to the right (counterclockwise viewed from top) checking each item in sequence for the conditions listed in the Walk-Around Inspection Checklist.

**⚠ WARNING**

To avoid possible injury be sure machine power is off during Walk-Around Inspection.

***NOTICE***

Do not overlook visual inspection of chassis underside. Checking this area may result in discovery of conditions which could cause extensive machine damage.

**INSPECTION NOTE:** On all components, make sure there are no loose or missing parts, that they are securely fastened, and no visible damage, leaks or excessive wear exists in addition to any other criteria mentioned.

1. **Platform Assembly and Gate** - Footswitch works properly, not modified, disabled or blocked. Gate latches and hinges in working condition.
2. **SkyGuard** - See Inspection Note.
3. **Platform Control Console** - Switches and levers return to neutral when activated and released, decals/placards secure and legible, control markings legible.
4. **Platform Rotator** - See Inspection Note.
5. **Jib Assembly and Jib Rotator** - See Inspection Note.
6. **All Hydraulic Cylinders** - No visible damage; pivot pins and hydraulic hoses undamaged, not leaking.
7. **Boom Sections/Uprights/Turntable** - See Inspection Note.

8. **Drive Motor, Brake, and Hub** - No evidence of leakage.
9. **Wheel/Tire Assemblies** - Properly secured, no missing lug nuts. Inspect for worn tread, cuts, tears or other discrepancies. Inspect wheels for damage and corrosion.
10. **Swing Motor and Worm Gear** - No evidence of damage.
11. **Hydraulic Pump and Hydraulic Reservoir** - See Inspection Note.
12. **Hood Assemblies** - See Inspection Note.
13. **Battery Compartment** - Batteries have proper electrolyte level; cables tight; no visible damage or corrosion.
14. **Tie Rod Ends and Steering Spindles** - See Inspection Note.
15. **Counterweight** - See Inspection Note.
16. **Battery Charger** - See Inspection Note.
17. **Ground Control Console** - Switches and levers return to neutral when activated and released, decals/placards secure and legible, control markings legible.
18. **Manual Descent** - See Inspection Note.
19. **Turntable Bearing** - Evidence of proper lubrication. No evidence of loose bolts or looseness between bearing and machine.

## 2.6 FUNCTION CHECK

**⚠ WARNING**

To avoid serious injury, do not operate machine if any control levers or toggle switches controlling platform movements do not return to the off position when released.

**⚠ WARNING**

To avoid a collision and injury if platform does not stop when a control switch or lever is released, remove foot from footswitch or use emergency stop to stop machine.

Perform the Function Check as follows:

1. From the ground control console with no load in the platform:
    a. Ensure that all machine functions are disabled when the Emergency Stop Button is pushed in.
    b. Ensure all functions stop when the function switch is released.
    c. Operate all functions and ensure proper operation;
    d. Ensure proper operation of the manual descent controls, as described in *Section — Machine Operation* of this manual.
2. From the platform control console:
    a. Ensure that the control console is firmly secured in the proper location
    b. Check that all guards protecting the switches or locks are in place.
    c. Ensure that all machine functions are disabled when the Emergency Stop Button is pushed in.
    d. Ensure that all machine functions stop when the footswitch is released.
    e. Operate all functions and ensure proper operation.
3. With the platform in the stowed position:
    a. Drive the machine on a grade, not to exceed the rated gradeability, and stop to ensure the brakes hold;
    b. Check that the tilt indicator is illuminated to ensure proper operation.
4. Swing the boom over either of the rear tires and ensure that the Drive Orientation indicator illuminates and that the Drive Orientation Override switch must be used for the drive function to operate.
5. With the machine positioned on a smooth, firm surface within the limits of the maximum operating slope, elevate the boom 10 degrees or greater above horizontal. Select high speed drive mode. Carefully attempt to drive and ensure the drive speed is reduced.

## 2.7 SKYGUARD® FUNCTION CHECK

From the Platform Control Station in an area free from obstructions:

1. Operate the telescope-out function.
2. Activate the **SkyGuard SkyLine®** sensor by pressing rod to break connection between the rod and the right bracket.

3. Once the sensor has been activated, verify the following conditions:
   a. Telescope-out function stops and telescope-in function operates for a short duration.
   b. The horn sounds.
   c. If equipped with a configured ClearSky CS550 or SkyGuard beacon, the beacon illuminates.

**Note:** If SkyGuard is enabled with the Soft Touch system, functions will cut out instead of reversing.

4. Release controls, reattach the rod to the right bracket and recycle the foot switch. Make sure normal operation is available.

If SkyGuard remains activated after function reversal or cutout, press and hold the SkyGuard Override Switch to allow normal use of machine functions until the sensor is deactivated.

Refer to the SkyGuard Activation/Deactivation section for additional information.

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# SECTION 3
# Machine Controls and Indicators

## 3.1 GENERAL

**NOTICE**

The manufacturer has no direct control over machine application and operation. The user and operator are responsible for conforming with good safety practices.

This section provides the necessary information needed to understand control functions.

## 3.2 CONTROLS AND INDICATORS

**Note:** The indicator panels use different shaped symbols to alert the operator to different types of operational situations that could arise. The meaning of those symbols are explained below.



**Indicates a potentially hazardous situation, which if not corrected, could result in serious injury or death. This indicator will be red.**

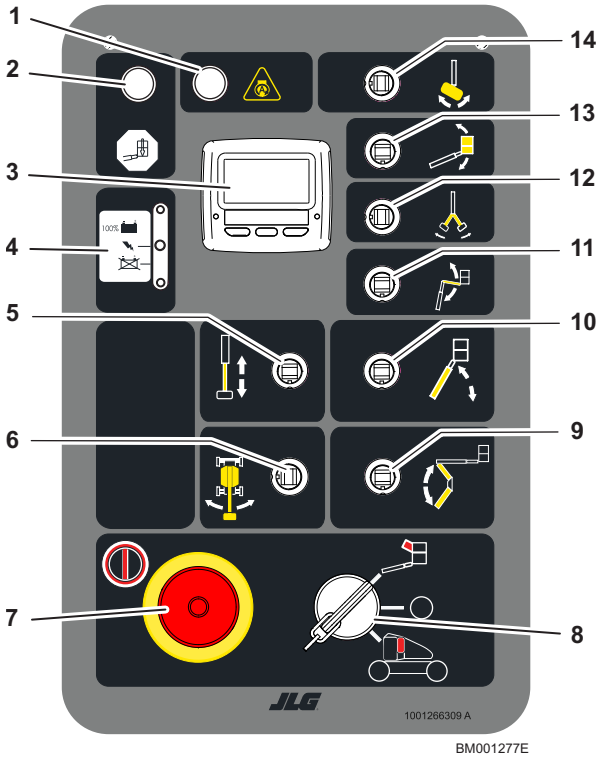


**Indicates an abnormal operating condition, which if not corrected, may result in machine interruption or damage. This indicator will be yellow.**



**Indicates important information regarding the operating condition, i.e. procedures essential for safe operation. This indicator will be green with the exception of the capacity indicator which will be yellow.**

## 3.3 GROUND CONTROL STATION




BM001277E

1. System Distress Indicator
2. Platform Overload Indicator
3. Multifunction Display
4. Battery Charger Status
5. Telescope
6. Swing
7. Power/Emergency Stop
8. Platform/Ground Select
9. Lower/Mid Lift
10. Upper Boom Lift
11. Jib
12. Jib Swing
13. Platform Leveling
14. Rotate

### 3.3.1 Ground Control Station Functions

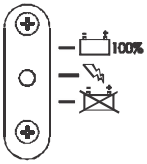
**⚠ WARNING**

To avoid serious injury, do not operate machine if any control levers or toggle switches controlling platform movement do not return to the off or neutral position when released.

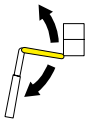
**Note:** When machine is shut down the Platform/ Ground Select switch and Emergency Stop must be positioned to off.



**Battery Charge Status**
A single LED light indicates charge status of battery. **Green** indicates full charge (100%). **Amber** indicates charge cycle in process. **Red** indicates charger fault or abnormal battery condition.



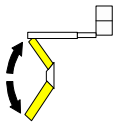

**Jib**
The Jib control switch provides raising and lowering of the jib.



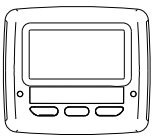
**Jib Swing (If Equipped)**
The Jib Swing control switch provides swinging of the jib when positioned left or right.



**Lower/Mid Boom Lift**
Provides for raising and lowering of Lower Boom.

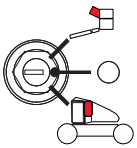


**Multifunction Display**
Registers machine hours and Diagnostic Trouble Codes (DTCs) from the JLG Control System.

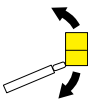


**Platform / Ground Select Switch**
A three position, key operated switch supplies power to the platform control console when positioned to Platform. With the switch key in the Ground position, power is shut off to platform and only ground controls are operable.

**Note:** When Platform/Ground Select switch is in the center position, power is shut off to the controls at both operating stations.



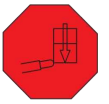
**Platform Leveling Override**
A three position switch allows the operator to adjust the automatic self leveling system. This switch is used to adjust platform level in situations such as ascending/descending a grade.



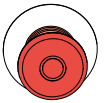
**⚠ WARNING**

Only use the platform leveling override function for slight leveling of the platform. Incorrect use could cause the load/occupant to shift or fall. Failure to do so could result in death or serious injury.

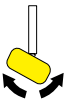
**Platform Overload**
Indicates the platform has been overloaded.



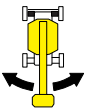
**Power / Emergency Stop Switch**
A two-position red mushroom shaped switch furnishes power to Platform/Ground Select switch when pulled out (on). When pushed in (off), power is shut off to the Platform/Ground Select switch.



**Rotate**
A three position Rotate control switch permits rotation of the platform.



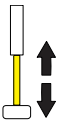
**Swing**
The Swing control switch provides 350 degrees non-continuous turntable rotation.



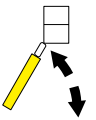
**System Distress Indicator**
The system distress indicator lights to signify an electrical system fault.



**Telescope**
Provides for extension and retraction of Upper Boom.



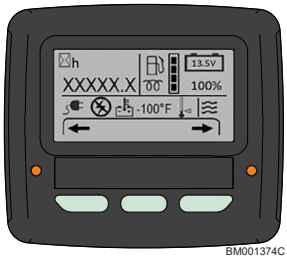
**Upper Boom Lift**
Provides for raising and lowering of Upper Boom.



## 3.4 MULTIFUNCTION DISPLAY

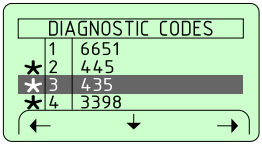
The multifunction display shows machine hours, battery level, and Diagnostic Trouble Codes (DTCs) from the JLG Control System (includes motor fault information). During machine start up, with no active DTCs in the control system, the

splash screen will show for 3 seconds and then switch to main screen. If there is an active DTC while powering up the machine, the splash screen will show for 3 seconds, and then launch the Diagnostics Screen. The indicator lamps will light when there is an active DTC in the Fault Log.



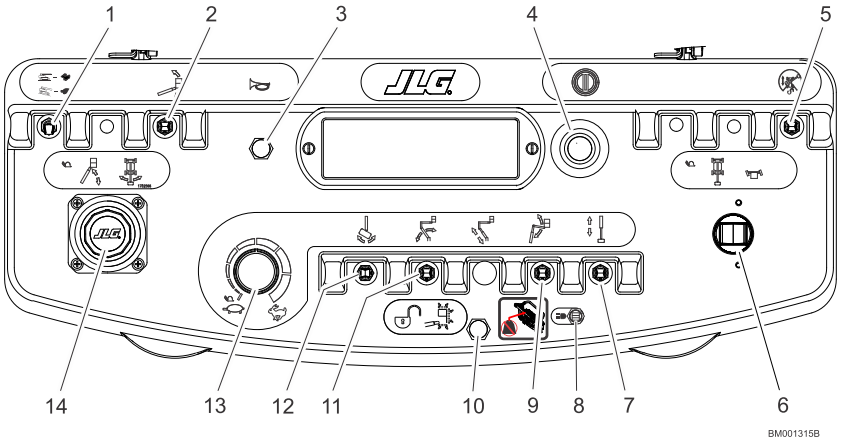

### 3.4.1 Multifunction Display Diagnostic Screen

The Diagnostic Screen will show active and inactive faults from the JLG Control System on the screen. An asterisk (*) will be displayed to show active faults.




If there is more than one DTC, exit from the individual DTC screen to select other active fault information.

## 3.5 PLATFORM CONTROL STATION




1. Drive Speed/Torque Select
2. Platform Leveling Override
3. Horn
4. Power/Emergency Stop
5. Drive Orientation Override
6. Drive/Steer
7. Telescope
8. Lights
9. Jib
10. Soft Touch/SkySense/SkyGuard Override
11. Lower Boom Lift
12. Platform Rotate
13. Function Speed
14. Main Lift/Swing

### 3.5.1 Platform Control Station Functions

**⚠ WARNING**

To avoid serious injury, do not operate machine if any control levers or toggle switches controlling platform movement do not return to the off or neutral position when released.

**⚠ WARNING**

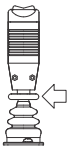
Only use the platform leveling override function for slight leveling of the platform. Incorrect use could cause the load/occupants to shift or fall. Failure to do so could result in death or serious injury.

**Drive Orientation Override**
When the boom is swung over the rear tires or further in either direction, the Drive Orientation indicator will illuminate when the drive function is selected. Push and release the switch, and within 3 seconds move the Drive/Steer control to activate drive or steer. Before driving, locate the black/ white orientation arrows on both the chassis and the platform controls and match the control direction arrow to the intended direction of travel.

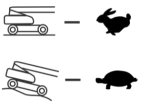


**Note:** To operate the Drive joystick, pull up on the locking ring below the handle.

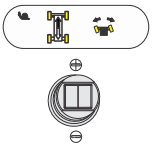
**Note:** The Drive joystick is spring loaded and will automatically return to neutral (off) position when released.



**Drive Speed / Torque Select**
The machine has a two position switch — The forward position gives maximum drive speed. The back position gives maximum torque for rough terrain and climbing grades.



**Drive / Steer**
The Drive controller provides for driving either forward or backward when positioned to Forward or Reverse. The controller is 'ramped' to allow infinitely variable drive speed between fast and slow.
Positioning the steer control thumb operated switch Right or Left enables steering the machine to the right or left respectively.



**Note:** When lower boom is raised above horizontal, or the upper boom is raised approximately 16 inches (40.64 cm) above boom rest, the high drive function will automatically switch to low drive. This also occurs when Function Speed Control is clicked on creep.

## ⚠ WARNING

To avoid serious injury, do not operate machine if any control levers or toggle switches controlling platform movement do not return to the off or neutral position when released.

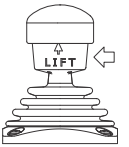
**Function Speed Control**
This control knob affects the speed of Lower Boom Lift, Jib Lift, Telescope, and Platform Rotate functions.



**Note:** During platform rotation, a speed difference may not be noticeable to the operator.

Turning the knob all the way counterclockwise until it clicks puts the machine into Creep Mode. Creep Mode puts the functions listed above, as well as Drive/Steer and Main Lift/ Swing functions into the slowest speed setting.

**Note:** To operate the Main Boom Lift/Swing joystick, pull up on the locking ring below the handle.




**Note:** The Main Boom Lift/Swing joystick is spring loaded and will automatically return to neutral (Off) position when released.

**Horn**
A push-type Horn switch supplies electrical power to an audible warning device when pressed.



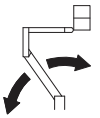
**Jib**
Provides for raising and lowering of the jib.



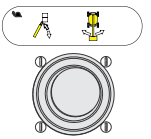
**Lights (If Equipped)**
This switch operates the accessory lights package if the machine is so equipped.



**Lower Boom Lift**
Provides for raising and lowering of Lower and Mid Boom.

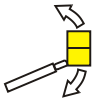


**Main Lift / Swing Controller**
Provides main lift and swing. Push forward to lift up, pull backward to boom down. Move right to swing right, move left to swing left. Moving the joystick activates switches to provide the functions selected.



**Note:** Lower lift will not function when operating main lift.

**Platform Level Override**
A three position switch allows the operator to adjust the automatic self leveling system. This switch is used to adjust platform level in situations such as ascending/descending a grade.



**Platform Rotate**
Provides rotation of the platform.



**Power / Emergency Stop**
A two-position red mushroom shaped switch furnishes power to Platform Controls when pulled out (On). When pushed in (Off), power is shut off to the platform functions.



**Soft Touch / SkyGuard / SkySense Override**



For machines equipped with SkyGuard:

The SkyGuard override switch enables functions cut out by the SkyGuard system to be operated again, allowing the operator to resume use of machine functions.

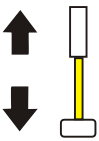
For machines equipped with both SkyGuard and Soft Touch:

The switch operates like the SkyGuard override switch as described above. The switch also enables the functions cut out by the Soft Touch system to operate again at creep speed, allowing the operator to move the platform away from the obstacle that caused the shutdown situation.

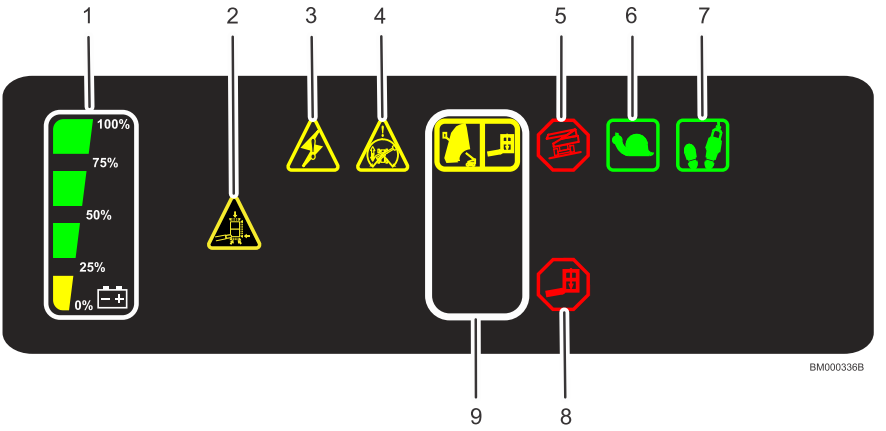
For machines equipped with both SkyGuard and SkySense:

The switch operates like the SkyGuard override switch as described above. The switch also enables the functions cut out by the SkySense system to operate again at creep speed, allowing the operator to move the platform closer to the obstacle that caused the shutdown situation if desired.

**Telescope**
Provides extension and retraction of the main boom.



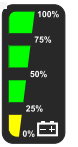
# 3.6 PLATFORM CONTROL INDICATOR PANEL




1. Battery Charge Level
2. Soft Touch/ SkyGuard/ SkySense Indicator
3. System Distress
4. Drive Orientation
5. Tilt alarm / Warning
6. Creep Speed
7. Footswitch Enable
8. Platform Overload
9. Capacity Zone Indicator

## 3.6.1 Platform Control Indicator Panel Functions

**Battery Charge Level**
Indicates the state-of-charge of the battery pack.




**Capacity Zone Indicator**
Indicates the maximum platform capacity zone for the current position of the platform. Restricted capacities are permitted at restricted platform positions (shorter boom lengths and higher boom angles).



**Creep Speed**
When the Function Speed Control is turned to the creep position, the indicator acts as a reminder that all functions are set to the slowest speed.



**Drive Orientation**
When the boom is swung beyond the rear drive tires or further in either direction, the Drive Orientation indicator will illuminate when the drive function is selected. This is a signal for the operator to verify that the drive control is being operated in the proper direction (i.e., controls reversed situations).



**Footswitch Enable**
To operate any function, the footswitch must be pressed down and the function selected within seven seconds. The enable indicator shows that the controls are enabled. If a function is not selected within seven seconds, or if a seven second lapse between ending one function and beginning the next function, the enable light will go out and the footswitch must be released and pressed again to enable the controls.
Releasing the footswitch removes power from all controls and stops all functions.



**⚠ WARNING**

To avoid serious injury, do not remove, modify, or disable the footswitch by blocking or any other means.

**Platform Overload**
Indicates the platform has been overloaded.



**Soft Touch/ SkyGuard/ SkySense Indicator**
Indicates the Soft Touch bumper is against an object or the SkyGuard sensor has been activated. All controls are cut out until the override button is pushed. For Soft Touch, controls are then active in the Creep Mode or for SkyGuard, controls will work normally.



**System Distress**
The light indicates that the JLG Control System has detected an abnormal condition and a Diagnostic Trouble Code has been set in the system memory. Refer to the Service Manual for instructions concerning the trouble codes and trouble code retrieval.



**Tilt Warning Light and Alarm**
This red illuminator indicates that the chassis is on a slope. If the boom is above horizontal and the machine is on a slope, the tilt alarm warning light will illuminate, an alarm will sound, available functions are placed in Creep speed, and drive is cut out in direction of travel. Drive in the opposite direction may be allowed under certain conditions.

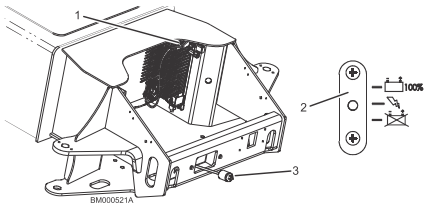


| Tilt Angle | Market |
|---|---|
| 3° | All Markets |

# ⚠ WARNING

If tilt warning light is illuminated when boom is raised or extended, retract and lower to below horizontal then reposition machine so that it is within the limits of the maximum operating slope before extending boom or raising boom above horizontal.

## 3.7 BATTERY CHARGER

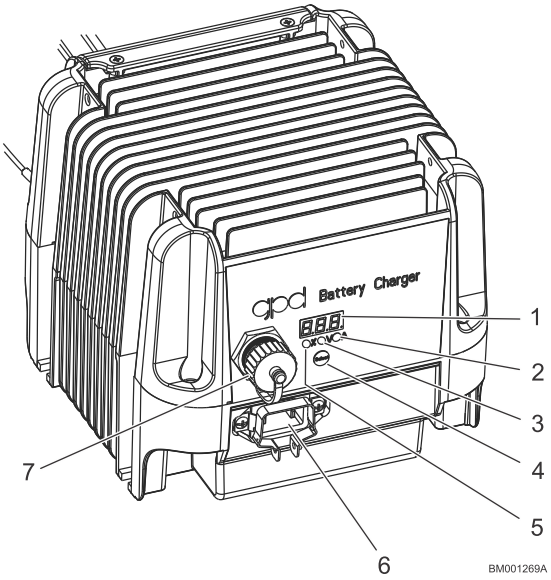



1. LED Indicator Panel on Charger (Under Hood)
2. LED Indicator on Ground Control Station
3. AC Input Plug (Rear of Machine)

**Note:** Some components removed for clarity.

1. **LED Indicator on Charger**
   - **AC Power On:** Blue LED on
   - **Low State of Charge:** Bottom Panel — Green LED flashing; Top Panel — Green LED off
   - **High State of Charge:** Bottom Panel — Green LED on; Top Panel — Green LED flashing
   - **Charge Complete:** Bottom Panel — Green LED on; Top Panel — Green LED on
   - **Fault Indicator:** Red LED on
   - **External Error Condition Caution:** Amber LED flashing
2. **LED Indicator on Ground Control Station**
   - **Full Charge (100%):** LED is green
   - **Charge Cycle in Process:** LED is amber
   - **Abnormal Battery Condition/Charger Fault:** LED is red

### 3.7.1 Optional Charger

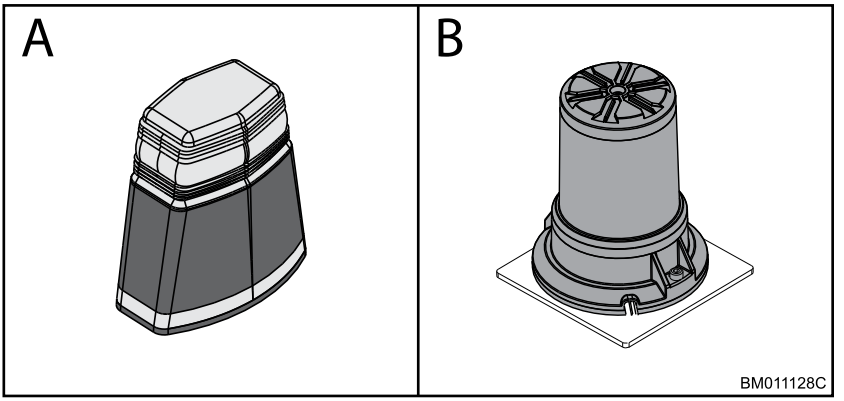



1. **Display**
2. **Charging Current** — The display will indicate the charging current
3. **Charging Voltage** — The display will indicate the charging voltage
4. **Options Button** — Pressing the button cycles through Curve State/Start EQ/ Check Battery Voltage
5. **Charging Capacity** — The display will indicate the charging capacity
6. **AC Input Plug**
7. **USB Port** — Used to update firmware, change curve, download charging data

#### LED Indicator

| LED Color and State | Function |
|---|---|
| Solid green | Electric quantity – 100% |
| Fast flashing green | Electric quantity – 75% to 99% |
| Fast flashing amber | Electric quantity – 50% to 75% |
| Slow flashing amber | Electric quantity – less than 50% |
| Flashing red | Error |
| Solid red | Communication Outage |

## 3.8 BEACONS




A. LED Motion / Amber Beacon (CS550) B. Beacon

**Note:** Image for reference only. Beacon design may vary based on beacon type, machine model and installation location.

### 3.8.1 ClearSky® LED Motion / Amber Beacon (CS550)

The ClearSky® CS550 is installed on ClearSky Smart Fleet™ equipped machines.

The CS550 can function as a machine beacon using multiple colors and flash patterns for communication and identification purposes. In addition to amber, colors include: red, blue, green, cyan, and white. The ClearSky Smart Fleet mobile app can command visual alerts or audible alarms to assist in machine identification. Where applicable, the CS550 can also be configured to function as a SkyGuard Beacon (see below).

The CS550 also functions as a visible connectivity point for ClearSky Smart Fleet. Refer to the ClearSky Smart Fleet section for more information.

### 3.8.2 Amber Beacon

This amber-colored beacon flashes in a consistent pattern to alert those nearby that the machine power is on. The device may also use different flash patterns to identify specific machine alerts.

### 3.8.3 Blue or Red SkyGuard® Beacon

The SkyGuard beacon is available in blue or red lamp options. The beacon will flash in conjunction with an audible alarm when the SkyGuard sensor is activated.

Refer to the SkyGuard Operation section for more information.

# SECTION 4
# Machine Operation

## 4.1 GENERAL

This machine is a mobile elevating work platform used to position personnel, along with their necessary tools and materials at work locations.

The primary operator control station is in the platform. From this control station, the operator can drive and steer the machine in both forward and reverse directions. The operator can raise or lower the boom or swing the boom to the left or right. Standard boom swing is 350° non-continuous. The machine has a Ground Control Station which will override the Platform Control Station. Ground Controls operate all functions except drive and steer. Except for performing inspections and the Function Check, the ground controls are to be used in an emergency to lower the platform to the ground should the operator in the platform be unable to do so.

## 4.2 OPERATING CHARACTERISTICS AND LIMITATIONS

### 4.2.1 Operating Conditions

The boom can be raised above horizontal with or without any load in platform, if:

1. Machine is positioned on a smooth, firm surface within the limits of the maximum operating slope.
2. Load is within manufacturer's rated capacity.
3. All machine systems are functioning properly.
4. Machine is as originally equipped from JLG.

### 4.2.2 Platform Load Sensing System (LSS)

The Platform Load Sensing System (LSS) measures platform load from a sensor in the platform support.

If the LSS senses an overload condition, the overload alarm will sound, the overload indicator will light up at both the platform control and the ground control stations, and all boom functions will be disabled. To regain boom control, reduce the load in the platform to not exceed the rated workload indicated on the capacity decal. If unable to resolve the overload condition, auxiliary power may be used to return the platform to a safe working condition. See Emergency Operation section.

## 4.3 STABILITY

Machine stability is based on two (2) positions which are called Forward and Backward stability. The machines position of least Forward stability is shown in *Figure — Position of Least Forward Stability, page 50*, and its position of least Backward stability is shown in *Figure — Position of Least Backward Stability, page 50*.

# ⚠ WARNING

To avoid forward or backward tipping, do not overload machine or operate the machine on an out-of-level surface.

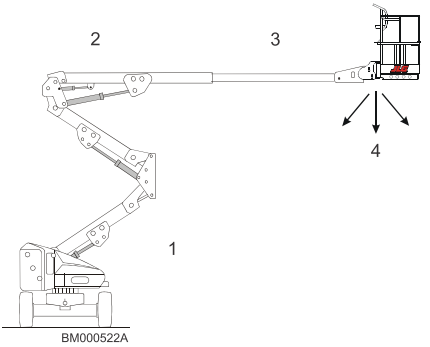



**Figure 3. Position of Least Forward Stability**

1. Tower and mid boom at 33°.
2. Upper boom horizontal.
3. Fly boom fully extended.
4. Machine will tip over in this direction if overloaded or operated beyond the limits of the maximum operating slope.

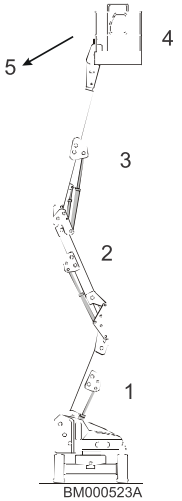



**Figure 4. Position of Least Backward Stability**

1. Lower boom fully elevated.
2. Mid boom full elevated.
3. Upper boom fully elevated and retracted.
4. Platform rotated 90°.
5. Machine will tip over in this direction if overloaded or operated beyond the limits of the maximum operating slope.

## 4.4 MOTOR OPERATION

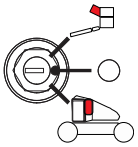
### 4.4.1 Power/Emergency Stop

The Power/Emergency Stop switch, when pulled out (on), provides battery power for all machine functions. The switch should be pushed in (off ) when recharging the batteries or parking the machine overnight.
Within about 2 seconds of pulling the switch out, the machine will perform a diagnostic check of the various electrical circuits, and if everything is OK, the platform alarm will beep once. During this time the lights on the indicator panel will also blink once as a bulb check.



### 4.4.2 Platform/Ground Select Switch

The Platform/Ground Select switch directs battery power to the desired control station when the Power/Emergency Stop switch is pulled out (on). With the switch held in the Ground position battery power is supplied to the ground control station. When the switch is in the Platform position, battery power is supplied to the platform control station.



### 4.4.3 Motor Activation

**NOTICE**

Footswitch must be depressed prior to activating any function, otherwise function will not operate.

The motor becomes activated and operates the desired function when the Emergency Stop switch is pulled out (on), the Platform/ Ground select switch is in the appropriate position and the Footswitch is depressed.

**⚠ CAUTION**

If a motor malfunction necessitates unscheduled shutdown, determine and correct cause before resuming any operation.

## 4.5 BATTERY CHARGING

**Note:** Park the machine in a well-ventilated area before charging.

1. Connect the charger AC input plug to a grounded outlet using a 3 wire heavy duty extension cord.

2. The charge cycle is complete when the single LED light on the ground control panel turns green. Additionally, the green LEDs on the top and bottom panels of the battery charger illuminates.

**⚠ CAUTION**

Only plug the charger into a properly installed and grounded outlet. Do not use ground adapters or modify plug in any way. Do not touch non-insulated portion of output connector or non-insulated battery terminal.

Do not operate charger if the AC supply cord is damaged, or if the charger has received a sharp blow, been dropped, or otherwise damaged in any way.

Always disconnect the charger AC supply before making or breaking the positive/ negative connections to the battery.

Do not open or disassemble charger.

## 4.6 INVERTER

The inverter converts 48 VDC to 110 VAC to allow operation of power tools from the machine's batteries.

- The inverter is operational when the emergency stop switch is pulled out.
- The machine and inverter can be operated at the same time.
- The inverter will shut off at approximately 42 VDC and stay off until the emergency stop switch is recycled. It will operate again until voltage drops to 42 VDC.
- The machine will operate down to 36 VDC.
- The inverter will shut down if the high temperature light indicated overheating. It will automatically turn back on when cooled.
- The overload light indicates an output wiring short circuit or a load that is too large for the rating of the inverter.

## 4.7 TRAVELING (GRADE/SIDE SLOPE)

**Note:** Refer to the Operating Specifications table for gradeability and side slope ratings.

All ratings for gradeability and side slope are based upon the machine's boom being in the stowed position, fully lowered, and retracted.

Traveling is limited by two factors:

1. Gradeability, which is the percent of grade of the incline the machine can climb.
2. Side slope, which is the angle of the slope the machine can be driven across.

### 4.7.1 Traveling on a Grade

When traveling a grade, maximum braking and traction are obtained with the boom stowed, in position over the rear (drive) axle, and in line with the direction of travel. Drive the machine forward when climbing a grade, and in reverse when descending a grade. Do not exceed the machine's maximum rated gradeability.

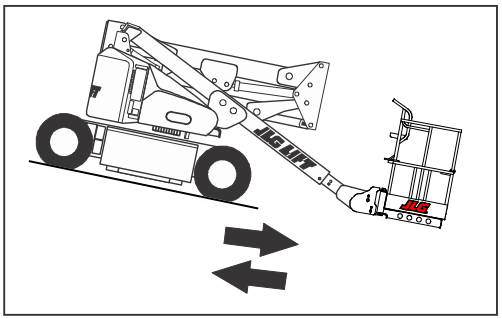



**Figure 5. Traveling on a Grade**

**NOTICE**

If the boom is over the front (steer) axle, direction of steer and drive movement will be opposite from the movement of the controls.

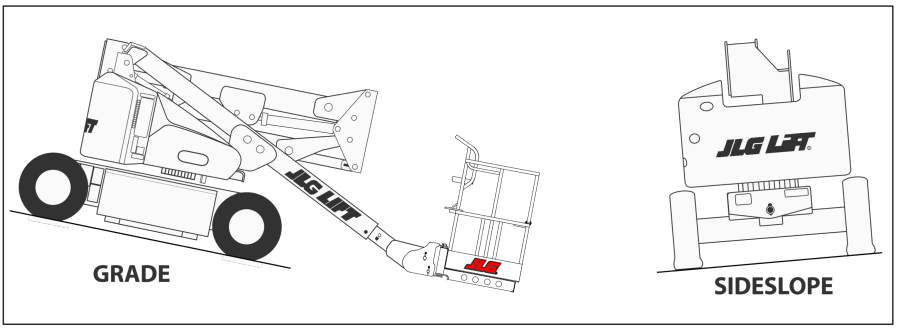



**Figure 6. Grade and Side Slope**

## 4.8 TRAVELING (DRIVING)

**Note:** For units equipped with optional tilt cutout, verify that the drive function is cut out when the boom is elevated and tilt alarm is activated.

**Note:** When lower boom is raised above horizontal, or the upper boom is raised approximately 16 inches (40.6 cm) above boom rest, the high drive function will automatically be in low drive.

# NOTICE

If the machine is operated at a very slow speed or stalled when climbing a grade of 20% or greater, drive function will stop. Remove foot from footswitch, and depress footswitch to reset.

# ⚠ WARNING

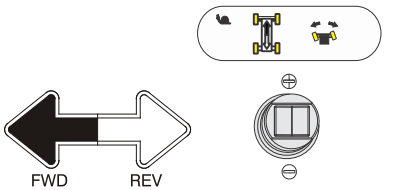
Do not drive with boom above horizontal except on a smooth, firm surface within the limits of the maximum operating slope.

To avoid loss of travel control or tip over on grades and side slopes, do not drive machine on grades exceeding those specified in the operating specifications section of this manual.

Do not drive on side slopes which exceed 3 degrees.

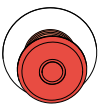
Use extreme caution when driving in reverse and at all times when driving with platform elevated.

Before driving, locate the black/white orientation arrows on both the chassis and the platform controls. Move the drive controls in a direction matching the directional arrows for the intended direction of travel.

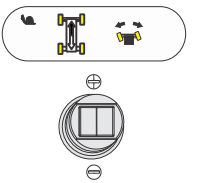



### 4.8.1 Traveling Forward and Reverse

1. At Platform Controls, pull out Emergency Stop switch, start engine, and activate footswitch.

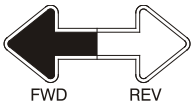


2. Position Drive controller to forward or reverse as desired.



This machine is equipped with a Drive Orientation Indicator. The yellow light on the platform control console indicates that the boom is swung beyond the rear drive tires and the machine may Drive/Steer in the opposite direction from the movement of the controls. If the indicator is illuminated, operate the Drive function in the following manner:

1. Match the black and white direction arrows on both platform control panel and the chassis to determine the direction the machine will travel.




2. Push and release the Drive Orientation Override switch. Within 3 seconds, slowly move the Drive control toward the arrow matching the intended direction of machine travel. The indicator light will flash during the 3 second interval until the drive function is selected.



## 4.9 STEERING



Press footswitch. Position thumb switch on Drive/Steer controller to Right for steering right, or to Left for steering left.

## 4.10 PLATFORM

JLG offers multiple platform sizes to accommodate a variety of applications. Refer to the Illustrated Parts Manual for available platforms.

Not all platform options may be of adequate size to allow for the maximum number of rated occupants shown on the machine's capacity decal. The number of platform occupants may never exceed the number of available lanyard anchorage points. Attach only one (1) lanyard per lanyard anchorage point.

### 4.10.1 Loading From Ground Level

1. Position chassis on a smooth, firm and level surface.
2. If total load (personnel, tools and supplies) is 500 lb (227 kg for ANSI markets and 230 kg for CE and Australia markets) or less, distribute load uniformly on platform floor and proceed to work position.

### 4.10.2 Loading From Positions Above Ground Level

Before loading weight to platform above ground level:

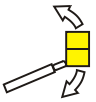
1. Determine what the total weight will be after additional weight is loaded (personnel, tools and supplies).
2. If total weight in platform will be 500 lb (227 kg for ANSI markets and 230 kg for CE and Australia markets) or less, proceed with adding weight.

### 4.10.3 Platform Level Adjustment

**⚠ WARNING**

Only use the platform leveling override function for slight leveling of the platform. Incorrect use could cause the load/occupants to shift or fall. Failure to do so could result in death or serious injury.

**During normal operation of the machine, the platform will automatically maintain its position. To manually level up or down, position the platform/level control switch up or down and hold until the platform is level.**



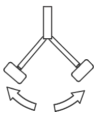
### 4.10.4 Platform Rotation

**To rotate the platform to the left or right, use the platform rotate control switch to select the direction and hold until the desired position is reached.**



### 4.10.5 Jib Swing

**To rotate jib and platform to the left, jib swing control switch is positioned to the left and held until desired position is reached.**



## 4.11 BOOM

**⚠ WARNING**

A red tilt warning light is located on the platform control indicator panel which lights when the chassis is on an excessive slope. Do not swing or raise boom above horizontal when indicator is lit.

Do not depend on the tilt warning light as a level indicator for the chassis. Tilt alarm indicates chassis is on an excessive slope (3 degrees or greater). Chassis must be positioned within the allowable operating slope before swinging or raising boom above horizontal or driving with the boom elevated.

To avoid tip over if red tilt warning light lights when the boom is raised above horizontal, lower platform to ground level. Then reposition machine so that chassis is within the allowable operating slope before raising boom.

If the platform does not stop when a control switch or lever is released, remove foot from footswitch or use emergency stop switch to stop the machine.

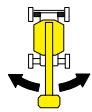
To avoid serious injury, do not operate machinery if any control lever or toggle switch controlling platform movement does not return to the ‘off’ or neutral position when released.

**⚠ CAUTION**

To avoid a collision and injury if platform does not stop when a control switch or lever is released, remove foot from footswitch or use emergency stop switch to stop the machine.

### 4.11.1 Swinging the Boom

To swing boom, use Swing control to select Right or Left direction.

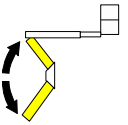


***NOTICE***

When swinging the boom make sure there is ample room for the boom to clear surrounding walls, partitions and equipment.

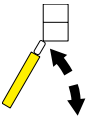
### 4.11.2 Raising and Lowering the Lower and Mid Boom

To raise or lower the Lower and Mid Boom, with footswitch activated, position Lower Boom Lift switch to UP or DOWN as desired.



### 4.11.3 Raising and Lowering the Upper Boom

To raise or lower the Upper Boom, use the Upper Boom Lift switch to select UP or DOWN until desired height is reached.



## 4.12 FUNCTION SPEED CONTROL

This control affects the speed of Telescope, Tower Boom Lift, Jib Lift, and Platform Rotate functions.

**Note:** During platform rotation, a speed difference may not be noticeable to the operator.

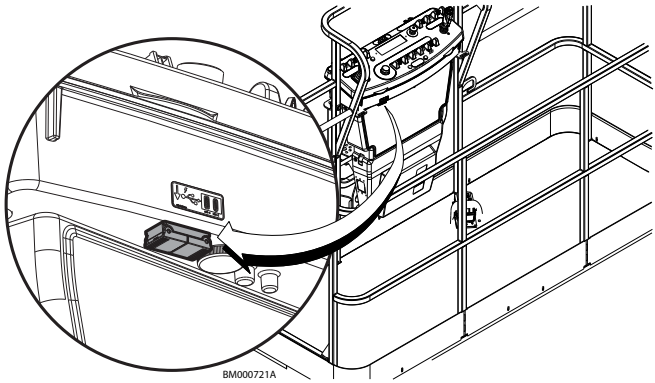


Turning the knob all the way counterclockwise until it clicks puts the machine into Creep Mode. Creep Mode puts the functions listed above, as well as the Drive/Steer and Main Lift/Swing functions into the slowest speed setting.

## 4.13 USB DC POWER PORTS

Machines equipped with the Rapid Replaceable Platform have two USB ports for DC charging. One port accepts a USB-A connector and one port accepts a USB-C connector.

Access to the ports is under the left side of the platform control station.




## 4.14 AC POWER RECEPTACLE (IF EQUIPPED)

The machine platform may be equipped with an AC receptacle for operations requiring alternating current.

Access to the receptacle is under the platform control station.

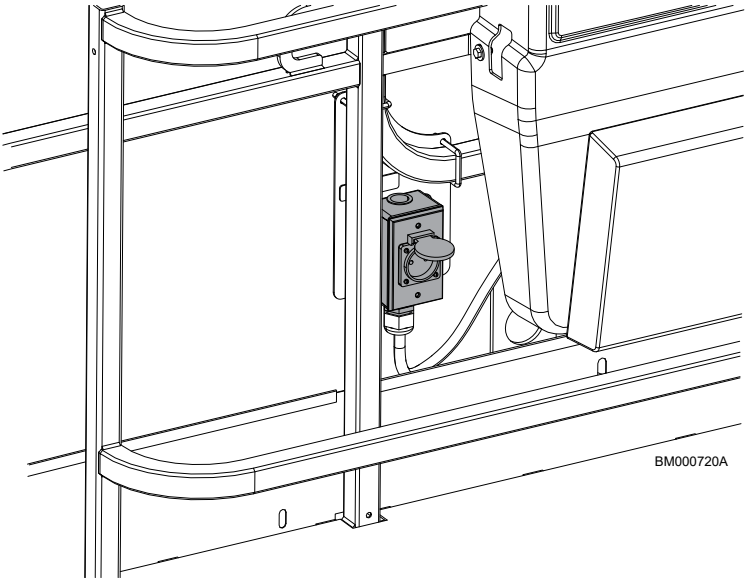



**Figure 7. Platform Power — AC Power Receptacle**

## 4.15 CLEARSKY SMART FLEET™

ClearSky Smart Fleet™ integrates on-machine hardware with web-based software and a mobile app to provide fleet management data and analytics. Personnel with the appropriate permissions can access telematics and machine identification data using a dashboard visible in the ClearSky Smart Fleet web portal or the ClearSky Smart Fleet mobile app. (Navigation and visual configuration may vary between the web portal or mobile app.)

Features include machine monitoring such as fuel level and battery charge, remote analyzer tasks including diagnostic trouble codes or system alerts, and access control (if available) restrictions.

Refer to the Access Control and Beacons sections of this manual for more information. Visit the ClearSky section of the JLG website for more resources and information about accessing web portal or mobile app data.

## 4.16 ACCESS CONTROL - CLEARSKY SMART FLEET™ (IF EQUIPPED)

**NOTICE**

Operator access to the machine may be placed into a restricted state remotely.

If a modification to a restricted state is required, contact the ClearSky Smart Fleet™ account owner. Only authorized personnel can make changes from within the web portal or mobile app.

This machine may be equipped with ClearSky Smart Fleet Access Control. Using the ClearSky Smart Fleet mobile app or web portal (remotely or locally), the machine can be placed into restricted states that limit machine functionality for all operators.

By using this machine, the operator acknowledges Access Control functionality, including restricted states, and accounts for it in their safe use plan.

**Restricted states may include:**

1. Speed Restricted — Machine is in Creep mode. See Operation section for more information on machine mode.
2. Speed and Function Restricted — Machine is in Creep mode and boom movement is restricted to transport position. In this state, once the boom reaches the transport position, it is not permitted to leave that defined position.
3. Locked Out — Machine has been locked out and will not operate (including engine start and auxiliary power, if applicable).

**⚠ CAUTION**

The Locked Out state will override the machine capability to use auxiliary power.

**Note:** Restricted functionality may occur if the CS550 (ClearSky® LED Motion / Amber Beacon) is damaged or removed. A protective cage is available through JLG.

Machines equipped with ClearSky Smart Fleet Access Control are also equipped with the CS550. Refer to the ClearSky Smart Fleet and Beacons sections of this manual for more information.

At time of publication, Access Control is not available for CE/UKCA markets.

## 4.17 SKYGUARD ACTIVATION/DEACTIVATION

SkyGuard provides enhanced protection at the Platform Control Station. When the SkyGuard sensor is activated, functions in use at the time of actuation will reverse or cutout. See SkyGuard Function Table.

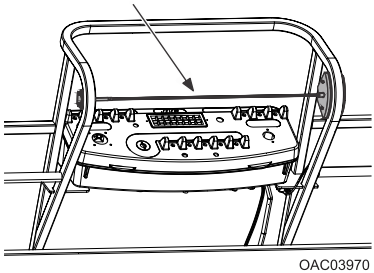



**Figure 8. SkyGuard - SkyLine**

To activate SkyGuard, the rod is pressed breaking the connection between the rod and right bracket.

During activation, the horn will sound and (if equipped and configured) a beacon will illuminate until sensor is reattached and footswitch is disengaged.

If SkyGuard activates inadvertently, release controls, reattach the rod to the right bracket and recycle the foot switch. Normal operation should resume.

If SkyGuard remains activated after rod reattachment, press and hold the SkyGuard Override Switch to allow functions to return the operator to the ground. Do not operate machine until the machine is inspected and any malfunctions are corrected.

**Table 4. SkyGuard Function Table**

| Function | Reversal / Cutout |
|---|---|
| Drive Forward | R * / C ** |
| Drive Reverse | R |
| Steer | C |
| Swing | R |
| Tower Lift Up | R |

**Table 4. SkyGuard Function Table (continued)**

| Function | Reversal / Cutout |
|---|---|
| Tower Lift Down | C |
| Tower Telescope Out | C |
| Tower Telescope In | C |
| Boom Lift Up | R |
| Boom Lift Down | R |
| Boom Telescope Out | R |
| Boom Telescope In | C |
| Jib Lift (If equipped) | C |
| Platform Level | C |
| Platform Rotate | C |

**R** = Indicates Reversal is Activated; **C** = Indicates Cutout is Activated
* DOS (Drive Orientation System) Enabled
** DOS Not Enabled, machine is driving straight without steering, and any other hydraulic function is active
**Note:** If SkyGuard is enabled with the Soft Touch system, functions will cut out instead of reversing.

## 4.18 BOOM SYNCHRONIZING PROCEDURE

**Note:** If the Lower Boom assembly does not fully lower:

1. Remove all personnel from the platform.
2. Pull the red knob located beside the main control valve.
3. From Ground Control, activate the lift control switch, raise Lower Boom 1.8 m (6 ft).
4. After raising Lower Boom, release the red knob.
5. Activate Lower Boom Down, fully lower boom.
6. Repeat step 1 through 5 if necessary.

## 4.19 SHUT DOWN AND PARK

**Note:** When parking battery powered units overnight, batteries should be charged properly to ensure readiness for following workday.

**Note:** Electric machines are equipped with a static strap due to static electricity build-ups. Strap is located under rear of machine chassis.

The preferred procedures to shut down and park the machine are as follows:

1. Drive machine to a reasonably well protected area.
2. Ensure boom is fully retracted and lowered over rear axle.
3. Shut down Emergency Stop at Platform Controls.
4. Shut down Emergency Stop at Ground Controls. Position Platform/Ground Select switch to center Off.
5. If necessary, cover Platform Controls to protect instruction placards, warning decals and operating controls from hostile environment.

**NOTICE**

If parking a MEWP with the boom elevated in an effort to conserve space, booms may be elevated, but shall not be extended. It is the operator's responsibility to ensure all safety precautions in section 1 of this manual are followed for each unique situation.

## 4.20 LIFTING AND TIE DOWN

### 4.20.1 Lifting

1. Refer to the Machine Serial Number Plate, call JLG Industries, or weigh the individual unit to find out the Gross Vehicle Weight.
2. Place the boom in the stowed position.
3. Remove all loose items from the machine.
4. Properly adjust the rigging to prevent damage to the machine and so the machine remains level.

### 4.20.2 Tie Down

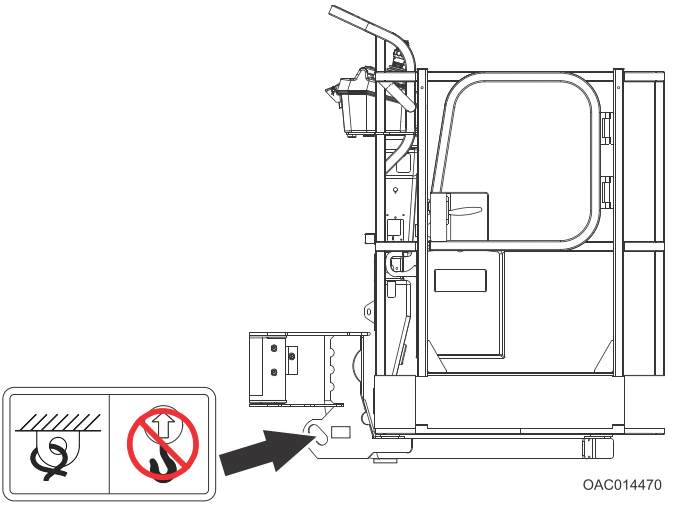
**NOTICE**

When transporting the machine, the boom must be fully lowered into the boom rest.

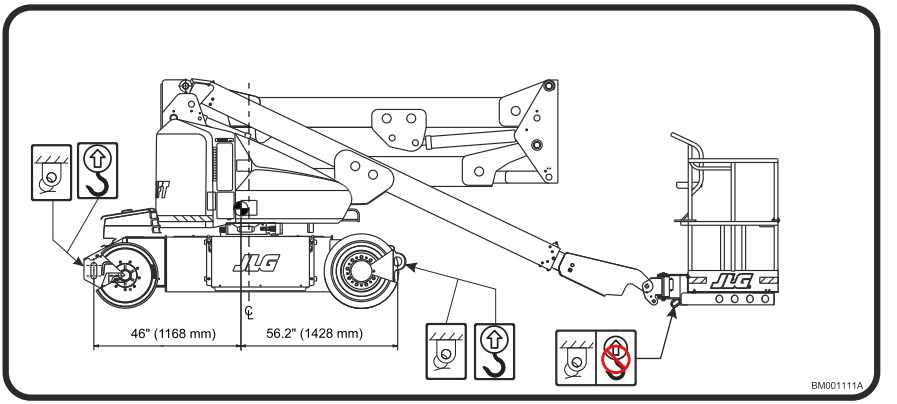
1. Place the boom in the stowed position.
2. Remove all loose items from the machine.
3. Secure the chassis using straps or chains of adequate strength.

4. Ensure the platform is lowered so the wear pad on the bottom rests on the surface of the transportation vehicle.

**Note:** Secure through the tie downs on the boom using straps or chains of adequate strength.




## 4.21 LIFTING CHART



# 4.22 E450AJ SAFETY DECALS

## 4.22.1 Safety Decals Location and Legend

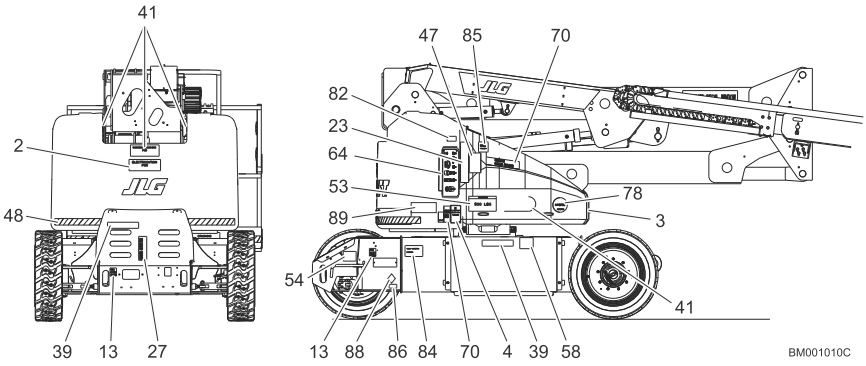



**Figure 9. Safety Decals - 1 of 6**

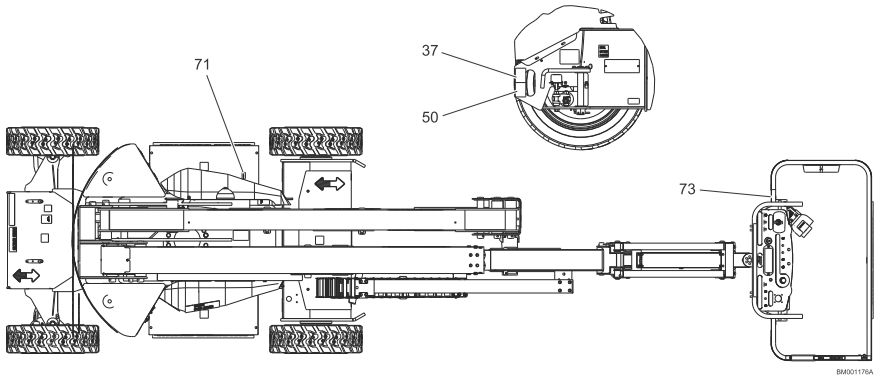



**Figure 10. Safety Decals - 2 of 6**

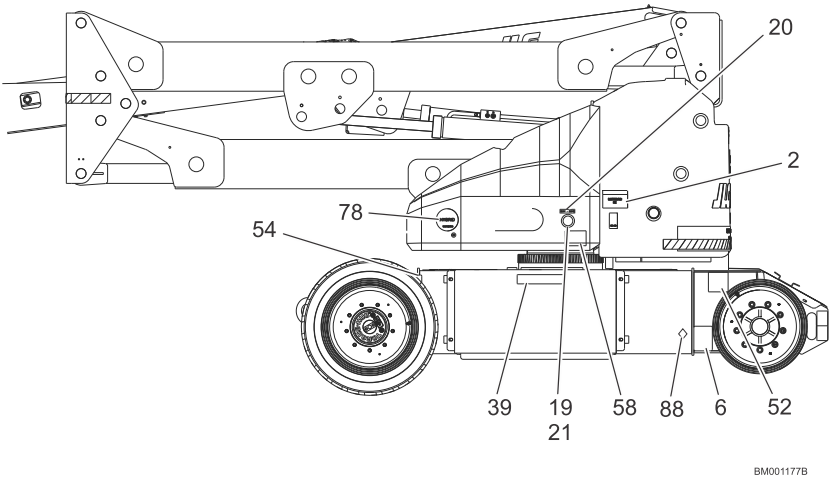



**Figure 11. Safety Decals - 3 of 6**

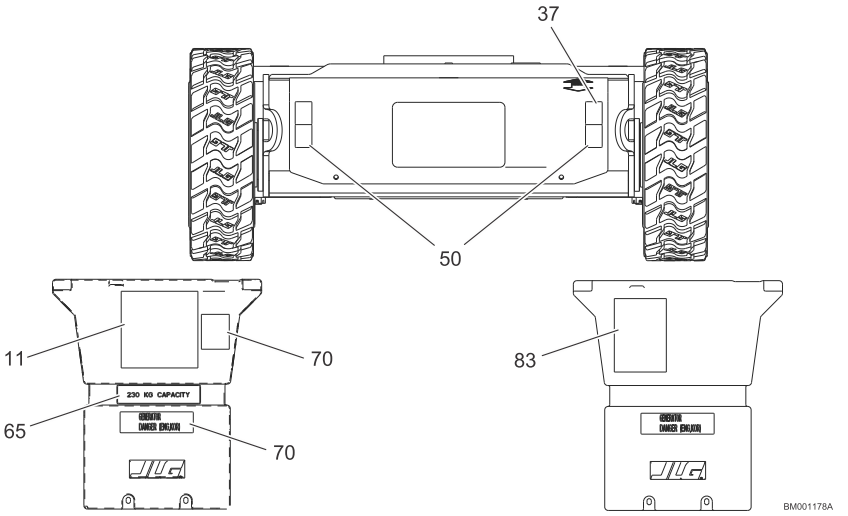



**Figure 12. Safety Decals - 4 of 6**

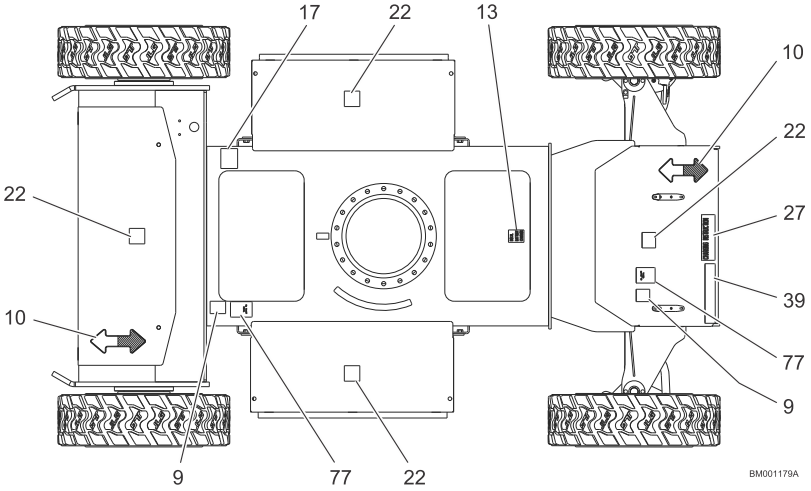



**Figure 13. Safety Decals - 5 of 6**

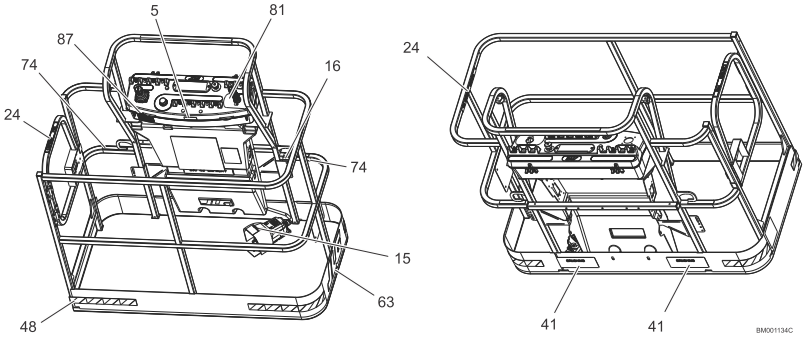



**Figure 14. Safety Decals - 6 of 6**

## Table 5. E450AJ Decal Legend

| Item # | ANSI | Australian | Japanese | Korean | Spanish | French | Chinese | Portuguese | CE |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 1703805 | - - | 1703938 | 1703939 | 1703935 | 1703936 | 1703937 | 1703940 | - - |
| 3 | 1001272055 | 1001272055 | 1001272055 | 1001272055 | 1001272055 | 1001272055 | 1001272055 | 1001272055 | 1001272055 |
| 4 | 1703798 | 1705822 | 1703932 | 1703933 | 1703929 | 1703930 | 1703931 | 1703934 | 1705822 |
| 6 | 1001131269 | - - | - - | - - | - - | 1700584 | - - | - - | - - |
| 7 | 1001253997 | 1001253996 | 1001253997 | 1001253997 | 1001253997 | 1001253997 | 1001253997 | 1001253997 | 1001253993 |
| 9 | 1701504 | 1701504 | 1701504 | 1701504 | 1701504 | 1701504 | 1701504 | 1701504 | 1701504 |
| 10 | 1701642 | 1701642 | 1701642 | 1701642 | 1701642 | 1701642 | 1701642 | 1701642 | 1701642 |
| 11 | 1703797 | 1705921 | 1703926 | 1703927 | 1703923 | 1703924 | 1703925 | 1703928 | 1705921 |
| 13 | 1701644 | 1701644 | 1701644 | 1701644 | 1701644 | 1701644 | 1701644 | 1701644 | 1701644 |
| 15 | - - | 1705828 | 1703980 | 1703981 | 1703983 | 1703984 | 1703982 | 1703985 | 1705828 |
| 16 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 |
| 20 | 3251243 | - - | - - | - - | 3251243 | 3251243 | - - | 3251243 | - - |
| 22 | 1701691 | 1701691 | 1701691 | 1701691 | 1701691 | 1701691 | 1701691 | 1701691 | 1701691 |
| 23 | 1001104864 | 1001104864 | 1001104864 | 1001104864 | 1001104864 | 1001104864 | 1001104864 | 1001104864 | 1001104864 |
| 24 | 1702868 | 1001218850 | - - | - - | 1704001 | 1704000 | - - | 1704002 | 1001218850 |
| 25 | 1001193949 | 1001193949 | 1001193949 | 1001193949 | 1001193949 | 1001193949 | 1001193949 | 1001193949 | - - |
| 27 | 1704446 | 1706378 | 1704417 | 1704418 | 1704454 | 1704452 | 1704419 | 1704453 | 1706378 |
| 37 | 1701500 | 1703811 | 1701500 | 1701500 | 1701500 | 1701500 | 1701500 | 1701500 | 1703811 |

**Table 5. E450AJ Decal Legend (continued)**

| Item # | ANSI | Australian | Japanese | Korean | Spanish | French | Chinese | Portuguese | CE |
|---|---|---|---|---|---|---|---|---|---|
| 39 | 1703813 | 1705670 | 1704342 | 1704343 | 1704339 | 1704340 | 1704344 | 1704341 | 1705670 |
| 40 | 3252347 | - - | - - | - - | - - | - - | - - | - - | - - |
| 41 | 1703804 | 1701518 | 1703950 | 1703951 | 1703947 | 1703948 | 1703949 | 1703952 | 1701518 |
| 47 | 1702265 | 1705977 | 1702271 | 1702265 | 1702265 | 1702265 | 1703988 | 1703991 | 1705977 |
| 48 | 0259550 | 0259550 | 0259550 | 0259550 | 0259550 | 0259550 | 0259550 | 0259550 | 0259550 |
| 50 | 1702300 | 1703814 | 1702300 | 1702300 | 1702300 | 1702300 | 1702300 | 1702300 | 1703814 |
| 52 | 1702631 | 1702631 | 1702631 | 1702631 | 1702631 | 1702631 | 1702631 | 1702631 | 1702631 |
| 53 | 1001253921 | 1705978 | 100125933 | 1001253925 | 1001253931 | 1001253923 | 1001253927 | 1001253929 | 1705978 |
| 54 | 1704445 | 1704445 | 1704445 | 1704445 | 1704445 | 1704445 | 1704445 | 1704445 | 1704445 |
| 65 | 1001253920 | 1705978 | 1001253932 | 1001253924 | 1001253930 | 1001253922 | 1001253926 | 1001253928 | 1705978 |
| 77 | 1704412 | 1704412 | 1704412 | 1704412 | 1704412 | 1704412 | 1704412 | 1704412 | 1704412 |
| 81 | 1705351 | - - | 1705426 | 1705427 | 1705910 | 1705429 | 1705430 | 1001113680 | - - |
| 84 | 1001223055 | - - | 1001224053 | 1001224048 | 1001224049 | 1001223971 | 1001224050 | 1001224052 | - - |
| 85 | 1001222801 | 1001222801 | 1001222801 | 1001222801 | 1001222801 | 1001222801 | 1001222801 | 1001222801 | 1001222801 |
| 86 | 1001228370 | - - | - - | - - | - - | 1001228370 | - - | - - | - - |
| 87 | 1001231801 | - - | - - | - - | - - | - - | - - | - - | - - |
| 89 | 1001285735 | 1001285735 | 1001285735 | 1001285735 | 1001285735 | 1001285735 | 1001285735 | 1001285735 | 1001285735 |

## 4.23 RAPID REPLACEABLE PLATFORM SAFETY DECALS

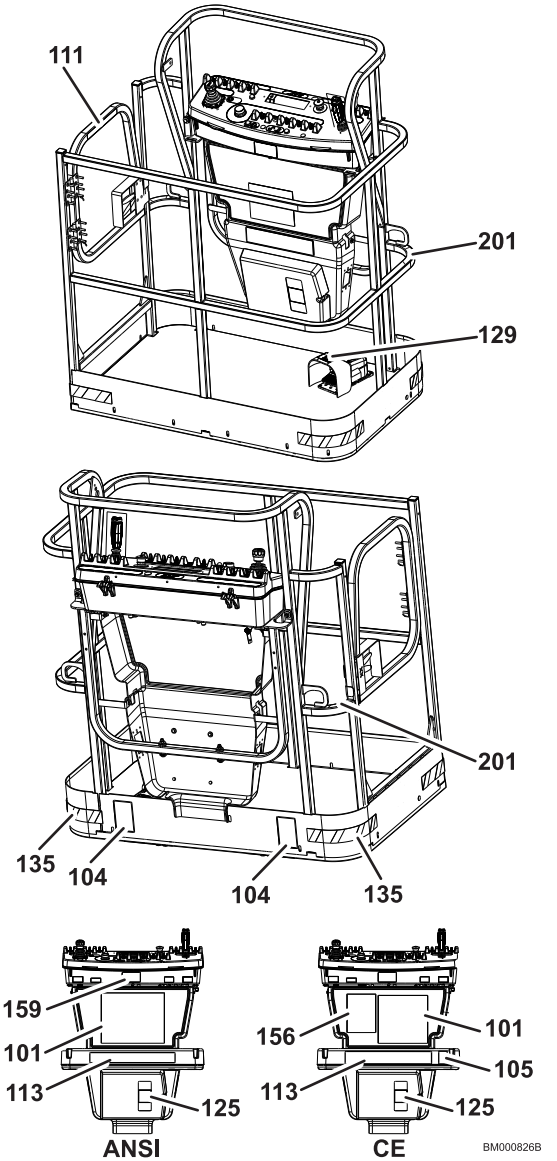



**Figure 15. Rapid Replaceable Platform Decal Installation**

## Table 6. Decal Legend - E450AJ

| Item # | ANSI | CE/UKCA | Japanese | Korean | Spanish | French | Chinese | Portuguese | Australian |
|---|---|---|---|---|---|---|---|---|---|
| 101 | 1001311931 | 1705921 | 1001311936 | 1001311937 | 1001311932 | 1001311933 | 1001311935 | 1001311938 | 1705921 |
| 104 | 1703804 | 1701518 | 1703950 | 1703951 | 1703947 | 1703948 | 1703949 | 1703952 | 1701518 |
| 105 | Not Used | | | | | | | | |
| 111 | 1702868 | - - | - - | - - | 1704001 | 1704000 | - - | 1704002 | - - |
| 113 | 1001253920 | 1705978 | 1001253932 | 1001253924 | 1001253930 | 1001253922 | 1001253926 | 1001253928 | 1705978 |
| 125 | 1701640 | 1701640 | 1701640 | 1701640 | 1701640 | 1701640 | 1701640 | 1701640 | 1701640 |
| 129 | 3252347 | 1705828 | 1703980 | 1703981 | 1703983 | 1703984 | 1703982 | 1703985 | 1705828 |
| 135 | 4420051 | 4420051 | 4420051 | 4420051 | 4420051 | 4420051 | 4420051 | 4420051 | 4420051 |
| 156 | - - | Not Listed | - - | - - | - - | - - | - - | - - | - - |
| 159 | 1001231801 | - - | - - | - - | - - | - - | - - | - - | - - |
| 201 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 | 1704277 |

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# SECTION 5
# Emergency Procedures

## 5.1 GENERAL

This section explains the steps to be taken in case of an emergency situation during operation.

## 5.2 INCIDENT NOTIFICATION

JLG Industries, Inc. must be notified immediately of any incident involving a JLG product. Even if no injury or property damage is evident, the factory should be contacted by telephone and provided with all necessary details.

- USA: 877-JLG-SAFE (554-7233)
- EUROPE: (32) 0 89 84 82 20
- AUSTRALIA: (61) 2 65 811111
- E-mail: ProductSafety@JLG.com

Failure to notify the manufacturer of an incident involving a JLG Industries product within 48 hours of such an occurrence may void any warranty consideration on that particular machine.

***NOTICE***

Following any incident, thoroughly inspect the machine and test all functions first from the ground controls, then from the platform controls. Do not lift above 3 m (10 ft.) until you are sure that all damage has been repaired, if required, and that all controls are operating correctly.

## 5.3 EMERGENCY OPERATION

### 5.3.1 Operator Unable to Control Machine

If the platform operator is pinned, trapped or unable to operate or control machine, do the following:

1. Other personnel should operate the machine from ground controls only as required.

2. Other qualified personnel on the platform may use the platform controls.

**⚠ WARNING**

Do not continue operation if controls do not function properly.

3. Cranes, forklift trucks or other equipment can be used to remove platform occupants and stabilize motion of the machine.

### 5.3.2 Platform or Boom Caught Overhead

If the platform or boom becomes jammed or snagged in overhead structures or equipment, do the following:

1. Shut off the machine.
2. Rescue all people in the platform before freeing the machine. Personnel must be out of the platform before operating any controls on the machine.
3. Use cranes, forklifts, or other equipment to stabilize motion of the machine to prevent a tip over as required.
4. From the ground controls, use the Auxiliary Power System (if equipped) to carefully free the platform or boom from the object.
5. Once clear, restart the machine and return the platform to a safe position.
6. Inspect the machine for damage. If the machine is damaged or does not operate properly, turn off the machine immediately. Report the problem to the proper maintenance personnel. Do not operate the machine until it is declared safe for operation.

## 5.4 EMERGENCY TOWING PROCEDURES

Towing this machine is prohibited, unless properly equipped. However, provisions for moving the machine, in case of a malfunction or power failure, have been incorporated. The following procedures are to be used ONLY for emergency movement to a suitable maintenance area.

1. Chock wheels securely.
2. Disengage drive hubs by reversing disconnect caps.
3. Connect suitable equipment, remove chocks, and move machine.

After moving machine, complete the following procedures:

1. Position machine on a firm and level surface.
2. Chock wheels securely.
3. Engage drive hubs by reversing disconnect caps on hubs.
4. Remove chocks from wheels as needed.

## 5.5 MANUAL DESCENT SYSTEM

The manual descent system is used, in the event of total power failure, to lower the upper and lower booms using gravity. To operate the manual descent system, proceed as follows:

1. Locate manual descent knob on main valve and turn clockwise. Install handle into manual descent pump and lower the Mid and Lower Booms by pumping the handle until they are completely lowered.

2. Turn manual descent knob counterclockwise and lower the Upper (or main) Boom by pumping the handle until it is completely lowered. Return manual descent knob to center position and stow handle in bracket provided.

## 5.6 MANUAL SWING OVERRIDE

The manual swing override is used to manually swing the boom and turntable assembly in the event of a total power failure when the platform is positioned over a structure or obstacle. To operate the manual swing override, proceed as follows:

1. Using a 7/8 inch socket and ratchet wrench, locate nut on swing worm gear on left side of machine.

2. Install wrench on nut and ratchet in the direction desired.

## 5.7 CLEARSKY SMART FLEET™ - LOCKED OUT STATE

The machine may be placed into a Locked Out state remotely through ClearSky Smart Fleet.

If the CS550 (ClearSky® LED Motion / Amber Beacon) is removed from a machine or disconnected from the control system through damage, the machine may also be placed into a Locked Out state.

***NOTICE***

Contact the ClearSky Smart Fleet™ account owner if the machine is in a Locked Out state.

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# SECTION 6
# Accessories

## 6.1 AVAILABLE ACCESSORIES AND RELATIONSHIP TABLE

**Table 7. Available Accessories Table**

| Accessory | Market | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ANSI (USA Only) | ANSI | AUS | CE/ UK-CA | CSA | GB (Chi-na) | EAC | MOL 70 | UL |
| Bolt-On Exter-nal Fall Arrest (30” x 48”) (30” x 60”) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Fabric Mesh to Mid Rail (30” x 48”) (30” x 60”) | ✓ | ✓ | ✓ | | | | | | |
| Fabric Mesh to Top Rail (30” x 48”) | ✓ | | | | ✓ | | ✓ | | ✓ |
| Fall Arrest Platform (30” x 60”) (36” x 72”) | ✓ | ✓ | | | ✓ | | | | ✓ |
| Pipe Racks | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Platform Mesh to Mid Rail (30” x 48”) (30” x 60”) | ✓ | ✓ | ✓ | | | | | | |
| Platform Mesh to Top Rail (30” x 48”) | ✓ | | | | ✓ | | ✓ | | ✓ |
| Platform Top Rail Extension (30” x 48”) (30” x 60”) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Platform Work Lights | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |

**Table 7. Available Accessories Table (continued)**

| Accessory | Market | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ANSI (USA Only) | ANSI | AUS | CE/ UK-CA | CSA | GB (Chi-na) | EAC | MOL 70 | UL |
| Platform Work Surface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SkySense® | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SkySense® Platform Bumper Padding | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Soft Touch (30” x 60”) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Soft Touch - Overhead | | ✓ | | | | | | | |

## Table 8. Accessories/Options Relationship Table

| Accessory | Required Item | Compatible With (Note 1) | Incompatible With | Interchangeable With (Note 2) |
|---|---|---|---|---|
| Nite Bright | | | Platform/Fabric MMR*, Platform/Fabric MTR**, Platform Work Lights, Top Rail Extension | |
| Pipe Racks | | SkyPower | Platform/Fabric MMR*, Platform/Fabric MTR**, SkySense, SkySense Platform Bumper Padding, Soft Touch | |
| Platform Work Surface | | | Platform Fall Arrest, Platform/Fabric MMR*, Platform/Fabric MTR**, Soft Touch | |
| SkyAir | SkyPower | SkyCutter, SkyGlazier, SkyWelder | | |
| SkyCutter | SkyPower | SkyWelder | 4 ft Platform, Pipe Racks, Platform/Fabric MMR*, Platform/Fabric MTR**, SkySense, SkySense Platform Bumper Padding, Soft Touch | SkyGlazier |
| SkyGlazier | | SkyPower | 4 ft Platform, Pipe Racks, Platform/Fabric MMR*, Platform/Fabric MTR**, SkySense, SkySense Platform Bumper Padding, Soft Touch, Top Rail Extension | SkyCutter, SkyWelder |
| SkyPower | | Nite Bright, SkyCutter, SkyGlazier, SkyWelder | SkySense, SkySense Platform Bumper Padding | |
| SkySense | | | Pipe Racks, Platform MMR*, Platform MTR**, SkyGlazier, SkyPower, SkyWelder, Soft Touch, Top Rail Extension | |
| SkySense Platform Bumper Padding | | SkySense | Nite Bright, SkyWelder, Soft Touch, Storage Tray, Top Rail Extensions, Sky Glazier, Sky Cutter, Platform Work Surface | |
| SkyWelder | SkyPower | Nite Bright, SkyCutter | 4 ft Platform, Pipe Racks, Platform/Fabric MMR*, Platform/Fabric MTR**, Soft Touch | SkyGlazier |

**Table 8. Accessories/Options Relationship Table (continued)**

| Accessory | Required Item | Compatible With (Note 1) | Incompatible With | Interchangeable With (Note 2) |
|---|---|---|---|---|
| Soft Touch | | SkyPower | Pipe Racks, SkyCutter, SkyGlazier, SkySense, SkySense Platform Bumper Padding, SkyWelder | |

**Note:** 1. Any non - "Sky" accessory not listed under "Incompatible With" is assumed to be compatible.

**Note:** 2. Can be used on the same unit but not simultaneously.

* MMR = Mesh to Mid Rail; ** MTR = Mesh to Top Rail

## 6.2 BOLT-ON EXTERNAL FALL ARREST

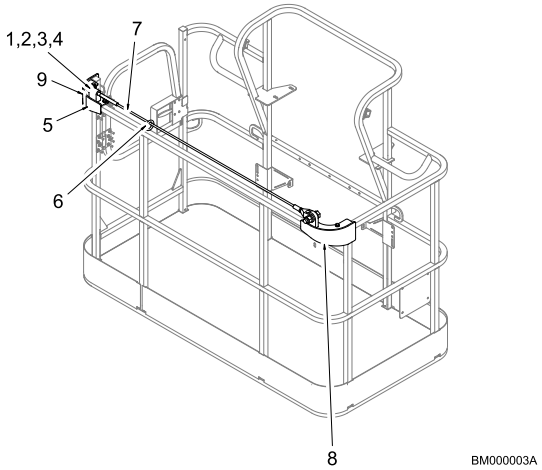



**Figure 16. Bolt-On External Fall Arrest System**

1. Belleville Washer
2. Washer
3. Hex Nut
4. Jam Nut
5. LH Bracket
6. Attachment Ring
7. Cable
8. RH Bracket
9. Decal

The bolt-on external fall arrest system is designed to provide a lanyard attach point while allowing the operator to access areas outside the platform. Exit/Enter the platform through the gate area only. The system is designed for use by one person.

Personnel must use fall protection at all times. A full-body harness is required with a shock absorbing lanyard or self-retracting lanyard not to exceed 6 ft (1.8 m) in length.

External Fall Arrest System capacity is 310 lb (140 kg) - one (1) person maximum.

Do not move platform during use of the external fall arrest system.

**⚠ WARNING**

Do not operate any machine functions while outside of platform. Be careful when entering/exiting the platform at elevation.

**⚠ WARNING**

If the external fall arrest system is used to arrest a fall or is otherwise damaged, the entire system must be replaced and the platform fully inspected before returning to service. Refer to the service manual for removal and installation procedures.

# NOTICE

The external fall arrest system requires an annual inspection and certification. The annual inspection and certification must be performed by a qualified person other than the user.

### 6.2.1 Inspection Before Use

The external fall arrest system must be inspected before each use of the machine. Replace components if there are any signs of wear or damage.

Before each use, perform a visual inspection of the following components:

- Cable: Inspect cable for proper tension, broken strands, kinks, or any signs of corrosion.

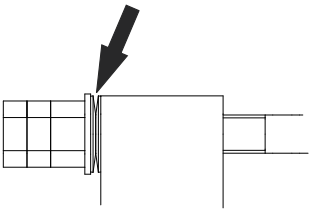


**Figure 17. Incorrect Gap**

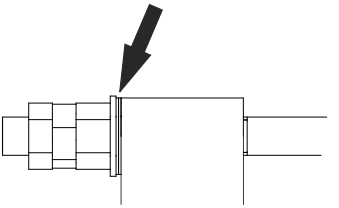


**Figure 18. Correct Gap**

**Note:** There should be no visible gap between the two Belleville washers when setting proper cable tension. If any gap is shown between the two Belleville washers, the cable tension is incorrect.

- Fittings & Brackets: Ensure all fittings are tight and there are no signs of fractures. Inspect brackets for any damage.
- Attachment Ring: No cracks or signs of wear are acceptable. Any signs of corrosion requires replacement.
- Attaching Hardware: Inspect all attaching hardware to ensure there are no missing components and hardware is properly tightened.
- Platform Rails: No visible damage is acceptable.

## 6.3 FALL ARREST PLATFORM

**Note:** See the JLG External Fall Arrest System manual (PN 3128935) for more detailed information.

The external fall arrest system is designed to provide a lanyard attach point while allowing the operator to access areas outside the platform. Exit/enter the platform through the gate area only. The system is designed for use by one person.

Personnel must use fall protection at all times. A full body harness is required with lanyard not to exceed 6 ft (1.8 m) in length, that limits the maximum arrest force to 900 lb (408 kg) for the transfastener type and 1350 lb (612 kg) for the shuttle type fall arrest system.

### 6.3.1 Safety Precautions

**⚠ WARNING**

Do not operate any machine functions while outside the platform. Use caution when entering/exiting the platform at elevation.

## 6.4 PIPE RACKS

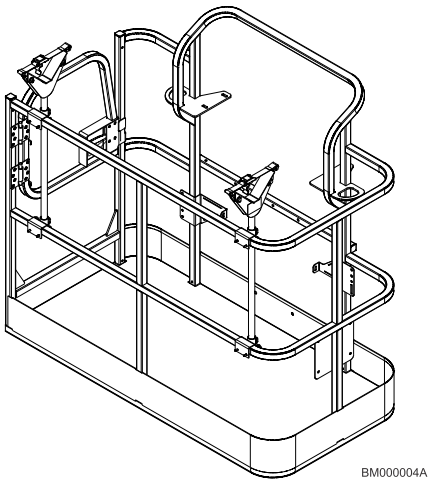



**Figure 19. Pipe Racks**

Pipe Racks provide a way to store pipe or conduit inside the platform in order to prevent rail damage and optimize platform utility. This accessory consists of two racks with adjustable straps to secure the load in place.

### 6.4.1 Capacity Specifications

| Max. Capacity in Racks | Max. Platform Capacity (With Max. Weight in Racks) |
|---|---|
| 80 kg | 184 kg |
| **Max. Length of Material in Racks**: 6.1 m<br>**Min. Length of Material in Racks**: 2.4 m | |

### 6.4.2 Safety Precautions

**⚠ WARNING**

Reduce platform capacity by 100 lb (45.5 kg) when installed.

**⚠ WARNING**

Weight in racks plus weight in platform must not exceed rated capacity.

***NOTICE***

The maximum load in the racks is 180 lb (80 kg) evenly distributed between the two racks.

***NOTICE***

The maximum length of material in racks is 20 ft (6.1 m).

- Ensure no personnel are beneath the platform.
- Do not exit platform over rails or stand on rails.
- Do not drive machine without material secured.
- Return racks to the stowed position when not in use.
- Use this option only on approved models.

### 6.4.3 Preparation and Inspection

- Ensure racks are secured to the platform rails.
- Replace torn or frayed tie-down straps.

### 6.4.4 Operation

1. To prepare racks for loading, remove locking pins, rotate each rack 90 degrees from stowed to working position, then secure with locking pins.
2. Loosen and remove tie-down straps. Place material on racks with weight evenly distributed between both racks.
3. Route the tie-down straps at each end across loaded material and tighten.
4. To remove material, loosen and remove tie-down straps, then carefully remove material from racks.

**Note:** Reinstall tie-down straps across any remaining material before continuing machine operations.

## 6.5 PLATFORM WORK LIGHTS

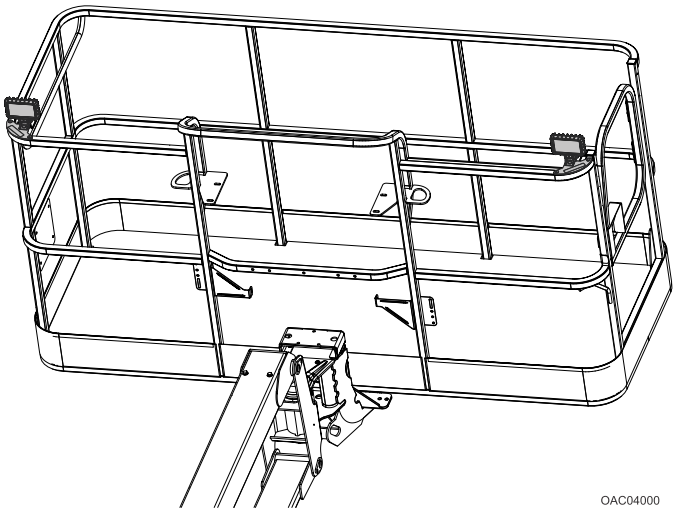



**Figure 20. Platform Work Lights**

The Platform Work Lights accessory consists of two 12V lights mounted to the platform railing.

## 6.6 PLATFORM WORK SURFACE

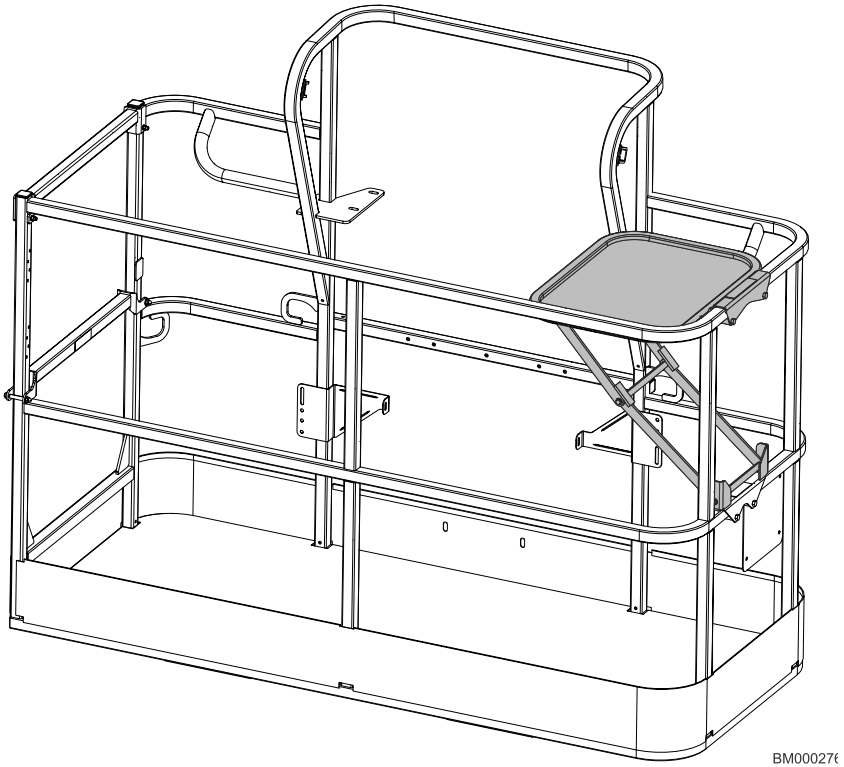



**Figure 21. Platform Work Surface**

The platform work surface option consists of a corner tray bolted onto the top and mid rails of the platform.

## 6.7 SKYSENSE®

**⚠ WARNING**

SkySense is not intended to replace or reduce the need for the operator to be aware of the environment around the machine. Hazards that will cause serious injury or death may not be prevented or reduced by SkySense. The operator must always look in the direction of travel, avoid power lines, avoid obstacles that could strike the machine or persons in the platform, and follow all instructions, decals, and other warnings provided with this machine.

The operator must not rely on SkySense as a substitute for following the instructions and warnings contained in the manuals and placards provided with this machine.

SkySense is intended to assist the operator. SkySense may not detect certain objects depending on shape, type of material, or orientation of the object to the sensors. It is the operator's responsibility to be aware of their surroundings at all times.

**⚠ WARNING**

De-rate the platform by 10 lb (4.5 kg) per bar when installed on the platform (20 lb (9 kg) or 30 lb (14 kg) total).

**Note:** SkySense is not active when operating the machine from the ground controls.

### 6.7.1 Preparation and Inspection

Pre-Operation Inspection:

1. Inspect each of the SkySense tubes for dents, cracks, or other damage.
2. Inspect each SkySense sensor for any damage to the housing or sensor.

To test the SkySense system:

1. In an area free of obstructions, ensure the machine is on a smooth, firm surface within the limits of the maximum operating slope.
2. From the platform control console, elevate the boom until the bottom of the platform is at least 6 feet off the ground.
3. Continue to elevate the platform.
4. While elevating, hold your hand 6 inches to 12 inches above one of the upward facing sensors. The machine should stop, and the LED corresponding to that sensor (left LED for left sensor bar; right LED for right sensor bar; both LEDs for center sensor bar or overhead sensor) should be red.
5. Recycle the footswitch and press the override button on the platform control console.

6. Ensure the area below the platform is clear of obstructions and lower the platform. The machine should slow down, (SkySense Status LED will blink yellow with increasing frequency) and stop, (SkySense Status LED will be illuminated solid red) when the bottom of the platform is approximately 12 inches from the ground. The alarm should sound if it is not muted (refer to SkySense Alarm).

7. Recycle the footswitch and press the override button on the platform control console.

8. Continue to lower the platform. The machine should move in the elevated drive speed mode (SkySense Status LED will remain red).

**Note:** The SkySense system will not stop machine operation while in Creep.

### 6.7.2 Operation

SkySense slows a machine's function to creep speed when it is a certain distance away from an object, known as the "warning zone." If the machine continues to approach the object and moves into the "stop zone," SkySense stops all machine functions.

For proportional functions activated by the joystick, the size of the warning zone varies based on the amount of joystick activation. The stop zone always activates at the same distance from the object regardless of the joystick's position.

If the function has reached the warning zone, normal drive speed will resume when a function is activated in the opposite direction. If the machine has reached the SkySense stop zone, release the function and recycle the footswitch to activate a function in the opposite direction.

SkySense is active during the following functions:

- Lift Up/Down (including jib functions)
- Platform Rotate (including jib rotate)
- Telescope Out
- Swing
- Reverse Drive

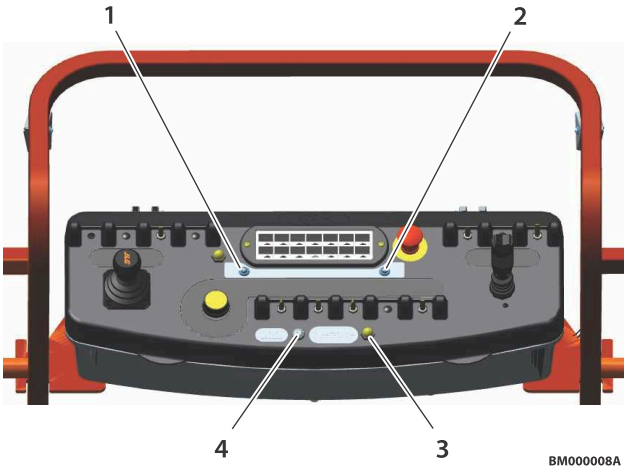
**Note:** During active DOS (Drive Orientation System), SkySense is active when driving in both forward and reverse directions.

There are two LED indicators on the platform control box that signal SkySense activity.

- **No LED**: Normal operation.
- **LED Flashing Yellow**: Machine is in SkySense warning zone and will reduce function speed to creep. Flash frequency correlates to proximity of object.
- **LED Red**: Machine is in SkySense stop zone and all machine functions will cease.

- **LED Flashing Red**: SkySense sensor is obstructed or damaged. Obstructions must be removed and proper function verified. Damaged sensors must be replaced.

### 6.7.3 SkySense Platform Panel Indicators




1. LED Indicator Light
2. LED Indicator Light
3. Override Button
4. Mute Speaker Button

### 6.7.4 SkySense Alarm

Activation of SkySense is signaled by an audible alarm and the LEDs on the platform console that indicate SkySense activity when reaching the warning or stop zones.

In the warning zone, the audible alarm will pulse and increase in frequency as the machine moves closer to the object. In the stop zone, the alarm will sound a continuous tone.

Additionally, when the machine is in the stop zone, the platform control panel audible alarm will sound. The system may be reset by recycling the footswitch.

The audible SkySense alarms can be muted by a button on the platform control console, although LEDs will continue to light. The platform control panel alarm will sound when the machine enters the SkySense stop zone even when muted.

### 6.7.5 SkySense Override Button

The yellow override button allows operators to bypass normal SkySense operation in order to move closer to an object in the stop zone.

When the operator overrides the SkySense via the override button to get closer to a work surface, the machine will maintain creep speed and flash the appropriate indicator color based on location in either the warning or stop zones.

**Note:** Override is only required to be engaged if the operator desires to move the platform closer to an object that is in or entering the stop zone.

# NOTICE

SkyGuard operation is affected when SkySense is installed on a machine. If SkySense activation occurs prior to SkyGuard activation, SkyGuard will only cut out functions if activated. If SkyGuard activation occurs prior to SkySense activation, SkyGuard will function normally.

### 6.7.6 SkySense Coverage Areas

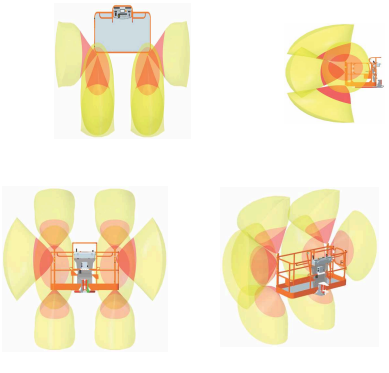



**Figure 22. SkySense Coverage Level 1 Areas (2– Bar)**

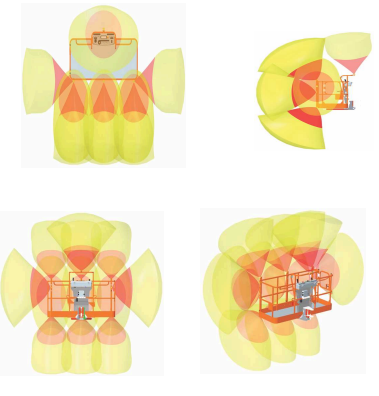



**Figure 23. SkySense Coverage Level 2 Areas (3 — Bar)**

**Note:** Sensor Cones shown are approximations for reference only.

## 6.8 SKYSENSE® PLATFORM BUMPER PADDING

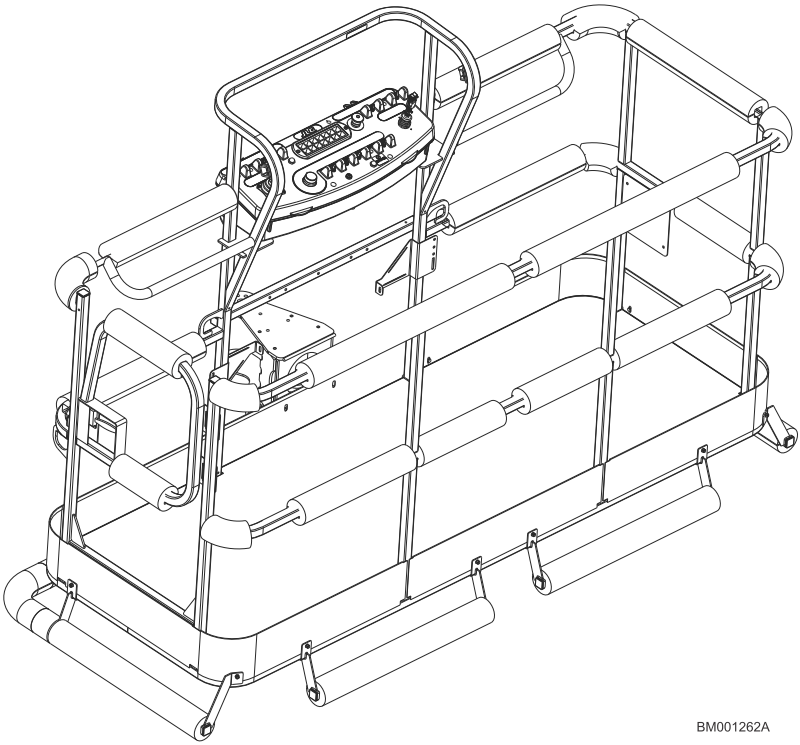



**Figure 24. Platform Bumper Padding**

This accessory outfits machines equipped with the SkySense accessory additional padding for the platform.

## 6.9 SOFT TOUCH

A padding kit is mounted to the platform rails and to a frame suspended below the platform. Limit switches deactivate platform functions when the padded framework contacts an adjacent structure. A button on the platform console allows override of the system.

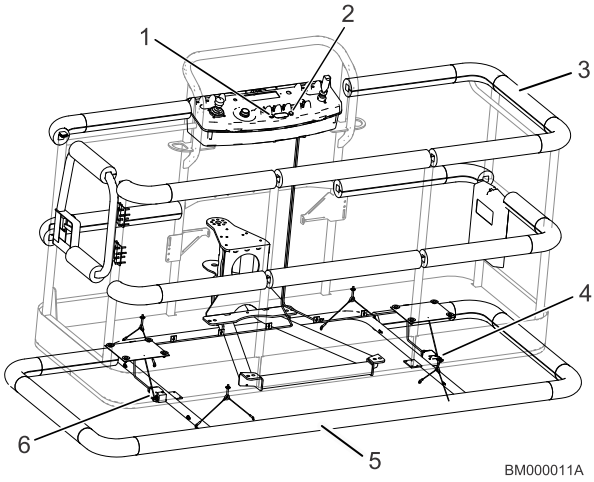
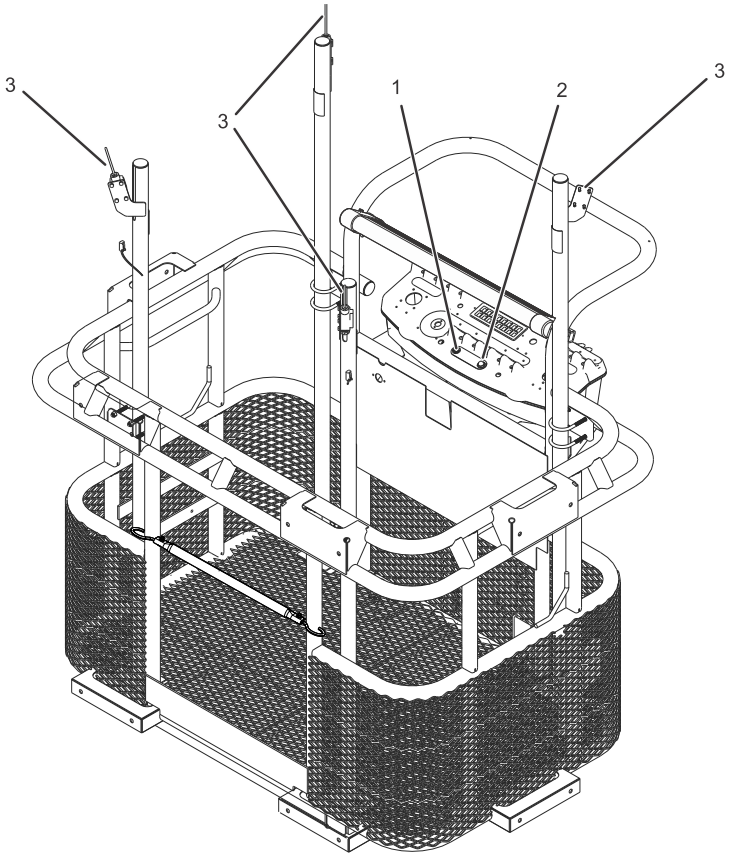



**Figure 25. Soft Touch System**

1. Override Indicator Light
2. Override Button
3. Rail Bumper
4. Limit Switch
5. Suspended Frame and Rail Bumper
6. Limit Switch

## 6.10 SOFT TOUCH — OVERHEAD

A collection of masts are mounted, extending near the operator's head height. Limit switches mounted to these masts deactivate all platform function when contacted by an adjacent structure. A button on the platform console allows override of the system.




1. Override Indicator Light
2. Override Button
3. Limit Switch

**Note:** Some parts hidden for clarity.

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# SECTION 7
# General Specifications and Operator Maintenance

## 7.1 GENERAL

This section of the manual provides additional necessary information to the operator for proper operation and maintenance of this machine.

The maintenance portion of this section is intended as information to assist the machine operator to perform daily maintenance tasks only and does not replace the more thorough Preventive Maintenance and Inspection Schedule included in the Service & Maintenance Manual.

## 7.2 OPERATING SPECIFICATIONS

| | |
|---|---|
| Travel Speed | 3.2 mph (5.2 km/h) |
| Maximum Work Load (Capacity)<br>ANSI, ANSI Export, CSA, MOL70, GB<br>Unrestricted | 500 lb (227 kg) |
| Maximum Work Load (Capacity)<br>CE/UKCA, AS/NZS<br>Unrestricted | 230 kg |
| Maximum Operating Slope | 3° |
| Maximum Travel Grade (Gradeability) | 30% |
| Maximum Travel Grade (Side Slope) | 3° |
| Maximum Height (Stowed) | 6 ft, 7 in (2.0 m) |
| Maximum Horizontal Platform Reach | 23 ft, 9 in. (7.24 m) |
| Turning Radius (Curb to Curb) | 15 ft, 3 in (4.65 m) |
| Turning Radius (Inside) | 2 ft (0.61 m) |
| Maximum Wind Speed | 28 mph (12.5 m/s) |
| Maximum Tire Load | 6,900 lb (3130 kg) |
| Ground Bearing Pressure | 75 psi (5.2 kg/cm$^2$) |
| System Voltage | 48 volts |
| Battery Life per Charge | 7 hours continuous |
| Battery Recharge Time | 17 hours from full discharge |

| | |
|---|---|
| Gross Machine Weight (Platform Empty) | 15,100 lb (6804 kg) |
| Ambient (Operating) Temperature | -20° F to 120° F (-29° C to 49° C) |

### 7.2.1 Capacities

| | |
|---|---|
| Hydraulic Oil Tank | 5 gal (19 L) w/ 10% air space |
| Hydraulic System (Including Tank) | 9 gal (34.1 L) |
| Torque Hub, Drive* | 25.5 oz (0.75 L) |
| *Torque hubs should be one half full of lubricant. | |

### 7.2.2 Tires

| | | |
|---|---|---|
| Size | IN240/55-17.5 | 26x7x20 |
| Load Range | E | N/A |
| Ply Rating | 10 | N/A |
| Tire Pressure | Foam-Filled | Solid |

### 7.2.3 Dimensional Data

| | |
|---|---|
| Machine Length (Stowed) | 21 ft, 2 in (6.45 m) |
| Up and Over Platform Height | 25 ft, 3 in (7.7 m) |
| Horizontal Reach @ Maximum Up and Over | 23 ft, 9 in (7.24 m) |
| Machine Width | 5 ft, 9 in (1.75 m) |
| Wheel Base | 6 ft, 7 in (2.00 m) |
| Working Height | 51 ft (15.54 m) |
| Platform Height | 45 ft (13.72 m) |
| Track Width | 5 ft (1.51 m) |
| Tail Swing (Any Position) | 0 |
| Ground Clearance | 8 in (20 m) |

### 7.2.4 Critical Stability Weights

| Component | LB | KG |
|---|---|---|
| Counter weight | 3,850 | 1746 |
| Tire & Wheel (foam-filled) | 207 | 94 |

| Component | LB | KG |
|---|---|---|
| Platform (4ft [1.2 m]) | 90 | 41 |
| Platform (5 ft [1.5 m]) | 100 | 45 |
| Battery (each) | 120 | 54 |

**⚠ WARNING**

Do not replace items critical to stability with items of different weight or specification (for example: batteries, filled tires, platform) do not modify unit in any way to affect stability.

## 7.3 BATTERY CHARGER

| Description | Specification |
|---|---|
| **Battery Charger Type** | Delta-Q |
| **Electrical System Voltage (DC)** | 48V (960 W) |
| **Input** | |
| AC Input Voltage | 85 – 270V AC |
| Nominal AC Input Voltage | 120 – 240V AC |
| Input Frequency | 50 – 60 Hz |
| Max. AC Input Current | Nominal 8.4A @ 120V AC<br>Nominal 4.3A @ 240V AC |
| Ingress Protection | IP66 |
| Operating Temperature | -40°F to 149°F (-40°C to 65°C) |
| Storage Temperature | -40°F to 185°F (-40°C to 85°C) |
| **Output** | |
| Nominal DC Output Voltage | 48V |
| Max. DC Output Voltage | 72V |
| Max DC Output Current | 20A |
| Derated | > 104° (40°F) |
| **Protection** | |
| Output Reverse Polarity | Electronic Protection-Auto Reset |
| Output Short Circuit | Current Limited |
| AC Overload | Current Limited |
| DC Overload | Current Limited |

## 7.4 HYDRAULIC OIL SPECIFICATIONS

**Table 9. Hydraulic Oil SAE Viscosity Grade Operating Temperature Ranges**

| Hydraulic System Operating Temperature Range | SAE Viscosity Grade |
|---|---|
| +0° to + 180° F (-18° to +83° C) | 10W |
| +0° to + 210° F (-18° to + 99° C) | 10W–20, 10W–30 |
| +50° to + 210° F (+10° to + 99° C) | 20W–20 |

**Note:** Hydraulic oils require anti-wear qualities at least to API Service Classification GL-3 and sufficient chemical stability for mobile hydraulic system service. JLG Industries recommends standard UTTO.

**Note:** Aside from JLG recommendations, it is not advisable to mix oils of different brands or types, as they may not contain the same required additives or be of comparable viscosities. If use of hydraulic oil other than standard UTTO is desired, contact JLG Industries for proper recommendations.

**Note:** Machine operation using non-JLG approved hydraulic fluids or operation outside of the temperature boundaries outlined in the hydraulic fluid operation charts may result in premature wear or damage to components of the hydraulic system.

**Note:** Machines may be equipped with standard UTTO biodegradable and non-toxic hydraulic oil. This is a fully synthetic hydraulic oil that possesses the same anti-wear and rust protection characteristics as mineral oils, but will not adversely affect the ground water or the environment when spilled or leaked in small amounts.

**Note:** When temperatures remain consistently below 20° F (-7° C), JLG Industries recommends the use of a premium “cold weather” hydraulic fluid (Viscosity Gr. 32).

**Table 10. Hydraulic Oil Properties and Classifications**

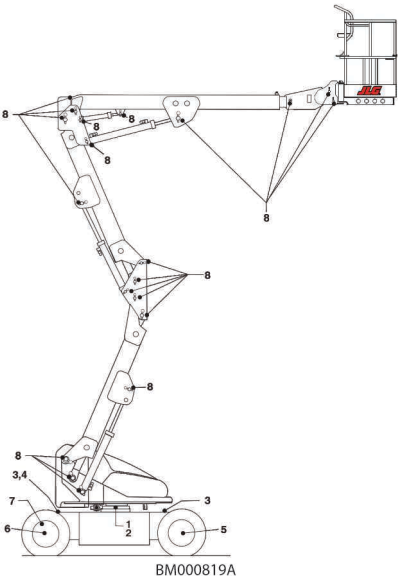
| Fluid | Properties | | Base | | | | Classifications | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | Viscosity at 40° C * | Viscosity Index | Mineral Oils | Vegetable Oils | Synthetic | Synthetic Polyol Esters | Readily Biodegradable** | Virtually Non-toxic † | Fire Resistant ‡ |
| **Shell Spirax S4 TXM - Recommended** | **67** | **146** | ✓ | | | | | | |
| Mobilfluid 424 - *Optional* | 60 | 134 | ✓ | | | | | | |
| **Shell Tellus S2 VX32 - Recommended** | **32** | **142** | ✓ | | | | | | |
| Mobil DTE 10 Excel 32 - *Optional* | 32 | 164 | ✓ | | | | | | |
| **Shell Tellus S4 VX32 - Recommended** | **32** | **296** | ✓ | | | | | | |
| Univis HVI 26 - *Optional* | 26 | 376 | ✓ | | | | | | |
| **Shell Panolin S2 Hydraulic EAL 32** | **31** | **192** | | ✓ | | | ✓ | ✓ | |
| **Shell Panolin S2 Hydraulic DU EAL 46** | **46** | **193** | | | ✓ | | ✓ | ✓ | |
| Quintolubric 888-46 | 48 | 190 | | | | ✓ | ✓ | ✓ | ✓ |
| Hydrolube HP-5046D | 46 | 192 | | | | ✓ | ✓ | ✓ | ✓ |

* cSt, Typical
** Readily biodegradeable classification indicates one of the following:

CO2 Conversion > 60% per EPA 560/6-82-003
CO2 Conversion > 80% per CEC-L-33-A-93

† Virtually Non-toxic classification indicates a LC50 > 5000 ppm per OECD 203
‡ Fire Resistant classification indicates Factory Mutual Research Corp. (FMRC) Approval

## 7.5 OPERATOR MAINTENANCE AND LUBRICATION DIAGRAM




## 7.6 OPERATOR MAINTENANCE AND LUBRICATION

**Table 11. Lubrication Specifications**

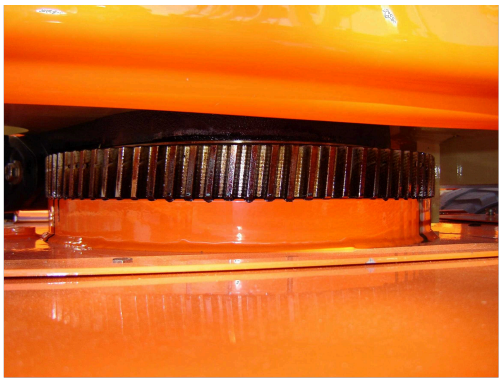
| KEY | SPECIFICATIONS |
|---|---|
| MPG | Multipurpose Grease having a minimum dripping point of 350 degrees F. Excellent water resistance and adhesive qualities; and being of extreme pressure type (Timken OK 40 pounds minimum). |
| EPGL | Extreme Pressure Gear Lube (oil) meeting API Service Classification GL-5 orMil-Spec Mil-L-2105. |
| HO | Hydraulic Oil. API Ser vice Classification GL-3 |
| OG* | Open Gear Lube - Tribol Molub-Alloy 936 Open Gear Compound. (JLG PartNo. 3020027) |
| BG* | Bearing Grease (JLG Part No. 3020029) Mobilith SHA 460. |
| LL | Synthetic Lithium Lubricant, Gredag 741 Grease. (JLG Part No. 3020022) |
| EO | Engine (crankcase) Oil. Refer to Engine Operation Manual. |
| *MPG may be substituted for these lubricants, if necessary, but service intervals will be reduced. | |

# NOTICE

Lubrication intervals are based on machine operation under normal conditions. For machines used in multi-shift operations and/or exposed to hostile environments or conditions, lubrication frequencies must be increased accordingly.

1. Swing Bearing
   Lube Point(s) - 2 Grease Fittings
   Capacity - A/R
   Lube - MPG
   Interval - Every 3 months or 150 hrs of operation
   Comments - Remote Access (Optional)

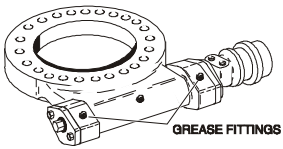
2. Swing Bearing/Worm Gear Teeth
   Lube Point(s) - Grease Fittings
   Capacity - Spray On
   Lube - OG or Mobiltac375NC
   Interval - A/R
   Comments - If necessary install grease fittings into worm gear housing and grease bearings.



**Note:** OG will allow better cycle times than Mobiltac375NC, however Mobiltac375NC must be used in dusty environments. If the swing function becomes noisy and/or rough lubricate the bearing teeth.

# ⚠ CAUTION

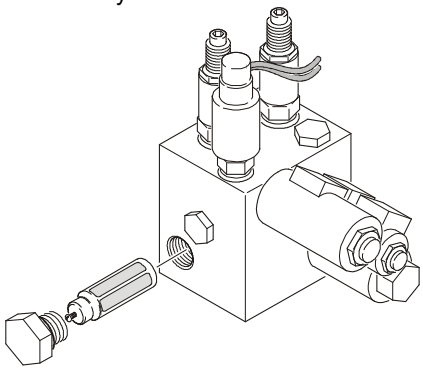
Do not overgrease bearings. Overgreasing bearings will result in blowing outer seal in housing.



3. Hydraulic Tank
   Lube Point(s) - Fill Cap
   Capacity - 4 Gal. (15.1 L)
   Lube - HO
   Interval - Check Level daily; Change every 2 years or 1200 hours of operation.
   Comments - On new machines, those recently overhauled, or after changing hydraulic oil, operate all systems a minimum of two complete cycles and recheck oil level in reservoir.

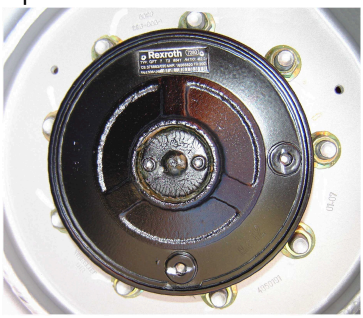


4. Hydraulic Return Filter
   Interval - Change after first 50 hrs. and every 6 months or 300 hrs. thereafter.
   Comments - Under certain conditions, it may be necessary to replace the hydraulic filter on a more frequent basis. A common symptom of a dirty filter is sluggishness experienced in hydraulic functions.

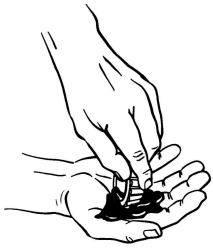




5. Wheel Drive Hub
   Lube Point(s) - Level/Fill Plug
   Capacity - 17 oz. (1/2 Full)
   Lube - EPGL
   Interval - Check level every 3 months or 150 hrs of operation; change every 2 years or 1200 hours of operation

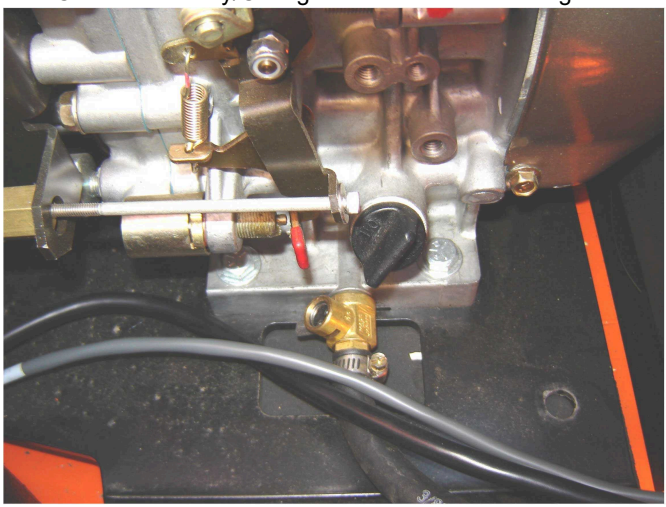


6. Wheel Bearings
   Lube Point(s) - Repack
   Capacity - A/R
   Lube - MPG
   Interval - Every 2 years or 1200 hours of operation



7. Spindles/Bushing
   Capacity - A/R
   Lube - Lithium Lubricant
   Interval - Every 2 years or 1200 hours of operation
   Comments - At Spindle/Bushing Replacement; Coat I.D. of bushings prior to installing king pins.

8. Engine
   Lube Point(s) - Fill Cap
   Capacity - Refer to Engine Manual
   Lube - EO
   Interval - 3 Months or 150 hours of operation
   Comments - Check level daily/Change in accordance with engine manual.





## 7.7 BATTERY MAINTENANCE AND CHARGING (LEAD ACID/AGM)

**⚠ WARNING**

To avoid injury from an explosion, do not smoke or allow sparks or a flame near battery during servicing. Always wear eye and hand protection when servicing batteries.

### 7.7.1 Battery Charging (Daily)

**⚠ WARNING**

When battery charger is to be used, charging harness must be plugged into a grounded receptacle. If receptacle is not grounded and a malfunction should occur, the machine could cause serious electrical shock.

For increased battery life:

- Batteries should be kept at highest state of charge permitted by availability at job site and machine use. Charge batteries before they reach 20% state of charge. Avoid completely discharging the batteries.
- Fully charge the batteries each day the machine is used.
- Charge the batteries at available times between use. Flooded lead acid/AGM batteries do not develop a charging memory.
- If applicable, be sure the battery fluid covers the battery plates before charging. To avoid overflow, do not top off the fluid level until after charging.

**⚠ CAUTION**

When adding distilled water to the batteries, non-metallic containers and/or funnels must be used. Add water until electrolyte covers plates. Do not charge batteries unless electrolyte covers the plates.

**Note:** To avoid electrolyte overflow, add distilled water to batteries after charging. When adding water to the battery, fill only to level indicated or 3/8" above separators.

### 7.7.2 Battery Maintenance (Quarterly)

**⚠ CAUTION**

When adding distilled water to the batteries, non-metallic containers and/or funnels must be used. Add water until electrolyte covers plates. Do not charge batteries unless electrolyte covers the plates.

**Note:** To avoid electrolyte overflow, add distilled water to batteries after charging. When adding water to the battery, fill only to level indicated or 3/8" above separators.

1. Open battery compartment cover to allow access to battery terminals and vent caps.

2. Remove all vent caps and inspect electrolyte level of each cell. Electrolyte level should be to the ring approximately one inch from top of battery. Fill batteries with distilled water only. Replace and secure all vent caps.

3. Remove battery cables from each battery post one at a time, negative first. Clean cables with acid neutralizing solution (e. g., baking soda and water or ammonia) and wire brush. Replace cables and/or cable clamp bolts as required.

4. Clean battery post with wire brush then reconnect cable to post. Coat non-contact surfaces with mineral grease or petroleum jelly.

5. When all cables and terminal posts have been cleaned, ensure all cables are properly positioned and do not get pinched. Close battery compartment cover.

6. Power up machine and verify it functions properly.

## 7.8 TIRES AND WHEELS

### 7.8.1 Tire Damage

For polyurethane foam filled tires, JLG Industries, Inc. recommends that when any of the following are discovered, measures must be taken to remove the JLG product from service immediately and arrangements must be made for replacement of the tire or tire assembly.

- a smooth, even cut through the cord plies which exceeds 3 inches (7.5 cm) in total length
- any tears or rips (ragged edges) in the cord plies which exceed 1 inch (2.5 cm) in any direction
- any punctures which exceed 1 inch in diameter
- any damage to the bead area cords of the tire

If a tire is damaged but is within the above noted criteria, the tire must be inspected on a daily basis to insure the damage has not propagated beyond the allowable criteria.

### 7.8.2 Tire Replacement

JLG recommends a replacement tire be the same size, ply and brand as originally installed on the machine. Please refer to the JLG Parts Manual for the part number of the approved tires for a particular machine model. If not using a JLG approved replacement tire, we recommend that replacement tires have the following characteristics:

- Equal or greater ply/load rating and size of original
- Tire tread contact width equal or greater than original
- Wheel diameter, width, and offset dimensions equal to the original

- Approved for the application by the tire manufacturer (including inflation pressure and maximum tire load)

Unless specifically approved by JLG Industries Inc. do not replace a foam filled or ballast filled tire assembly with a pneumatic tire. When selecting and installing a replacement tire, ensure that all tires are inflated to the pressure recommended by JLG. Due to size variations between tire brands, both tires on the same axle should be the same.

### 7.8.3 Wheel Replacement

The rims installed on each product model have been designed for stability requirements which consist of track width and load capacity. Size changes such as rim width, center piece location, larger or smaller diameter, etc., without written factory recommendations, may result in an unsafe condition regarding stability.

### 7.8.4 Wheel Installation

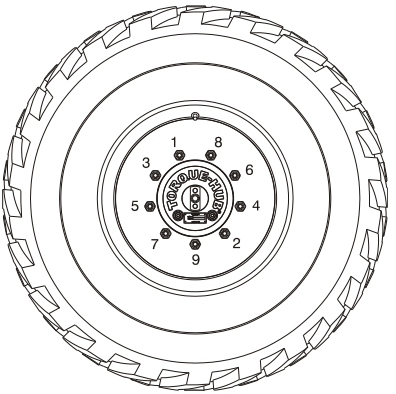
It is extremely important to apply and maintain proper wheel mounting torque.

**⚠ WARNING**

Wheel nuts must be installed and maintained at the proper torque to prevent loose wheels, broken studs, and possible dangerous separation of wheel from the axle. Be sure to use only the nuts matched to the cone angle of the wheel.

Tighten the lug nuts to the proper torque to prevent wheels from coming loose. Use a torque wrench to tighten the fasteners. If you do not have a torque wrench, tighten the fasteners with a lug wrench, then immediately have a service garage or dealer tighten the lug nuts to the proper torque. Over-tightening will result in breaking the studs or permanently deforming the mounting stud holes in the wheels. The proper procedure for attaching wheels is as follows:

1. Start all nuts by hand to prevent cross threading. DO NOT use a lubricant on threads or nuts.
2. Tighten nuts in the following sequence:



3. The tightening of the nuts should be done in stages. Following the recommended sequence, tighten nuts per wheel torque chart.

4. Wheel nuts should be torqued after first 50 hours of operation and after each wheel removal. Check torque every 3 months or 150 hours of operation.

**Table 12. Wheel Torque Chart**

| TORQUE SEQUENCE | | |
|---|---|---|
| 1st Stage | 2nd Stage | 3rd Stage |
| 40 ft. lbs. (55 Nm) | 95 ft. lbs. (130 Nm) | 170 ft. lbs. (230 Nm) |

## 7.9 RADIO FREQUENCY (RF) INFORMATION

**Note:** The ClearSky Smart Fleet™ CS550 connectivity module antenna is internal to the assembly. The CS550 connectivity module complies with the wireless certification regulations in the regions of sale. Machines equipped with ClearSky Smart Fleet telematics must be received by countries that are certified to have ClearSky Smart Fleet. For a full listing of ClearSky Smart Fleet certified countries, please refer to the ClearSky webpage on the JLG website.

### 7.9.1 Federal Communications Commission (FCC)

**FCC Interference Statement**

ClearSky CS550 has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**Notice Regarding Radio Frequency Radiation Exposure**

ClearSky CS550 complies with the FCC radio frequency exposure limits prescribed for mobile use (i.e,. antennas are greater than 20 cm from a person's body) in an uncontrolled environment. Consequently, a person within 20 cm (8 in) of a CS550 that is connected to machine battery power could expose that person to RF energy in excess of what has been established by the FCC RF exposure guidelines.

### 7.9.2 Innovation, Science and Economic Development (ISED)

#### Radio Frequency Interference Requirements

The ClearSky CS550 Class B digital apparatus complies with Canadian ICES-003. [ Canada Compliance Label: CAN ICES-3 (B)/NMB-3(B) ]

This device complies with Industry Canada license-exempt RSS standard (s). Operation is subject to the following two conditions:

> (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### Notice Regarding Radio Frequency Radiation Exposure

ClearSky CS550 complies with the ISED radio frequency exposure limits prescribed for mobile use (i.e,. antennas are greater than 20 cm from a person's body) in an uncontrolled environment. Consequently, a person within 20 cm (8 inches) of a CS550 that is connected to machine battery power could expose that person to RF energy in excess of what has been established by the ISED RF exposure guidelines.

### 7.9.3 European Union Conformity (CE)

#### CE Interference Statement

JLG Industries, Inc. declares that the radio equipment ClearSky Smart Fleet CS550 Connectivity Module complies with Directive 2014/53/EU. Full details can be found on the declaration of conformity. The CS550 is intended to be mounted on JLG machines and has integrated beacon functionality. Additionally, it provides telematics data via WiFi or Cell, and provides local diagnostic data exchange with a mobile device connected via WiFi and BLE. Mobile device software is obtained through Google Play Store or Apple App Store.

Frequencies of Operation [and maximum power output]:

- LTE Cat M1: 700/750/800/850/900/1700/1800/1900/2100 MHz [23 dBm±2 dB]
- 2G GPRS: 900MHz [Class 4, 33 dBm ±3 dB], 1800MHz [Class 1, 30 dBm ±3 dB]
- 2G EGPRS: 900MHz [Class E2, 27 dBm ±3 dB], 1800MHz [Class E2, 26 dBm ±3 dB]
- WiFi (IEEE 802.11b/g/n): 2400-2483.5 MHz [18 dBm e.i.r.p]
- Bluetooth (BLE, Mesh 1.0 and proprietary GATT): 2400-2483.5 MHz [12.1 dBm e.i.r.p]
- GNSS (receive only: GPS, GLONASS, BeiDou, Galileo): 1575.42MHz, 1561.098MHz, 1602MHz

Ensure at least 20 cm separation distance is maintained between user's body and CS550 module to meet Maximum Permissible Exposure (MPE) restrictions for RF exposure.

Contact: JLG EMEA B.V., Polaris Avenue 63, 2132 JH Hoofddorp, Netherlands

## 7.10 SUPPLEMENTAL INFORMATION ONLY APPLICABLE TO CE/UKCA MACHINES

The following information is provided in accordance with the requirements of the European Machinery Directive 2006/42/EC or Supply of Machinery (Safety) Regulations 2008 No. 1597.

The A-Weighted emission sound pressure level at the specified workstation based on test methods per EN280-1:2022 Annex M.1 is 73 dB (A).

The vibration highest root mean square value of weighted acceleration to which the whole body is subjected during driving or lifting does not exceed 0.5 $m/s^2$.

JLG declares that machines included in this manual, before placing on the market, have been subjected to the required tests in accordance with EN280-1:2022, clause 5.3.

# 7.11 EC DECLARATION OF CONFORMITY

**Manufacturer**
JLG Industries, Inc.

**Address**
1 JLG Drive
McConnellsburg, PA 17233 USA

**Technical File**
JLG EMEA B.V.
Polaris avenue 63,
2132 JH Hoofddorp
The Netherlands

**Contact/Position**
Senior Manager — Product Strategy EMEAI

**Date/Place**
Hoofddorp, Netherlands

**Machine Type**
Mobile Elevating Work Platform

**Model Type**
E450AJ

**EC-Number**
2842

**Certificate Number**
KCEC5401

**Notified Body**
Kuiper Certificering b.v.

**Address**
Van Slingelandtstsraat 75, 7331 NM
Apeldoorn, The Netherlands

**Reference Standards**

- EN 55011:2016+A11:2020
- EN 61000-6-2:2005
- EN 60204-1:2018
- EN 280–1:2022
- EN ISO 12100:2010

JLG Industries, Inc. hereby declares that the above mentioned machine conforms with the requirements of:

- 2006/42/EC — Machinery Directive
- 2014/30/EU — EMC Directive
- 2014/53/EU — RED Directive (If fitted with optional equipment)

**Note:** This declaration conforms with the requirements of annex II-A of the council directive 2006/42/EC. Any modification of the above described machine violates the validity of this declaration.

# 7.12 UKCA DECLARATION OF CONFORMITY

**Manufacturer**
JLG Industries, Inc.

**Address**
1 JLG Drive
McConnellsburg, PA 17233 USA

**Technical File**
JLG Industries UK Ltd
Braunstone Frith Industrial Estate
Unit 3 Sunningdale Road
Leicester, LE3 1UX
United Kingdom

**Contact/Position**
Director of Engineering — Europe

**Date/Place**
Leicester, United Kingdom

**Machine Type**
Mobile Elevating Work Platform

**Model Type**
E450AJ

**AB-Number**
0463

**Certificate Number**
AVUK5401

**Approved Body**
Amtri Veritas

**Address**
Pierce Street, Macclesfield, SK11 6ER, England

**Reference Standards**

- EN 55011:2016+A11:2020
- EN 61000-6-2:2005
- EN 60204-1:2018
- EN 280–1:2022
- EN ISO 12100:2010

JLG Industries, Inc. hereby declares that the above mentioned machine conforms with the requirements of:

- 2008 No. 1597 - Supply of Machinery (Safety) Regulations 2008
- 2016 No. 1091 - Electromagnetic Compatibility Regulations 20165
- 2017 No. 1206 - Radio Equipment Regulations 2017 (if fitted with optional equipment)

**Note:** This declaration conforms with the requirements of annex II-A of the Regulations 2008 No. 1597. Any modification of the above described machine violates the validity of this declaration.

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## Serial Number _____

Any additional required certificates can be attached to the rear cover of this manual or stored in the manual box.

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## Inspection, Maintenance and Repair Log

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**Corporate Office**
**JLG Industries, Inc.**
**1 JLG Drive**
**McConnellsburg, PA 17233-9533 USA**
**(717) 485-5161 (Corporate)**
**(877) 554-5438 (Customer Support)**
**(717) 485-6417**

**Visit our website for JLG Worldwide Locations.**
**www.jlg.com**



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