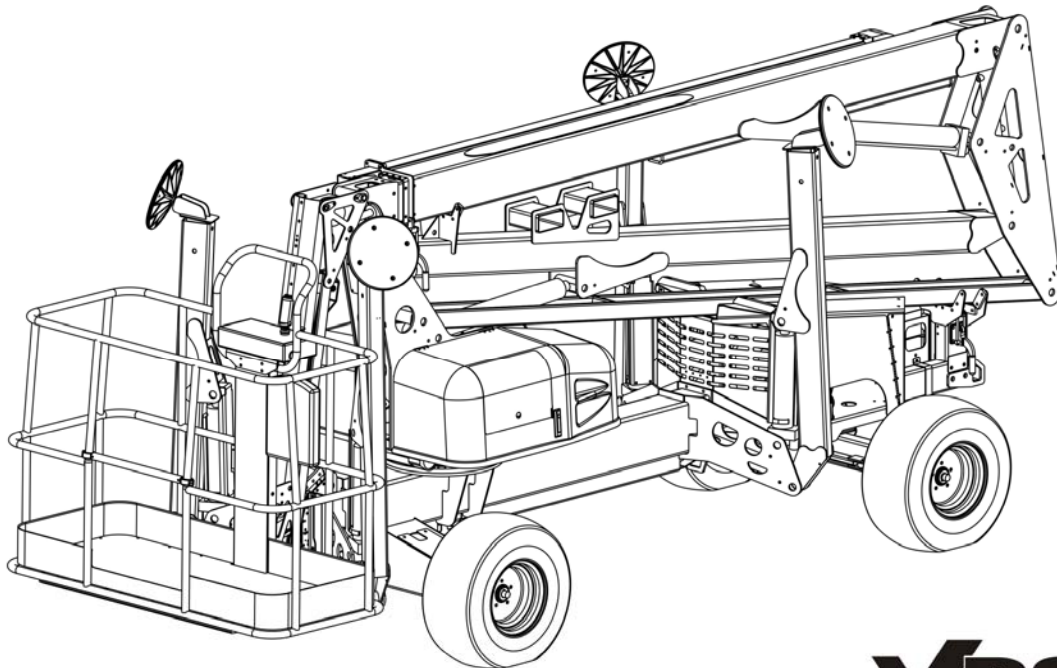


OPERATOR'S & MAINTENANCE MANUAL

Haulotte 
GROUP

45XA / HLA 16 PX



X-BOOM
AERIAL WORK PLATFORMS®

SELF-PROPELLED AERIAL WORK PLATFORM

This equipment is designed and manufactured in compliance with the duties, responsibilities and standards set forth for manufacturers in the ANSI, CSA, AS and / or CE standards in effect at the time of manufacture.

This equipment meets or exceeds applicable ANSI, CSA, AS and / or CE codes and standards when operated in accordance with manufacturer's recommendations.

It is the responsibility of the user to follow all Federal, State, and Local codes and regulations that govern the safe operation of this equipment.

Obtain, read and obey all safety precautions before performing maintenance or repairs or attempting to operate this equipment. This includes all manufacturer recommendations as well as all Federal, State, and Local codes and regulations.

To ensure proper and safe use of this equipment, it is strongly recommended that only trained and authorized personnel attempt to operate and maintain the aerial work platform. Some countries require that operators are licensed to operate aerial work platforms. Check with all Federal, State, and Local codes and regulations before operation this machine.

This manual shall be considered a permanent and necessary component of the aerial work platform and shall be kept with the machine at all times.

Owners and Lessors should complete a full inspection of all components and perform a test of all functions, including brake functions, before commissioning or reselling the aerial work platform. Repair or replace all damaged or malfunctioning components. Check local requirements with your manager.

Haulotte Group is dedicated to the continuous improvement of this and all Haulotte Group products. Therefore, equipment information is subject to change without notice. Direct any questions or concerns regarding errors and / or discrepancies in this manual to the Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

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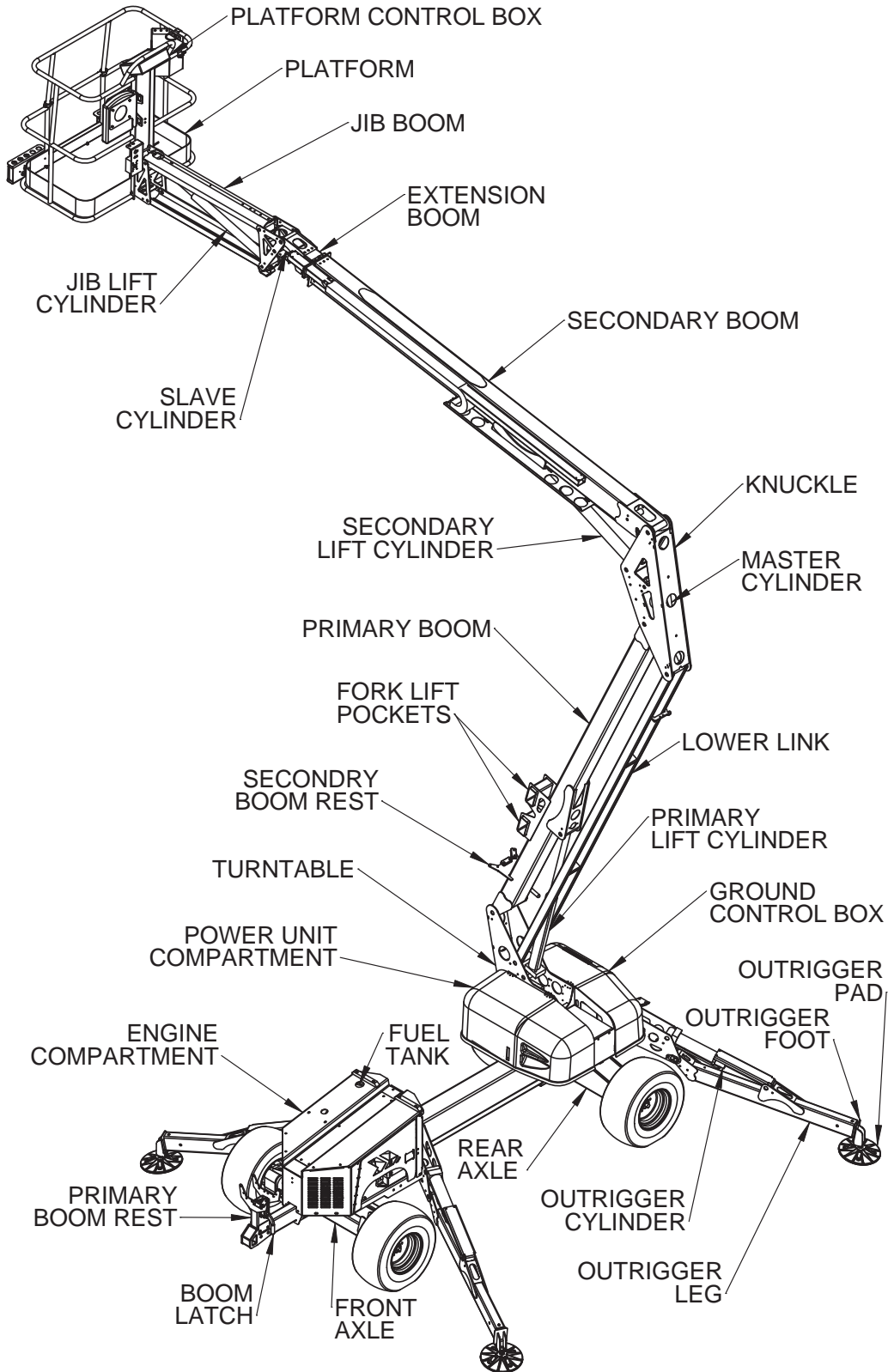
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PRIMARY MACHINE COMPONENTS



1 SAFETY

Proper training is required for the safe operation of any mechanical device. Failure to follow all instructions and safety precautions in this manual and attached to the aerial work platform will result in death or personal injury.

Prior to Operation:

- Read, understand and obey all instructions and safety precautions in this manual and attached to the aerial work platform.
- Read, understand and obey all Federal, State and Local codes and regulations.
- Become familiar with the proper use of all controls.
- Inexperienced users should receive instruction by a qualified instructor before attempting to operate or maintain the aerial work platform.

The use of intelligence and common sense is the best practice when following any safety policy.

LEGEND: SAFETY ADVISORIES

The following safety advisories are used throughout this manual to indicate specific hazards when operating or maintaining the aerial work platform. Read, understand and obey all safety advisories to prevent improper service, damage to equipment, personal injury or death.



DANGER

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



WARNING

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



CAUTION

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

NOTICE

Contains information important in the prevention of errors that could damage the machine or its components.

NOTE: Contains additional information important for performing a procedure.

BEFORE OPERATION

Ensure the following general safety precautions are followed before operating the aerial work platform:

ALWAYS inspect the usage area for potential hazards, such as unstable or unlevel surfaces, overhead obstructions and electrically charged wires or conductors. **ALWAYS** watch for moving vehicles in the operating area.

ALWAYS conduct a thorough visual inspection of the aerial work platform before operation. Check for damaged or worn parts, hydraulic leaks, damaged wiring, loose wiring conductors, damaged outriggers, low tire pressure, uneven tire wear or tire damage. Check for any improperly operating components. **NEVER** operate the aerial work platform if any damage is observed or suspected. Repair damaged or malfunctioning equipment before operation.

ALWAYS wear proper clothing. Wear protective equipment as required by Federal, State and Local codes and regulations. Keep loose clothing, jewelry, gloves and hair away from moving parts.

ALWAYS wear a Safety Harness and energy-absorbing Lanyard, such as the Safety Harness and Lanyard available through the Haulotte Group.

ALWAYS inspect platform floor and outrigger footpads for mud, grease, debris or other foreign material. **ALWAYS** remove any such material from the aerial work platform before operation.

ALWAYS RED tag any part of this machine known or suspected to be damaged or malfunctioning. **ALWAYS** remove a malfunctioning, damaged or defective aerial work platform from service. **NEVER** operate an aerial work platform that has any known or suspected defect.

ALWAYS comply with the instructions found in Safety and / or Service Bulletins distributed by the manufacturer / factory. Bulletins may contain critical procedures that supersede the information contained in this manual.

NEVER operate this aerial work platform while under the influence of drugs or alcohol, while taking prescription medications that may leave the operator drowsy or prone to dizziness, or while feeling ill.

NEVER modify, alter or change the aerial work platform in any way that would affect its original design or operation.

NEVER deface, modify or obscure any decals or markings on the aerial work platform.

NEVER operate this aerial work platform in any way for which it is not intended.

NEVER operate this aerial work platform in explosive or flammable environments.

Before attempting aerial work platform operations, operator(s) should:

- Attend a training program as required by all Federal, State, and Local codes and regulations.
- Obtain, read and obey all safety precautions as indicated by manufacturer's recommendations and all Federal, State and Local codes and regulations.
- Become familiar with the location and use of all controls.
- Verify that there are no overhead obstructions or live power sources in the work area that could interfere with the safe operation of the aerial work platform.
- Cordon off the area surrounding the aerial work platform to keep personnel, vehicles and moving equipment away from the aerial work platform while in use.
- Position the aerial work platform on a firm and level surface.
- Conduct a pre-operation inspection by performing all recommended daily service checks. Refer to the "Equipment Maintenance" section of this manual.

DURING OPERATION

Ensure the following general safety precautions are followed while operating the aerial work platform:

ALWAYS position away from power lines, this ensures that no part of the aerial work platform accidentally reaches into an unsafe area. This includes full extension of the telescoping boom through 700° of Non-Continuous rotation.



DANGER

This aerial work platform is **NOT** insulated for use near electrical power lines and **DOES NOT** provide protection from contact with or close proximity to any electrically charged conductor. Operator must maintain safe clearances at all times (10 ft (3.05 m) minimum) and must always allow for Platform movement due to gusty winds. Always contact power company before working near power lines. Assume every power line is live. Power lines can be blown by the wind.

Refer to Table 1-1 for minimum safe approach distances between the machine and electrical power lines.

TABLE 1-1. MINIMUM SAFE APPROACH DISTANCES		
Voltage Range (Phase to Phase)	Minimum Safe Approach Distance	
	(Feet)	(Meters)
0 to 300V	Avoid Contact	
Over 300V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72

ALWAYS check with local electrical authorities regarding any local requirements which may differ from those shown in Table 1-1.

ALWAYS keep away from an aerial work platform that is exposed to electrically charged power lines. If the aerial work platform comes in contact with electrically charged power lines, **NEVER** touch or operate the aerial work platform from ground level until power lines are shut off.

ALWAYS operate only on a firm and level surface. **NEVER** operate on surfaces that do not support the aerial work platform with its rated load capacity, or on surfaces that do not support force exerted by the outriggers during aerial work platform operation. Operate only on surfaces that can support a pressure of 25 psi (1.8 kg/cm²) to ensure safe operation.

ALWAYS keep personnel away from potential pinch and shear points and from potential crush hazards as indicated by decals attached to the aerial work platform.

ALWAYS keep the safety bar lowered (closed) unless personnel are entering or exiting the work platform.

DURING OPERATION (CONTINUED)

ALWAYS use a three (3) point contact (both hands and one foot) when entering or exiting the work platform.

ALWAYS wear proper footwear. **ALWAYS** keep the platform free of debris.

ALWAYS keep personnel and obstructions clear of the aerial work platform when repositioning the boom or platform.

ALWAYS cordon the area surrounding the outriggers to keep personnel, vehicles and moving equipment away from the aerial work platform while in use.

ALWAYS stay clear of overhead obstructions, including wires and cables.

ALWAYS disengage aerial work platform travel latches before raising aerial work platform sections and reengage aerial work platform travel latches before transporting.

ALWAYS exercise caution when rotating the boom from the ground (lower) control panel. **ALWAYS** watch for personnel inside the radius of the turntable and boom arm when rotating from the ground (lower) or platform (upper) controls.

ALWAYS remove personnel from the aerial work platform before attempting to free an elevated platform that has become caught or snagged on an adjacent structure or obstacle.

NEVER operate the aerial work platform from a position on a truck-bed, trailer, floating vessel or scaffolding without written approval from the manufacturer / factory.

ALWAYS maintain joystick enable lever during drive operation.

NEVER allow electrode contact with any part of the aerial work platform while welding from the platform. **NEVER** use the aerial work platform as a ground for welding.

NEVER operate without the outriggers fully extended or when the aerial work platform is not level.

NEVER position an elevated platform against another object to steady the platform.

NEVER override or bypass the manufacturer's safety devices.

NEVER attach a safety harness to an adjacent structure, pole, or to nearby equipment while working from the platform.

NEVER raise the outriggers with materials or personnel on board, or while platform is raised or extended.

NEVER sit, stand or climb on platform railing. **ALWAYS** keep both feet firmly on the platform floor.

NEVER attempt to increase the working height with boxes, ladders, stools or any other materials.

NEVER operate this aerial work platform when exposed to high winds, thunderstorms, ice or any weather conditions that would compromise operator safety.

NEVER operate aerial work platform in conditions where wind speeds exceed 28 mph (12.5 m/sec or 45 km/h). Steady or gusty winds that exceed the recommended wind speed may affect stability and aerial work platform operation.

NEVER allow ropes, electric cords, hoses or other equipment to become entangled in the aerial work platform.

NEVER exceed the load limits set by the manufacturer / factory. Use only the material lifting hook, supplied as an option and manufactured by Haulotte Group when lifting materials. Safely stow all tools and equipment.

DURING OPERATION (CONTINUED)

NEVER exceed load ratings by transferring loads to the aerial work platform at elevated heights.

NEVER use the platform to lift a load that exceeds the platform dimensions. **NEVER** lift a load in such a way that the center of gravity is higher than the top guardrail of the platform.

NEVER modify the platform or carry materials that would increase the surface area of the platform. Increasing the area exposed to the wind may affect the aerial work platform stability. **NEVER** attach overhanging loads when raising or lowering the platform.

NEVER use the boom or platform to push or pull or to lift any part of the machine.

NEVER use the boom or platform to place a load against any structure, materials or equipment.

NEVER climb on the boom.

NEVER leave an elevated platform unattended.

NEVER leave the keys in the aerial work platform while unattended or not in use.

DRIVE SAFETY

ALWAYS maintain an awareness of limited sight and blind spots when operating drive functions.

ALWAYS limit travel speed according to surface conditions, slope, location of personnel and obstructions and any other factors which may result in collision.

NEVER operate drive functions on slopes exceeding 45% (24°).

NEVER engage in stunt driving, horseplay or any other behavior considered unsafe according to employer, job site and all Federal, State, and Local codes and regulations.

NEVER operate the internal combustion engine in an area that is not properly ventilated.

NEVER fuel the internal combustion engine while smoking, or while near spark or open flame.

FALL PROTECTION

- Occupants must wear a safety belt or harness in accordance with all Federal, State, and Local codes and regulations. Attach lanyard to the anchor provided on the work platform.
- **Never** sit, stand, or climb on the platform guard rails. Maintain a firm footing on the platform floor at all times.
- **Never** climb down from the platform when raised. If a power failure should occur, ground personnel should use the manual controls to lower the platform. Refer to the "Operation" section of this manual for manual operation.
- Keep platform floor clear of debris.
- Lower the platform entry mid-rail or close the entry gate before operating.



MANUAL FORCE

- **Never** push off or pull toward any object outside the platform.
- Maximum allowable manual force is 90 lb. (400 N).

WIND LOADING

- **Never** operate the aerial work platform in strong or winds that exceed 28 mph (12.5 m/s) or 45 km/h). **Never** increase the surface area of the platform or the load. Increasing the area exposed to the wind will decrease the aerial work platform stability.
- The Beaufort scale of wind force is accepted internationally and is used when communicating weather conditions. It consists of a number 0-10>, each representing a certain strength or velocity of wind at 33 ft (10 m) above ground level in the open. Refer to Table 1-2

TABLE 1-2. BEAUFORT SCALE

Description of wind		Specifications for use on land	m/h	km/hr	m/s
0	Calm	Calm; smoke rises vertically.	1	0-1	0-0.3
1	Light Air	Direction of wind shown by smoke.	1-3	1-5	0.3-1.5
2	Light Breeze	Wind felt on face; leaves rustle; ordinary vanes moved by wind.	4-7	6-11	1.6-3.3
3	Gentle Breeze	Leaves and small twigs in constant motion; wind exceeds light flag.	8-12	12-19	3.4-5.4
4	Moderate Breeze	Raises dust and loose paper; small branches are moved.	13-17	20-28	5.5-7.9
5	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland waterways.	18-24	29-38	8.0-10.7
6	Strong Breeze	Large branches in motion; whistling heard in telephone wires; umbrellas used with difficulty.	25-30	39-49	10.8-13.8
7	Near Gale	Whole trees in motion; inconvenience felt when walking against wind.	31-38	50-61	13.9-17.1
8	Gale	Breaks twigs off trees; generally impedes progress.	39-46	62-74	17.2-20.7
9	Strong Gale	Slight structural damage occurs (chimney pots and slates removed).	47-54	75-88	20.8-24.4
10>	Storm, Violent Storm, Hurricane	Trees uprooted, widespread damage to structures, widespread devastation	55>	89>	24.5>

EXPLOSION HAZARD

- **NEVER** operate aerial work platform if you smell or detect Liquid Petroleum Gas (LPG), gasoline, diesel fuel or other explosive substances.
- **ALWAYS** charge Batteries in an open, well-ventilated area away from sparks, flames and lighted tobacco.

If this aerial work platform is equipped with a generator:

- **NEVER** refuel with the engine running.
- **NEVER** operate engine unless in a well-ventilated area to avoid carbon monoxide poisoning.

MAINTENANCE

Ensure the following general safety precautions are followed while performing maintenance on the aerial work platform:

General Maintenance

ALWAYS perform maintenance procedures according to manufacturer's guidelines. **NEVER** disregard or bypass proper maintenance procedures.

ALWAYS inspect hydraulic system to ensure that all lines, connectors and fittings are properly fastened and are in good condition.

ALWAYS turn the key switch to the "OFF" position and remove key before performing maintenance.

Whenever possible, **ALWAYS** perform maintenance with the boom and platform in a fully lowered, "stowed" position.

ALWAYS secure the boom before performing maintenance on hydraulic cylinders.

ALWAYS disconnect power to the hydraulic pump drive motor before making electrical checks to the hydraulic valves.

ALWAYS keep all mechanical parts properly adjusted and lubricated according to maintenance schedule and manufacturer / factory specifications. Refer to the "Equipment Maintenance" section of this manual.

ALWAYS perform a function check of operating controls before each use and after any repairs have been made.

ALWAYS locate and protect against possible pinch points before performing any maintenance or repairs. Be aware of personnel under, and around the aerial work platform.

ALWAYS use only manufacturer-approved parts to repair or maintain aerial work platform. If any portion of this aerial work platform is rebuilt or repaired, retesting is required in accordance with manufacturer / factory instructions.

ALWAYS maintain a safe distance while testing the hydraulic components. **ALWAYS** relieve hydraulic pressure before loosening or removing hydraulic components. **NEVER** test or operate the hydraulic components while personnel are near the aerial work platform.

NEVER allow water or foreign particles into the DC electric motor housing. Inclusion of water or foreign particles may cause serious damage to the motor. If the motor becomes wet, refer to the "Motor Drying Instructions" located in the Equipment Maintenance section of this manual, or contact the Haulotte Customer Service Department: at 1-800-537-0540 for proper drying instructions.

NEVER add unauthorized fluids to the hydraulic system or battery. **NEVER** mix hydraulic oils. Consult manufacturer specifications. Refer to the "Equipment Maintenance" section of this manual for hydraulic system maintenance procedures. Refer to the next page for Battery maintenance.

NEVER exceed the manufacturer's recommended relief valve settings.

NEVER touch or allow metal tools to contact any components that are sensitive to static discharge. **ALWAYS** use static discharge prevention mats and grounding devices when handling electronic components.

NEVER adjust, repair, replace or bypass any hydraulic or electrical control or safety device. These include, but are not limited to; hydraulic load control and flow control valves, solenoid valves and limit switches. **ALWAYS** consult an authorized Haulotte Group technician by contacting the Customer Service Department: at 1-800-537-0540 if repairs are necessary.

NEVER modify, alter or change the aerial work platform without first consulting an authorized Haulotte Group technician, and **NEVER** in any way that would affect its original design or operation.

MAINTENANCE (CONTINUED)

Battery Maintenance

Ensure the following general safety precautions are followed when performing battery maintenance on the aerial work platform:

ALWAYS check the battery fluid level daily.

ALWAYS wear safety glasses when working with or near batteries.

ALWAYS avoid contact with battery acid. Battery acid causes serious burns and should be kept away from skin or eyes. If contact occurs, flush with water and consult a physician immediately.

ALWAYS disconnect ground cable first when removing battery.

ALWAYS connect ground cable last when installing battery.

ALWAYS charge batteries in open, well-ventilated areas.

ALWAYS replace batteries using only parts recommended by manufacturer / factory. **ALWAYS** use only batteries with sealed caps over cells.

NEVER smoke while servicing batteries.

NEVER charge batteries near flammable materials.

NEVER allow batteries to overcharge and boil.

NEVER short across battery posts to check for current. **NEVER** break a live circuit at the battery.

NEVER disconnect battery from charger while charger is connected to a live power source.

NEVER jump-start other vehicles using the aerial work platform batteries.

2 SPECIFICATIONS

The following information is based on ideal working conditions. Machine performance may vary based on work environment and on machine options.

Only one telescoping boom motion is permitted at a time and only as long as the telescoping boom is within the safe operating zone. When a selected telescoping boom motion exceeds a safe operating limit, the telescoping boom motion ceases and another telescoping boom motion must be selected within the safe operating zone. Refer to Figure 2-1.

RANGE OF MOTION

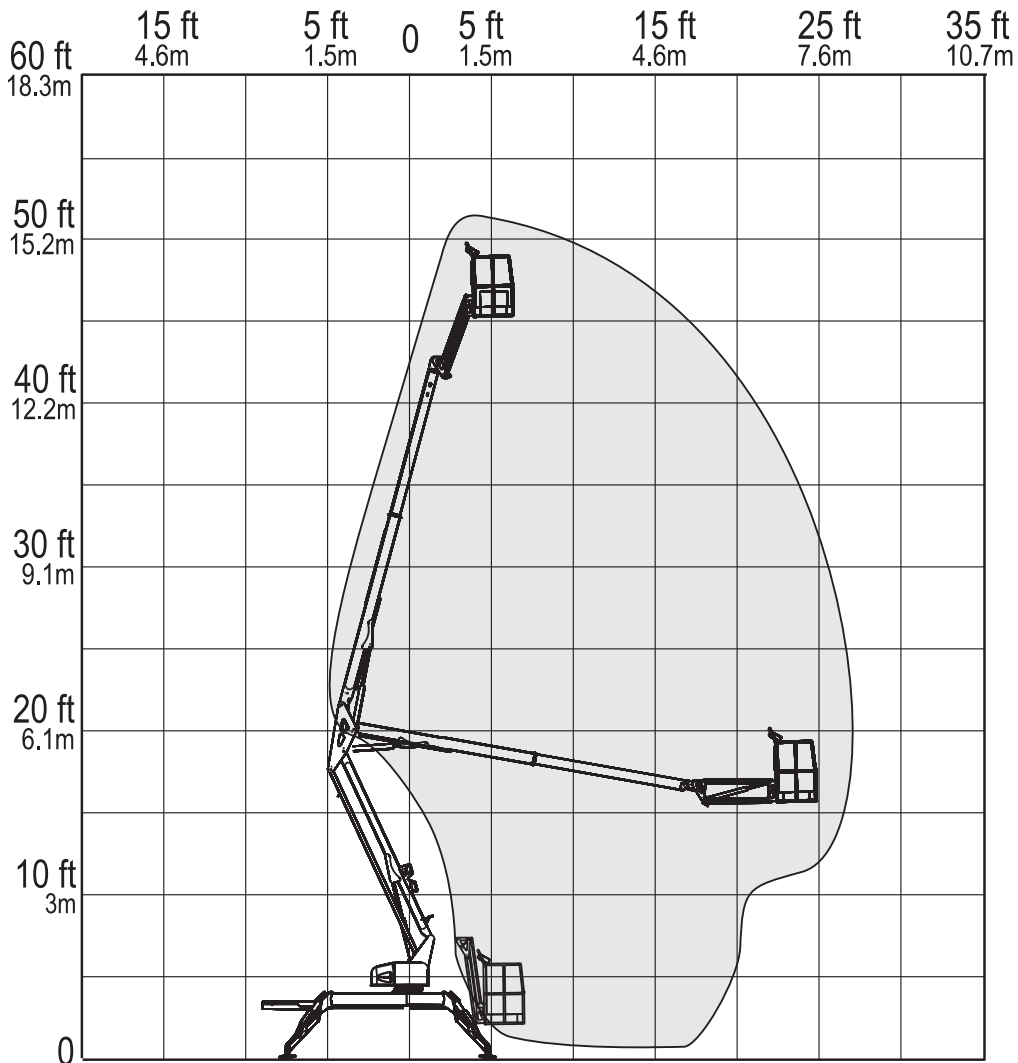


Figure 2-1. Range of Motion

SPECIFICATIONS	
Maximum Working Height	51 ft 0 in (15.7 m)
Maximum Platform Height	45 ft 0 in (13.7 m)
Up and Over Height	20 ft 9 in (6.3 m)
Maximum Horizontal Outreach	
From Centerline of Rotation	27 ft 0 in (8.2 m)
From Outrigger Footpad Edge	21 ft 0 in (6.4 m)
Rated Platform Capacity	
Without Platform Rotation	500 lb (227 kg)
With Platform Rotation	440 lb (200 kg)
Maximum Number of Occupants	2
Total Weight	4,900 lb (2,223 kg)
Turntable Rotation	700° Non-Continuous
Leveling Capability	12.5°
Wheel Base	8 ft 8 in (2.7 m)
Turning Radius	
Inside	11 ft 0 in (3.4 m)
Outside	16 ft 8 in (5.0 m)
Platform Dimensions	
Height	3 ft 7 in (1.1 m)
Length	2 ft 6 in (0.8 m)
Width	5 ft 0 in (1.5 m)
Platform Rotation / Type (Optional)	120° / Manual
Stowed Dimensions	
Height	6 ft 7 in (2.1 m)
Length	18 ft 2 in (5.5 m)
Width	5 ft 6 in (1.7 m)
Jib Dimensions	
Length	4 ft 3 in (1.3 m)
Vertical Motion	150° (+70° / -80°)
Outrigger Footprint (To Center of Pad)	
Length	12 ft 4 in (3.8 m)
Width	11 ft 4 in (3.5 m)
Footpad Diameter	12.5 in (0.3 m)
Brake	Spring Applied
Maximum Drive Speed	
DC	1.75 mph (3 km/h)
IC	3.5 mph (6 km/h)
Gradeability	45%
Tire Size	26 x 12 Bar Lug
Control System	24V DC
Battery	4 x 6V 245 amp-hr
Charger	110 Volt 60 Hz 220 Volt 50 Hz
Engine	
Gas (Air Cooled) Kawasaki	21 hp (15.7 kw)
Diesel (Air Cooled) Hatz	16 hp (11.2 kw)

SPECIFICATIONS (CONTINUED)	
Hydraulic Pressure	3,000 psi (207 bar) (20,684 kPa)
Reservoir Capacity	4.3 Gallons (16.3 L)
Hydraulic System Capacity	6.3 Gallons (23.9 L)
Hydraulic Oil (Standard)	HVI AW32
Maximum Noise Level	
DC Mode – Ground (Lower)	60 dBA
DC Mode – Platform (Upper)	55 dBA
Engine Mode – Ground (Ground)	70 dBA
Engine Mode – Platform (Upper)	65 dBA
Function Speeds	
Boom - Primary	
Primary, Up - Fast	22-26 sec
Primary, Up - Slow	54-58 sec
Primary, Down – Fast	22-26 sec
Primary, Down - Slow	89-93 sec
Boom - Secondary	
Secondary Up - Fast	20-24 sec
Secondary Up - Slow	38-42 sec
Secondary Down - Fast	32-36 sec
Secondary Down - Slow	74-78 sec
Boom - Jib	
Jib, Up – Fast	8-12 sec
Jib, Up - Slow	12-16 sec
Jib, Down - Fast	20-24 sec
Jib, Down - Slow	38-42 sec
Extension Boom	
Boom Extend - Fast	24-28 sec
Boom Extend - Slow	48-52 sec
Boom Retract - Fast	28-32 sec
Boom Retract - Slow	58-62 sec
Turntable 700° Non Continuous Rotation	
Turntable Rotation - Fast	194-198 sec
Turntable Rotation - Slow	326-330 sec
Platform	
Platform Compensation - Up - Fast	10-14 sec
Platform Compensation - Up - Slow	18-22 sec
Platform Compensation - Down - Fast	10-14 sec
Platform Compensation - Down - Slow	14-18 sec
Outrigger (Auto Level)	
Outrigger Extend	18-22 sec
Outrigger Retract	30-34 sec
Localized (Foot Plate) Pressure per Outrigger	25 psi (1.8 kg/cm ²) (176.5 kPa)
Maximum Pressure per Tire - Floor Loading	35 psi (2.5 bar)
Operating Temperature Range	-20° to 110° Fahrenheit (-29° to 43° Celsius)

WARRANTY - NEW PRODUCT; HAULOTTE NORTH AMERICA

Haulotte US Inc (Haulotte) warrants its new products made by it to be free from defects in material or workmanship for twelve (12) months under normal operational conditions from the warranty start date (delivery date).

In addition, Haulotte further warrants the structural elements of each new product made by it, as defined in its then current warranty policies and procedures, to be free from defects in material or workmanship for five (5) years from the warranty start date (delivery date).

Haulotte agrees to repair or replace at its own expense; at its facility in Frederick MD, or at an authorized repair facility designated by Haulotte, any part or parts of the product found to be defective in material or workmanship, provided Haulotte is notified of such defect or defects within the applicable warranty period and given a reasonable time to correct the defect. In no case shall any warranty extend to defects in materials, components, or services furnished by third parties. Defects caused by chemical action or the presence of abrasive materials and defects arising following the operation beyond rated capacity or the improper use or application of any products shall not be considered defects within the scope of this warranty. If any repairs or alterations are made or any parts are replaced during the applicable warranty periods by anyone other than Haulotte or an entity authorized by Haulotte for use in its products, customer shall pay for such repairs or parts without recourse against Haulotte, and Haulotte should be relieved of responsibility for fulfillment of this warranty with respect to such repairs, alterations, or replacement so made. Haulotte obligations under this warranty shall at all times be subject to its current warranty policies and procedures. The above mentioned warranty shall not apply to replacement or service parts made and sold by Haulotte. Periodic maintenance, periodic maintenance items (including paint and decals), and minor adjustments are excluded from this warranty. Certain components, including, but not limited to, engines, tires and batteries, which may be part of the product are not manufactured or warranted by Haulotte. Any applicable warranty for such component is provided through the original manufacturer of the component or its distributor organization. Haulotte warranty does not apply to defects caused by negligence, misuse, accidental damage, inadequate or improper use or maintenance, acts of nature and normal wear and tear of the products.

Under no circumstances shall Haulotte be liable for any consequential or special damages which any person or entity may incur or claim to incur as a result of any defect in the product or in any correction or alteration thereof made or furnished by Haulotte or others. Consequential or special damage includes, but not limited to cost of transportation, lost sales, lost orders, lost profits, lost income, increased over head, labor and material costs, and cost of manufacturing variances and operational inefficiencies. Haulotte maximum liability under this warranty shall be the purchase price paid to Haulotte with respect to the product to which such warranty is claimed. This warranty constitutes Haulotte entire and exclusive warranty as to the product and is the sole and exclusive remedy for the product defects in material and workmanship. Haulotte does not assume (and has not authorized any other person to assume on its behalf) any other warranty or liability in connection with any product covered by this warranty.

Haulotte expressly disclaims any and all other warranties of any kind whatsoever as to the product furnished hereunder, including but not limited to any express warranties, except for the exclusive warranty provided herein, or implied warranties as to merchantability, or fitness for any particular purpose.

This warranty shall be void, if, upon the occurrence of any incident involving any product made by Haulotte and resulting in any personal injury or property damage, customer shall fail to notify Haulotte within 48 hours of such occurrence or permit Haulotte and its representatives to have immediate access to such product and all records of or within the control of the customer relating to the product and occurrence. For the procedure to apply for warranty please refer to the warranty procedure (document # QC-00001).

North America Warranty 2010/4.

QC-00002

WARRANTY CLAIMS PROCEDURE

In order to qualify for warranty coverage, the following conditions must be met:

- 1) Return of completed "Warranty Registration" form to Haulotte Group|BilJax within 15 days of receipt of product;
- 2) Notification to Haulotte Group|BilJax Service within 48 hours of any claimed defect, or damage resulting from the claimed defect;
- 3) Warranty is limited to parts that are determined to be defective by an authorized service dealership in conjunction with Haulotte Group|BilJax Service. This does not include parts worn out due to normal wear and tear.

Haulotte Group|BilJax authorized dealers or distributors are responsible for filing claims under warranty. Listed below is the warranty claims procedure.

- 1) Contact Haulotte Group|BilJax Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com to report the claim and verify warranty coverage. Machine serial number and machine hours must be provided when call is placed. A call ID number will be created when the call is placed. The service representative will issue the call ID number to you at the end of the call.
- 2) Identify the components to be claimed under warranty along with description of failure. An RMA number will be issued from Haulotte Group|BilJax to return warranty parts at the time the parts order is placed.
- 3) Replacement parts will then be sent by Haulotte Group|BilJax to the dealer or distributor. All parts are invoiced at dealer|distributor list price. Credits will be issued when defective parts are returned to Haulotte Group|BilJax under the proper RMA number and found to be defective under warranty.
- 4) After completing repairs, submit warranty application form and return the defective parts to Haulotte Group|BilJax. Warranty application form and parts must be received within 30 days of claim in order to be eligible for credit. Returned parts are to be sent prepaid and will be credited when part is received and verified. Warranty labor rate will be paid at current rate set by Haulotte Group|BilJax. The amount of labor hours reimbursed will be determined by Haulotte Group|BilJax and will be limited to 4 hours unless approved by Haulotte Group|BilJax Service.
- 5) The warranty application must include; the issued RMA number, the invoice number for the associated parts, the machine serial number, the machine hours on the date of failure, the issued call ID number, failure and repair description, and requested customer information.

Failure to follow the warranty claims procedure may result in delay in processing claim or denial of the claim. Haulotte Group|BilJax reserves the right to limit or adjust warranty claims with regard to parts, labor, and travel time. Replacement components purchased from suppliers other than Haulotte Group|BilJax are not covered under the terms of this warranty.

QC-00001

DAMAGED EQUIPMENT POLICY

Safety Statement

At Haulotte Group we are dedicated to the safety of all users of our products. All Haulotte Group aerial work platforms are designed, manufactured and tested to comply with current applicable ANSI, CSA, AS and / or CE Standards and regulations.

Damage Policy

There may be occasions when a Haulotte Group aerial work platform is involved in an incident that results in structural damage to the aerial work platform. Such damage can seriously compromise the ability of the aerial work platform to perform in a safe manner. Therefore, whenever a Haulotte Group aerial work platform has sustained visual structural damage, or when there is suspected internal structural damage, Haulotte Group may require that the aerial work platform be returned to our facility for a complete inspection and recertification. For any questions concerning whether your aerial work platform may have sustained structural damage or the Damaged Equipment Policy, direct any questions to the Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com.

Damage Repair Notice

There may be occasions when a Haulotte Group aerial work platform is involved in an accident resulting in damage to non-structural components. When such damage occurs and repairs are made by the owner or area distributor, please notify Haulotte Group of these non-maintenance repairs and request a repair form to be filled out and returned to Haulotte Group.

3 OPERATION

The Haulotte Model 45XA / HLA 16 PX is a Self-Propelled aerial work platform, designed and manufactured to position personnel with their tools and equipment at overhead work locations. The platform load capacity is rated at 500 pounds (227 kilograms). During all aerial work platform operations, four extended outriggers support the unit.

The aerial work platform drive function has the option to be battery (DC) or fuel (IC) powered, the boom functions are battery (DC) operated only. This machine is operated with electronic pushbutton controls, a hydraulic power unit, a hydraulic gear motor and hydraulic cylinders. The hydraulic power unit includes a reservoir, pump and control valves. Hydraulic cylinders elevate and extend the telescoping boom and maintain the platform leveling during operation. The hydraulic motor and mating worm gear allow the telescoping boom to rotate 700° Non-Continuous around a vertical axis.

The hydraulic power unit uses a 24-Volt DC motor to drive the hydraulic pump.

The DC motor is powered by four 6-Volt DC, 245 amp-hour deep charge batteries connected in series. An automatic onboard battery charger is provided for recharging the batteries at the end of each work period.

The Kawasaki (IC) engine (21 hp (16 kw)) is fueled by gas. The Hatz (IC) engine (16 hp (12 kw)) is fueled by diesel.

The ground (lower) control panel controls the power, outriggers, boom lift elevation, and rotation functions.

The platform (upper) control panel also controls the power, outriggers, boom lift elevation, rotation functions, and drive functions.

NOTE: The elevation and rotation controls are operational only when the outriggers are correctly extended and the extension boom is within a programmed safe operating zone.

The ground (lower) control panel includes a lighted text window that displays the current operating status or an existing error condition.

Safety devices prevent the boom from retracting suddenly in the event of a hydraulic hose or system failure. It is strongly recommended that no one adjust or tamper with these safety devices. If service is required, contact the Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com.

In the event of power loss, control system failure or other malfunction, boom lowering functions may be accomplished manually.

To manually operate boom retraction, and turntable rotation functions, use the hand pump, and “motion selection” valve on the hydraulic pump unit that can be accessed inside the pump compartment.

Manual lowering of the boom and platform may also be performed by actuating the valve plunger found on the base of each boom lift cylinder. Pushing in and holding the valve “button” on the appropriate cylinder retracts that cylinder, thereby retracting that part of the boom. The boom may need to be rotated to a clear area before lowering.

GROUND (LOWER) CONTROL PANEL

The ground (lower) control panel is used to operate outriggers and all boom functions. To access the ground (lower) control panel, open the control panel access cover found on the turntable.

The ground (lower) control panel includes the following controls and indicators. Refer to Figure 3-1.

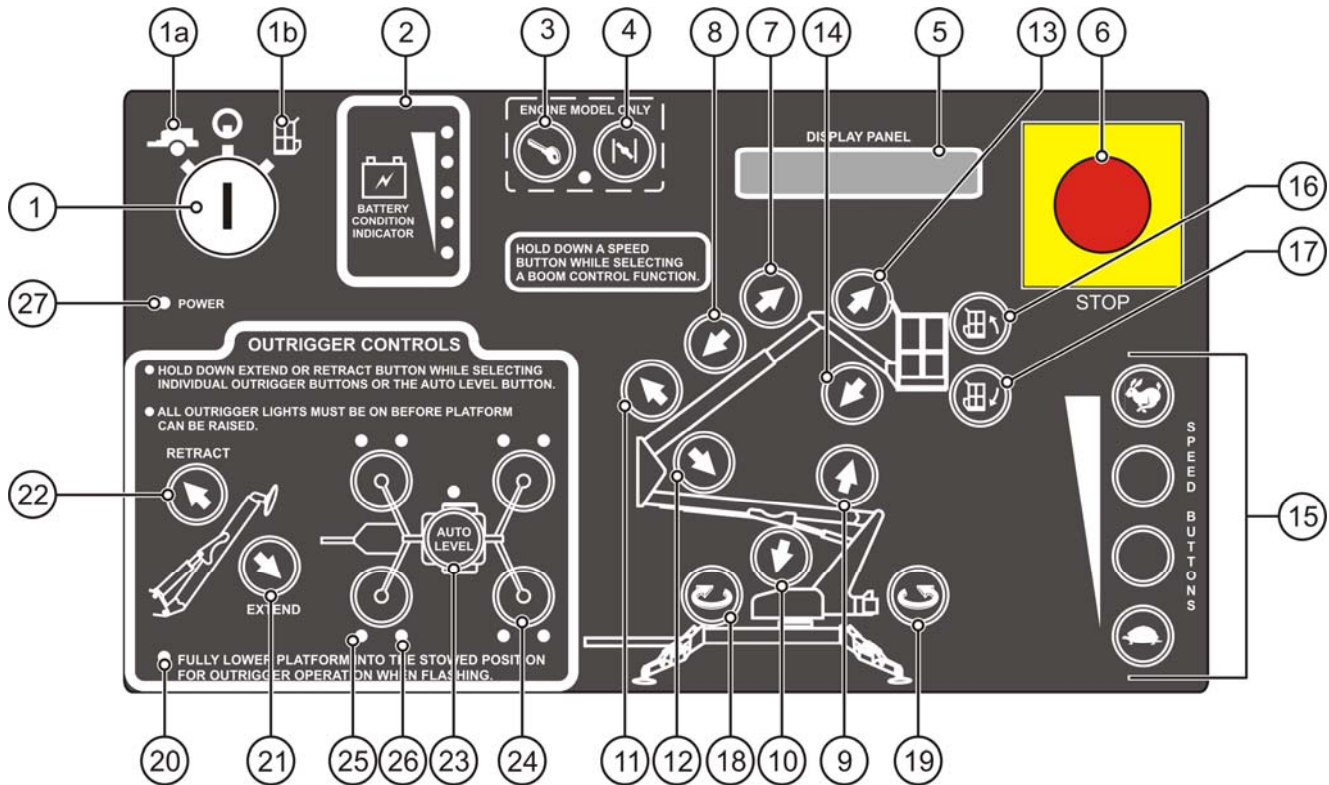


Figure 3-1. Ground (Lower) Control Panel

1. Key Switch

Turning the **KEY SWITCH (1)** counter clockwise to the **GROUND (1a)** icon selects operation from the ground (lower) control panel. Turning the **KEY SWITCH (1)**, clockwise to the **PLATFORM (1b)** icon selects operation from the platform (upper) control panel. Turning the **KEY SWITCH (1)** to the vertical position (power “OFF”) interrupts all electric and hydraulic power operations except emergency lowering. Removal of the **KEY** protects against any unauthorized persons attempting to operate the aerial work platform. The **KEY** may be removed with the **KEY SWITCH (1)** in any selected position.

2. Battery Condition Indicator

Indicator LEDs light up to indicate the level of charge in the batteries.

- A lighted green LED indicates an adequate charge level.
- A lighted yellow LED indicates the need for charging soon.
- A lighted red LED warns that the battery charge level is low; all functional operations become non-functional until the batteries are recharged.

3-4. Engine Start and Choke / Glow Plug

Start a cold engine by pressing (pushing) in and holding the **CHOKE (4)** button then press (push) the **ENGINE START (3)** button. To start / restart a warm engine, press (push) the **ENGINE START (3)** button only.

GLOW PLUG OPERATION – Press (push) the **GLOW PLUG OPERATION (4)** button and hold for 30-60 seconds then press (push) the **ENGINE START (3)** button.

GROUND (LOWER) CONTROL PANEL (CONTINUED)

5. Display Panel

The **DISPLAY PANEL** is a lighted text window that displays the current operating status or an existing error condition when the **KEY SWITCH (1)** is positioned at either **(1a)** or **(1b)**.

6. Emergency Stop Button

When pushed in, the **EMERGENCY STOP (6)** button disconnects electrical power to the ground (lower) and platform (upper) control panels. The **EMERGENCY STOP** button should only be pressed (pushed) in to immediately stop all aerial work platform motion. To resume control, "pull out" the **EMERGENCY STOP (6)**.

7-8. Boom Extend / Retract Buttons

Pressing (pushing) in and holding a desired **SPEED (15)** button, and the **BOOM EXTEND (7)** button at the same time extends the secondary boom. Pressing (pushing) in and holding a desired **SPEED (15)** button, and the **BOOM RETRACT (8)** button at the same time retracts the secondary boom. Telescopic boom motion continues until the buttons are released, or until the boom reaches a hard stop, or a safe travel limit.

9-14. Boom Raise / Down Buttons

- Pressing (pushing) and holding a desired **SPEED (15)** button, and the **PRIMARY BOOM RAISE (9)** button at the same time will raise the primary boom. Pressing (pushing) and holding a desired **SPEED (15)** button, and the **PRIMARY BOOM DOWN (10)** button at the same time will retract the primary boom.
- Pressing (pushing) and holding a desired **SPEED (15)** button, and the **SECONDARY BOOM RAISE (11)** button at the same time will raise the secondary boom. Pressing (pushing) and holding a desired **SPEED (15)** button, and the **SECONDARY BOOM DOWN (12)** button at the same time will retract the secondary boom.
- Pressing (pushing) and holding a desired **SPEED (15)** button, and the **JIB BOOM RAISE (13)** button at the same time will raise the **JIB BOOM**, pressing (pushing) and holding a desired **SPEED (15)** button, and the **JIB BOOM DOWN (14)** button at the same time will retract the **JIB BOOM**.

The selected Boom motion continues until the buttons are released or until the selected boom reaches a hard stop or a safe travel limit.

15. Speed Buttons

The **SPEED (15)** buttons are located along the lower right side of the control panel, one of the speed buttons must be pressed (pushed) in and held while selecting any boom function. There are four speeds that range from fast (**RABBIT**), to slow (**TURTLE**), available to help control the positioning of the Boom and the Jib.

16-17. Platform Tilt Buttons

Press (push) and hold any **SPEED (15)** button, and the desired **PLATFORM TILT UP (16)** or **PLATFORM TILT DOWN (17)** button at the same time to level the work platform. This levels the platform only, NOT the aerial work platform.

18-19. Boom Rotation Buttons

Pressing (pushing) and holding a desired **SPEED (15)** button, and the **BOOM ROTATION (18)** button at the same time enables the boom to rotate in the **CLOCKWISE** direction. Pressing (pushing) and holding a desired **SPEED (15)** button, and the **BOOM ROTATION (19)** button at the same time enables the boom to rotate in the **COUNTER CLOCKWISE** direction. The boom will rotate through 700° of Non-Continuous rotation until the buttons are released or the stop is reached.

GROUND (LOWER) CONTROL PANEL (CONTINUED)

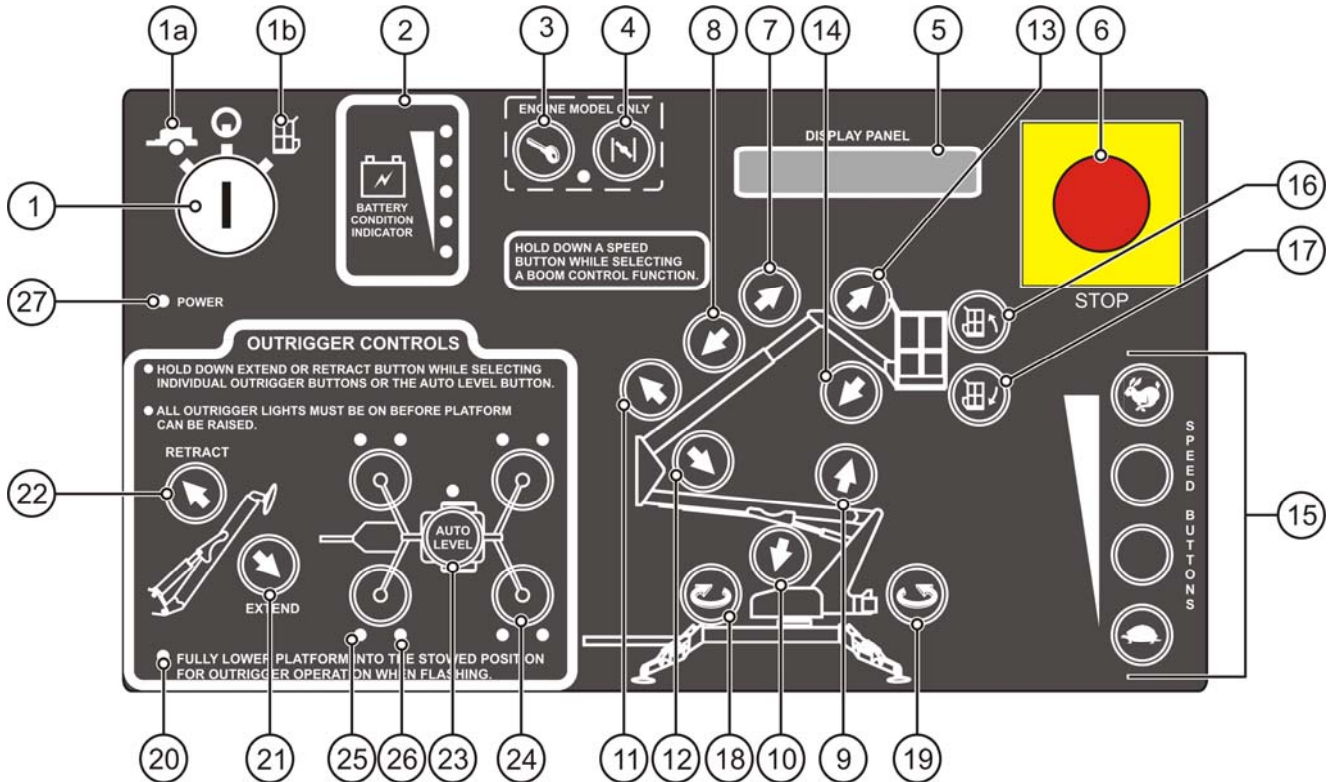


Figure 3-1. Ground (Lower) Control Panel

20. Auto Level LED

When this LED is “FLASHING” it indicates that the booms are not in the “stowed” position, and the outriggers are not functional. When this LED is “ON SOLID” it indicates that the booms are in the “stowed” position, and the outriggers are functional.

21-24. Outrigger Controls

For simultaneous automatic outrigger extension / retraction of all four (4) outriggers: Select the **EXTEND (21)** button or **RETRACT (22)** button and the **AUTO LEVEL (23)** button at the same time. To individually extend or retract the outriggers: Select the **EXTEND (21)** button or **RETRACT (22)** button, and one of the four **OUTRIGGER (24)** buttons at the same time. The outrigger indicator LEDs (20) lights up when the outriggers are properly deployed and the aerial work platform weight is on the outrigger foot pads. Each of the outer outrigger LEDs (25) indicates load is on the outrigger foot pad. Each of the inner outrigger LEDs (26), when flashing, indicate that side is low, and needs to be further raised for leveling.

PLATFORM (UPPER) CONTROL PANEL

The platform (upper) control panel is used to control all functions. The platform (upper) control panel is activated by turning the **KEY SWITCH (1)** on the ground (lower) control panel, clockwise to the **PLATFORM (1b)** icon. Enter the work platform using a three (3) point contact (both hands and one foot).

The platform (upper) control panel includes the following controls and indicators. Refer to Figure 3-2.

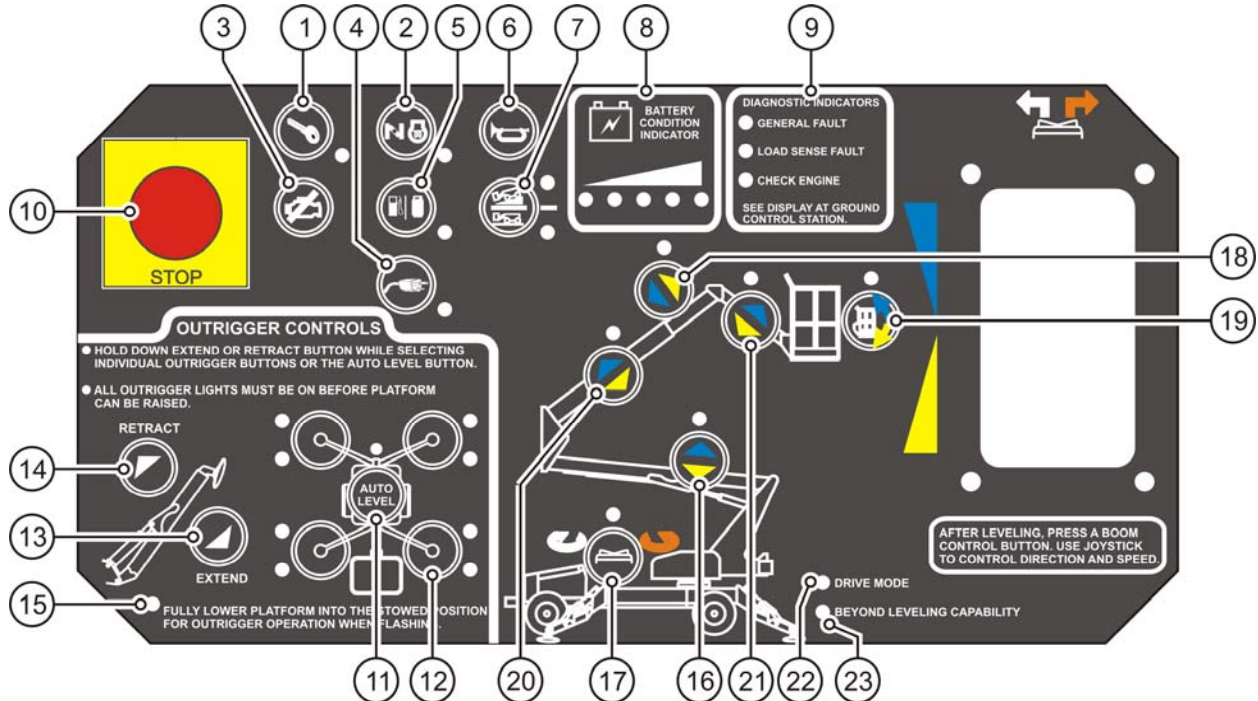


Figure 3-2. Platform (Upper) Control Panel

1-2. Engine Start and Choke / Glow Plug

Start a cold engine by pressing (pushing) and holding the **CHOKE (2)** button and pressing (pushing) the **ENGINE START (1)** button to start the Engine. To start / restart a warm Engine, press (push) the **START (1)** button only.

GLOW PLUG OPERATION – Press (push) and hold the **GLOW PLUG (2)** button for 30-60 seconds then press (push) the **ENGINE START (1)** button.

3. Engine Stop

Press (push) the **ENGINE STOP (3)** button to shut the engine “OFF”.

4. Generator On / Off

To activate and / or deactivate the generator, press (push) the **GENERATOR ON / OFF (4)** button. When the generator is “ON” the LED will be lit. The generator provides power to the battery charger as well as both GFI outlets (one on the wall of the turntable, one on the bulkhead).

5. Fuel Toggle

Press (push) the **FUEL TOGGLE (5)** button to change between the different types of fuel.

6. Horn Button

Pressing (pushing) the **HORN (6)** button will sound the **HORN**. Use the **HORN (6)** button to warn personnel in the area of a falling object hazard, impending boom motions, or the need for assistance.

7. Drive Speed Selector

Press (push) the **DRIVE SPEED SELECTOR (7)** button to switch between low speed / high torque and high speed / low torque. The Low speed / high torque setting is the machines’ default setting, and is recommended when operating on inclines.

PLATFORM (UPPER) CONTROL PANEL (CONTINUED)

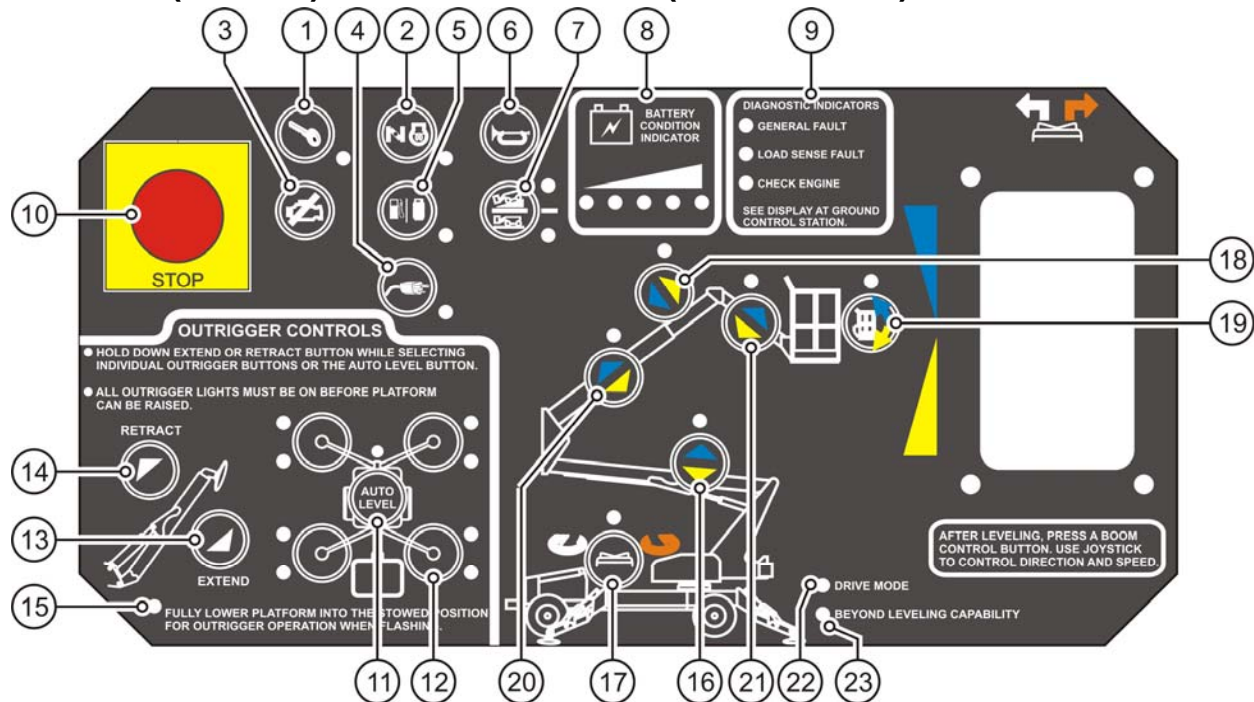


Figure 3-2. Platform (Upper) Control Panel

8. Battery Condition Indicator

Indicator LEDs light up to indicate the level of charge in the batteries.

- A lighted green LED indicates an adequate charge level.
- A lighted yellow LED indicates the need for charging soon.
- A lighted red LED warns that the battery charge level is low; all functional operations become non-functional until the batteries are recharged.

9. Diagnostic Indicators

Indicator LED's warn of machine or engine issues.

9A. General Fault - When lit, refer to the **DISPLAY PANEL** on the ground (lower) control panel for an error code.

Refer to Table 4-3 Error Code Definitions, located in the "Equipment Maintenance" section of this manual.

9B. Load Sense Fault - When lit, this is an indication of too much weight in the work platform; all functional operations become non-functional until the weight is below the Maximum Allowable Capacity (500 lb (227kg)) rating.

9C. Check Engine - When lit, turn the engine "OFF" by using the **ENGINE STOP (5)** button; refer to the **DISPLAY PANEL** on the ground (lower) control panel for an error code. Refer to Table 4-3 Error Code Definitions, located in the "Equipment Maintenance" section of this manual.

10. Emergency Stop Button

When pushed in, the **EMERGENCY STOP (10)** button disconnects electrical power to the ground (lower) and platform (upper) control panels. The **EMERGENCY STOP (10)** button should only be pressed (pushed) to immediately stop all aerial work platform functions. To resume control, pull the **EMERGENCY STOP (10)** button out.

11-15 Outrigger Controls

The Outrigger controls on the platform (upper) control panel are identical to the controls on the ground (lower) control panel. Refer to the previous section for details.

PLATFORM (UPPER) CONTROL PANEL (CONTINUED)

NOTE: For all Boom Raising and Lowering, Extending and Retracting functions: Boom motion continues until the **JOYSTICK** is released, or until the boom reaches a hard stop or a safe travel limit is reached. When referencing moving the **JOYSTICK** forward or backwards, forward is away from the operator, backwards is towards the operator.

16. Primary Boom Raise / Boom Lower Button

Press (push) the **PRIMARY BOOM RAISE / BOOM LOWER (16)** button until the LED is lit. Pressing (squeezing) the **ENABLE LEVER** on the **JOYSTICK**, enables the function. Using the color-coded direction arrows, move the **JOYSTICK** slightly off center; move the **JOYSTICK** forward to raise the primary boom, move the **JOYSTICK** backwards to lower the boom. Refer to the next section **JOYSTICK – PLATFORM (UPPER) CONTROL PANEL** for a visual of the **JOYSTICK**.

17. Boom Rotation Button

Press (push) the **BOOM ROTATION (17)** button until the LED is lit. To rotate **CLOCKWISE** press and hold the right side (orange arrow) of the **TOGGLE** button on top of the **JOYSTICK**. To rotate **COUNTER CLOCKWISE** press and hold the left side (white arrow) of the **TOGGLE** button on top of the **JOYSTICK**. To rotate the boom, press (squeeze) the **ENABLE LEVER** on the **JOYSTICK** and move the joystick slightly off center. The boom will rotate through 700° of Non-Continuous rotation until the **JOYSTICK** is released, or a hard stop is reached.

18. Boom Extend / Retract Buttons

Press (push) the **BOOM EXTEND / RETRACT (18)** button until the LED is lit. Pressing (squeezing) the **ENABLE LEVER** on the **JOYSTICK**, enables the function. Using the color-coded direction arrows, move the **JOYSTICK** slightly off center; move the **JOYSTICK** back to extend the secondary boom, move the **JOYSTICK** forward to retract the secondary boom.

19. Platform Tilt Button

Press (push) the **PLATFORM TILT (19)** button until the LED is lit. Pressing (squeezing) the **ENABLE LEVER** on the **JOYSTICK**, enables the function. Using the color-coded direction arrows move the **JOYSTICK** slightly off center; move the **JOYSTICK** forward to raise the platform, move the **JOYSTICK** backwards to lower the platform.

This levels the platform only, NOT the aerial work platform.

20. Secondary Boom Raise / Boom Lower Button

Press (push) the **SECONDARY BOOM RAISE / BOOM LOWER (20)** button until the LED is lit. Pressing (squeezing) the **ENABLE LEVER** on the **JOYSTICK**, enables the function. Using the color-coded direction arrows, move the **JOYSTICK** slightly off center; move the **JOYSTICK** forward to raise the secondary boom, move the **JOYSTICK** backwards to lower the boom.

21. Jib Boom Raise / Boom Lower Button

Press (push) the **JIB BOOM RAISE / BOOM LOWER (21)** button until the LED is lit. Pressing (squeezing) the **ENABLE LEVER** on the **JOYSTICK**, enables the function. Using the color-coded direction arrows, move the **JOYSTICK** slightly off center; move the **JOYSTICK** forward to raise the jib boom, move the **JOYSTICK** backwards to lower the boom.

22. Drive Enable LED

Once the outriggers are retracted and in the “stowed” (upright) position, the aerial work platform defaults to the **DRIVE MODE**, the **DRIVE MODE LED (22)** will be lit, and the machine is drivable. If the LED is not lit, check the control panel to see if there are any boom function LED's lit, if so toggle it off to enable the drive mode.

23. Beyond Leveling Capability

When the **BEYOND LEVELING CAPABILITY LED (23)** is lit; it is an indication that the aerial work platform is on a grade that is beyond the machines leveling capability. The LED will stay lit until the aerial work platform has reached a location that is within the machines leveling capability.

JOYSTICK - PLATFORM (UPPER) CONTROL PANEL

The platform (upper) control panel includes a **JOYSTICK** that operates the drive and boom functions when the **ENABLE LEVER** is pressed (squeezed). Refer to Figure 3-3.

JOYSTICK TOGGLE SWITCH

The **TOGGLE SWITCH** is used in conjunction with two separate functions; boom rotation, and steering while driving the aerial work platform.

JOYSTICK ENABLE LEVER

To activate a function, press (push) the desired function button until the LED is lit, pressing (squeezing) the **ENABLE LEVER** on the **JOYSTICK** enables the function. Using the color-coded direction arrows move the **JOYSTICK** slightly off of the neutral position, and in the desired direction.

Moving the **JOYSTICK** away from the neutral position increases the function speed. Boom motion continues until:

- The **JOYSTICK** is released.
- The **JOYSTICK** is returned to center.
- The boom reaches a hard stop or a safe travel limit.

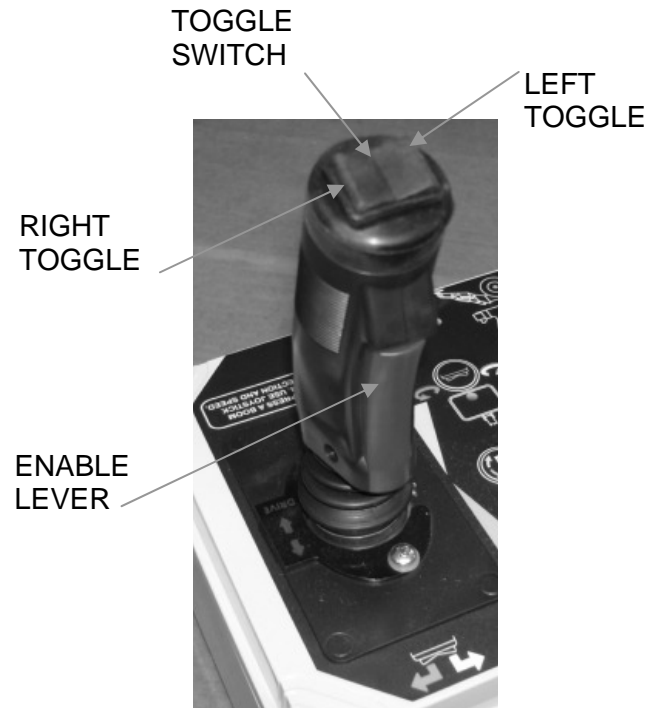


Figure 3-3. Platform Controls Joystick Shown upside down and reversed for clarity.

Boom Rotation

Use the **TOGGLE SWITCH** to determine the direction of rotation. To rotate **CLOCKWISE** press the right side of the **TOGGLE SWITCH**, to rotate **COUNTER CLOCKWISE** press the left side of the **TOGGLE SWITCH**.

To rotate the boom: press (squeeze) the **ENABLE LEVER**, using the **TOGGLE SWITCH**, select (press) a direction, then move the joystick in either direction.

NOTE: When rotating the turntable, the turntable will rotate in the desired direction regardless of the direction of the **JOYSTICK**.

Driving the aerial work platform

The **TOGGLE SWITCH** on the **JOYSTICK** is used to steer the machine.

To drive the aerial work platform, grasp the **JOYSTICK** and press (squeeze) the **ENABLE LEVER**, move the **JOYSTICK** slightly off of the neutral position and in the direction of travel desired.

To turn / steer the aerial work platform either right or left, press (squeeze) the **ENABLE LEVER** and press the desired **TOGGLE SWITCH** on top of the **JOYSTICK**.

NORMAL OPERATING PROCEDURE

Become familiar with the location and function of all controls. Learn to smoothly **START** and **STOP** all boom functions.

Perform the following procedures to operate the machine:

- Read and obey all safety precautions and operating instructions, as well as all Federal, State, and Local codes and regulations.
- Conduct a Pre-Operation Inspection by performing all recommended Daily Service Checks. Refer to the “Equipment Maintenance” Section of this manual.
- Position the aerial work platform at the work area. Make sure the aerial work platform is on a firm and level surface and there are no potential hazards such as overhead obstructions or electrically charged conductors. **DO NOT** operate the aerial work platform if such hazards exist.
- Release both travel latches, (1) the primary latch on the boom rest, and (2) the secondary latch on the Primary Boom, by raising the latch handle and swinging the clasp down. Refer to Figure 3-4.



① PRIMARY LATCH



② SECONDARY LATCH

Figure 3-4. Boom Travel Latches

NORMAL OPERATING PROCEDURE (CONTINUED)

Become familiar with the location and function of all controls. Learn to smoothly **START** and **STOP** all boom functions.

- At the ground (lower) control panel, turn the **KEY SWITCH (1)** counter clockwise to the **GROUND CONTROLS (1a)** icon. If power does not come on, make sure that both of the **EMERGENCY STOP** buttons; **GROUND (6)**, and **PLATFORM (5)**, are pulled out and the main power disconnect plug is plugged in.
- The control microprocessor will perform self-diagnostics to test the operating system. After several seconds, the **DISPLAY PANEL** window will read:

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- Monitor the battery condition indicator during operation and charge the batteries as necessary.
- Extend the four outriggers individually, or for simultaneous extension use the **AUTO LEVEL (23)** button on the ground (lower) control panel. When the aerial work platform is leveled properly, a buzzer will sound, the two LEDs at each **OUTRIGGER (25 and 26)** button, and the LED at the **AUTO LEVEL (23)** button will be lit. Refer to Figure 3-5.

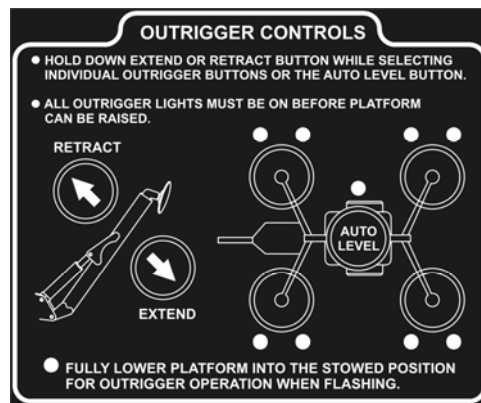


Figure 3-5. Outrigger Control Panel

- **Auto Level:** Press (push) and hold the **EXTEND (21)** and **AUTO LEVEL (23)** buttons at the same time.
- **Manual Level:** Extend the two outriggers closest to the trailer coupler first. Lower the front pair of outriggers by pressing (pushing) the **EXTEND (21)** button and the two front **OUTRIGGER** buttons at the same time. Lower the back pair of outriggers by pressing (pushing) the **EXTEND (21)** button and the two back **OUTRIGGER** buttons at the same time.
- Verify that the **AUTO LEVEL (23)** indicator LED is lit. If the **AUTO LEVEL (23)** indicator is not lit, the aerial work platform may not be level, and the weight of the machine may not be on the outrigger foot pad.

NOTE: If the boom is not level or if one or more outriggers are not supporting the machines load the safety interlock system prevents all boom operations.

NOTE: The Range of Motion Diagrams at the ground (lower) and platform (upper) control stations displays the range of platform motion (safe operating zone). Verify that the operating zone is clear of obstructions through 700° of Non-Continuous rotation.

NORMAL OPERATING PROCEDURE (CONTINUED)

- Use the ground (lower) control panel to operate the boom lift functions. Raise, lower, extend and rotate the booms by pressing (pushing) and holding the desired **SPEED** and function buttons at the same time.
- Fully lower the boom onto the boom rest to enter the platform using a three (3) point contact (both hands and one foot).
- Raise the safety bar and enter the work platform by using a three (3) point contact (both hands and one foot). Put on a safety harness and attach the lanyard to the **ANCHORAGE** (attachment point) on the side of the platform support beam.
- Use the platform (upper) control panel to operate the boom lift functions. Press (push) the desired function button until the LED is lit. Pressing (squeezing) the enable lever on the joystick enables the function. Using the color-coded direction arrows move the joystick slightly off center in the desired direction.
- Moving the joystick further off center increases the function speed, moving the joystick back toward the center decreases the function speed. Boom motion continues until: the joystick released, the joystick is returned to center, or until the boom reaches a hard stop or a safe travel limit.

NOTE: When rotating the turntable, press the desired toggle switch, the turntable will rotate in the desired direction regardless of the direction of the joystick.

- When all aerial work platform operations are complete, fully retract all boom extensions. Center the boom over the boom rest and fully lower the boom until seated in the “stowed” position for transport.

NOTE: Always fully retract, rotate and lower the boom to the “stowed” position before exiting the platform.

- Turn the key switch to the **GROUND CONTROL (1a)** position.
- Unfasten the safety harness and exit the platform by using a three (3) point contact (both hands and one foot).
- Engage both travel latches.

NOTE: Refer back to Figure 3-4 for a visual of these latches.

- Inspect the area beneath the aerial work platform and trailer for obstructions before retracting outriggers. Press (push) and hold the outrigger **RETRACT (22)** button and the **AUTO LEVEL (23)** button until all outriggers are fully retracted to their “stowed” (upright) positions.

NOTE: Safety switches prevent outrigger retraction until the boom is completely lowered and in the “stowed” position.

- At the ground (lower) control panel turn the **KEY SWITCH (1)** to the vertical (power “OFF”) position, and remove the key.

DRIVE FUNCTION

The Drive Function allows the operator to drive the aerial work platform, deploy, retract and level the outriggers from the platform (upper) control panel. The platform (upper) control panel is used to control all functions.

Use the following procedure to operate the Drive Function.

- Fully lower all booms into the “stowed” position.
- Raise all outriggers into the “stowed” (upright) position.
- Press (push) the **DRIVE SPEED SELECTOR (7)** button on the platform (upper) control panel. Refer to Figure 3-6.
- Use the **JOYSTICK** to determine the direction to be driven, use the **TOGGLE SWITCH** to steer the machine in the desired direction. The aerial work platform will continue to move until the joystick is released, or the joystick is returned to center (neutral) position.
- Once the work location is reached, lower the outriggers, and level the aerial work platform using either the ground (lower) or platform (upper) control panel.

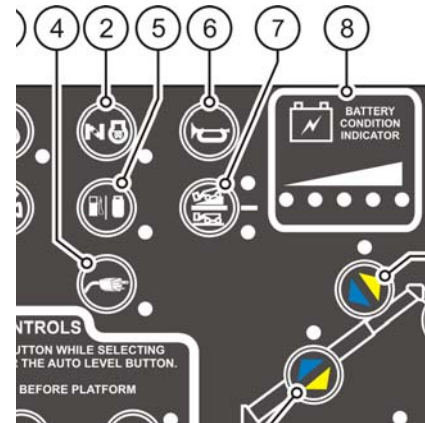


Figure 3-6. Drive Speed Selector

NOTE: Boom functions are not available until all outriggers are fully deployed and the aerial work platform is leveled.

MANUAL BRAKE RELEASE

When the aerial work platform is shut down, or is inoperable, the brakes are automatically locked. The brakes need to be released to allow the wheels to roll in order to winch / tow the machine on to a truck bed or trailer.

Use the manual brake release located in the engine compartment to release the brakes. Refer to Figure 3-7.

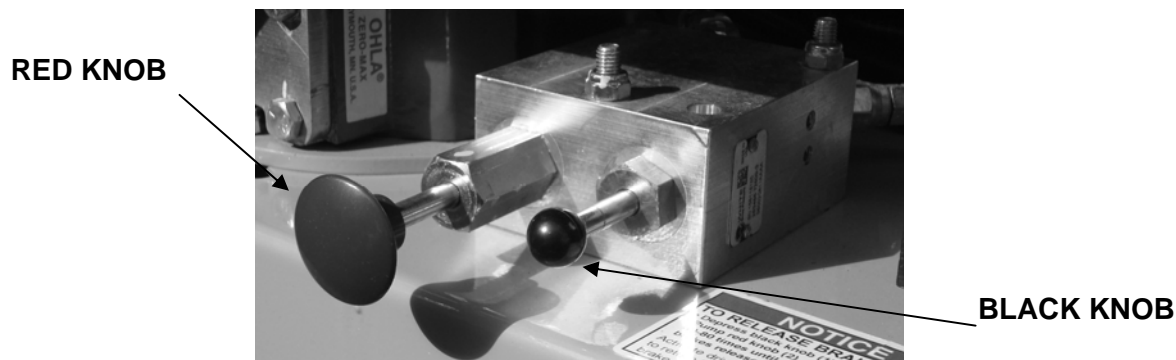


Figure 3-7. Manual Brake Release

To release the brakes:

- Depress the small **BLACK** knob.
- Pump the larger **RED** knob 60-80 times until there is resistance, or until the brakes release.

To re-activate the brakes, activate the drive function at the platform (upper) control station.

MANUAL BOOM OPERATION

Manual retraction, rotation and lowering functions allow the booms to be moved and lowered during hydraulic power interruption or failure.

The following procedures for manual retraction, rotation and lowering require a person on the ground to operate the manual controls and hand pump.

The hydraulic hand pump is located in the pump compartment. In case of a power failure, the hand pump and selected hydraulic valve can be used to manually retract the booms or rotate the boom turntable.

To begin manual retraction or rotation, turn the proportional valve counterclockwise until it stops, and insert pump handle, or tire iron into the pump handle fitting.

Manual Retraction

Begin manual retraction or rotation, by turning the proportional valve counterclockwise until it stops; insert the pump handle into the pump handle fitting. Pushing and holding the **RETRACT** button while simultaneously actuating the **HAND PUMP** will retract the secondary boom. Refer to Figure 3-8.

Manual Rotation

To rotate the TURNTABLE counterclockwise:

- Push and hold the **ROTATION** button **IN**.
- Simultaneously actuate the **HAND PUMP**.

To rotate the TURNTABLE clockwise:

- Pull the **ROTATION** button **OUT**.
- Simultaneously actuate the **HAND PUMP**.

NOTE: Turn the **PROPORTIONAL VALVE** clockwise to return it to its original position before lowering the booms or resuming normal operation.

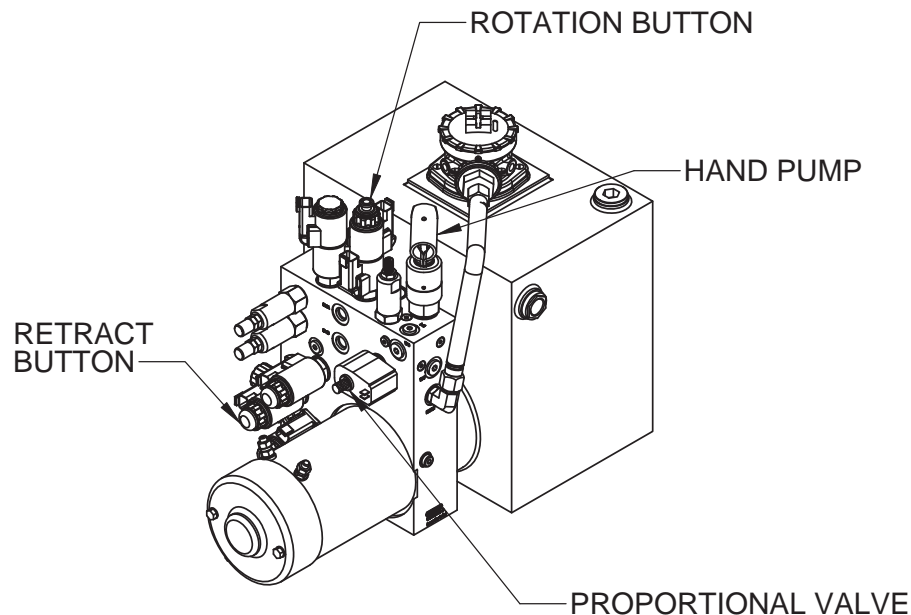


Figure 3-8. Hand Pump Controls for Manual Operation

MANUAL BOOM OPERATION (CONTINUED)

Manual Boom Lowering Procedure

Each lift cylinder is equipped with a **MANUAL LOWERING VALVE**, found at the base of each lift cylinder. Use the **VALVE** to lower the platform in case of a complete electrical power failure, a load shift, or any other emergency. The booms may be lowered in any order, but the logical order would be:

- The **PRIMARY** boom first.
- The **SECONDARY** boom next.
- The **JIB** boom last.

To lower the boom, push in on the **MANUAL LOWERING VALVE** "button" on the cylinder that controls the boom that is to be lowered. Follow this procedure until the boom is completely lowered and in the "stowed" position.

Refer to Figures 3-9 and 3-10.

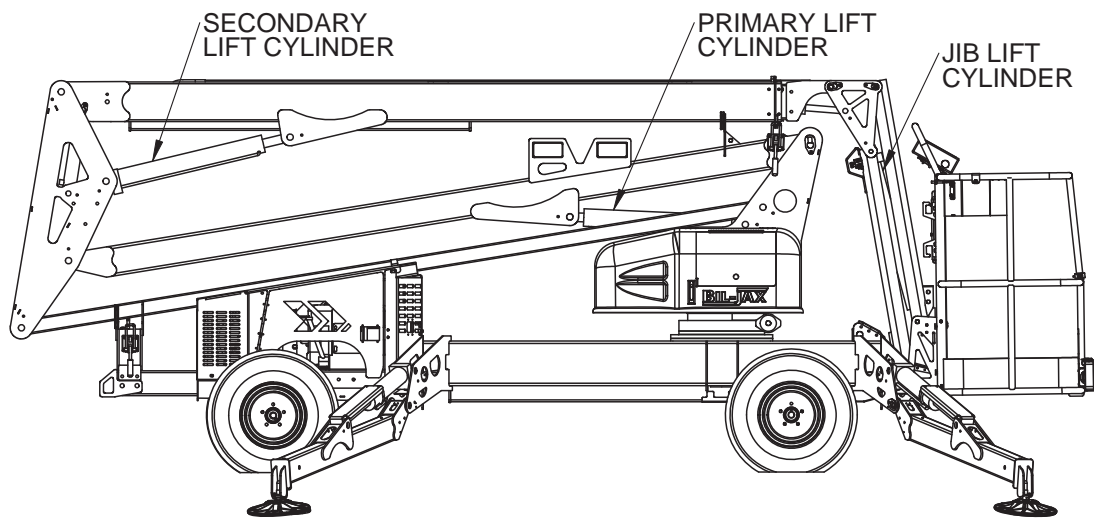


Figure 3-9. Location of Lift Cylinders for Manual Boom Lowering

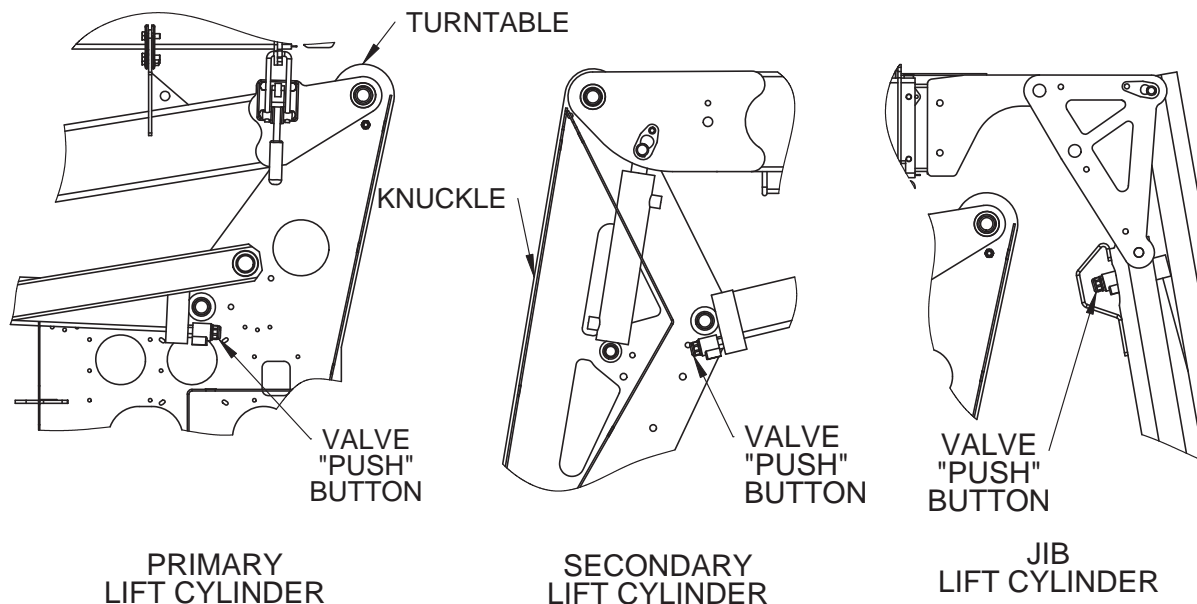


Figure 3-10. Location of Manual Lowering Valves

LIFTING THE AERIAL WORK PLATFORM

Refer to Figure 3-11.

- Completely retract and lower all booms into the “stowed” position.
- Secure both boom travel latches (A).
- Remove all loose materials from machine.
- Retract all outriggers cylinders to fully “stowed” (upright) position.
- When using a crane, use only the designated crane (fork lift) pockets (B). Follow all crane operating instructions as indicated by the crane manufacturer.
- When using a forklift, use only the designated forklift pockets (B). Follow all forklift operating instructions as indicated by the forklift manufacturer.
- Adjust rigging to keep the machine level and to minimize the risk of damage to machine.

NOTE: Only trained and authorized personnel should attempt to lift the aerial work platform.

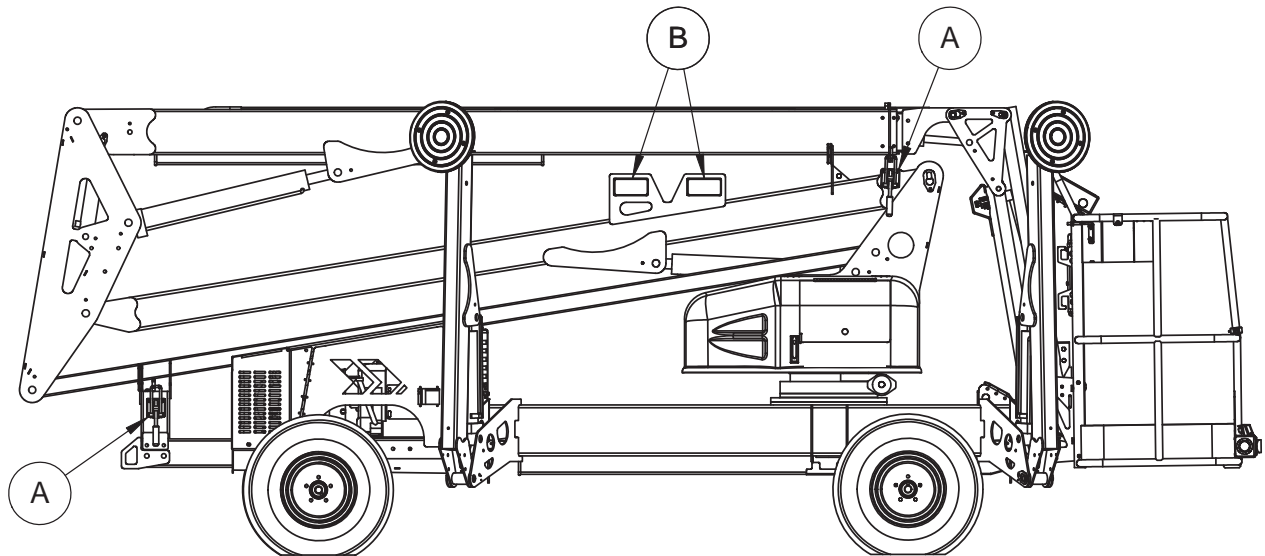


Figure 3-11. Lifting the Aerial Work Platform

TRANSPORTING THE AERIAL WORK PLATFORM ON TO A TRUCK BED

Refer to Figure 3-12.

- Verify that the truck or trailer is parked on a firm and level surface.
- Completely retract and lower all booms into the “stowed” position.
- Secure both **BOOM TRAVEL LATCHES (A)**.
- Retract all **OUTRIGGER CYLINDERS** to the fully “stowed” (upright) position.
- Winch / tow the boom onto a truck bed or trailer.
- Secure the aerial work platform to the truck bed or trailer using straps or chains. Use the two designated attachment points (B) shown below.
- Adjust the tightening of the strap / chain as necessary to prevent damage to rigging equipment or machine.

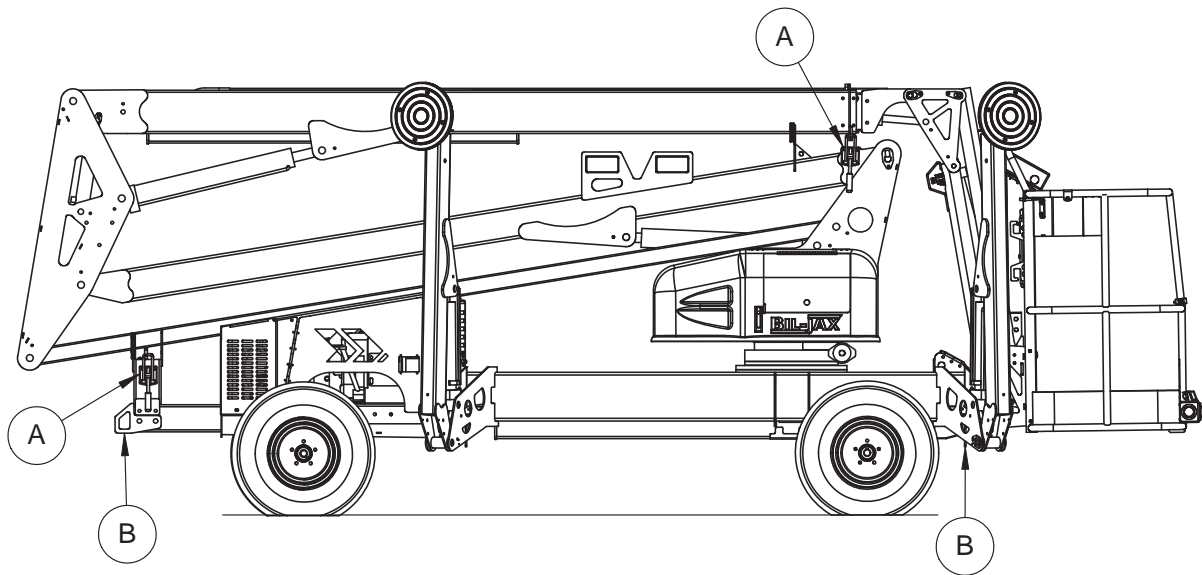


Figure 3-12. Transport the Aerial Work Platform

4 EQUIPMENT MAINTENANCE

Performing the appropriate maintenance procedures will extend the life of the aerial work platform and will help ensure the safety of personnel operating the equipment.

Repair, replacement or adjustment of any hydraulic or electrical control device should be performed only by fully trained and authorized personnel. These include, but are not limited to, hydraulic load valves, hydraulic flow control valves, solenoid valves, and limit switches. These are safety related controls. Improper adjustment or tampering with these devices may impair aerial work platform function and result in safety or damage hazards.

Persons performing maintenance or repairs on the aerial work platform should be trained in accordance with the manufacturer's recommendations. Contact Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com if additional information is needed.

Critical or suspect areas identified during any scheduled inspection of the aerial work platform shall be examined by qualified personnel in accordance with all Federal, State, and Local codes and regulations.

NEVER operate the aerial work platform if a defect or malfunction is identified or suspected. All defects and malfunctions must be repaired, and all maintenance performed, before returning an aerial work platform to service.

This manual contains a list of recommended maintenance procedures to be performed daily, weekly, monthly, and annually. Refer to it when inspecting this machine.

It is the practice of Haulotte Group to issue Service and / or Safety Bulletins, which may include updates to the information contained in this manual. In such instances, procedures contained in Haulotte Group Service Bulletins or Safety Bulletins supersede the information contained in manual.

ALWAYS follow the maintenance schedule, regardless of use.

BATTERY RECHARGE

Recharge aerial work platform batteries after each 8-hour work shift or as needed. When using the gas engine, press (push) the **GENERATOR (4)** button on the platform (upper) control panel to charge the batteries. When the aerial work platform is not in use, batteries should be recharged at least once per week. Under normal circumstances, battery recharge should take approximately 10-12 hours. However, a full recharge may take up to 24 hours, if the battery charge is extremely low.



WARNING

Recharge batteries in a well-ventilated area only. **DO NOT** charge batteries near fire, spark or other potential ignition sources. Batteries may emit highly explosive Hydrogen gas while charging. Failure to properly ventilate the charge gasses could result in death or serious injury. Always charge aerial work platform batteries away from flammable materials.

To recharge the aerial work platform batteries:

- Move the aerial work platform to a well-ventilated area with direct access to an AC electrical outlet. Keep the aerial work platform and batteries away from open flame or other potential ignition sources.
- Attach a 12 AWG multi-strand, grounded **EXTENSION CORD** with a maximum length of 50 feet (15 meters) to the receptacle located inside the **ENGINE COMPARTMENT**. The generator may need to be disconnected from the receptacle prior to connecting the extension cord.

NOTE: Using an underrated or long power cord will reduce the output of the battery charger and may extend charge time.

- Plug the **EXTENSION CORD** into outlet. Verify that the **GREEN CHARGING** indicator **LED** is lit on the **BATTERY CHARGER FACEPLATE**. Refer to Figure 4-1.
- The charging indicator **LED** remains lit continuously during the first stage of the charge cycle. The charge current will be displayed on the **BATTERY CHARGER FACEPLATE**.
- To display the Battery Voltage, press (push) in and hold the **BATTERY VOLTAGE** button. Refer to Figure 4-1.

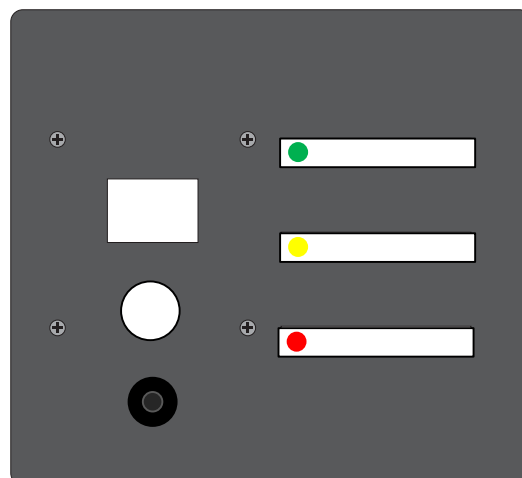



Figure 4-1. Battery Charger Faceplate

BATTERY RECHARGE (CONTINUED)

- If a Battery fault is detected, a fault code will appear on the **CHARGE CURRENT** display. The red **CHECK BATTERY** indicator **LED** will become lit. Refer to Table 4-1 for battery charger fault codes.



WARNING

DO NOT disconnect any output leads or connectors between the batteries and the charger when the charger is on. To stop a charge in progress, always unplug the extension cord from the AC Power source.

- When the battery charge reaches 80% of capacity, the yellow **“80% CHARGED”** indicator **LED** will become lit and the **“GREEN CHARGING”** indicator **LED** will begin to flash.
- When the batteries have reached a full charge, the green and yellow indicator **LEDs** will turn themselves off. **CC** (Charge Complete) will appear on the **CHARGE CURRENT** display. After two hours, this display will fade and the **CHARGE CURRENT** will read 00.
- Unplug the **EXTENSION CORD** from the outlet and the charger receptacle on the aerial work platform. Store the **EXTENSION CORD** for next use.

BATTERY FAULT CODES

TABLE 4-1. BATTERY CHARGER FAULT CODES

Code	Description	Limits	Cause
F0	No Battery	<10 volts	Loose connection or battery missing
F1	Over Voltage	>112% charge voltage	Connected to wrong battery voltage
F2	Over Current	>60 amperes	Operating machine while charging
F3	Bulk Mode Timeout	<80% charge at 16 hrs.	Battery fault
F4	ARD Mode Timeout	>80% and <full charge after 6 hrs Max.	Battery fault
F9	Current Measurement Error Standby		Board fault or charger exposed to extreme cold
FA	Triac Error		Board shorted
FF	Full Power to Transformer, No Current Output		Battery shorted or low AC line voltage or charge fault
CO	Charger Off		Charger resting between pulses (AGM batteries only)
CC	Charge Mode Complete		Batteries charged

NOTICE

Always unplug the battery charger power cord before moving the aerial work platform. Failure to disconnect power cord could cause damage to the equipment.

DAILY SERVICE CHECKS

The following Maintenance Procedures should be performed daily or before each operation:

Verify that all decals are legible, correctly applied, and in plain view.

Refer to the “Decal Replacement” section of this manual for decal locations.

Verify that all controls and indicators at the ground (lower) and platform (upper) control stations operate properly.

- Lower outriggers to level the aerial work platform.
- Operate all boom functions, including all jib functions.
- Press (push) the **EMERGENCY STOP** button. Verify that all functions are deactivated.
- Verify that the cylinders are functional and there is no internal leakage, an indication of this is that the booms would not remain elevated, and / or they may drift.
- Pull out the **EMERGENCY STOP** button, all functions will now be activated. Lower the booms.
- If either control panel is unresponsive, refer to the Trouble Shooting procedures. **TABLE 4-2 TROUBLESHOOTING** is located later in this section.
- If the **GROUND (LOWER) CONTROL DISPLAY PANEL** displays an error code, refer to the Control Panel Error Code definitions. **TABLE 4-3 ERROR CODE DEFINITIONS** is located later in this section.
- If the **MOTOR CONTROLLER’S** green light is flashing there is an error, refer to the Motor Controller Error Code Definitions. **TABLE 4-4 ERROR CODE DEFINITIONS – MOTOR CONTROLLER**, is located later in this section.
- If the aerial work platform has the Drive and Set option, operate the drive function from the platform (upper) control panel.

Verify correct operation of turn signals, brakes and running lights.

Verify proper tire inflation. See the side wall of the tire for proper inflation.

Inspect tires for damage or loose or missing lug nuts.

- Repair or replace as necessary.

Inspect structural components and platform for obvious damage or debris.

- Repair or replace as necessary.

Inspect the aerial work platform for missing, loose or damaged fasteners, including pins and bolts.

Verify that the boom / jib limit switches operate correctly.

- Limit switches are actuated when the primary, secondary and jib booms are in the fully lowered “stowed” position. Limit switches must be activated to raise or lower outriggers.
- If outrigger controls are unresponsive when the booms are fully lowered and “stowed”, inspect the limit switches for loose mounting or visible damage.
- Repair or replace as necessary.

Check engine oil level.

- Add oil as necessary. Manufacturer recommends engine oil type 5W-30.

Check engine fuel level.

- Add fuel as necessary.

DAILY SERVICE CHECKS (CONTINUED)

Verify that outrigger safety interlocks operate correctly.

- Begin with the outriggers fully extended and the aerial work platform leveled. Raise one outrigger until the footpad is **not** in contact with the ground.
- Verify that boom functions are unresponsive when one outrigger is raised.
- Repeat this procedure for each outrigger.
- Raise all outriggers until the footpads are **not** in contact with the ground. Verify that all outrigger status **LEDs** on the ground (lower) control panel are **unlit**.
- Lower one outrigger until the footpad makes contact with the ground and the outrigger begins lifting the trailer.
- If the **LED** is lit before the footpad makes contact with the ground or if the **LED** remains unlit after the weight is transferred to the outrigger, the position switch or wiring is faulty. Refer to Figure 4-2.
- Repeat this procedure for each outrigger.
- Repair or replace as necessary.

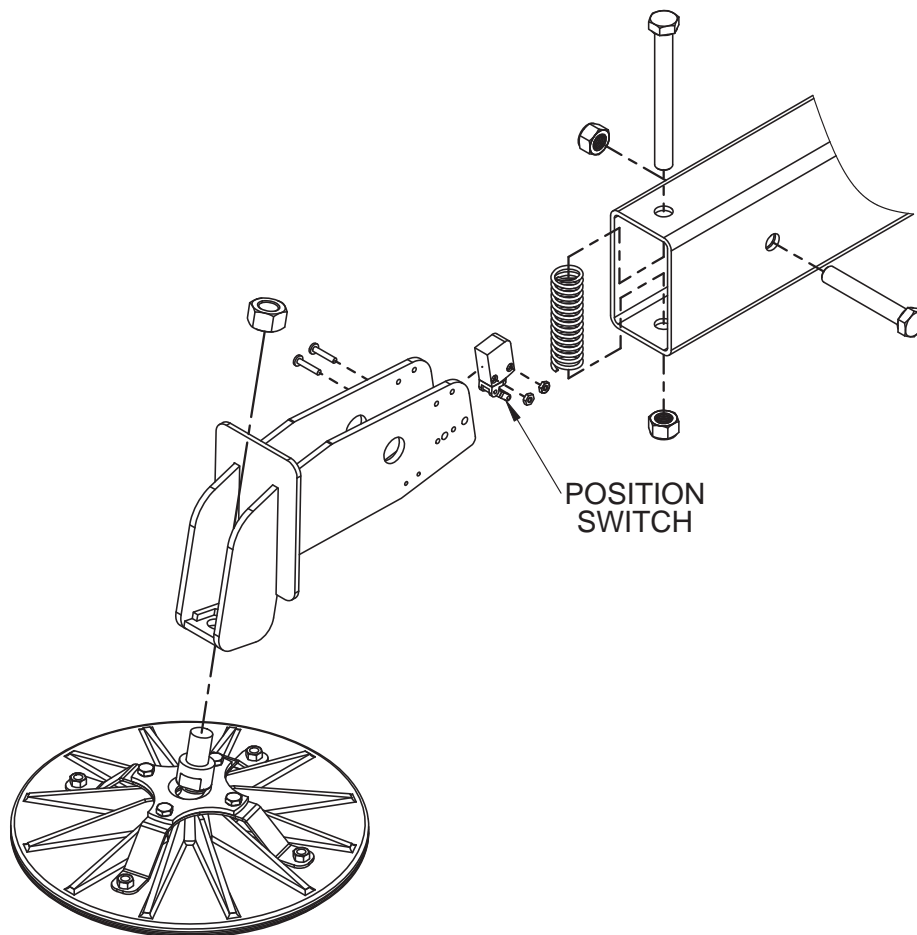


Figure 4-2. Outrigger Position Switch

DAILY SERVICE CHECKS (CONTINUED)

Inspect Hydraulic System and Fluid Levels.

- Check all hydraulic hoses and fittings for leaks and / or damage. Tighten or replace as necessary to prevent hydraulic oil or pressure loss.
- The hydraulic oil level should be checked with the booms down, all outriggers raised, and in the “stowed” (upright) position, and the trailer wheels on a level surface.
- Hydraulic oil level should be visible in, but not above, the sight gauge.
- If the hydraulic oil level is not visible to at least half way up the sight gauge, add clean Hydraulic Fluid while all booms are in the “stowed” (down) position, and the outriggers are fully retracted and in the “stowed” (upright) position. Pour slowly to avoid creating air pockets in the reservoir. **DO NOT** fill above the sight gauge. Refer to Figure 4-3.
- Overfilling the hydraulic reservoir may cause damage to hydraulic lines and may result in aerial work platform malfunction.
- The hydraulic reservoir is originally filled with HVI AW32 Hydraulic Oil. A minimum Viscosity Index of 175 is recommended for this aerial lift platform.

NOTICE

DO NOT mix hydraulic oils. DO NOT add any fluid to the hydraulic system that is not expressly recommended by the manufacturer. Adding unauthorized fluids to the hydraulic system could cause damage to the aerial work platform.

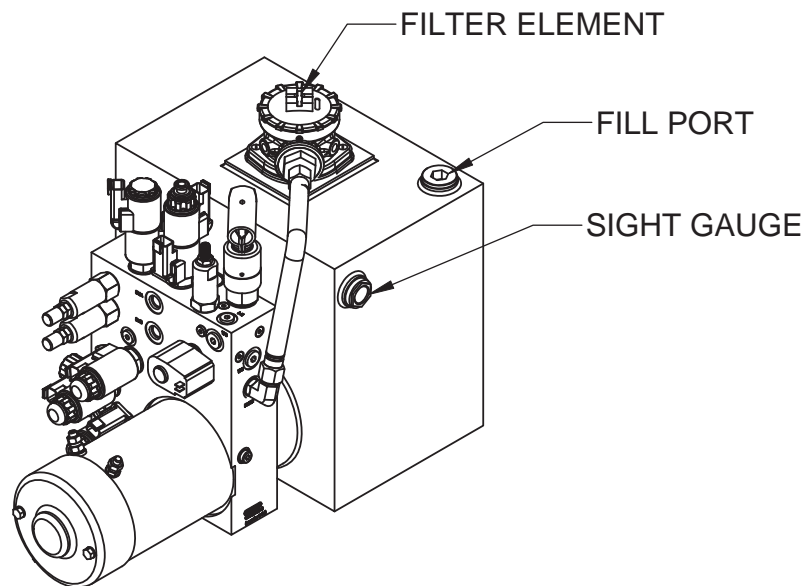


Figure 4-3. Hydraulic Reservoir

WEEKLY SERVICE CHECKS

Perform the following service checks at least once each week in addition to all recommended Daily Service Checks:

Check Battery Electrolyte level.

- If battery charge is low, add enough water to bring the electrolyte level to the top of the plates.
- If batteries are fully charged, raise electrolyte level to full mark in each cell.

Inspect all electrical wiring.

- Check for cuts, loose terminals, broken wires, chaffing and corrosion.
- Repair all damage, remove corrosion and seal with proper materials.

Inspect the aerial work platform for missing, loose or damaged hardware.

- Repair or replace as necessary.

Inspect all hydraulic system components including pump and motor and cylinders for damage, leaks, loss of pressure or speed, and unusual noise or vibration.

- Repair or replace as necessary.

Inspect Jib Bushings for damage.

- Check the Jib Bushings, the bushings should **not** spin or separate from the retaining bore.
- Replace annually, or more frequently as necessary.

Inspect telescoping boom section for missing or damaged Wear Pads.

- Check Wear Pads for loose or missing hardware.
- Repair or replace as necessary.

MONTHLY SERVICE CHECKS

Perform the following service checks at least once each month:

Check battery for loose connections or damaged wires.

Clean all battery terminals.

Verify proper operation of manual lowering valves and hand pump.

- For manual boom operating procedures, refer to the “Operation” section of this manual.

Lubricate slew ring and mating gear.

Use NLGI Grade 2 multi-purpose grease

Check wheel nut torque.

- For correct wheel nut tightening sequence, Refer to Figure 4-4.
- Evenly tighten wheel nuts to 25 lb-ft (34 N-m) in the tightening sequence shown.
- Repeat tightening sequence, tighten wheel nuts to 60 lb-ft (81 N-m) and then to 100 lb-ft (136 N-m).

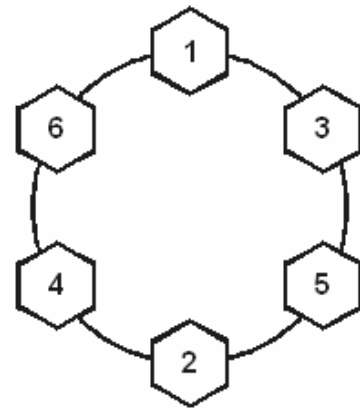


Figure 4-4. Wheel Nut Tightening Sequence

NOTICE

When wheels are newly installed or replaced, verify wheel nut torque monthly. Follow this procedure each time the wheel is removed and reinstalled. Improperly torqued wheel nuts could result in wheel separation, pre-mature tire wear, or damage to the equipment.

Verify that the Level Sensor is operating correctly.

- Fully deploy outriggers until all outrigger **LEDs** and **AUTO LEVEL LED's** are lit, and the buzzer at the ground (lower) control panel sounds.
- Verify that the aerial work platform is level, and that the level sensor located on the control side of the turntable, is giving an accurate reading.
- Repair or replace as necessary.

For aerial work platforms with material hook option:

- Verify the weight reading displayed on the ground (lower) control panel is within 10% of actual weight tested. Recalibrate load cell if needed. See the “Overload Protection Calibration” procedure located later in this section.

ANNUAL SERVICE CHECKS

Perform the following service checks at least once each year:

Replace Hydraulic Oil and Oil Filter.

- Wipe away dirt and excess oil from the area around the power unit, hoses and filter(s) using cleaning cloths and alcohol solvent.
- Drain reservoir by removing the hex plug located on the bottom side of the reservoir.
- After oil is drained, remove oil filter(s) from top of tank.
- Replace the filter being careful not to introduce any debris into the system. Do not over-tighten.
- Replace oil with HVI AW32 or equivalent Hydraulic oil with a minimum viscosity rating of 175.
- With the fill port cap on but not tightened, completely raise and lower the telescoping boom to bleed trapped air from the lift cylinders. Repeat as necessary.
- Repeat every 100 **RUN** hours, or annually, which ever comes first. Run hours are displayed by simultaneous pressing (pushing) the **RABBIT (2)** and the **TURTLE SPEED (3)** buttons on the ground (lower) control panel and reading the **DISPLAY PANEL (1)**. Refer to Figure 4-5.

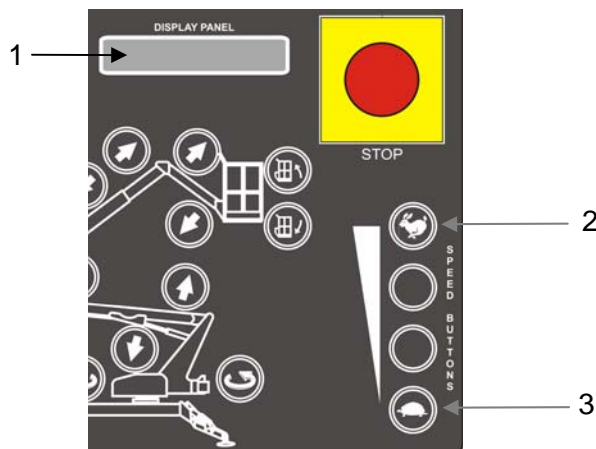


Figure 4-5. Display Run Time Hours

Inspect pivot pins and cylinders, including rod ends, for wear or damage. Replace as necessary.

Visually inspect welds and structural components for wear, damage and corrosion.

- Follow all manufacturers' recommendations when making repairs to critical components.
- Personnel making repairs to welds should be certified in accordance with the Structural Welding Code AWS D1 and Haulotte design standards.

Inspect outriggers for wear or damage. Repair or replace as necessary.

Load test boom lift operations with 500 lb (227 kg) load. Machines equipped with Platform Rotator, must be tested with 440 lb (200 kg) load.

Measure wear pad thickness.

- If wear pad thickness is at or below 0.20in (5.0mm), remove telescoping boom section and replace all outer and inner wear pads.

ANNUAL SERVICE CHECKS (CONTINUED)

Check slew bearing for wear or damage.

- Deploy the outriggers using the **AUTO LEVEL** and **EXTEND** buttons on the ground (lower) control panel. The tires will be slightly off the ground in this position.
- Place a 175 lb (79 kg) load in the platform and raise the **PRIMARY** boom to the full out position.
Refer to Figure 4-6.

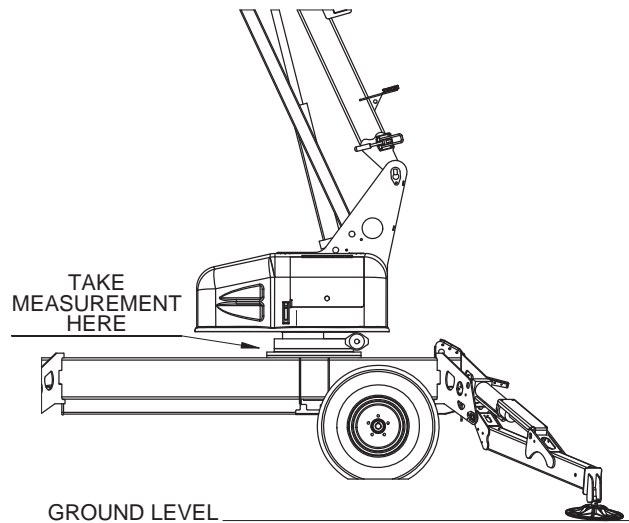


Figure 4-6. Machine Position for Slew Ring Measurement

- Measure the distance between the slew ring gear and the horizontal plate above, using a 2 in. (50 mm) caliper or bore micrometer.
Refer to Figure 4-7.

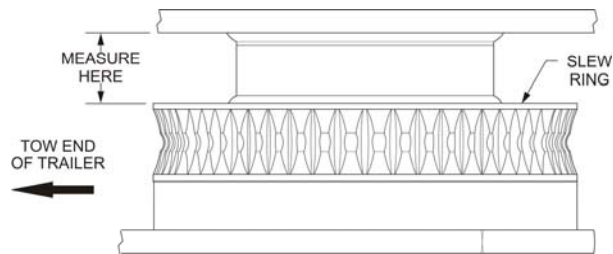


Figure 4-7. Slew Ring Position Measurement

- Record the measurement.
- Rotate the platform 180° and re-record the measurement.
Refer to Figure 4-8.
- If the difference in measurements is greater than 0.25 in (6.35 mm) the slew ring bearing should be replaced. Contact Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com if additional information is needed.

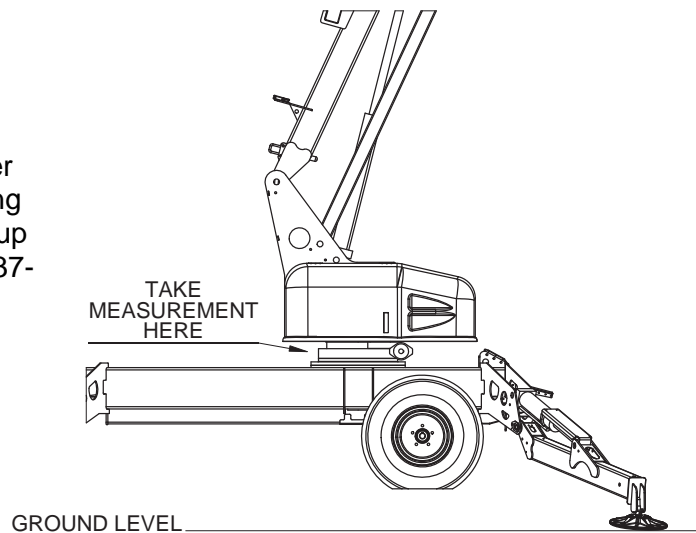


Figure 4-8. Platform Position After Rotation

STRUCTURAL INSPECTION

A comprehensive structural inspection of the unit shall be performed under any of the following conditions:

- Ten years from the date of manufacture and every five years thereafter.
- After any actual, suspected or potential damage is sustained that could affect the structural integrity or stability of the aerial work platform.
- After a change in ownership. Owners should provide a complete service history when reselling the unit.
- The structural inspection shall include the following considerations:
 - The service history of the unit, including hours of service, work performed and environmental conditions.
 - The inspection and maintenance record of the aerial work platform.
 - The effectiveness of all controls and components.
 - A visual inspection of the aerial work platform for wear or damage.
 - Manufacturer recommendations.
 - A visual weld inspection, to be performed by qualified personnel in accordance with the Structural Welding Code AWS D1 and Haulotte design standards.

MOTOR DRYING INSTRUCTIONS

Inclusion of water or foreign particles into the DC electric motor housing may cause serious damage to the motor. If the motor becomes wet, follow these instructions or contact an authorized Haulotte Group service technician

- Remove brush cover band.
- Blow warm air into motor using a heat gun.
- Spray electrical contact cleaner solution into motor armature area.
- Replace brush cover band.

LEVELING SYSTEM CALIBRATION PROCEDURE

Machine Leveling Instructions

Deploy all of the outriggers, and slightly raise the base of the machine to position it for leveling. Refer to Figure 4-9.

Place a small, standard “level” on the base of the turntable (Level Placement Option A). If a small “level” is not available, place any size, standard “level” on the base of the machine (Level Placement Option B). Using the outriggers individually, level the base of the machine.

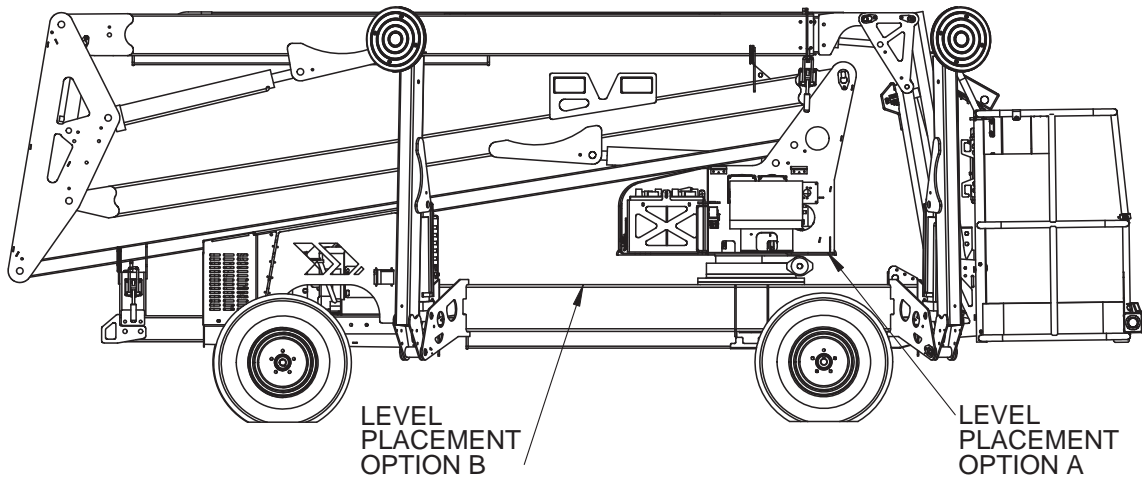


Figure 4-9. Position Machine for Leveling

Level Sensor Calibration Instructions

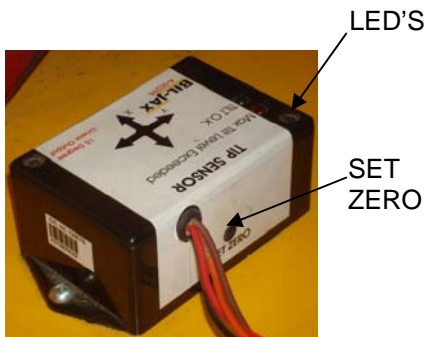


Figure 4-10. Level Sensor Digitally Based



Figure 4-11. Level Sensor Pendulum Based

If your level sensor resembles the image in **Figure 4-10**, (digitally based level sensor), follow these instructions. Be aware that the LED's on the top of the sensor will need to be observed, the “Max Tilt Level Exceeded” LED is red, and the “TILT OK” LED is green.

- Press (push) and hold the **SET ZERO** button, located on the rear of the sensor, for 5 seconds. Both LED's will begin to flash.
- While they are flashing, release the **SET ZERO** button, and press (push) again 3 times within the next 5 seconds.
- Both the red and the green LED will be “ON SOLID”, after several moments the red LED should turn “OFF”, the “green” LED will stay lit. This is an indication that the sensor “recognizes” this level position.
- Proceed to the “Ground (Lower) Control Box Calibration Instructions”.

If your level sensor resembles the image in **Figure 4-11**, (pendulum based level sensor), follow these instructions. Be aware that the “Bubble Level” on the top of the sensor will need to be observed.

- Using the nuts on the top of sensor adjust the sensor until the bubble is centered in the smallest circle.
- Proceed to the “Ground (Lower) Control Box Calibration Instructions”.

LEVELING SYSTEM CALIBRATION PROCEDURE (CONTINUED)

Ground (Lower) Control Box Calibration Instructions

Use the ground (lower) control panel to access the control box maintenance menu. Refer to Figure 4-12.

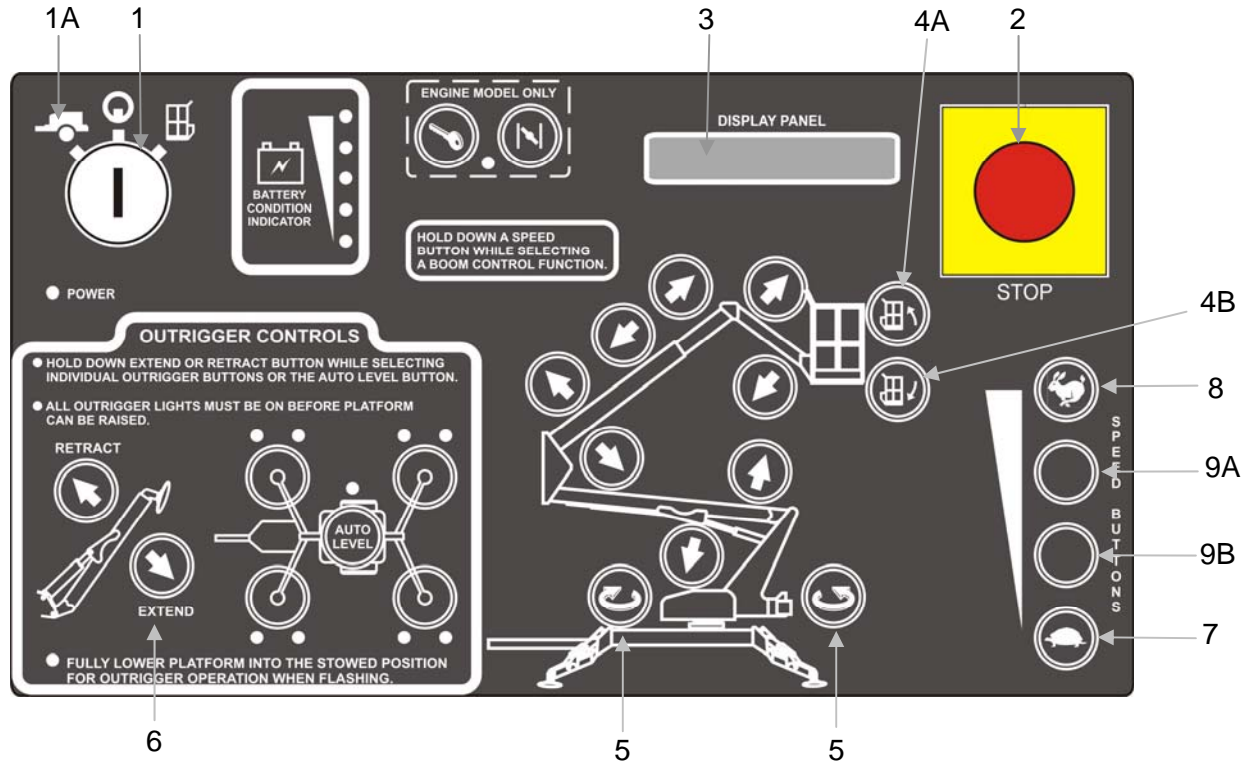


Figure 4-12. Ground (Lower) Control Panel for Leveling System

- 1) Verify that the **KEY SWITCH (1)** is turned to the **GROUND (1A)** icon, and that both **EMERGENCY STOP (2)** buttons (ground and platform) are “pulled out”
- 2) Enter the maintenance mode by pressing (pushing) both **ROTATE (5)** buttons and the **OUTRIGGER EXTEND (6)** button on the ground (lower) control panel simultaneously and holding for 5 seconds.
- 3) Scroll through the maintenance menu using the **TURTLE (7)** button to scroll down, use the **RABBIT (8)** button to scroll back up, until “LEVEL SENSOR CALIBRATION UTILITY” is displayed in the **DISPLAY PANEL (3)**. The display will automatically change to “LEVEL MACHINE THEN PRESS MID-SPEED KEYS”
- 4) Press (push) both **MID SPEED** buttons **MID-HIGH [(9A) / MID-LOW (9B)]** on the ground (lower) control panel simultaneously. Three consecutive beeps will sound indicating the calibration is confirmed.
- 5) Exit the maintenance mode by scrolling through the menu using the **TURTLE (7)** button.

OVERLOAD PROTECTION CALIBRATION PROCEDURE

Load Sense Zeroing

- 1) Remove the **CLEVIS PIN** securing the **PLATFORM** to the **PLATFORM MOUNTING BRACKET**, allowing the **PLATFORM** to pivot about the **PLATFORM PIN** and rest on the ground. This removes the load from the **LOAD CELL**. Refer to Figure 4-13.

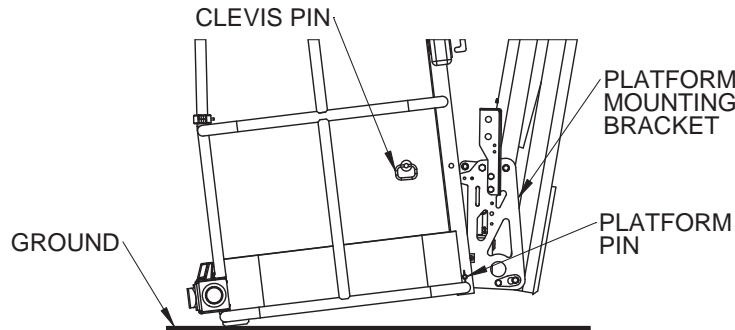


Figure 4-13. Platform Position

- 2) Use the ground (lower) control panel to access the control box maintenance menu. Refer to Figure 4-14

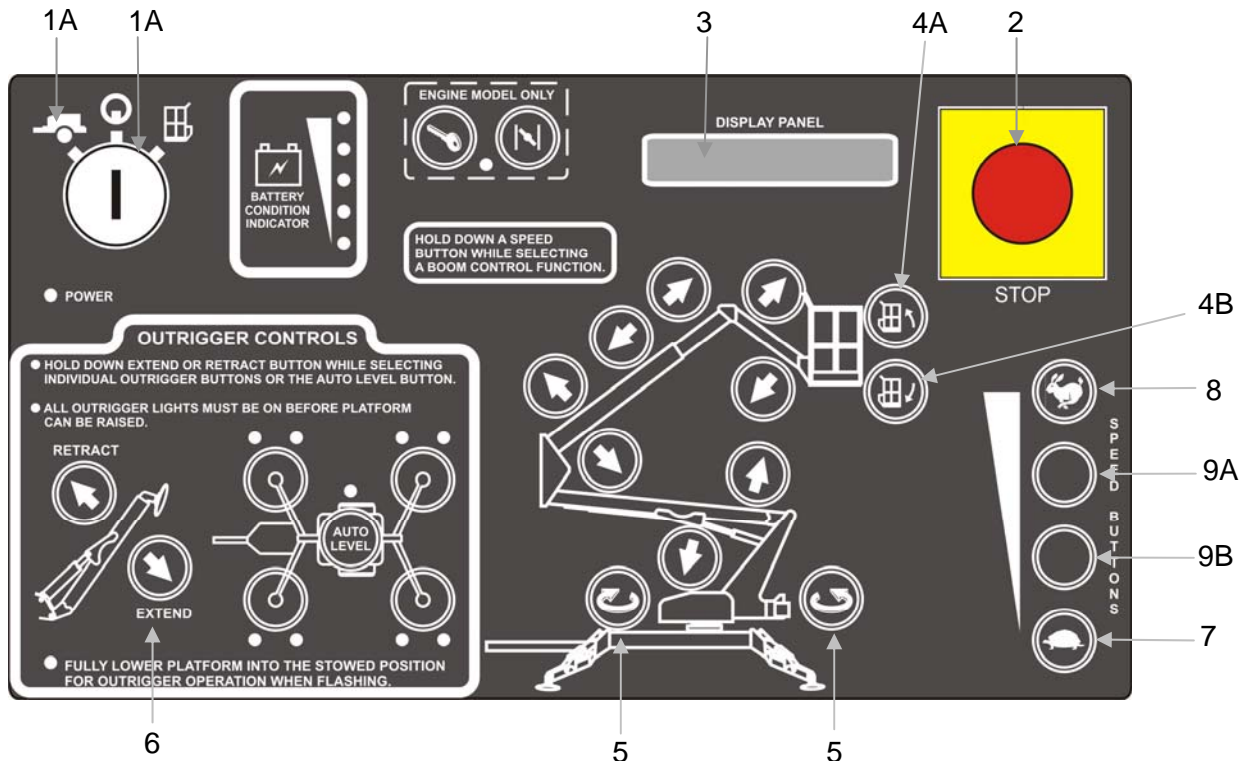


Figure 4-14. Ground (Lower) Control Panel for Overload Protection

- 3) Verify that the **KEY SWITCH (1)** is turned to the **GROUND (1A)** icon, and that both **EMERGENCY STOP (2)** buttons (ground and platform) are “pulled out”
- 4) Enter the maintenance mode by pressing (pushing) both **ROTATE (5)** buttons and the **OUTRIGGER EXTEND (6)** button on the ground (lower) control panel simultaneously and holding for 5 seconds.

OVERLOAD PROTECTION CALIBRATION PROCEDURE (CONTINUED)

- 5) Scroll through the maintenance menu using the **TURTLE (7)** button to scroll down, use the **RABBIT (8)** button to scroll back up, until "LOAD SENSE ZERO CALIBRATION UTILITY" is displayed in the **DISPLAY PANEL (3)**. The display will automatically change to "REMOVE WEIGHT THEN PRESS MID-SPEED KEYS".
- 6) Press (push) both **MID SPEED** buttons [**MID-HIGH (9A)** / **MID-LOW (9B)**] on the ground (lower) control panel simultaneously. Three consecutive beeps will sound and the **DISPLAY PANEL (3)** will read "LOAD SENSE HAS BEEN ZERO CALIBRATED" confirming the operation. The maintenance mode will then go to "LOAD SENSE SCALING UTILITY".

Load Sense Scaling

- 1) Return the platform to the upright position and re-install the **CLEVIS PIN**.
- 2) Exit the maintenance mode by scrolling through the menu using the **TURTLE (7)** button.
- 3) Press (push) the **PLATFORM TILT UP (4A)** button and **PLATFORM TILT DOWN (4B)** button simultaneously to display the platform's weight ($\pm 10\%$) in the **DISPLAY PANEL (3)**.

4 Foot Platform = 65 LBS (30KGS)	4 Foot Platform with Platform Rotate = 125 LBS (57KGS)
5 Foot Platform = 75 LBS (34KGS)	5 Foot Platform with Platform Rotate = 135 LBS (61KGS)

NOTE: To change the display from pounds (LBS) to kilograms (KGS), or vice versa:

- Verify that the **KEY SWITCH (1)** is turned counter clockwise to the **GROUND (1A)** icon, and that both **EMERGENCY STOP (2)** buttons (ground and platform) are "pulled out".
 - Enter the maintenance mode by pressing (pushing) both **ROTATE (5)** buttons and the **OUTRIGGER EXTEND (6)** button on the ground (lower) control panel simultaneously and holding for 5 seconds.
 - Scroll through the maintenance menu using the **TURTLE (7)** button to scroll down, use the **RABBIT (8)** button to scroll back up, until the **DISPLAY PANEL (3)** reads "TO CHANGE LBS TO KGS PRESS MID-SPEED KEYS SIMULTANEOUSLY" [**MID-HIGH (9A)** / **MID-LOW (9B)**]. Change to the desired mode.
 - Exit the maintenance mode by scrolling through the menu using the **TURTLE (7)** button.
- 4) Add between 350 - 400 lbs (159 - 182 kg) to platform.
 - 5) Determine the total "Boom Load" (Platform weight plus the added weight), and make a note of it.
 - 6) Press (push) the **PLATFORM TILT UP (4A)** button and **PLATFORM TILT DOWN (4B)** button simultaneously to display the platform's weight in the **DISPLAY PANEL (3)**.
 - If the displayed weight is within $\pm 10\%$, of the determined "Boom Load", calibration is complete. Proceed to step (11).
 - If the displayed weight is above $\pm 10\%$, of the determined "Boom Load", calibration is complete. Continue on to step (7).
 - 7) Verify that the **KEY SWITCH (1)** is turned counter clockwise to the **GROUND (1A)** icon, and that both **EMERGENCY STOP (2)** buttons (ground and platform) are "pulled out".
 - 8) Enter the maintenance mode by pressing (pushing) both **ROTATE (5)** buttons and the **OUTRIGGER EXTEND (6)** button on the ground (lower) control panel simultaneously and holding for 5 seconds.
 - 9) Scroll through the maintenance menu using the **TURTLE (7)** button to scroll down, use the **RABBIT (8)** button to scroll back up, until "LOAD SENSE SCALING UTILITY" is displayed in the **DISPLAY PANEL (3)**. The **DISPLAY PANEL (3)** should read a ratio of "3.68:1=0XXX" (platform plus load).

OVERLOAD PROTECTION CALIBRATION PROCEDURE (CONTINUED)

- 10) Adjust displayed weight by pressing (pushing) the **MID-HIGH (9)** or **MID-LOW (9) SPEED** buttons until the weight is within tolerances. The Ratio should be within **3.50:1** to **4.00:1**. If so, continue on to Step 11. If the ratio is **not** within the above values, contact Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com
- 11) Exit the maintenance mode by scrolling through the menu using the **TURTLE (7)** button. Remove the weight from the platform. The Boom Load should now return to the weight of the platform.
- 12) Operate all functions in all speeds from both the ground (lower) and platform (upper) control panels to verify proper operation.
- 13) Recalibration is complete.

ADDITIONAL SERVICE INFORMATION

Seals on hydraulic cylinders should be replaced every five years or as indicated by aerial work platform performance.

All service checks should be performed on an aerial work platform that has been stored without use for a period exceeding thirty (30) days.

Check for air in the hydraulic system if the aerial work platform has been stored without use for a period exceeding thirty (30) days, or if the aerial work platform was stored without use during a seasonal climate change. Air trapped in the hydraulic system will affect aerial work platform performance. Follow procedures for bleeding air from the hydraulic system, found in the "Cylinder Replacement" section of this manual.

Owners and lessors should complete a full inspection of all components and perform a test of all functions, including brake functions, before commissioning or reselling the aerial work platform. Always repair or replace all damaged or malfunctioning components before commissioning or reselling an aerial work platform.

When a change in ownership occurs, it is the responsibility of the seller to provide the new owner with all manuals for the aerial work platform. It is the responsibility of the buyer to notify the manufacturer of the unit model and serial number and the name and address of the new owner within sixty (60) days of the purchase.

Use the service checklists found at the back of this manual to record all service checks as well as any maintenance, repairs or alterations performed on the aerial work platform.

Records of frequent safety checks need not be made. However, where a safety hazard is found, it shall be reported in writing to the owner of the aerial work platform, and a record of any corrective action shall be maintained for five years or as required by the authority having jurisdiction.

MANUAL OUTRIGGER RETRACTION

The Manual Outrigger Retraction procedure allows the outriggers to be retracted into the “stowed” (upright) position during hydraulic power interruption or power failure.

The Manual Outrigger Control Kit, Part Number: **A-00819**, including a wire harness, is required to perform this manual procedure.

Refer to Figure 4-15.

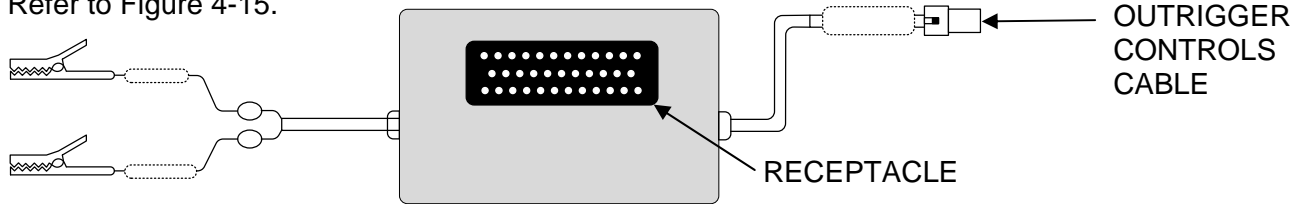


Figure 4-15. Manual Outrigger Control Wire Harness

The hand pump is a component of the hydraulic power unit which is located in the pump compartment. The hand pump and the hydraulic valve “C7”; must be used to manually retract the outriggers.

Refer to Figure 4-17.

The boom(s) **must** be completely lowered and in the “stowed” position prior to raising the outriggers. Use manual controls if necessary to “stow” the booms. Refer to the “Manual Boom Operation” section of this manual, if necessary.

Procedure to raise the outriggers manually:

- Disconnect the outrigger’s wire harness from the lower control (lower) box. Refer to Figure 4-16.
- Plug it into the receptacle on the Manual Outrigger Control Wire Harness. Refer to Figure 4-15.
- Disconnect the wire harness from **C7 VALVE** on the hydraulic power unit and replace it with the Outrigger controls cable. Refer to Figure 4-15.
- Turn the **PROPORTIONAL VALVE** counterclockwise until it stops.
- Attach battery +/- clips to the battery. If the battery on the lift has no charge, use an alternate 12v power source.
- Insert the tire iron into the **PUMP HANDLE RECEPTACLE** on hydraulic power unit and actuate the **PUMP HANDLE** to raise the outriggers. Refer to Figure 4-17.

B
W



Figure 4-16. Bottom Side of the Ground (lower) Control Box.

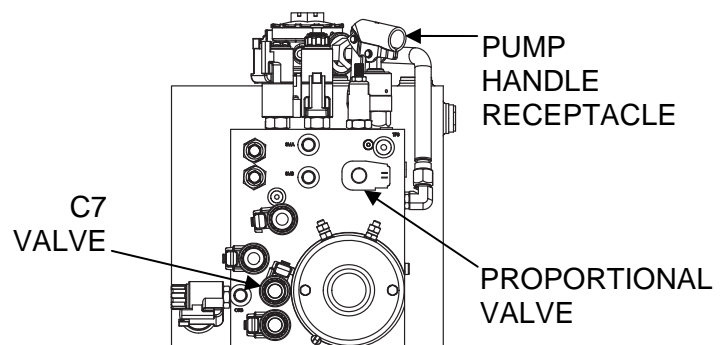


Figure 4-17. Hydraulic Power Unit

NOTE: Before resuming normal operation, turn the proportional valve clockwise to return it to its original position.

HYDRAULIC PRESSURE GAUGE

The Hydraulic Pressure Gauge Part Number **B02-16-0020** is used to measure the aerial work platform's system pressure. It is used as a diagnostic tool when the Boom is **NOT** performing as expected.

The female quick disconnect is attached to the Hydraulic Power Unit at the "TP1" port. Refer to Figure 4-18.

The Pressure Gauge is composed of:

- B02-00-0064 Pressure Gauge that measures from 0-5000 psi (351 kg/cm²) (34473 kPa).
- B02-02-0316 Female Quick Disconnect.

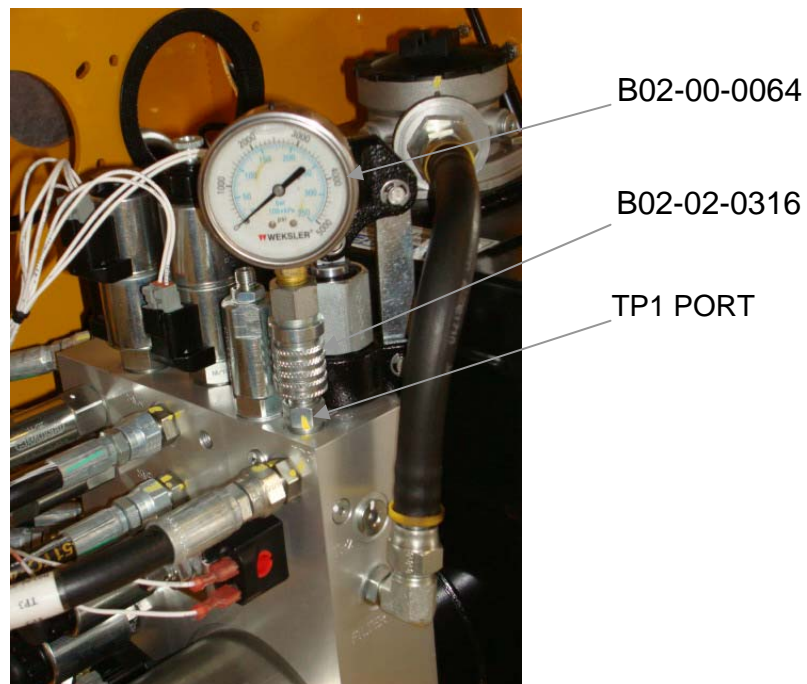


Figure 4-18. Attaching the Pressure Gauge to the Hydraulic Power Unit.

TROUBLESHOOTING

Refer to the following Table for basic Troubleshooting Operations. Contact Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com with any questions or before attempting any advanced troubleshooting operations.

TABLE 4-2. TROUBLE SHOOTING

PROBLEM	CAUSE	SOLUTION
No lights on panel when key switch is turned to the on position.	<ul style="list-style-type: none"> a. EMERGENCY STOP engaged. b. Battery charge is low. c. Battery ground or in-series cable is loose. d. Battery main disconnect unplugged. e. Blown Fuse 	<ul style="list-style-type: none"> a. Disengage EMERGENCY STOP buttons. b. Recharge as needed. c. Inspect and repair battery connections. d. Plug in main disconnect. e. Replace Fuse as necessary.
Error code displayed on Ground Control Panel.	<ul style="list-style-type: none"> a. Error detected by Control Box. 	<ul style="list-style-type: none"> a. Refer to Error Code Definitions, Table 3-3.
Green light flashing on Motor Controller.	<ul style="list-style-type: none"> b. Error detected by Motor Controller. 	<ul style="list-style-type: none"> a. Refer to Motor Controller Error Code Definitions, Table 3-4.
Hydraulic function does not work and display window shows an error message.	<ul style="list-style-type: none"> a. Error detected by safety interlock microprocessor. b. Aerial work platform electric or electronic failure. 	<ul style="list-style-type: none"> a. Refer to error code definitions, Table 3-3. b. Refer to error code definitions, Table 3-3.
Outrigger indicator LED lights do not function.	<ul style="list-style-type: none"> a. Key switch turned to the OFF or platform controls position. b. EMERGENCY STOP engaged. c. Outriggers not deployed. 	<ul style="list-style-type: none"> a. Turn key switch to ground controls position. b. Disengage EMERGENCY STOP buttons. c. Deploy all outriggers.
<p>One or more boom controls do not function.</p> <p>OR</p> <p>One or more Boom Controls function improperly.</p> <p>OR</p> <p>One or more Boom Controls function intermittently.</p>	<ul style="list-style-type: none"> a. Key switch is turned to the OFF or incorrect control position. b. Battery charge is low. c. EMERGENCY STOP engaged. d. Battery ground or in-series cable loose. e. All outriggers not properly deployed. f. Hydraulic pump inoperative. g. Loose wiring connector. h. Valve solenoid not operating properly. i. Error detected by system interlock. j. Broken or loose wire. 	<ul style="list-style-type: none"> a. Turn key switch to ground or platform controls position. b. Recharge battery. c. Disengage EMERGENCY STOP buttons. d. Inspect and repair battery connections. e. Deploy all outriggers and level aerial work platform. f. Inspect pump; replace or repair as needed. g. Check wiring terminals in control box and at valve manifold; replace or repair as needed. h. Clean valve solenoid and recheck function(s); replace or repair as needed. i. Check display for system status. Refer to Table 3-3 for error code definitions and correction. j. Inspect wiring in control box and at valve manifold and valve coil; repair or replace as needed.

ERROR CODE DEFINITIONS – CONTROLS

The **DISPLAY PANEL** located on the ground (lower) control panel, indicates the present operating status of the aerial work platform. If an error condition is detected, the appropriate error code will be displayed on this panel.

Refer to Table 4-3 to resolve the error, or contact Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com with any additional questions.

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
001 MACHINE IS IN DOWN ONLY MODE	Machine went out of level with use, moment sense or load sense circuits have detected an overload	Level machine, raise boom and tilt level sensor	This is a self clearing error. When error condition is corrected, error is cleared	Error will be displayed only if boom is raised
002 LOSS OF PLATFORM COMMUNICATION	Lower Control has lost RS485 communication with Platform Control	Open Platform Control and remove green wire from J1	This is a latched error. Power must be cycled to clear error	The Platform Control "Engine On" LED will also blink a 2 blink error code.
003 LOSS OF DRIVE COMMUNICATION	Lower Control has lost RS485 communication with Drive Control	Open Drive Control and remove green wire from J1	This is a latched error. Power must be cycled to clear error	Machines with Drive option only. The Drive Control "Engine On" LED will also blink a 2 blink error code.
004 LOSS OF PC COMMUNICATION	Lower Control has lost RS232 communication with PC	Connect a PC without running the configuration program	This is a self clearing error. When error condition is corrected, error is cleared	Error message will only be display if connected to a PC that is not communicating.
005 PLATFORM CONTROL HAS STUCK KEY	Platform Control has detected a stuck or pressed key on power up	On Platform Control hold down a key at power up	This is a latched error. Power must be cycled to clear error	The Platform Control "Engine On" LED will also blink a 1 blink error code.
006 DRIVE CONTROL HAS STUCK KEY	Drive Control has detected a stuck or pressed key on power up	On Drive Control hold down a key at power up	This is a latched error. Power must be cycled to clear error	Machines with Drive option only. The Drive Control "Engine On" LED will also blink a 1 blink error code.
007 DRIVE CONTROL HAS STUCK JOYSTICK	Drive Control has detected a stuck or pressed joystick on power up	On Drive Control hold joystick to side at power up	This is a latched error. Power must be cycled to clear error	Machines with Drive option only. The Drive Control "Engine On" LED will also blink a 3 blink error code.
008 GROUND CONTROL HAS STUCK KEY	Lower Control has detected a stuck or pressed key on power up	On Lower Control hold down a key at power up	This is a latched error. Power must be cycled to clear error	The Lower Control "Power" LED will also blink a 1 blink error code.
009 BOOM UP WITHOUT OUTRIGGERS ON GROUND	Lower Control has detected the boom is up and all four outriggers are not on the ground	Disconnect a wire from either the boom down or any outrigger switch and turn on machine	This is a self clearing error. When error condition is corrected, error is cleared	
010 LEVEL SENSOR HAS ERRATIC OUTPUT	The Lower Control has detected an erratic output from the level sensor	Shaking the level sensor after machine has been leveled	This is a self clearing error. When error condition is corrected, error is cleared	This error is suppressed during extending and retracting outriggers
011 TRYING TO DRIVE W/ TRAILER BRAKE OFF	An attempt was made to drive machine without engaging the trailer brake	Trying to drive machine with trailer brake off	This is a self clearing error. When error condition is corrected, error is cleared	Machines with Drive and Set option only
012 ANGLE SENSOR IS DISCONNECTED OR BAD	Angle sensor output is out of range	Disconnect Angle Sensor	This is a self clearing error. When error condition is corrected, error is cleared	Machines with Moment Sense option only

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
013 PRESSURE SENSOR IS DISCONNECTED OR BAD	Pressure sensor output is out of range	Disconnect Pressure Sensor	This is a self clearing error. When error condition is corrected, error is cleared	Machines with Moment Sense option only
014 CHECK ENGINE LOW OIL PRESSURE	Engine had low oil pressure while running	Kawasaki Engine: While engine is running, disconnect engine oil pressure sense wire Kubota Engine: While engine is running, disconnect engine oil pressure sense wire and connect wire to ground	This is a latched error. Power must be cycled to clear error	X-Boom Machines with Kawasaki or Kubota engines
015 MACHINE IS NOT LEVEL	Machine has gone out of level with use	Tilt level sensor	This is a self clearing error. When error condition is corrected, error is cleared	
016 LIFT BOOM	A Boom Rotate, Extend or Retract function has been requested while boom is down	Try to Rotate, Extend or Retract the boom while boom is down	This is a self clearing error. When error condition is corrected, error is cleared	
017 STOW BOOM	An Outrigger function has been requested while boom is up	Try to move an outrigger while boom is up	This is a self clearing error. When error condition is corrected, error is cleared	
018 LOSS OF LOAD SENSE COMMUNICATION	Lower Control has lost RS485 communication with Load Sense Module	Remove Load Sense Module from machine	This is a latched error. Power must be cycled to clear error	Machines with Load Sense option only
019 BOOM FUNCTION DISABLED	Load Sense Module has detected an overloaded boom and disabled boom functions	Overload Boom	This is a latched error. Power must be cycled to clear error	Machines with Load Sense option only
020 LOSS OF LOAD CELL CONNECTION	Load Sense Module has lost connection with Load Cell	Disconnect Load Cell from Load Sense Module	This is a self clearing error. When error condition is corrected, error is cleared	Machines with Load Sense option only
021 OPEN CIRCUIT PRIMARY UP	A load of less than 70mA was detected when Primary Up circuit was energized	Disconnect a wire from Primary Up coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
022 SHORTED CIRCUIT PRIMARY UP	Excessive load was detected when Primary Up circuit was energized	Use a piece of wire to short the Primary Up coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
023 OPEN CIRCUIT PRIMARY DOWN	A load of less than 70mA was detected when Primary Down circuit was energized	Disconnect a wire from Primary Down coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
024 SHORTED CIRCUIT PRIMARY DOWN	Excessive load was detected when Primary Down circuit was energized	Use a piece of wire to short the Primary Down coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
025 OPEN CIRCUIT SECONDARY UP	A load of less than 70mA was detected when Secondary Up circuit was energized	Disconnect a wire from Secondary Up coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
026 SHORTED CIRCUIT SECONDARY UP	Excessive load was detected when Secondary Up circuit was energized	Use a piece of wire to short the Secondary Up coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
027 OPEN CIRCUIT SECONDARY DOWN	A load of less than 70mA was detected when Secondary Down circuit was energized	Disconnect a wire from Secondary Down coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
028 SHORTED CIRCUIT SECONDARY DOWN	Excessive load was detected when Secondary Down circuit was energized	Use a piece of wire to short the Secondary Down coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
029 OPEN CIRCUIT JIB UP	A load of less than 70mA was detected when Jib Up circuit was energized	Disconnect a wire from Jib Up coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
030 SHORTED CIRCUIT JIB UP	Excessive load was detected when Jib Up circuit was energized	Use a piece of wire to short the Jib Up coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
031 OPEN CIRCUIT JIB DOWN	A load of less than 70mA was detected when Jib Down circuit was energized	Disconnect a wire from Jib Down coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
032 SHORTED CIRCUIT JIB DOWN	Excessive load was detected when Jib Down circuit was energized	Use a piece of wire to short the Jib Down coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
033 OPEN CIRCUIT EXTEND	A load of less than 70mA was detected when Extend circuit was energized	Disconnect a wire from Extend coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
034 SHORTED CIRCUIT EXTEND	Excessive load was detected when Extend circuit was energized	Use a piece of wire to short the Extend coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
035 OPEN CIRCUIT RETRACT	A load of less than 70mA was detected when Retract circuit was energized	Disconnect a wire from Retract coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
036 SHORTED CIRCUIT RETRACT	Excessive load was detected when Retract circuit was energized	Use a piece of wire to short the Retract coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
037 OPEN CIRCUIT PLATFORM LEVEL UP	A load of less than 70mA was detected when Platform Level Up circuit was energized	Disconnect a wire from Platform Level Up coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
038 SHORTED CIRCUIT PLATFORM LEVEL UP	Excessive load was detected when Platform Level Up circuit was energized	Use a piece of wire to short the Platform Level Up coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
039 OPEN CIRCUIT PLATFORM LEVEL DOWN	A load of less than 70mA was detected when Platform Level Down circuit was energized	Disconnect a wire from Platform Level Down coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
040 SHORTED CIRCUIT PLATFORM LEVEL DOWN	Excessive load was detected when Platform Level Down circuit was energized	Use a piece of wire to short the Platform Level Down coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
041 OPEN CIRCUIT PLATFORM CW	A load of less than 70mA was detected when Platform CW circuit was energized	Disconnect a wire from Platform CW coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
042 SHORTED CIRCUIT PLATFORM CW	Excessive load was detected when Platform CW circuit was energized	Use a piece of wire to short the Platform CW coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
043 OPEN CIRCUIT PLATFORM CCW	A load of less than 70mA was detected when Platform CCW circuit was energized	Disconnect a wire from Platform CCW coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
044 SHORTED CIRCUIT PLATFORM CCW	Excessive load was detected when Platform CCW circuit was energized	Use a piece of wire to short the Platform CCW coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Articulating Boom Models
045 OPEN CIRCUIT TURNTABLE CW	A load of less than 70mA was detected when Turntable CW circuit was energized	Disconnect a wire from Turntable CW coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
046 SHORTED CIRCUIT TURNTABLE CW	Excessive load was detected when Turntable CW circuit was energized	Use a piece of wire to short the Turntable CW coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
047 OPEN CIRCUIT TURNTABLE CCW	A load of less than 70mA was detected when Turntable CCW circuit was energized	Disconnect a wire from Turntable CCW coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
048 SHORTED CIRCUIT TURNTABLE CCW	Excessive load was detected when Turntable CCW circuit was energized	Use a piece of wire to short the Turntable CCW coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
049 OPEN CIRCUIT OUTRIGGER RETRACT	A load of less than 70mA was detected when Outrigger Retract circuit was energized	Disconnect a wire from Outrigger Retract coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
050 SHORTED CIRCUIT OUTRIGGER RETRACT	Excessive load was detected when Outrigger Retract circuit was energized	Use a piece of wire to short the Outrigger Retract coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
051 OPEN CIRCUIT OUTRIGGER EXTEND	A load of less than 70mA was detected when Outrigger Extend circuit was energized	Disconnect a wire from Outrigger Extend coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
052 SHORTED CIRCUIT OUTRIGGER EXTEND	Excessive load was detected when Outrigger Extend circuit was energized	Use a piece of wire to short the Outrigger Extend coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
053 OPEN CIRCUIT LF OUTRIGGER	A load of less than 70mA was detected when LF Outrigger circuit was energized	Disconnect a wire from LF Outrigger coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
054 SHORTED CIRCUIT LF OUTRIGGER	Excessive load was detected when LF Outrigger circuit was energized	Use a piece of wire to short the LF Outrigger coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
055 OPEN CIRCUIT RF OUTRIGGER	A load of less than 70mA was detected when RF Outrigger circuit was energized	Disconnect a wire from RF Outrigger coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
056 SHORTED CIRCUIT RF OUTRIGGER	Excessive load was detected when RF Outrigger circuit was energized	Use a piece of wire to short the RF Outrigger coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
057 OPEN CIRCUIT LR OUTRIGGER	A load of less than 70mA was detected when LR Outrigger circuit was energized	Disconnect a wire from LR Outrigger coil	This is a latched error. Power must be cycled to clear error	Checked only at power up

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
058 SHORTED CIRCUIT LR OUTRIGGER	Excessive load was detected when LR Outrigger circuit was energized	Use a piece of wire to short the LR Outrigger coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
059 OPEN CIRCUIT RR OUTRIGGER	A load of less than 70mA was detected when RR Outrigger circuit was energized	Disconnect a wire from RR Outrigger coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
060 SHORTED CIRCUIT RR OUTRIGGER	Excessive load was detected when RR Outrigger circuit was energized	Use a piece of wire to short the RR Outrigger coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
061 OPEN CIRCUIT ENGINE THROTTLE	A load of less than 70mA was detected when Engine Throttle circuit was energized	Disconnect a wire from Engine Throttle coil	This is a latched error. Power must be cycled to clear error	Error Suppressed due to low current draw
062 SHORTED CIRCUIT ENGINE THROTTLE	Excessive load was detected when Engine Throttle circuit was energized	Use a piece of wire to short the Engine Throttle coil	This is a latched error. Power must be cycled to clear error	Error Suppressed due to low current draw
063 OPEN CIRCUIT ENGINE STARTER	A load of less than 70mA was detected when Engine Starter circuit was energized	Disconnect a wire from Engine Starter coil	This is a latched error. Power must be cycled to clear error	Not Tested, Do not want to crank engine on power up
064 SHORTED CIRCUIT ENGINE STARTER	Excessive load was detected when Engine Starter circuit was energized	Use a piece of wire to short the Engine Starter coil	This is a latched error. Power must be cycled to clear error	Not Tested, Do not want to crank engine on power up
065 OPEN CIRCUIT ENGINE CHOKE	A load of less than 70mA was detected when Engine Choke circuit was energized	Disconnect a wire from Engine Choke coil	This is a latched error. Power must be cycled to clear error	Error Suppressed due to low current draw
066 SHORTED CIRCUIT ENGINE CHOKE	Excessive load was detected when Engine Choke circuit was energized	Use a piece of wire to short the Engine Choke coil	This is a latched error. Power must be cycled to clear error	Error Suppressed due to low current draw
067 OPEN CIRCUIT ENGINE STOP	A load of less than 70mA was detected when Engine Stop circuit was energized	Disconnect a wire from Engine Stop coil	This is a latched error. Power must be cycled to clear error	Error Suppressed due to low current draw
068 SHORTED CIRCUIT ENGINE STOP	Excessive load was detected when Engine Stop circuit was energized	Use a piece of wire to short the Engine Stop coil	This is a latched error. Power must be cycled to clear error	Error Suppressed due to low current draw
069 OPEN CIRCUIT PROPORTIONAL	A load of less than 70mA was detected when Proportional circuit was energized	Disconnect a wire from Proportional coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
070 SHORTED CIRCUIT PROPORTIONAL	Excessive load was detected when Proportional circuit was energized	Use a piece of wire to short the Proportional coil	This is a latched error. Power must be cycled to clear error	Checked only at power up
071 OPEN CIRCUIT MOTOR CONTROL ENABLE	A load of less than 70mA was detected when Motor Control Enable circuit was energized	Disconnect a wire from Motor Control Enable coil		Error Suppressed due to low current draw
072 SHORTED CIRCUIT MOTOR CONTROL ENABLE	Excessive load was detected when Motor Control Enable circuit was energized	Use a piece of wire to short the Motor Control Enable coil		Error Suppressed due to low current draw

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
073 OPEN CIRCUIT SPARE OUTPUT	A load of less than 70mA was detected when Spare Output circuit was energized	Disconnect a wire from Spare Output coil	This is a latched error. Power must be cycled to clear error	Not Used
074 SHORTED CIRCUIT SPARE OUTPUT	Excessive load was detected when Spare Output circuit was energized	Use a piece of wire to short the Spare Output coil	This is a latched error. Power must be cycled to clear error	Not Used
075 OPEN CIRCUIT AC SWITCH	A load of less than 70mA was detected when AC Switch circuit was energized	Disconnect a wire from AC Switch coil		Error Suppressed due to low current draw
076 SHORTED CIRCUIT AC SWITCH	Excessive load was detected when AC Switch circuit was energized	Use a piece of wire to short the AC Switch coil		Error Suppressed due to low current draw
077 OPEN CIRCUIT STROBE	A load of less than 70mA was detected when Strobe circuit was energized	Disconnect a wire from Strobe		Error Suppressed due to low current draw
078 SHORTED CIRCUIT STROBE	Excessive load was detected when Strobe circuit was energized	Use a piece of wire to short the Strobe coil		Error Suppressed due to low current draw
079 OPEN CIRCUIT DRIVE PWM	A load of less than 70mA was detected when Drive PWM circuit was energized	Disconnect a wire from Drive PWM coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with Drive option only
080 SHORTED CIRCUIT DRIVE PWM	Excessive load was detected when Drive PWM circuit was energized	Use a piece of wire to short the Drive PWM coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with Drive option only
081 OPEN CIRCUIT DRIVE ENABLE	A load of less than 70mA was detected when Drive Enable circuit was energized	Disconnect a wire from Drive Enable coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with Drive option only
082 SHORTED CIRCUIT DRIVE ENABLE	Excessive load was detected when Drive Enable circuit was energized	Use a piece of wire to short the Drive Enable coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with Drive option only
083 OPEN CIRCUIT DRIVE DUMP (C21)	A load of less than 70mA was detected when Drive Dump (C21) circuit was energized	Disconnect a wire from Drive Dump (C21) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
084 SHORTED CIRCUIT DRIVE DUMP (C21)	Excessive load was detected when Drive Dump (C21) circuit was energized	Use a piece of wire to short the Drive Engage coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
085 OPEN CIRCUIT TURN LEFT (C22)	A load of less than 70mA was detected when Turn Left (C22) circuit was energized	Disconnect a wire from Turn Left (C22) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
086 SHORTED CIRCUIT TURN LEFT (C22)	Excessive load was detected when Turn Left (C22) circuit was energized	Use a piece of wire to short the Turn Left (C22) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
087 OPEN CIRCUIT TURN RIGHT (C23)	A load of less than 70mA was detected when Turn Right (C23) circuit was energized	Disconnect a wire from Turn Right (C23) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
088 SHORTED CIRCUIT TURN RIGHT (C23)	Excessive load was detected when Turn Right (C23) circuit was energized	Use a piece of wire to short the Turn Right (C23) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
089 OPEN CIRCUIT FORWARD 1 (C24)	A load of less than 70mA was detected when Forward 1 (C24) circuit was energized	Disconnect a wire from Forward 1 (C24) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
090 SHORTED CIRCUIT FORWARD 1 (C24)	Excessive load was detected when Forward 1 (C24) circuit was energized	Use a piece of wire to short the Forward 1 (C24) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
091 OPEN CIRCUIT REVERSE 1 (C25)	A load of less than 70mA was detected when Reverse 1 (C25) circuit was energized	Disconnect a wire from Reverse 1 (C25) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
092 SHORTED CIRCUIT REVERSE 1 (C25)	Excessive load was detected when Reverse 1 (C25) circuit was energized	Use a piece of wire to short the Reverse 1 (C25) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
093 OPEN CIRCUIT FORWARD 2 (C27)	A load of less than 70mA was detected when Forward 2 (C27) circuit was energized	Disconnect a wire from Forward 2 (C27) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
094 SHORTED CIRCUIT FORWARD 2 (C27)	Excessive load was detected when Forward 2 (C27) circuit was energized	Use a piece of wire to short the Forward 2 (C27) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
095 OPEN CIRCUIT REVERSE 2 (C28)	A load of less than 70mA was detected when Reverse 2 (C28) circuit was energized	Disconnect a wire from Reverse 2 (C28) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
096 SHORTED CIRCUIT REVERSE 2 (C28)	Excessive load was detected when Reverse 2 (C28) circuit was energized	Use a piece of wire to short the Reverse 2 (C28) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
097 OPEN CIRCUIT TORQUE H/L (C29)	A load of less than 70mA was detected when Torque H/L (C29) circuit was energized	Disconnect a wire from Torque H/L (C29) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
098 SHORTED CIRCUIT TORQUE H/L (C29)	Excessive load was detected when Torque H/L (C29) circuit was energized	Use a piece of wire to short the Torque H/L (C29) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
099 OPEN CIRCUIT TORQUE H/L (C30)	A load of less than 70mA was detected when Torque H/L (C30) circuit was energized	Disconnect a wire from Torque H/L (C30) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
100 SHORTED CIRCUIT TORQUE H/L (C30)	Excessive load was detected when Torque H/L (C30) circuit was energized	Use a piece of wire to short the Torque H/L (C30) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
101 OPEN CIRCUIT TORQUE H/L (C31)	A load of less than 70mA was detected when Torque H/L (C31) circuit was energized	Disconnect a wire from Torque H/L (C31) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only
102 SHORTED CIRCUIT TORQUE H/L (C31)	Excessive load was detected when Torque H/L (C31) circuit was energized	Use a piece of wire to short the Torque H/L (C31) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WD option only

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
103 OUTREACH NEAR MAXIMUM	Boom has exceeded 95% of maximum outreach	Put 500lbs in boom, level boom and extend until alarm sounds and error is displayed	This is a self clearing error. When error condition is corrected, error is cleared	Machines with Moment Sense option only
104 OUTREACH AT MAXIMUM	Boom has reached maximum outreach setting	Put 500lbs in boom, level boom and extend until alarm sounds and error is displayed	This is a self clearing error. When error condition is corrected, error is cleared	Machines with Moment Sense option only
105 OVER MAXIMUM CYLINDER PRESSURE	Cylinder pressure has exceeded maximum pressure setting	Put 500lbs in boom, lower cylinder pressure setting using configuration program and extend boom until alarm sounds and error is displayed	This is a latched error. Power must be cycled to clear error	Machines with Moment Sense option only
106 OUTREACH SENSING FAULT	Cylinder safety pressure switch has detected maximum pressure setting	Disconnect safety pressure switch wires	This is a latched error. Power must be cycled to clear error	Machines with Moment Sense option only
107 ENGINE TEMP HIGH CHECK WATER LEVEL	Excessive engine temperature was detected	Remove wire from engine temperature sensor and connect wire to ground	This is a self clearing error. When error condition is corrected, error is cleared	Machines with 4WS option only
108 CHECK ALTERNATOR NOT CHARGING	Engine alternator is not charging	Remove P wire from alternator and connect wire to ground	This is a self clearing error. When error condition is corrected, error is cleared	Machines with 4WS option only
109 ENGINE RPM FAULT HIGH RPM IS TOO LOW	When driving, engine high RPM was too low	Misadjust engine high RPM to a value less than 3000 RPM and attempt to drive	This is a latched error. Power or engine must be cycled to clear error	Machines with 4WS option only
121 OPEN CIRCUIT BRAKE (FWS C21)	A load of less than 70mA was detected when Brake (FWS C21) circuit was energized	Disconnect a wire from Brake (FWS C21) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
122 SHORTED CIRCUIT BRAKE (FWS C21)	Excessive load was detected when Brake (FWS C21) circuit was energized	Use a piece of wire to short the Brake (FWS C21) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
123 OPEN CIRCUIT RS RET (FWS C22)	A load of less than 70mA was detected when RS Ret (FWS C22) circuit was energized	Disconnect a wire from RS Ret (FWS C22) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
124 SHORTED CIRCUIT RS RET (FWS C22)	Excessive load was detected when RS Ret (FWS C22) circuit was energized	Use a piece of wire to short the RS Ret (FWS C22) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
125 OPEN CIRCUIT RS EXT (FWS C23)	A load of less than 70mA was detected when RS Ext (FWS C23) circuit was energized	Disconnect a wire from RS Ext (FWS C23) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
126 SHORTED CIRCUIT RS EXT (FWS C23)	Excessive load was detected when RS Ext (FWS C23) circuit was energized	Use a piece of wire to short the RS Ext (FWS C23) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
127 OPEN CIRCUIT FS RET (FWS C24)	A load of less than 70mA was detected when FS Ret (FWS C24) circuit was energized	Disconnect a wire from FS Ret (FWS C24) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
128 SHORTED CIRCUIT FS RET (FWS C24)	Excessive load was detected when FS Ret (FWS C24) circuit was energized	Use a piece of wire to short the FS Ret (FWS C24) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
129 OPEN CIRCUIT FS EXT (FWS C25)	A load of less than 70mA was detected when FS Ext (FWS C25) circuit was energized	Disconnect a wire from FS Ext (FWS C25) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
130 SHORTED CIRCUIT FS RET (FWS C25)	Excessive load was detected when FS Ext (FWS C25) circuit was energized	Use a piece of wire to short the FS Ext (FWS C25) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
131 OPEN CIRCUIT DC D FWD (FWS C26)	A load of less than 70mA was detected when DC D Fwd (FWS C26) circuit was energized	Disconnect a wire from DC D Fwd (FWS C26) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
132 SHORTED CIRCUIT DC D FWD (FWS C26)	Excessive load was detected when DC D Fwd (FWS C26) circuit was energized	Use a piece of wire to short the DC D Fwd (FWS C26) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
133 OPEN CIRCUIT DC D REV (FWS C27)	A load of less than 70mA was detected when DC D Rev (FWS C27) circuit was energized	Disconnect a wire from DC D Rev (FWS C27) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
134 SHORTED CIRCUIT DC D REV (FWS C27)	Excessive load was detected when DC D Rev (FWS C27) circuit was energized	Use a piece of wire to short the DC D Rev (FWS C27) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
135 OPEN CIRCUIT DC D (FWS C28)	A load of less than 70mA was detected when DC D (FWS C28) circuit was energized	Disconnect a wire from DC D (FWS C28) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
136 SHORTED CIRCUIT DC D (FWS C28)	Excessive load was detected when DC D (FWS C28) circuit was energized	Use a piece of wire to short the DC D (FWS C28) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
137 OPEN CIRCUIT DC D (FWS C29)	A load of less than 70mA was detected when DC D (FWS C29) circuit was energized	Disconnect a wire from DC D (FWS C29) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
138 SHORTED CIRCUIT DC D (FWS C29)	Excessive load was detected when DC D (FWS C29) circuit was energized	Use a piece of wire to short the DC D (FWS C29) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
139 OPEN CIRCUIT DC D (FWS C30)	A load of less than 70mA was detected when DC D (FWS C30) circuit was energized	Disconnect a wire from DC D (FWS C30) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
140 SHORTED CIRCUIT DC D (FWS C30)	Excessive load was detected when DC D (FWS C30) circuit was energized	Use a piece of wire to short the DC D (FWS C30) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
141 OPEN CIRCUIT DC D (FWS C31)	A load of less than 70mA was detected when DC D (FWS C31) circuit was energized	Disconnect a wire from DC D (FWS C31) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
142 SHORTED CIRCUIT DC D (FWS C31)	Excessive load was detected when DC D (FWS C31) circuit was energized	Use a piece of wire to short the DC D (FWS C31) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
143 OPEN CIRCUIT (FWS C32)	A load of less than 70mA was detected when (FWS C32) circuit was energized	Disconnect a wire from (FWS C32) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
144 SHORTED CIRCUIT (FWS C32)	Excessive load was detected when (FWS C32) circuit was energized	Use a piece of wire to short the (FWS C32) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
145 OPEN CIRCUIT (FWS C33)	A load of less than 70mA was detected when (FWS C33) circuit was energized	Disconnect a wire from (FWS C33) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
146 SHORTED CIRCUIT (FWS C33)	Excessive load was detected when (FWS C33) circuit was energized	Use a piece of wire to short the (FWS C33) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
147 OPEN CIRCUIT (FWS C34)	A load of less than 70mA was detected when (FWS C34) circuit was energized	Disconnect a wire from (FWS C34) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
148 SHORTED CIRCUIT (FWS C34)	Excessive load was detected when (FWS C34) circuit was energized	Use a piece of wire to short the (FWS C34) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
149 OPEN CIRCUIT (FWS R2)	A load of less than 70mA was detected when (FWS R2) circuit was energized	Disconnect a wire from (FWS R2) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
150 SHORTED CIRCUIT (FWS R2)	Excessive load was detected when (FWS R2) circuit was energized	Use a piece of wire to short the (FWS R2) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
151 OPEN CIRCUIT (FWS GEN G1)	A load of less than 70mA was detected when (FWS Gen G1) circuit was energized	Disconnect a wire from (FWS Gen G1) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
152 SHORTED CIRCUIT (FWS GEN G1)	Excessive load was detected when (FWS Gen G1) circuit was energized	Use a piece of wire to short the (FWS Gen G1) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
153 OPEN CIRCUIT (FWS CON 24V)	A load of less than 70mA was detected when (FWS Con 24V) circuit was energized	Disconnect a wire from (FWS Con 24V) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
154 SHORTED CIRCUIT (FWS CON 24V)	Excessive load was detected when (FWS Con 24V) circuit was energized	Use a piece of wire to short the (FWS Con 24V) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
155 OPEN CIRCUIT (FWS SPARE 1)	A load of less than 70mA was detected when (FWS Spare 1) circuit was energized	Disconnect a wire from (FWS Spare 1) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
156 SHORTED CIRCUIT (FWS SPARE 1)	Excessive load was detected when (FWS Spare 1) circuit was energized	Use a piece of wire to short the (FWS Spare 1) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
157 OPEN CIRCUIT (FWS SPARE 2)	A load of less than 70mA was detected when (FWS Spare 2) circuit was energized	Disconnect a wire from (FWS Spare 2) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only

TABLE 4-3 ERROR CODE DEFINITIONS

ERROR MESSAGE	ERROR DEFINITION	TO SIMULATE ERROR	TO CLEAR ERROR	COMMENTS
158 SHORTED CIRCUIT (FWS SPARE 2)	Excessive load was detected when (FWS Spare 2) circuit was energized	Use a piece of wire to short the (FWS Spare 2) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
159 OPEN CIRCUIT (FWS SPARE 3)	A load of less than 70mA was detected when (FWS Spare 3) circuit was energized	Disconnect a wire from (FWS Spare 3) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
160 SHORTED CIRCUIT (FWS SPARE 3)	Excessive load was detected when (FWS Spare 3) circuit was energized	Use a piece of wire to short the (FWS Spare 3) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
161 OPEN CIRCUIT (FWS PROP A1)	A load of less than 70mA was detected when (FWS Prop A1) circuit was energized	Disconnect a wire from (FWS Prop A1) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
162 SHORTED CIRCUIT (FWS PROP A1)	Excessive load was detected when (FWS Prop A1) circuit was energized	Use a piece of wire to short the (FWS Prop A1) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
163 OPEN CIRCUIT (FWS PROP A2)	A load of less than 70mA was detected when (FWS Prop A2) circuit was energized	Disconnect a wire from (FWS Prop A2) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
164 SHORTED CIRCUIT (FWS PROP A2)	Excessive load was detected when (FWS Prop A2) circuit was energized	Use a piece of wire to short the (FWS Prop A2) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
165 OPEN CIRCUIT (FWS PROP B1)	A load of less than 70mA was detected when (FWS Prop B1) circuit was energized	Disconnect a wire from (FWS Prop B1) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
166 SHORTED CIRCUIT (FWS PROP B1)	Excessive load was detected when (FWS Prop B1) circuit was energized	Use a piece of wire to short the (FWS Prop B1) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
167 OPEN CIRCUIT (FWS PROP B2)	A load of less than 70mA was detected when (FWS Prop B2) circuit was energized	Disconnect a wire from (FWS Prop B2) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only
168 SHORTED CIRCUIT (FWS PROP B2)	Excessive load was detected when (FWS Prop B2) circuit was energized	Use a piece of wire to short the (FWS Prop B2) coil	This is a latched error. Power must be cycled to clear error	Checked only at power up Machines with 4WS option only

ERROR CODE DEFINITIONS – MOTOR CONTROLLER

The Motor Controller indicates the operational status of the controller, it is located under the power compartment cover (left / drivers side), and behind the ground (lower) control panel. If an error condition is detected, the appropriate error code will be displayed by a flashing indicator light. Refer to Figure 4-19 for a visual of the controller.

Refer to Table 4-4 to resolve the Fault, or contact Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com with any questions.

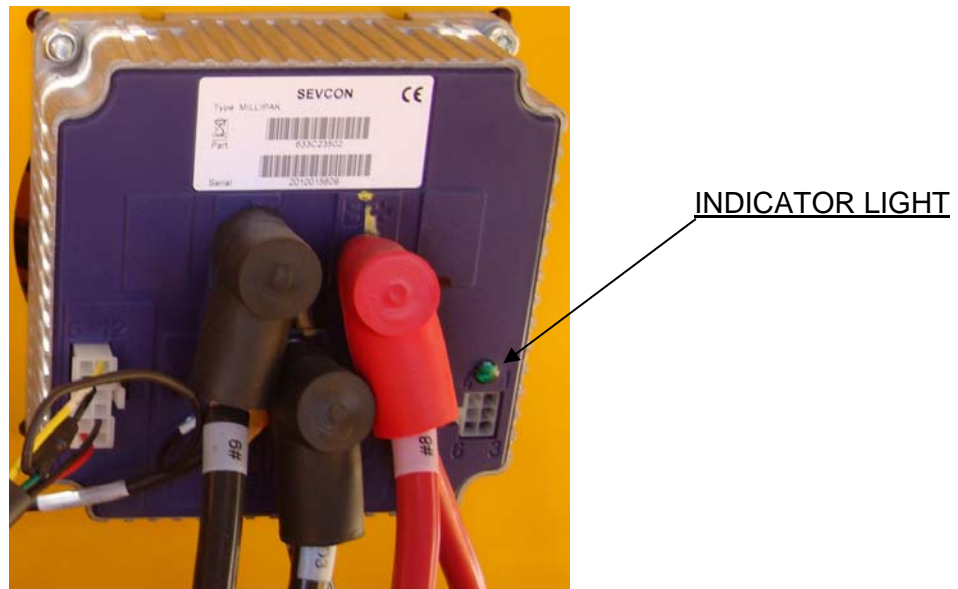


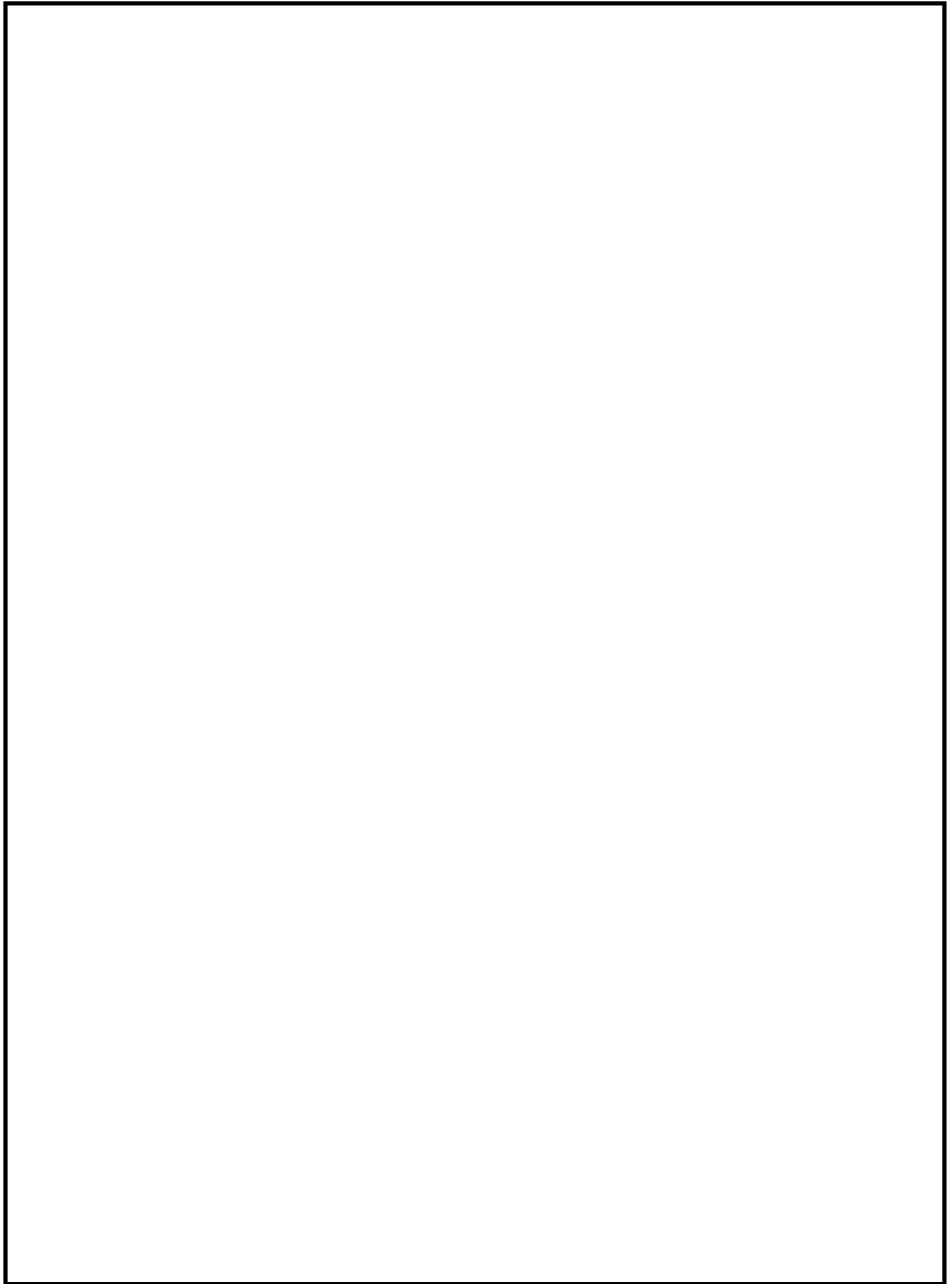
Figure 4-19. Motor Controller

TABLE 4-4. ERROR CODE DEFINITIONS - MOTOR CONTROLLER

FLASH FAULT	PRIORITY ID	FAULT	DESCRIPTION	SOLUTION
Steady ON, no flashing	1	None	System is operating normally.	None required.
1	11	Configuration Range Error	One or more controller personality settings are out of range.	Use Sevcon calibrator to enter correct settings from latest Personality Sheet.
1	12	CRC Error	The controller personality checksum is incorrect.	Use Sevcon calibrator to enter correct settings from latest Personality Sheet. Otherwise, replace motor controller.
2	5	Sequence Fault	Enable line is active at power up.	Check enable line, B- wiring, and Molex connector.
2	6	Accelerator Fault	Invalid accelerator personality setting.	Check speed input line, B- wiring, Molex connector, and 1000 ohm resistor.
3	17	MOSFET Short Circuit	MOSFET short circuit or controller miswire detected	Check for miswired B+, B-, or pump cables. Make sure pump terminals are not shorted to frame. If cables and pump are OK, then replace motor controller.
4	14	Line Contactor Welded	The line contactor is welded or otherwise shorted.	Check line contactor wiring. If wiring is OK, then replace line contactor.

TABLE 4-4. ERROR CODE DEFINITIONS - MOTOR CONTROLLER

FLASH FAULT	PRIORITY ID	FAULT	DESCRIPTION	SOLUTION
4	15	Line Contactor did not Close	Line contactor did not close or is otherwise open circuit.	Check line contactor wiring and Molex connector. Measure the contactor coil resistance; it should be around 50 ohms. If contactor and wiring are OK, then replace motor controller.
5	16	Motor Open Circuit	Pump motor cable disconnected.	Check pump-motor and controller cables. Measure pump motor resistance it should be near zero ohms.
6	N/A	Not used in this application	N/A	N/A
7	7	Low Battery	Battery voltage is too low.	Recharge the batteries. Look for shorted battery cells. Make sure one or more batteries are not reversed.
7	8	High Battery	Battery voltage is too high.	Make sure battery charger is off. Check for poor or corroded battery connections.
7	10	High Battery with Line Contactor Open	High battery voltage was detected at power up before line contactor closed.	Make sure battery charger is off or that the battery is not overcharged.
8	1	Thermal Cutback	Maximum power available to motor has been reduced due to excessive heat sink temperature.	Remove power and allow controller to cool. If fault repeatedly occurs, look for binding on the hydraulic cylinders or sticking valves. Otherwise, the pump motor may be failing.
8	3	Pump I ² T Current Limit Cutback	Maximum power available to pump motor has been reduced by the Current Limit Cutback function.	Recycle power. If fault repeatedly occurs, look for binding on the hydraulic cylinders or sticking valves. Otherwise, the pump motor may be failing.
9	N/A	Not used in this application	N/A	N/A
10	N/A	Not used in this application	N/A	N/A
11	18	Auto Zero Out of Range	Internal pump current measurement circuit could not be calibrated.	Replace motor controller.
11	24	System Monitor	Illegal system condition sensed due to internal hardware fault.	Replace motor controller.
Single flash, then off	19	MOSFETs Off	MOSFETs did not pulse when the internal failsafe circuit was enabled.	Check for reversed cables among B+, B-, and A terminals. If no miswire is found, replace motor controller.
Single flash, then off	20	MOSFETs On	MOSFETs pulsed while the internal failsafe circuit was disabled.	Check for reversed cables among B+, B-, and A terminals. If no miswire is found, replace motor controller.
Single flash, then off	22	Contactor Drive Off	Contactor output did not pulse with the internal failsafe circuit enabled.	Replace motor controller.
Single flash, then off	23	Contactor Drive On	Contactor output pulsed while the internal failsafe circuit was disabled.	Replace motor controller.



5 CYLINDER REPLACEMENT

If repair or replacement of an aerial work platform or outrigger hydraulic cylinder(s) or its component parts becomes necessary, observe the following procedures in accordance with the safety precautions established in the “Safety” section of this manual.

Removal of hydraulic cylinders from the aerial work platform may require the use of specialized tools and lifting equipment. **NEVER** attempt to operate overhead hoists or cranes or related equipment without proper training, authorization and supervision. Perform all maintenance procedures only in an area that is well-lit and well-ventilated. Haulotte Group is not responsible for personal injury or property damage resulting from the improper use of equipment or failure to follow all procedures and related safety precautions.

Direct all questions regarding cylinder removal and replacement to Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com.

WARNING

Repair and removal of the hydraulic cylinder requires the use of lifting straps and an overhead crane or lifting gear to support the aerial work platform and hydraulic cylinders. Personnel should be thoroughly trained in the operation of these devices before attempting installation or removal. Hydraulic cylinders are heavy and may have hydraulic oil on their surface. Failure to use proper equipment or to securely support aerial work platform and cylinders could result in death or serious injury and damage to aerial work platform.

MASTER / SLAVE CYLINDER REPLACEMENT

Use the following procedure to remove and replace faulty cylinders.

Master Cylinder

Refer to Figure 5–1 for the location of this cylinder.

- With the boom in the “stowed” position, raise the upper boom until there is adequate exposure of the pin retainer and pivot pin.
- Verify that the upper boom is supported by lifting straps and an overhead hoist or equivalent.
- Unbolt and remove the pin retainer at the rod end of the cylinder.
- Remove the pivot pin using a hammer and a brass or hardwood drift.
- Tag and number all hydraulic hoses that attach to the cylinder valve block. Use a marker to label the valve block ports with the appropriate hose numbers.

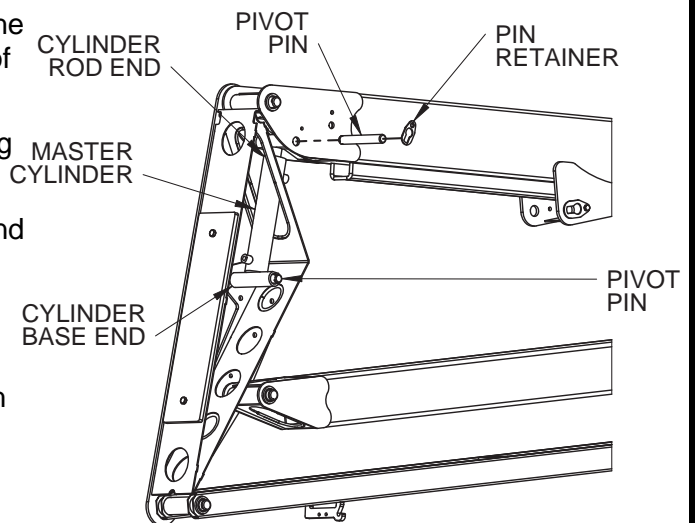


Figure 5-1. Location of Master Cylinder

MASTER / SLAVE CYLINDER REPLACEMENT (CONTINUED)

Master Cylinder (Continued)

- Place absorbent cloths below the cylinder ports and detach hydraulic hoses from the cylinder. Elevate hoses to prevent leakage. Plug or cap exposed hose fittings and cylinder ports.
- Unbolt and remove the pin retainer at the base end of the cylinder.
- Remove the pivot pin using a hammer and a brass or hardwood drift.
- Replace or reinstall the cylinder by following the above instructions in the reverse order of removal.
- Actuate the hydraulic system and check for leakage. Tighten hydraulic fittings as needed.
- Bleed trapped air from the hydraulic system by raising and lowering the telescoping boom with the reservoir fill port cap on, but not tightened. Allow several cycles of operation for trapped air to escape. Repeat as necessary.

Slave Cylinder

Refer to Figure 5–2 for the location of this cylinder.

- With the boom in the “stowed” position, extend the telescoping boom until there is adequate exposure of the pin retainer and pivot pin (approximately 2 ft. (0.7 m)).
- Verify that the upper boom is supported by lifting straps and an overhead hoist or equivalent.
- Unbolt and remove the pin retainer at the rod end of the cylinder.
- Remove the pivot pin using a hammer and a brass or hardwood drift.
- Tag and number all hydraulic hoses that attach to the cylinder valve block. Use a marker to label the valve block ports with the appropriate hose numbers.
- Place absorbent cloths below the cylinder ports and detach hydraulic hoses from the cylinder. Elevate hoses to prevent leakage. Plug or cap exposed hose fittings and cylinder ports.
- Unbolt and remove both pin retainers at the base end of the cylinder.
- Remove the pivot pin using a hammer and a brass or hardwood drift.
- Replace or reinstall the cylinder by following the above instructions in the reverse order of removal.
- Actuate the hydraulic system and check for leakage. Tighten hydraulic fittings as needed.
- Bleed trapped air from the hydraulic system by raising and lowering the telescoping boom with the reservoir fill port cap on, but not tightened. Allow several cycles of operation for trapped air to escape. Repeat as necessary.

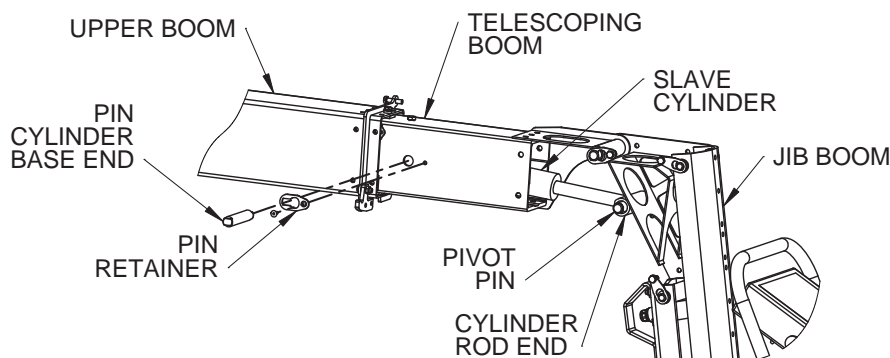


Figure 5-2. Location of Slave Cylinder

LIFT CYLINDER REPLACEMENT

45XA / HLA 16 PX Aerial Work Platforms have three (3) lift cylinders, use the following procedure to remove and replace faulty or damaged hydraulic cylinders. Refer to Figure 5-3 for the location of these cylinders.

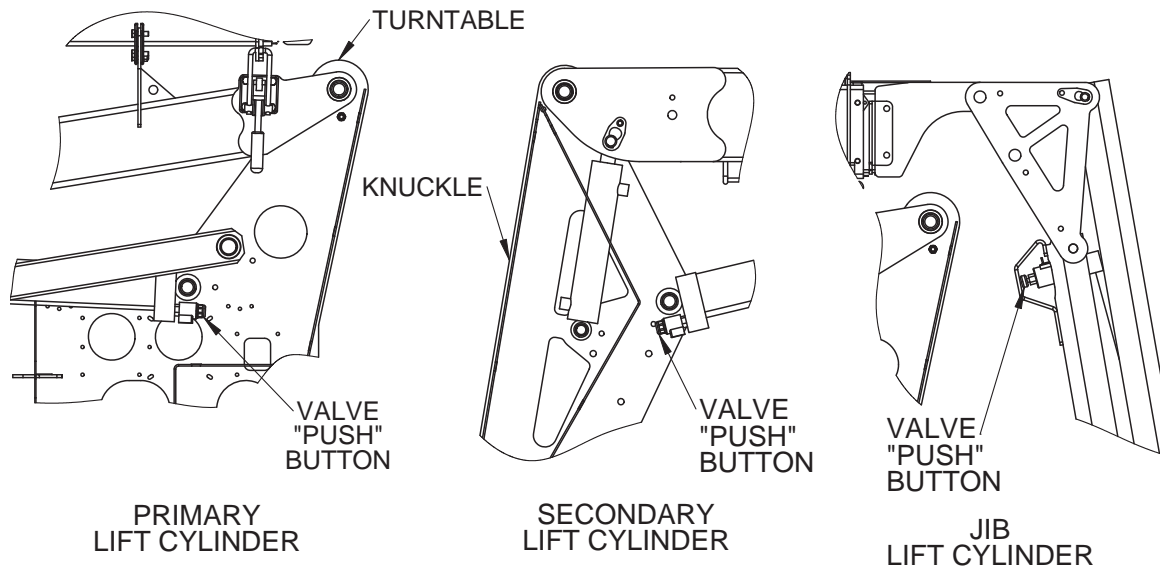


Figure 5-3. Location of Manual Lowering Valves for Lift Cylinder Replacement

- With the boom in the “stowed” position, press (push) in and hold the emergency lowering valve “button” on the lift cylinder to relieve all hydraulic pressure to the cylinder. Refer to Figure 5-4.
- Turn the key switch at the ground (lower) control panel, to the “OFF” position and remove the key.
- Locate the piston rod end of the cylinder to be removed. Unbolt and remove the pin retainer from each side of the pivot pin. Refer to Figure 5-5.

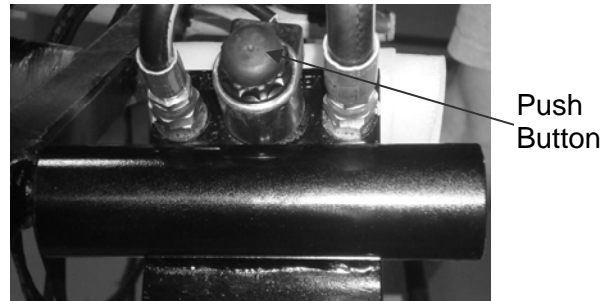


Figure 5-4. Push “Button” Lowering Valve

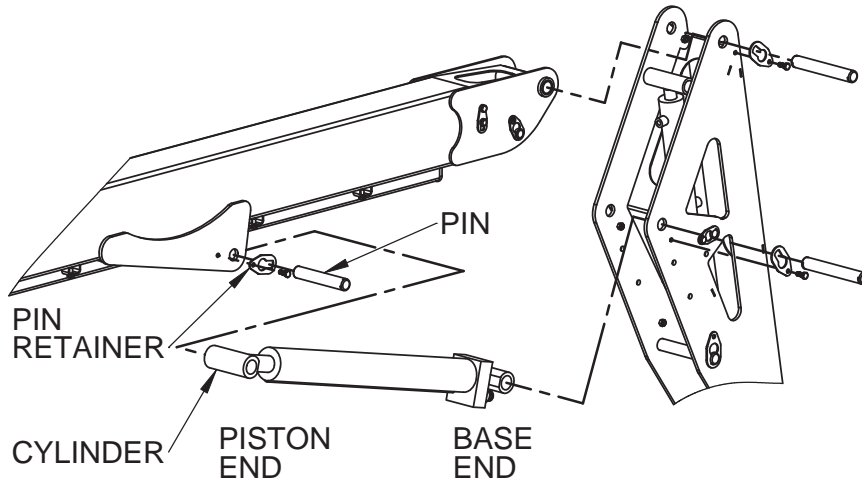


Figure 5-5. Lift Cylinder Replacement

LIFT CYLINDER REPLACEMENT (CONTINUED)

- Verify that the cylinder is supported by lifting straps and an overhead hoist or equivalent.
- Remove the pivot pin using a hammer and a brass or hardwood drift.
- Use an overhead crane or lifting gear to raise the boom section. Adequate clearance is necessary to reach the cylinder valve block (base end) and hydraulic hose ports.
- Remove the valve solenoid by unscrewing the cap, sliding the coil off, then unscrewing the valve.
- Tag and number all hydraulic hoses that attach to the cylinder valve block. Use a marker to label the valve block ports with the appropriate hose numbers.
- Place absorbent cloths below the cylinder ports and detach hydraulic hoses from the cylinder. Elevate hoses to prevent leakage. Plug or cap exposed hose fittings and cylinder ports.
- At the base of the cylinder, unbolt and remove the pin retainer from each side of the pivot pin.
- Remove the pivot pin using a hammer and a brass or hardwood drift.
- Lift and remove the cylinder using an overhead hoist and lifting straps or equivalent.
- Replace or reinstall the cylinder by following the above instructions in the reverse order of removal.
- Actuate the hydraulic system and check for leakage. Tighten hydraulic fittings as needed.
- Bleed trapped air from the hydraulic system by raising and lowering the boom with the reservoir fill port cap on, but not tightened. Allow several cycles of operation for trapped air to escape. Repeat as necessary.

OUTRIGGER CYLINDER REPLACEMENT

Use the following procedure to remove and replace faulty or damaged hydraulic cylinders on the outriggers:

- Lower the outrigger until the footpad is touching the ground. DO NOT transfer the weight of the aerial work platform onto the outrigger. Leave the weight of the aerial work platform on the trailer wheels.
- Remove the bolts securing the outrigger cylinder guard. Remove the cylinder guard. Refer to Figure 5-6.

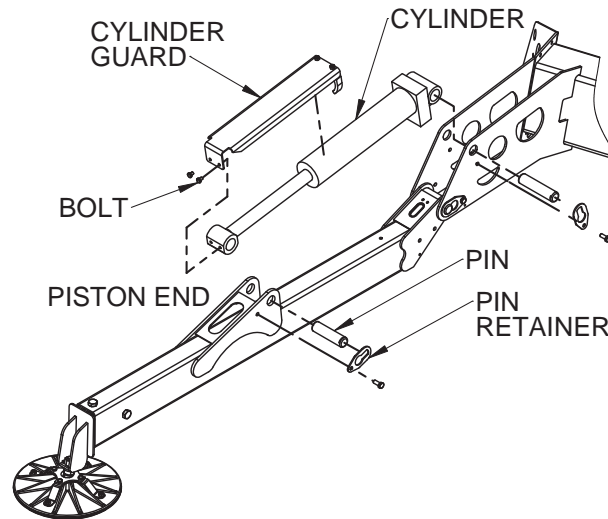


Figure 5-6. Outrigger Cylinder Replacement

- At the piston rod end of the cylinder, unbolt and remove the pin retainer from each side of the pivot pin.
- Place a block of wood shoring between the outrigger tube and the cylinder.
- Remove the pivot pin using a hammer and a brass or hardwood drift.
- Fully retract the cylinder.
- Turn the key at the ground (lower) control station to the "OFF" position and remove the key.
- Tag and number all hydraulic hoses that attach to the cylinder valve block. Use a marker to label the valve block ports with the appropriate hose numbers.
- Remove the valve solenoid by unscrewing the cap, sliding the coil off, then unscrewing the valve. Refer to Figure 5-7.
- Place absorbent cloths below the cylinder ports and detach hydraulic hoses from the cylinder. Elevate hoses to prevent leakage. Plug or cap exposed hose fittings and cylinder ports.



Figure 5-7. Cylinder Valve Removal

OUTRIGGER CYLINDER REPLACEMENT (CONTINUED)

- At the base of the cylinder, unbolt and remove the pin retainer from each side of the pivot pin.
- Remove the pivot pin using a hammer and a brass or hardwood drift.
- Lift and remove the cylinder using an overhead hoist and lifting straps or equivalent.
- Replace or reinstall the cylinder by following the above instructions in the reverse order of removal.
- Actuate the hydraulic system and check for leakage. Tighten hydraulic fittings as necessary.
- Bleed trapped air from the hydraulic system by extending and retracting the outrigger with the reservoir fill port cap on but not tightened. Allow several cycles of operation for trapped air to escape. Repeat as necessary.

6 DECAL REPLACEMENT



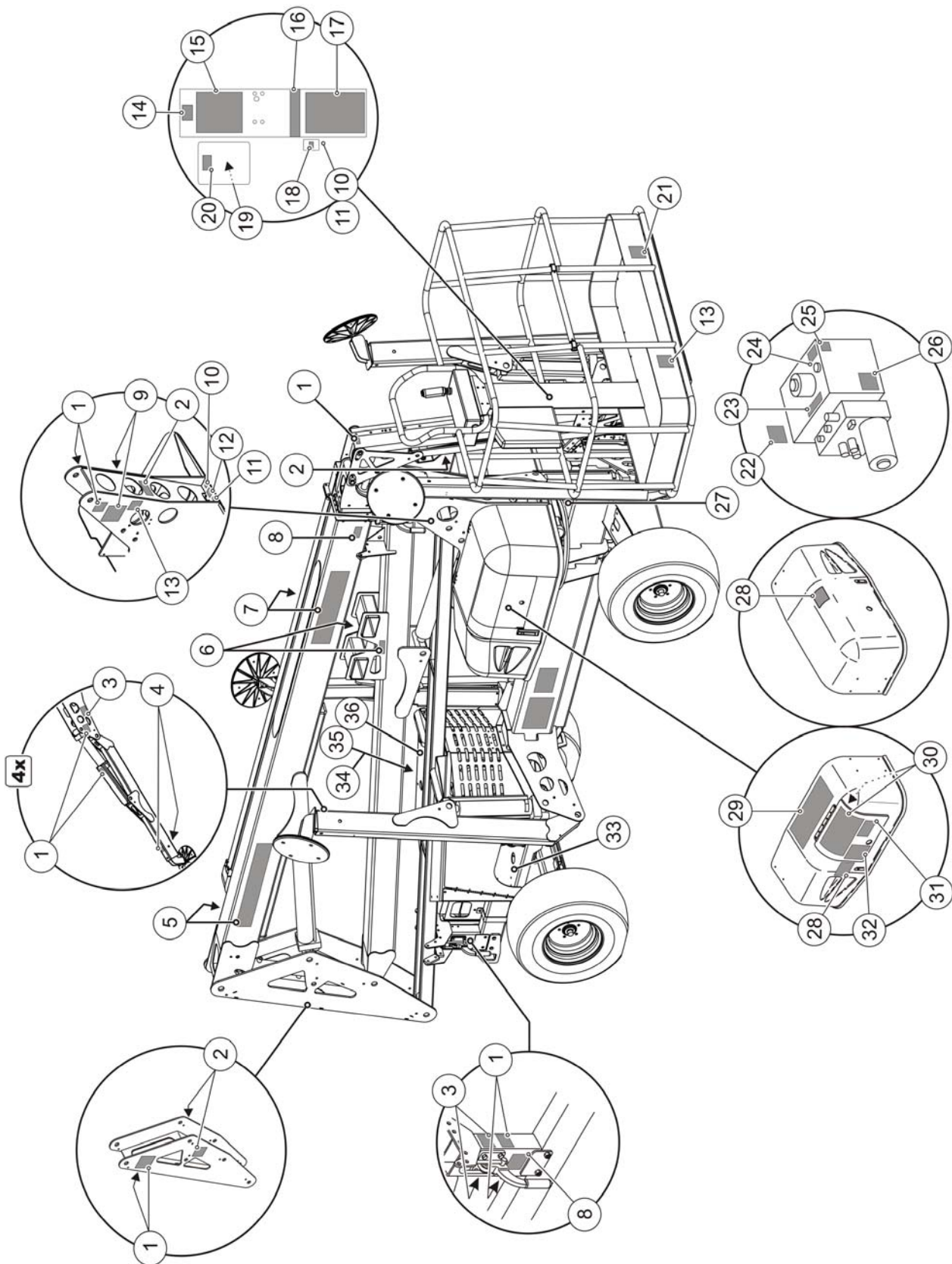
WARNING

Decals contain information that is required for the safe and proper use of the aerial work platform.

Decals should be considered necessary components of the machine and should be checked before each use to verify that they are correctly attached and legible.

Promptly replace all decals that are no longer legible.

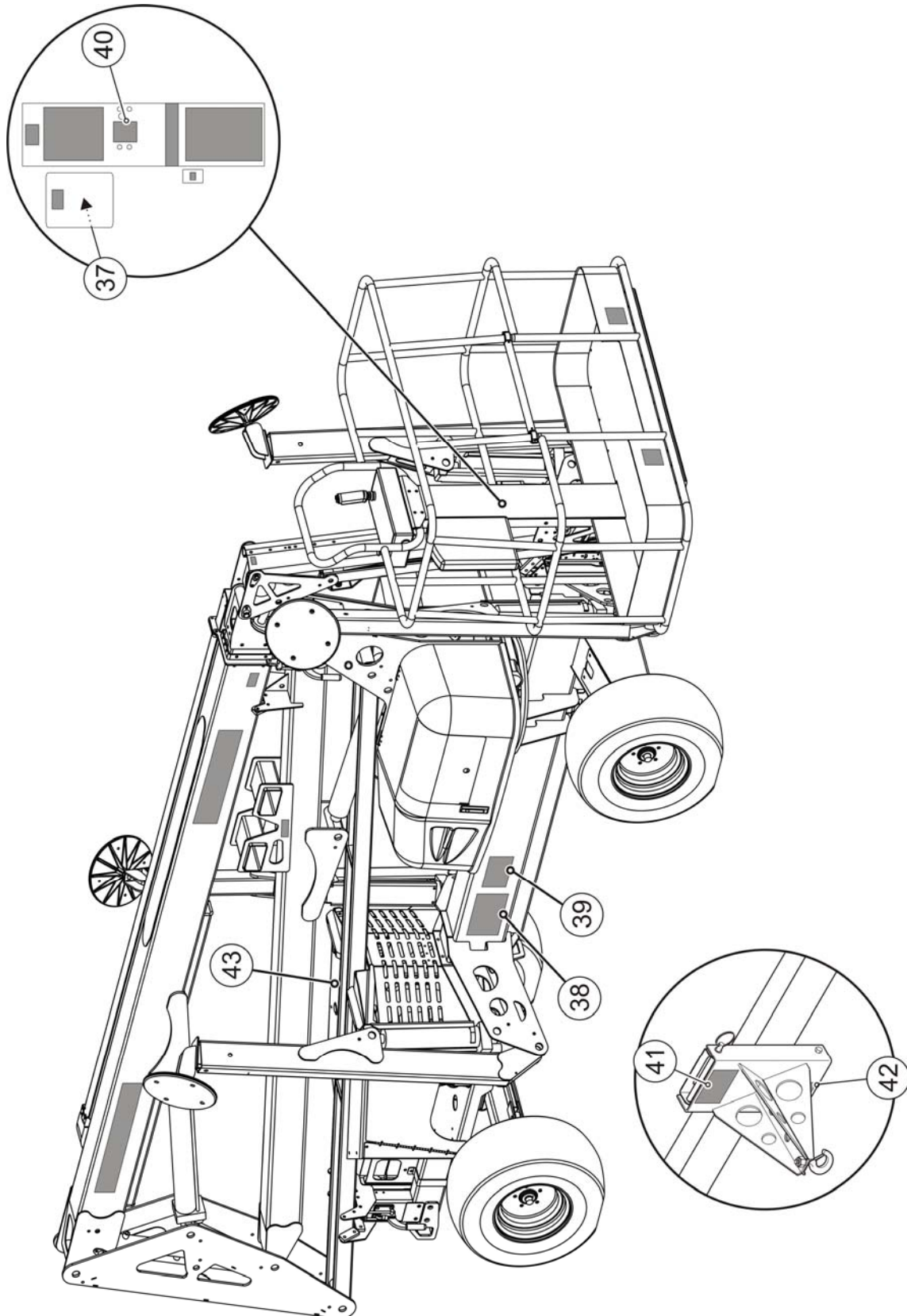
DECAL KIT - ANSI



DECAL KIT - ANSI

B06-01-4033		DECAL KIT - Includes the following:	
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B06-00-0405	Decal - Warning - Hand Pinch Point	17
2	B06-00-0403	Decal - Emergency Lower Valve	4
3	B06-00-0521	Decal - Danger - Tip Over Hazard	7
4	B06-00-0404	Decal - Warning - Outrigger Crush Foot	8
5	B06-00-0161B	Decal - 'Haulotte BilJax' - 5 in Black / Red on Clear	2
6	B06-00-0477	Decal - Warning - Fork Lift Use	2
7	B06-00-0564	Decal - 45XA Transfer - Black	2
8	B06-00-0481	Decal - Caution - Transport Latch	2
9	B06-00-0482	Decal - Danger - Electrocutation	2
10	B06-00-0531	Decal - Water - 3000 PSI	2
11	B06-00-0530	Decal - Air - 120 PSI	2
12	B06-00-0037	Decal - "Lubricate Semi - Annually"	1
13	B06-00-0536	Decal - Notice - Range of Motion – 45XA	2
14	0202-0523	Decal - Flag, Made In USA	1
15	B06-00-0562	Decal - Warning - Platform Control X-Booms	1
16	B06-00-0552	Decal - Notice - Lanyard Attachment	1
17	B06-00-0471	Decal - Danger - Main Instruction / Hazard - Platform	1
18	B06-00-0062	Decal - Notice - AC Power	2
19	B06-00-0473	Decal - Notice - Operator Manual Missing	1
20	B06-00-0475	Decal - Warning - Read / Understand Manual	1
21	B06-00-0474	Decal - Notice - Platform Maximum Load	1
22	B06-00-0503	Decal - Notice - Handle Applications	1
23	B06-00-0504	Decal - Notice - Emergency Hand Pump	1
24	B06-00-0068	Decal - Notice - Low Foam Hydraulic Oil	1
25	B06-00-0494	Decal - Notice - Contains Hazardous Material	1
26	B06-00-0541	Decal - Caution - Manual Rotate / Retract	1
27	B06-00-0608	Decal - Drive Direction Arrows	1
28	B06-00-0495	Decal - Caution - Compartment Access	2
29	B06-00-0505	Decal - Danger - Main Instruction / Hazard - Base	1
30	B06-00-0561	Decal - Warning, Ground Control X-Booms	2
31	B06-00-0484	Decal - Danger - Battery / Charger Instruction	1
32	B06-00-0034	Decal - Danger - Battery / Charger Safety	1
33	B06-00-0576	Decal - Gas Engine 4WD Booms - Kawasaki	1
34	B06-00-0488	Decal - Caution - Component Damage (Gas Engine Option)	1
35	B06-00-0581	Decal - Notice - Brake Release X-Booms	1

IDENTIFICATION PLATES & OPTIONAL EQUIPMENT - ANSI



IDENTIFICATION PLATES & OPTIONAL EQUIPMENT – ANSI

IDENTIFICATION PLATES (Used on all standard equipment)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
36	B06-00-0487	Decal - Notice - Unleaded Fuel Only (Gas Engine Option)	1
37	B06-00-0526	Key Ring Tag	1
38	B06-00-0524	Annual Inspection Plate	1
39	B06-00-0639	ANSI ID Plate	1

REPLACEMENT DECALS FOR OPTIONAL EQUIPMENT – ANSI

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
40	B06-00-0529	Decal - Notice - Platform Rotate (Manual Rotation Option)	1
41	B06-00-0485	Decal - Notice - Material Lift Set - up (Material Lift Option)	1
42	B06-00-0497	Decal - Notice - Material Lift Max 500 lb (Material Lift Option)	1
43	B06-00-0498	Decal - Notice - Diesel Fuel Only	1

DECALS - ANSI

⚠ DANGER

FAILURE TO READ, UNDERSTAND AND FOLLOW THESE SAFETY INSTRUCTIONS OR ANY IMPROPER USE OF THIS EQUIPMENT WILL RESULT IN DEATH OR SERIOUS INJURY.

BEFORE USE
Operator is responsible for proper machine operation.

DO NOT operate this machine unless you have:

- been fully trained in proper operation.
- read and understood Operators Manual.
- read and understood all warning and instruction decals.

Inspect machine for any damaged or worn components (see Operators Manual for complete maintenance and inspection procedures)

NEVER TAKE CHANCES - DO NOT use this machine if you are under the influence of drugs or alcohol, or if you feel dizzy, ill or unsteady.

SET UP
Survey the jobsite and identify/avoid all potential hazards. When working on public roads, warnings and barriers must be set up in accordance with all local, state and federal traffic codes.

Cordon off area around base to keep unauthorized personnel and other equipment away from machine.

Operate on firm and level surface only. **DO NOT** use machine on any surface which will not support the load applied to outrigger foot pads.

Lower all four outriggers until weight of the machine is fully supported by the outriggers and machine is level (green "auto level" light should be lit).

Using ground controls, perform operational test of all boom functions.

ELECTROCUTION HAZARDS
This machine is NOT electrically insulated and DOES NOT provide protection for personnel from contact with, or close proximity to, any live electrical power source and should be considered energized by all personnel coming in contact with machine.

Voltage Range (Phase to Phase)	Minimum Safe Approach Distance (Feet)	(Meters)
0 to 300V	Avoid Contact	
Over 300V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72

TIP HAZARDS
DO NOT use unless all four outriggers are completely lowered and the machine is level.

DO NOT set machine up on any surface unless it can be leveled using only outriggers.

DO NOT use chocks, blocks or shims of any kind to level machine.

DO NOT release outriggers with boom extended or operator occupying platform.

DO NOT exceed rated load capacity.

DO NOT continue to operate machine if tilt alarm sounds. Retract and lower boom immediately.

DO NOT operate machine in strong or gusty winds.

DO NOT increase surface area of platform. Increasing areas exposed to wind will decrease machine stability.

DO NOT push off or pull on any object outside of the platform.

IF YOU HAVE NOT BEEN PROVIDED WITH SAFETY LITERATURE, OR HAVE QUESTIONS CONCERNING THE SAFE USE OF THIS MACHINE, CONTACT YOUR REGIONAL HAULOTTE DEALER OR HAULOTTE SERVICES AT 888-440-9240.

B06-00-0471

B06-00-0471

⚠ DANGER

FAILURE TO FOLLOW THESE BATTERY AND CHARGER SAFETY RULES WILL CAUSE SERIOUS INJURY OR DEATH.

ELECTROCUTION HAZARDS
Risk of Electric Shock

- DO NOT expose batteries or charger to water and/or rain.
- DO NOT use frayed or damaged electric cords when charging.
- Connect input cord only to properly grounded three wire outlet with specified voltage and frequency.

BURN HAZARDS

- Batteries contain acid. **Always** wear protective eyewear, face shield and protective clothing when working on or near battery.

EXPLOSION HAZARDS

- DO NOT contact battery terminals or cable clamps with tools that may cause sparks.
- During charging, explosive oxyhydrogen gas is generated.
- DO NOT smoke or allow open fire, sparks, or embers near battery when charging.

COMPONENT DAMAGE HAZARDS

- Keep terminals and terminal connections clean.
- Batteries must be charged using rated voltage noted on serial plate.
- Consult Operators Manual and Parts and Service Manual for additional information on battery maintenance.

B06-00-0034

B06-00-0034

⚠ DANGER

ELECTROCUTION HAZARD

It is unlawful to operate this equipment within 10 feet of high voltage lines of 50,000 volts or less. This machine is **NOT** insulated.

Do not use within 10 ft. of power lines or other electrically charged sources.

This machine **DOES NOT** provide protection for personnel from contact with or close proximity to any live electrical power source and should be considered energized by all personnel coming in contact with machine.

KEEP CLEAR

UTA B06-00-0482

B06-00-0482

⚠ DANGER

BATTERY AND CHARGER OPERATING INSTRUCTIONS

OBSERVE AND FOLLOW

- Do not use external charger or booster battery.
- Recharge batteries after each work shift.
- Use proper AC input voltage for charging as indicated on charger.
- Do not expose charger to water.

TO CHARGE BATTERY

- Remove battery vent caps and check battery fluid level. If necessary, add only enough water to cover the plates. Do not overfill. Replace battery vent caps.
- Be sure battery disconnect plug is connected before charging batteries.
- Connect the battery charger to a grounded AC circuit.
- The charger will automatically shut off when charging cycle is complete.

UTA B06-00-0484

B06-00-0484

⚠ DANGER

TIP-OVER HAZARD

Machine tip-over will cause death or serious injury.

Do not alter or disable limit switch(es).

B06-00-0521

B06-00-0521

45XA

B06-00-0564

Haulotte | BILJAX

B06-00-0161B

Proudly Made In The USA

0202-0523

0202-0523

AIR

120 PSI

UTA B06-00-0530

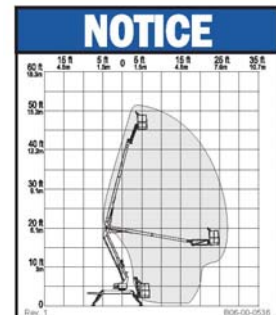
B06-00-0530

WATER

3000 PSI

UTA B06-00-0531

B06-00-0531



B06-00-0536

45XA / HLA 16 PX

DECALS – ANSI (CONTINUED)

⚠ DANGER

FAILURE TO READ, UNDERSTAND AND FOLLOW THESE SAFETY INSTRUCTIONS OR ANY IMPROPER USE OF THIS EQUIPMENT WILL RESULT IN SERIOUS INJURY OR DEATH.

BEFORE USE
Operator is responsible for proper machine operation.
DO NOT operate this machine unless you have:
• been fully trained in proper operation.
• read and understood Operators Manual.
• read and understood all warning and instruction decals.

Inspect machine for any damaged or worn components (see Operators Manual for complete maintenance and inspection procedures).

NEVER TAKE CHANCES. DO NOT use this machine if you are under the influence of drugs or alcohol, or if you feel dizzy, ill or unsteady.

SET UP
Survey the jobsite and identify/avoid all potential hazards.

When working on public roads, warnings and barriers must be set up in accordance with all local, state and federal traffic codes.

Operate on firm and level surface only. DO NOT use machine on any surface which will not support the load applied to outrigger foot pads. Lower all four outriggers until weight of the machine is fully supported by the outriggers and machine is level (green "auto level" light should be lit).

Using ground controls, perform operational test of all boom functions.

ELECTROCUTION HAZARDS
This machine is NOT electrically insulated and DOES NOT provide protection for personnel from contact with, or close proximity to, any live electrical power source and should be considered energized by all personnel coming in contact with machine.

Voltage Range (Phase to Phase)	Minimum Safe Approach Distance (Feet)	(Meters)
Up to 300V	Avoid Contact	
Over 300V to 500V	10	3.05
Over 500V to 2000V	15	4.56
Over 2000V to 3500V	20	6.10
Over 3500V to 5000V	25	7.52
Over 5000V to 7500V	35	10.67
Over 7500V to 10000V	40	13.72

TIP HAZARDS
DO NOT use unless all four outriggers are completely lowered and the machine is level. DO NOT set machine up on any surface unless it can be leveled using only outriggers. DO NOT use chocks, blocks or shims of any kind to level machine. DO NOT release outriggers with boom extended or operator occupying platform.

DO NOT exceed rated load capacity. DO NOT continue to operate machine if tilt alarm sounds. Retract and lower boom immediately. DO NOT operate machine in strong or gusty winds. DO NOT increase surface area of platform. Increasing areas exposed to wind will decrease machine stability. DO NOT push off or pull on any object outside of the platform. DO NOT place or attach overhanging loads to any part of platform. DO NOT exceed platform capacity when transferring loads to the platform while elevated.

FALL HAZARDS
All platform occupants must wear a full body harness and lanyard.
• Attach lanyard to fall protection attachment point provided in platform.
DO NOT stand, sit or climb on guard rails or top edge of platform. DO NOT lean out over top edge of platform guard rails to perform work.
• Maintain a firm footing on the platform at all times.
DO NOT use boxes, ladders, scaffolding, or any other means to increase working height.

DO NOT climb up or down boom. DO NOT climb down from platform when raised. DO NOT allow ropes, electric cords, hoses, or similar objects to become entangled in the machine. DO NOT operate machine without platform entry mid-rail fully lowered into position. DO NOT move or reposition machine while platform is raised.

COLLISION HAZARDS
DO NOT use where operator can come in contact with overhead obstructions such as electric wires, cables, ropes, overhangs or similar hazards. To avoid hand injuries, always keep hands inside platform area during boom movement.

MISUSE HAZARDS
DO NOT override, alter, or bypass safety devices. DO NOT use boom turntable rotation or platform rotation for pushing or pulling. DO NOT use platform as a crane for lifting materials. Always remove platform and use optional material lifting hook attachment. DO NOT operate when exposed to rain, snow, or other severe weather.

EXPLOSION HAZARDS
DO NOT allow flames, sparks, or embers near batteries. DO NOT smoke near batteries. Batteries produce a hydrogen-oxygen gas mixture which can explode. DO NOT smoke while near fuel tank on internal combustion engine (if equipped).

GENERAL INSTRUCTIONS
Be sure all tires are in good condition, air filled tires are properly inflated and lug nuts are properly torqued. DO NOT leave keys in machine while unattended.

MATERIAL LIFT HAZARDS (IF EQUIPPED)
DO NOT exceed material lifting hook rated capacity. DO NOT raise load unless material lifting hook is properly secured to machine. DO NOT raise unless load is properly balanced and secured to machine. DO NOT stand under or allow personnel under load or machine when load is raised.

IF YOU HAVE NOT BEEN PROVIDED WITH SAFETY LITERATURE, OR HAVE QUESTIONS CONCERNING THE SAFE USE OF THIS MACHINE, CONTACT YOUR REGIONAL HAULOTTE DEALER OR HAULOTTE SERVICES AT 888-440-9240.

B06-00-0505

⚠ WARNING

GROUND OPERATING INSTRUCTIONS

Remove lift from trailer before operation. Refer to Drive instructions on platform and/or in Operator's Manual.

SETUP:

1. Read and follow all instructions in Operator's Manual and on all decals prior to operation.
2. Conduct a pre-operation inspection of machine and work area. Refer to Operator's Manual for additional instructions.
3. Set key switch to ground controls.
4. Release both emergency stop buttons (ground and platform controls).
5. Deploy outriggers using **AUTO LEVEL**. Press and hold "extend" and "auto level" button simultaneously, or refer to Operator's Manual for Manual Leveling instructions.
6. When properly leveled, two lights at each outrigger button and the light at the "auto level" button will be on.

OPERATION:

1. Disengage boom transport latch.
2. On Telescopic models, release platform transport latch, swing platform into operating position until platform lock pins are engaged.
3. Check all functions for proper operation.
 - Set key switch to ground controls.
 - Release both emergency stop buttons (ground and platform controls).
 - Press and hold the desired function and speed buttons to operate the machine.
4. Fully retract, then lower booms to stowed position. Move key switch to platform controls. Lift is now ready for operation from the platform.

WARNING DEVICE:
Tilt alarm will sound if boom becomes out of level. If this occurs, operator must immediately:

1. Fully retract, then lower booms to stowed position.
2. Check outrigger footing and releve lift.

EMERGENCY STOP:
Push in red emergency stop button to stop all functions.

EMERGENCY LOWERING:
Emergency lowering can only be accomplished from the ground.

1. Open cover on pump side of the lift, opposite ground control panel.
2. Locate instruction decal.
3. Follow instructions for Auxiliary/Manual Boom Rotation and Retraction.
4. Emergency lowering valves are located at the end of each hydraulic cylinder. Use instructional decals to locate and operate emergency lowering valves.

Refer to Operator's Manual when using optional material lift hook.

Improper use of this equipment will result in serious injury or death. This machine must not be operated unless you are completely familiar with and follow all instructions contained in the Operator's Manual.

B06-00-0561

⚠ WARNING

CRUSH HAZARD



Stand clear of outrigger being lowered or raised.
Contact with outrigger will cause serious crushing injury.

B06-00-0404

⚠ WARNING

PINCH POINT HAZARD



STAY CLEAR

B06-00-0405

⚠ WARNING

Failure to read, understand and follow enclosed Operators Manual may result in serious injury or death.

UTA
B06-00-0475

B06-00-0475

⚠ WARNING

FORK LIFT USE
Engage and lock boom transport latch(es) before lifting.
Do not exceed forklift lifting capacity. Fully insert forks into pockets. Failure to follow all forklift rules and instructions will result in property damage, serious injury or death.

COIA
B06-00-0477

B06-00-0477

⚠ CAUTION

All boom sections must be fully retracted then completely lowered to tow.
All transport latches must be fully engaged and locked.

UTA
B06-00-0481

B06-00-0481

LUBRICATE SEMI-ANNUALLY

COIA
B06-00-0037

B06-00-0037

DECALS – ANSI (CONTINUED)

⚠ WARNING

PLATFORM OPERATING INSTRUCTIONS

SETUP:

1. Remove lift from trailer before operation.
2. Read and follow all instructions in Operator's Manual and on all decals prior to operation.
3. Conduct a pre-operation inspection of machine and work area. Refer to Operator's Manual for additional instructions.
4. Release both emergency stop buttons (ground and platform controls).
5. Deploy outriggers using **AUTO LEVEL**. Press and hold "extend" and "auto level" button simultaneously, or refer to Operator's Manual for Manual Leveling instructions.
6. When properly leveled, two lights at each outrigger button and the LED at the "auto level" button will be lit.
7. Operators must wear a safety harness and lanyard when operating machine from platform.

OPERATION:

1. Press the desired function button until the adjacent LED becomes lit.
2. Depress the joystick trigger and move joystick off center. Use the color-coded arrows to determine direction the boom will move. Move the joystick further off center to increase function speed.
3. To rotate turntable, depress joystick trigger and toggle switch while moving the joystick off center. Use the color-coded arrows to determine direction the boom will move. Move the joystick further off center to increase function speed.
4. Return the joystick to center or release trigger to stop lift functions.

WARNING DEVICE:
Tilt alarm will sound if boom becomes out of level. If this occurs, operator must immediately:

1. Fully retract, then lower booms to stowed position.
2. Check outrigger footing and level lift.

EMERGENCY STOP:
Push in red emergency stop button to stop all functions.

DRIVE FUNCTIONS:

1. Retract all booms and outriggers to a fully stowed position.
2. Verify "drive mode" LED is lit. "Drive mode" LED lights automatically when all booms and outriggers are fully retracted and in a stowed position.
3. Depress the joystick trigger and move joystick off center. Moving the joystick further off center will increase drive speed.
4. Return joystick to center or release trigger to stop drive functions.
5. To steer, depress joystick trigger and toggle switch while moving the joystick off center.
6. Use the color-coded arrows to determine direction the machine will move.
7. Redeploy outriggers to resume lift functions.

Refer to Operator's Manual for additional operating instructions.

Improper use of this equipment will result in serious injury or death. This machine must not be operated unless you are completely familiar with and follow all instructions contained in the Operator's Manual.

B06-00-0562

⚠ CAUTION

MANUAL BOOM FUNCTIONS

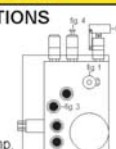
1. Turn proportional valve (fig. 1) counterclockwise until it stops.
2. Insert pump handle into hand pump (fig. 2).

MANUAL RETRACTION
Push and hold retract button (fig. 3) and simultaneously pump hand pump.

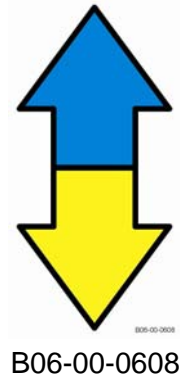
MANUAL ROTATION
To rotate counterclockwise: Push and hold rotation button (fig. 4) and simultaneously pump hand pump.
To rotate clockwise: Pull rotation button out (fig. 4) and simultaneously pump hand pump.

NOTE: Turn proportional valve clockwise into original position prior to manual lowering or lift operation.

MANUAL LOWERING
Lower each boom individually by pushing the release valve located on each cylinder.



B06-00-0541



MANUFACTURER: Haulotte GROUP 125 TAYLOR PARKWAY • ARCHBOLD, OH 43502 USA		YEAR OF MANUFACTURE: _____ MAKE: _____ MODEL: _____
SERIAL NUMBER: _____	THIS AERIAL DEVICE COMPLIES WITH THE REQUIREMENTS OF ANSI/SIA A92.5, CAN/CSA B354.4, AS 1418.10 AND CE.	
MAXIMUM PLATFORM HEIGHT: _____	MAXIMUM PLATFORM REACH: _____	EXTERNAL ELECTRICAL SUPPLY: _____
MAXIMUM LOAD CAPACITY: _____	AERIAL DEVICE SYSTEM PRESSURE: _____	INSULATED OR NON-INSULATED: _____
NUMBER OF PLATFORMS: _____	MAXIMUM PLATFORM OCCUPANCY: _____	QUALIFICATION VOLTAGE: _____
DESIGN VOLTAGE: _____	CONTROL SYSTEM VOLTAGE: _____	DATE OF TEST: _____
MAXIMUM INCLINATION FOR SETUP: _____	MAXIMUM WIND SPEED: _____	UNIT EQUIPPED WITH MATERIAL HANDLING ATTACHMENT: _____
	OPERATING TEMPERATURE RANGE: _____	

B06-00-0639

⚠ CAUTION

COMPARTMENT ACCESS IS RESTRICTED

Improper contact with components under any cover will cause serious injury.



Only trained and authorized maintenance personnel should access compartments.

Access by operator is only advised when performing preoperation inspection. All compartments must remain closed and secured during operation and transport.

B06-00-0495

CAUTION

COMPONENT DAMAGE HAZARD

Prior to transport, close the fuel shut-off valve. Open valve for operation. Failure to close the fuel shut-off valve before transporting machine may result in engine damage.

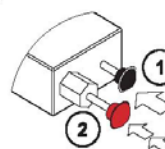
B06-00-0488

NOTICE

TO RELEASE BRAKES:

- Depress black knob (1)
- Pump red knob (2) 60-80 times until brakes release.

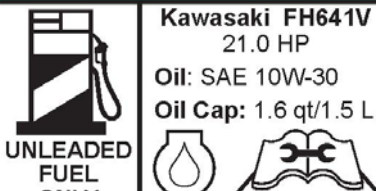
Activate drive function to return to normal brake operation.



B06-00-0581

Kawasaki FH641V
21.0 HP

Oil: SAE 10W-30
Oil Cap: 1.6 qt/1.5 L



UNLEADED FUEL ONLY

B06-00-0544

NOTICE

EMERGENCY HAND PUMP HANDLE INSERTION



B06-00-0504

NOTICE

FALL PROTECTION ATTACHMENT POINTS



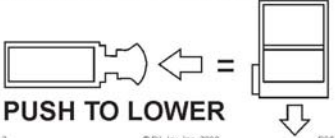
LIMIT ONE PERSON PER ATTACHMENT POINT. LANYARDS SHOULD NOT EXCEED 6ft (2m) IN LENGTH.

B06-00-0552

DECALS – ANSI (CONTINUED)

NOTICE	
<p>Not Equipped with Platform Rotation and/or Jib Rotate</p> <p>Total of occupants and equipment must not exceed 500 lbs. / 227 kg.</p>	<p>Maximum Load: 500 lbs. / 227 kg</p> <p>Maximum Occupants: 2</p>
<p>Equipped with Platform Rotation and/or Jib Rotate</p> <p>Total of occupants and equipment must not exceed 440 lbs. / 200 kg.</p>	<p>Maximum Load: 440 lbs. / 200 kg</p> <p>Maximum Occupants: 2</p>

B06-00-0474

NOTICE	
<p>EMERGENCY LOWERING VALVE</p>	
	
<p>PUSH TO LOWER</p>	

B06-00-0403

NOTICE	
<p>One or more of the following hazardous materials are used on this machine:</p> <ul style="list-style-type: none"> • Gasoline • Liquid Petroleum Gas (LPG) • Diesel Fuel • Hydraulic Fluid • Antifreeze • Engine Oil • Grease • Lead Acid Battery 	

B06-00-0494

NOTICE	
<p>The hydraulic system of this machine is designed to use AW32 hydraulic oil with a viscosity index of 190 or higher.</p>	

B06-00-0068

NOTICE	
<p>Handle should be used for the following applications:</p> <ul style="list-style-type: none"> • Manual Hand Pump • Tire Iron 	

B06-00-0503

NOTICE	
<p>If Operators Manual is missing, please contact your regional Haulotte dealer or Haulotte Services at 888-440-9240.</p>	

B06-00-0473

NOTICE	
<p>AC POWER</p> 	


B06-00-0062

NOTICE	
<p>UNLEADED FUEL ONLY</p> 	


B06-00-0487

NOTICE	
MATERIAL LIFTING CONFIGURATION	
<ul style="list-style-type: none"> • Release clamp on the back of the platform control box and remove it from the bracket. Disconnect plug from the load sense module. Take box to area near ground controls. • Open turntable cover at ground controls. • Remove electric plug from bottom right of ground controls and insert platform control connection. Insert removed electric plug into load sense module where platform control box was connected. Close turntable cover. • Secure platform while removing pin holding platform to boom. 	<ul style="list-style-type: none"> • Lift platform up and remove from machine. • Remove pin securing material lifting hook to base. Release material lifting hook. • Insert material lifting hook into the bottom rail of the platform mounting bracket and rotate up into position. Insert clevis pin. • Operate material lifting hook from ground with platform control box for optimal control. If using ground controls, be certain keyswitch is in correct position. • Reverse above process to convert machine to personnel lift.

B06-00-0485

NOTICE	
<p>LOW SULFUR OR ULTRA LOW SULFUR DIESEL FUEL ONLY</p> 	

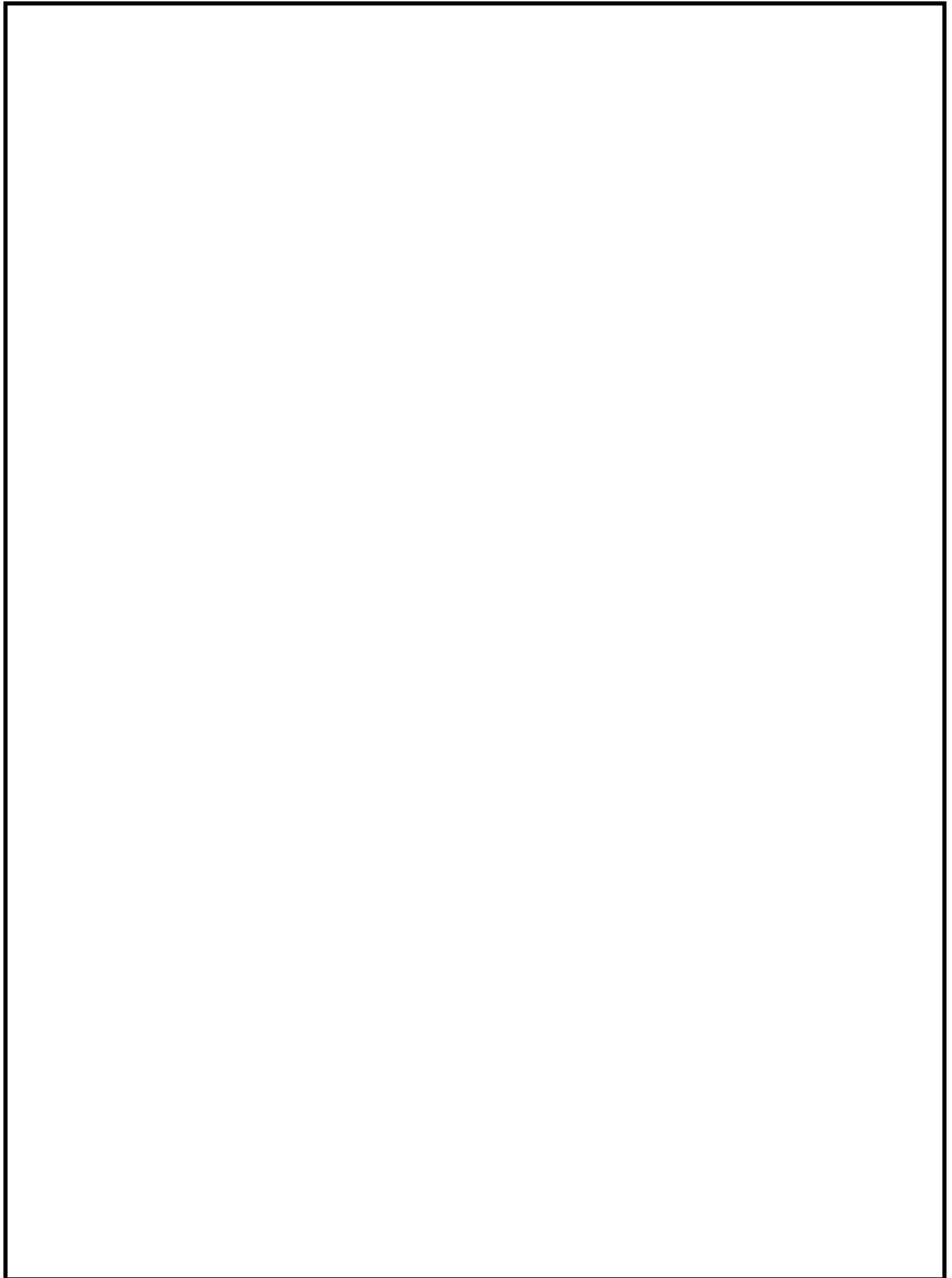
B06-00-0498

NOTICE	
<p>PLATFORM ROTATION Turn handle in direction of desired rotation.</p> 	

B06-00-0529

NOTICE	
<p>MATERIAL LIFTING HOOK</p> <p>Maximum Load: 500 lbs / 227 kg</p>	

B06-00-0497



7 OPTIONAL EQUIPMENT

The Haulotte Model 45XA / HLA 16 PX is a Self-Propelled aerial work platform that may be equipped with one or more optional components designed for the convenience and safety of operators when using the equipment to accomplish specific tasks.

Always use only those components manufactured and / or authorized by Haulotte Group. Never make any adjustments or modifications or otherwise alter the equipment in any way that is not expressly recommended by the manufacturer.

When operating an aerial work platform equipped with optional components, observe all safety precautions set forth by the manufacturer, as well as all Government codes and regulations regarding this equipment and its components.

Consult rental agency or manufacturer regarding which optional components may be installed on the aerial work platform. For questions regarding safe use, contact Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com.

MATERIAL LIFT HOOK

If an aerial work platform is equipped with the Material Lift Hook option, several steps need to be performed to change from the Platform to the Lift Hook. Use the follow procedure to make this change.

- Unwind the platform (upper) control box's six foot (6') cord from the cord wrap on the platform.
- Disconnect the platform (upper) control box's **PLUG**; from the **LOAD SENSE MODULE**, located on the **PLATFORM MOUNT**. Refer to Figure 7-1

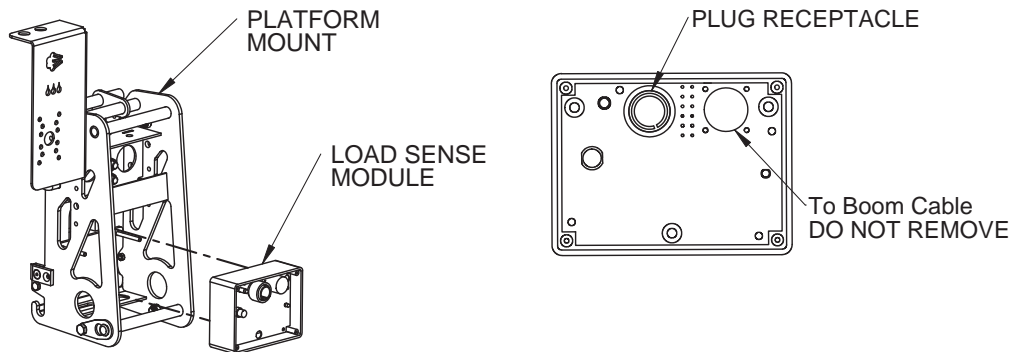


Figure 7-1. Disconnect Plug from Load Sense Module

- Remove the platform (upper) control box from the platform by releasing the **LATCH** on the back of the control box; take the platform (upper) control box to the ground (lower) control station. Refer to Figure 7-2.

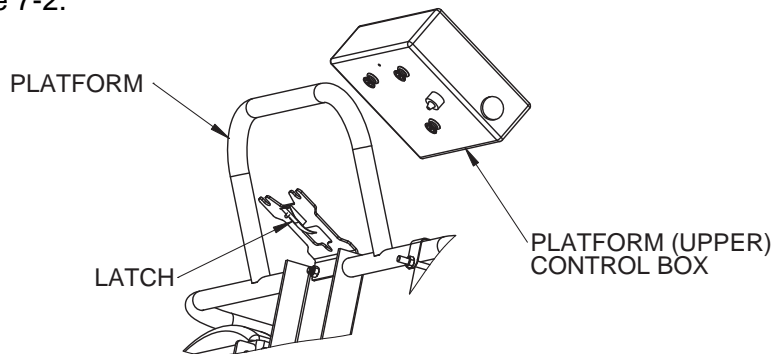


Figure 7-2. Remove Platform (Upper) Control Box.

- Disconnect the electric **LOOPBACK PLUG** from the receptacle on the bottom right of the ground (lower) control box. Refer to Figure 7-3

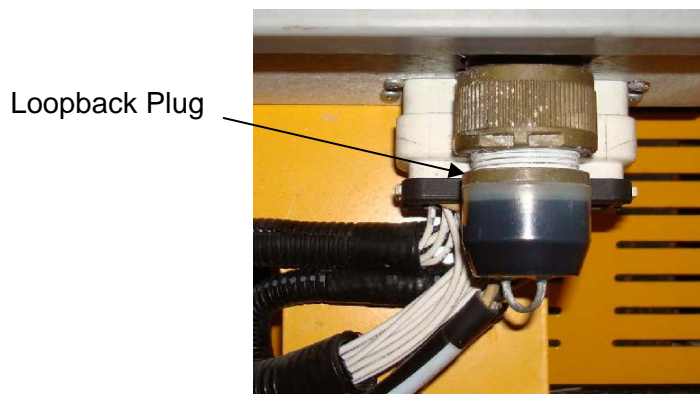


Figure 7-3. Loopback plug

MATERIAL LIFT HOOK (CONTINUED)

- Insert the **PLUG** from the platform (upper) control panel into the receptacle on the bottom right of the ground (lower) control box (replacing the **LOOPBACK PLUG** from the previous step).
- Take the **LOOPBACK PLUG** and insert it into the open receptacle on the **LOAD SENSE MODULE**, located on the **PLATFORM MOUNT**.

NOTE: If the loopback plug is not inserted into the Load Sense, the Emergency Stop circuit will not be complete, and the aerial work platform will not function.

- Firmly secure the platform to prevent equipment damage.
- Remove the **CLEVIS PIN** holding the platform to the **PLATFORM MOUNT**. Refer to Figure 7-4.
- Remove the platform from the **PLATFORM MOUNT** by lifting it up and away from the **PLATFORM MOUNT**.

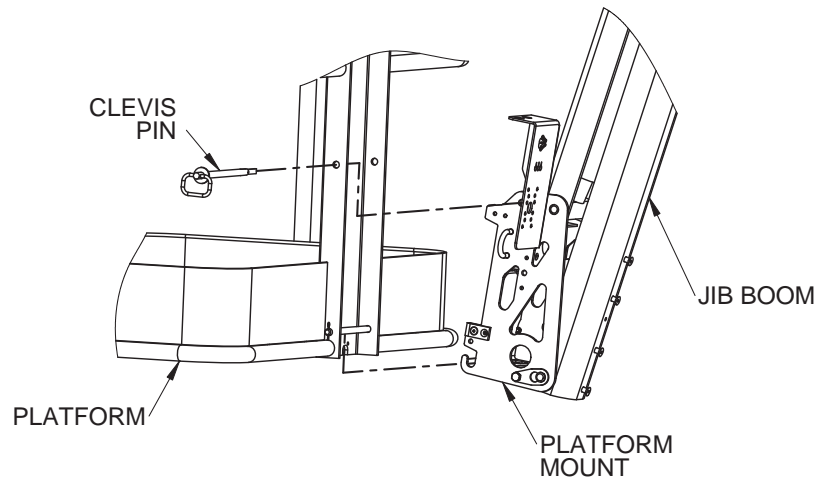


Figure 7-4. Platform Removal

- Attach the material lifting hook to the mounting bracket on the **PLATFORM MOUNT** and re-insert the **CLEVIS PIN**. Refer to Figure 7-5.

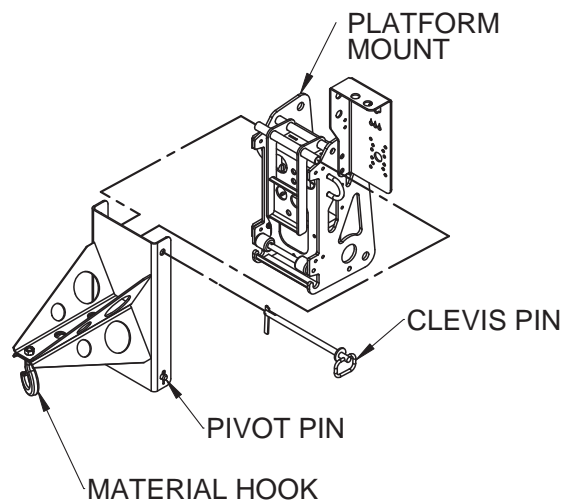


Figure 7-5. Material Lifting Hook Installation

MATERIAL LIFT HOOK (CONTINUED)

- On the ground (lower) control panel, turn the key switch (1) clockwise to the platform control (1b) icon. This provides for optimal control of the lift by using the platform (upper) control panel, and also allows for remote access.
- Reverse this procedure to reattach the Work Platform.

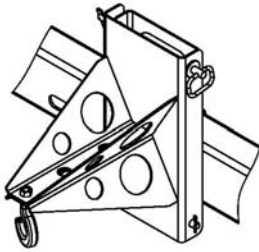


Figure 7-6. Material Lift “Stowed” Position

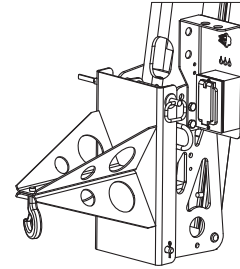


Figure 7-7. Material Lift “In Use” Position

NOTE: To recalibrate the load sense, refer to the “Overload Protection Calibration Procedure” located in the “Equipment Maintenance” section of this manual.

WARNING

ALWAYS observe the manufacturer’s weight lifting limitations when using the material lifting hook. **ALWAYS** use lifting straps or wire rope slings that are rated at a minimum 500 lb (227kg) lifting capacity. **NEVER** stand beneath an elevated load or position an elevated load above personnel. Falling objects could cause death or serious injury.

DANGER

This aerial work platform is not insulated for use near electrical power lines and **DOES NOT** provide protection from contact with or close proximity to any electrically charged conductor. Operator must maintain safe clearances at all times and always allow for platform movement such as wind-induced sway. Refer to Table 1-1 for minimum safe approach distances between the aerial work platform and electrical power lines.

PLATFORM ROTATOR

The optional platform rotator allows the operator to rotate the elevated work platform 90° around a vertical axis by actuating a rotator handle found below the platform control panel. Refer to Figure 6-2.

To operate manual platform rotator, turn the rotator handle in the direction of desired rotation (clockwise or counterclockwise). Motion continues in the desired direction until rotator handle is released or the platform reaches a safe travel limit.

WARNING

Installation of a Manual Platform Rotator may reduce the rated load limit of the work platform. Follow all manufacturer's recommendations and safety precautions when operating an aerial work platform equipped for platform rotation.

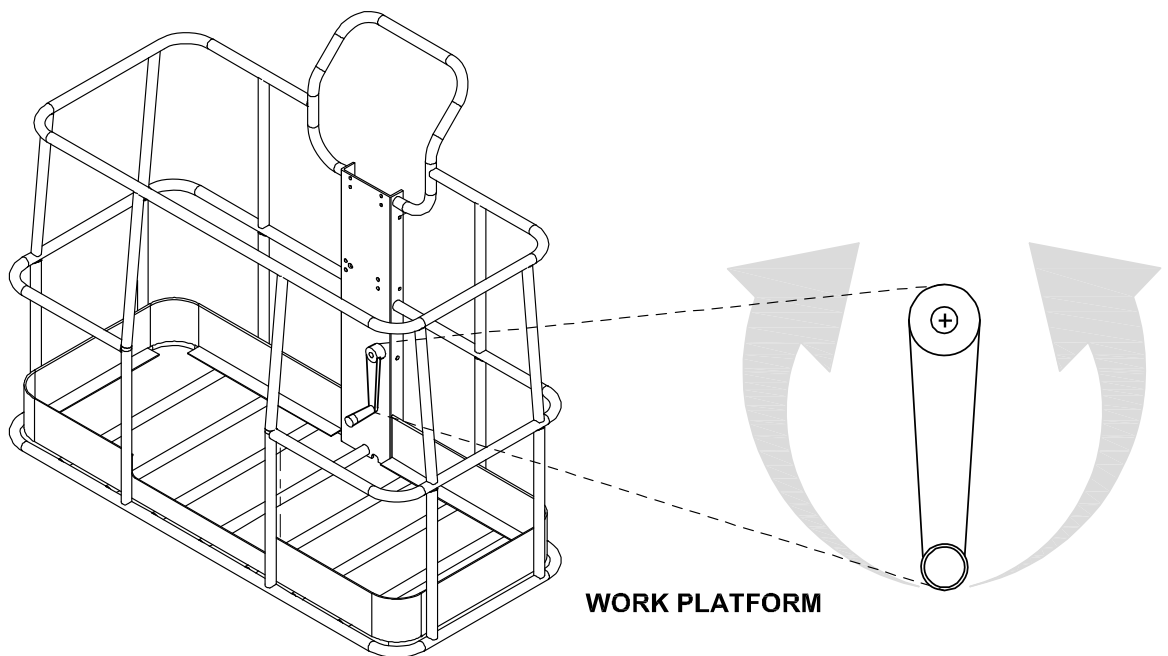
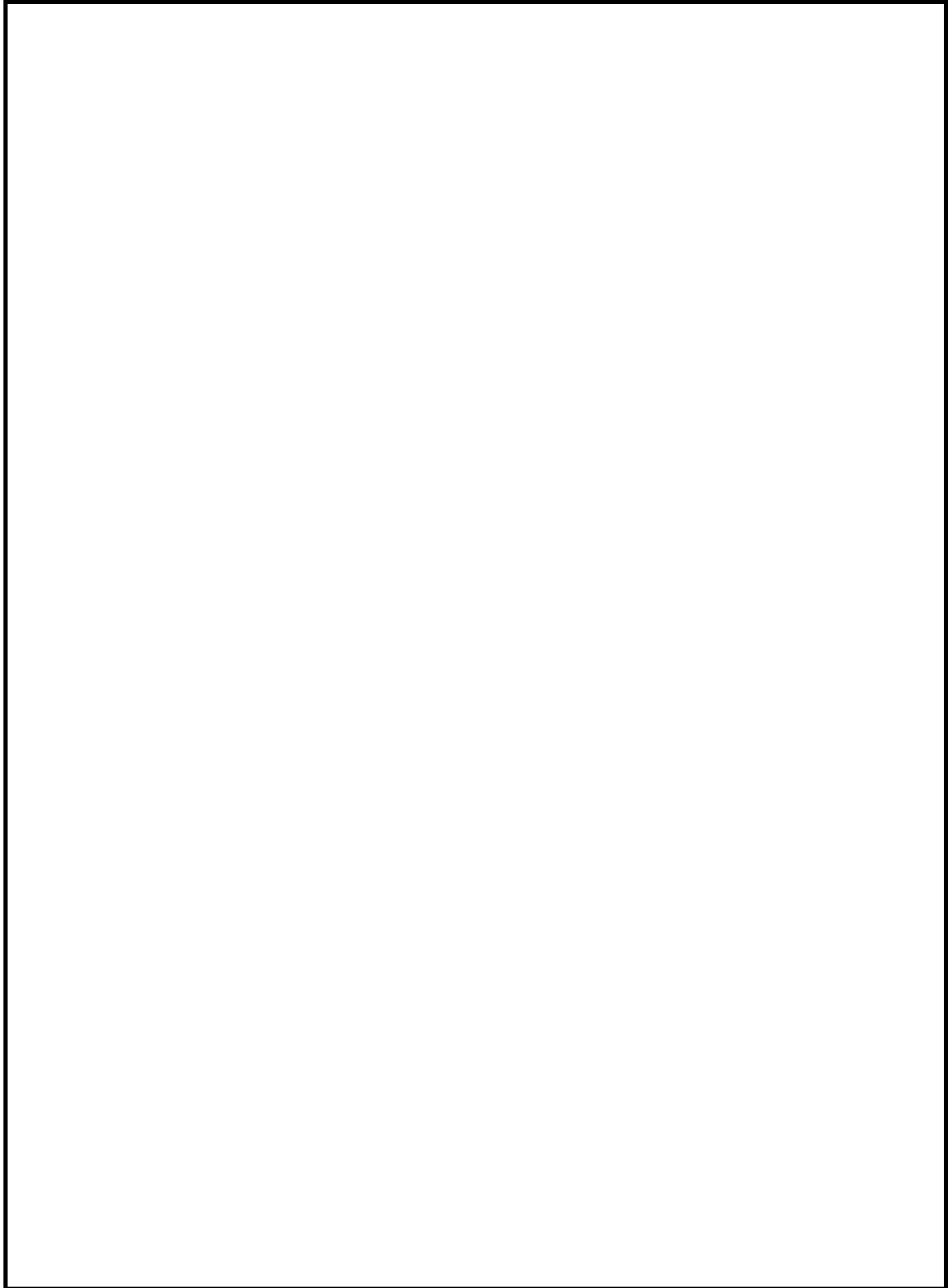


Figure 7-8. Manual Platform Rotator



8 MATERIAL SAFETY

The following Material Safety Data Sheets describe the correct procedures for the safe handling of chemical components within the Model 45XA HLA 16 PX Self-Propelled Aerial Work Platform, as well as any potential health and safety hazards related to these chemicals. Material Safety Data Sheets are included here in accordance with applicable federal and state regulations. Read and observe all safety precautions. Maintain awareness of potential health and safety hazards.

MATERIAL SAFETY DATA SHEET LEAD ACID BATTERIES, WET, FILLED WITH ACID – UN 2794

CHEMTREC CODE: C677

SECTION I: GENERAL INFORMATION

Manufacturers Name: Crown Battery Mfg. Company
Street Address: 1445 Majestic Drive
City, State, Zip: Fremont, Ohio 43420
Phone Number: 419 334-7181
Revision Date: 03/01/08

For Chemical Emergency
Spill Leak Fire Exposure or Accident
Call CHEMTREC Day or Night
DOMESTIC NORTH AMERICA 800-424-9300
INTERNATIONAL, CALL 703-527-3887
(collect calls accepted)

SECTION II: MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS	PERCENT	OSHA PEL	ACGIH TLV	OTHER LIMITS	CAS NUMBER
Hazardous Components					
1% or greater					
Carcinogens 0.01 % or greater					
METALLIC METAL ALLOY	25.5%	0.05mg/m3	.05 mg/m3	NONE	7439-92-1
LEAD SULFATES	18.2%	0.05mg/m3	.05 mg/m3	NONE	7439-92-1
LEAD OXIDES	18.0%	0.05mg/m3	.05 mg/m3	NONE	7439-92-1
POLYPROPYLENE CASE MTL	6.4%				
SEPARATORS	3.5%				
SULFURIC ACID (H2SO4)	5.2%	1.0 mg/m3	1.0 mg/m3	NONE	7664-93-9
WATER	19.2%				

SECTION III: PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling Point	Approximately 203F	Vapor Density:	Greater than 1
Vapor Pressure	14 @ 37% @ 80 F	Melting Point:	-35 F to +10.6 F
Solubility in Water	100%	Water Reactive	Yes, Produces Heat
Specific Gravity	1.245 - 1.295 Battery Electrolyte		
Appearance & Odor:	Clear Liquid with Sharp Pungent Odor		

SECTION IV: FIRE AND EXPLOSION HAZARD DATA:

Flash Point: Not Combustible NFPA WARNING: 1
Auto Ignition Temperature N/A Flammability Limits in Air % by Volume: N/A
Extinguishing Media: Dry Chemical Carbon Dioxide, Water Fog, Water
Special Fire Fighting Procedures: Sulfuric Acid Fumes, Sulfur Dioxide Gas or Carbon Monoxide may be released when acid decomposes. Wear NIOSH approved self contained breathing apparatus.

Unusual Hazards: Water applied to sulfuric acid generates heat and causes acid to spatter. Wear full-cover acid resistant clothing. Sulfuric acid reacts violently with metals, nitrates, chlorates, carbides, fulminates, picrates and other organic materials. Reacts with most metals to yield explosive/flammable hydrogen gas. This reaction is intensified when sulfuric acid is diluted with water to form battery electrolyte.

MATERIAL SAFETY DATA SHEET

LEAD ACID BATTERIES, WET, FILLED WITH ACID - UN 2794 (CONT.)

SECTION V: REACTIVITY DATA

Stability: STABLE

NFPA WARNING: 0

CONDITIONS TO AVOID: Charging and over-charging without proper ventilation.

Incompatibility: AVOID COMBUSTIBLES, ORGANIC MATERIALS, AND STRONG REDUCING AGENTS.

Hazardous Decomposition Products:

SULFUR TRIOXIDE, CARBON MONOXIDE, SULFURIC ACID FUMES AND
SULFUR DIOXIDE. Hydrogen, Arsine, Stibene with over charging.

Hazardous Polymerization: Should not occur

SECTION VI – HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: Inhalation - Yes
Skin Yes
Ingestion Yes

NFPA WARNING: 3

HEALTH HAZARDS - Acute: Eyes, Skin, Respiratory System & Digestive System
Chronic: Eyes, Skin, Respiratory System & Digestive System

Exposure to Lead Compounds can occur only when product is heated, oxidized or other-wised processed or damaged to create dust vapor or fume. Lead is a systemic poison.

Carcinogenicity - NTP: No

Carcinogenicity - IARC: Yes (Group 2 B *94-4*

Carcinogenicity -OSHA: No

Signs and Symptoms of Exposure: Irritation of Exposed Area, Burns, and Respiratory Problems
No possibility of over exposure of lead will occur unless battery is destroyed.

MEDICAL CONDITIONS GENERALLY:

Aggravated by Exposure: Exposure to acid mist may cause lung damage & aggravate pulmonary conditions.

EMERGENCY FIRST AID PROCEDURES

_ Seek medical assistance for further treatment, observation and support if necessary.

Eye Contact: Wash with copious quantities of cool water for at least 15 minutes.

Skin Contact: Flush area with large amounts of cool water for at least 15 minutes.

Inhalation: Remove to fresh air, if breathing is difficult – give oxygen.

Ingestion: Give milk to drink. DO NOT INDUCE VOMITING, CALL PHYSICIAN.

MATERIAL SAFETY DATA SHEET

LEAD ACID BATTERIES, WET, FILLED WITH ACID-UN 2794 (CONT.)

SECTION VII: SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

STEPS TO TAKE IF MATERIALS RELEASED:

Wash area with water, neutralize with lime, caustic soda or sodium bicarbonate. If released on soils: work neutralizing materials into top three inches of soils.

Neutralizing Agent: Lime, Caustic Soda, or Sodium Bicarbonate.

Waste Disposal Method: Neutralize and dispose of residue in accordance with federal, state and local regulation for chemical and toxic metals disposal.

Lead and Sulfuric Acid is packed into a container to form the lead-acid battery. Since all containers are subject to leakage and breakage, employees who work in operations where they handle batteries in containers are potentially exposed to hazardous chemicals, and, therefore, need access to information as well as training.

SECTION VI II- SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

Respiratory Protection: Sulfuric Acid Mist-Mask with filter approved for acid mist.

Ventilation: Local exhaust: Room air change four times per hour.

Protective Gloves: Rubber

Eye Protection: Goggles, Face Shield

Other Protective Equipment: Rubber Apron, Acid Resistant Clothing Recommended

Work Hygienic Practices: Wash thoroughly after handling

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

COMPONENTS

METALLIC METAL ALLOY	25.5%
LEAD SULFATES	18.2%
LEAD OXIDES	18.0%
POLYPROPYLENE CASE MTL	6.4%
SEPARATORS	3.5%
SULFURIC ACID (H ₂ SO ₄)	5.2%
WATER	19.2%

MATERIAL SAFETY DATA SHEET

LEAD ACID BATTERIES, WET, FILLED WITH ACID - UN 2794 (CONT.)

SECTION X – STABILITY AND REACTIVITY

Stability: STABLE

CONDITIONS TO AVOID: Charging and over-charging without proper ventilation.

Incompatibility: AVOID COMBUSTIBLES, ORGANIC MATERIALS, AND STRONG REDUCING AGENTS.

SECTION XI: TOXICOLOGICAL INFORMATION

HEALTH HAZARDS - Acute: Eyes, Skin, Respiratory System & Digestive System
Chronic: Eyes, Skin, Respiratory System & Digestive System

Signs and Symptoms of Exposure: Irritation of Exposed Area, Burns, and Respiratory Problems
No possibility of over exposure of lead will occur unless battery is destroyed.

MEDICAL CONDITIONS GENERALLY:

Aggravated by Exposure: Exposure to mist may cause lung damage & aggravate pulmonary conditions.

SECTION XII – ECOLOGICAL INFORMATION

All care should be taken to protect the environment from any adverse impact by lead-acid batteries or from the batteries ingredients.

SECTION XIII – DISPOSAL CONSIDERATION

Lead-Acid Batteries are restricted land disposal objects. All spent lead-acid batteries should be properly Recycled to a permitted Secondary Lead Smelter.

All battery parts should be properly recycled.

No whole spent lead-acid battery should be land-filled or placed in house hold garbage.

MATERIAL SAFETY DATA SHEET

LEAD ACID BATTERIES, WET, FILLED WITH ACID - UN 2794 (CONT.)

SECTION XIII – TRANSPORT INFORMATION

Electric storage batteries containing electrolyte acid or alkaline corrosive battery fluid must be completely protected so that short circuits will be prevented.

DOT SHIPPING NAME: LEAD-ACID BATTERIES, WET, FILLED WITH ACID

DOT CLASS: 8

DOT ID NUMBER: UN2794

DOT PACKING GROUP: III

DOT LABEL REQUIREMENTS: CORROSIVE

SECTION XV – REGULATION INFORMATION

REGULATORY INFORMATION: Those ingredients in lead-acid batteries listed above are not subject to the reporting requirements of 313 of Title III of the Superfund Amendments and Re-authorization Act, if the lead acid batteries are in storage and have no potential to leak, spill or break during normal storage prior to use.

DOT REGULATIONS: 49 CFR 173.159

EPA REGULATIONS: 40 CFR 266.80

OSHA REGULATIONS: 29 CFR 1910.1200

MATERIAL SAFETY DATA SHEET

POWERFLOW™ AW HVI HYDRAULIC OIL



Powerflow™ AW HVI Hydraulic Oil (All Grades)

Material Safety Data Sheet

1. Product and Company Identification

Product Name:	Powerflow™ AW HVI Hydraulic Oil (All Grades)
MSDS Number:	814636
Synonyms:	Powerflow™ AW HVI Hydraulic Oil 32 Powerflow™ AW HVI Hydraulic Oil 46 Powerflow™ AW HVI Hydraulic Oil 68
Intended Use:	Hydraulic Fluid
Manufacturer/Supplier:	ConocoPhillips Lubricants 600 N. Dairy Ashford, 2W900 Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
Customer Service:	U.S.: 800-822-6457 or International: +1-83-2486-3363
Technical Information:	800-766-0050
MSDS Information:	Internet: http://w3.conocophillips.com/NetMSDS/

2. Hazards Identification

Emergency Overview

This material is not considered hazardous according to OSHA criteria.

NFPA



Appearance: Clear and bright
Physical Form: Liquid
Odor: Petroleum

Potential Health Effects

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Contact may cause mild skin irritation including redness and a burning sensation. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available on acute toxicity.

Ingestion (Swallowing): Low degree of toxicity by ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Pre-Existing Medical Conditions: Conditions which may be aggravated by exposure include skin disorders.

See Section 11 for additional Toxicity Information.

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MATERIAL SAFETY DATA SHEET

POWERFLOW™ AW HVI HYDRAULIC OIL (CONTINUED)

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Date of Issue: 14-Nov-2008

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3. Composition / Information on Ingredients

Component	CASRN	Concentration*
Lubricant Base Oil (Petroleum)	VARIOUS	>90
Additives	PROPRIETARY	<10

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Notes to Physician: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Acute aspirations of large amounts of oil-laden material may produce a serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

5. Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 0 Flammability: 1 Instability: 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. Accidental Release Measures

MATERIAL SAFETY DATA SHEET

POWERFLOW™ AW HVI HYDRAULIC OIL (CONTINUED)

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Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

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Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.

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Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

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Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

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Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

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6. Accidental Release Measures

9 ANSI REPRINT

The following sections are reprinted from the ANSI A92.5-2006 code in effect at the time of manufacture and govern the safe use of the Haulotte Group.

It is the responsibility of all owners and operators of this machine to read, understand and obey the recommendations set forth by the ANSI code.

Permission to reprint this material has been granted by the Scaffold Industry Association.

5 Responsibilities of Dealers.

5.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the training of operators, in maintenance, application, safety provisions and operation of the aerial platform with due consideration of the knowledge that the unit will be carrying personnel.

5.2 Manuals.

5.2.1 Machine Manual(s). Dealers shall keep and maintain a copy(ies) of the:

- (1) Operating manual.
- (2) Maintenance manual.
- (3) Parts manual.
- (4) Repair manual.

The operating manual and maintenance manual shall be provided with each rental, lease, or sale delivery and shall be stored in the weather resistant storage compartment on the aerial platform. Manual(s) are considered an integral part of the aerial platform and are vital to communicate necessary safety information to owners, users and operators. In addition, repair and parts manuals should be provided with each sale delivery.

5.2.2 Manual of Responsibilities. The current Manual of Responsibilities for dealers, owners, users, operators, lessors, lessees and brokers of boom-supported elevating work platforms shall be provided and stored in the weather resistant storage compartment.

5.3 Pre-delivery Preparation. Aerial platforms shall be inspected, serviced and adjusted to manufacturer's requirements prior to each delivery by sale, lease, or rental.

5.4 Maintenance, Inspection and Repair.

5.4.1 Maintenance. When a dealer accomplishes preventive maintenance on the aerial platform, it shall be in accordance with the manufacturer's recommendations and based on the environment and severity of use.

5.4.2 Inspection. When the dealer accomplishes frequent and annual inspections, they shall be in accordance with the manufacturer's manuals and instructions.

5.4.3 Repairs. Repairs accomplished to correct malfunctions and problems shall be in accordance with the manufacturer's manuals and instructions.

5.5 Maintenance Safety Precautions.

Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable:

- (1) Power plant stopped and starting means rendered inoperative.
- (2) All controls in the "Off" position and all operating systems secured from inadvertent motion by brakes, blocks, or other means.

- (3) Boom and platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping.
- (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components.
- (5) Safety props or latches installed where applicable as prescribed by the manufacturer.

5.6 Replacement Parts. When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

5.7 Training. The dealer shall offer appropriate training to facilitate owners, users, and operators to comply with requirements set forth in this standard regarding the inspection, maintenance, use, application, and operation of the aerial platform.

5.8 Familiarization upon Delivery. Upon delivery by sale, lease, rental or any form of use, the dealer shall have the responsibility with the person designated by the receiving entity for accepting the aerial platform to:

- (1) Identify the weather resistant compartment (for manual(s) storage).
- (2) Confirm that the manual(s), as specified by the manufacturer, are on the aerial platform.
- (3) Review control functions.
- (4) Review safety devices specific to the model aerial platform being delivered.

5.9 Dealer as User. Whenever a dealer directs personnel to operate an aerial platform (loading, unloading, inspecting, sales demonstrations, or any form of use), the dealer shall assume the responsibilities of users as specified in Section 7 of this standard. All personnel authorized to operate the aerial platform shall have been:

- (1) Trained.
- (2) Familiarized with the aerial platform to be operated.
- (3) Made aware of the responsibilities of operators as outlined in Section 8 of this standard.

5.10 Assistance to Owners and Users. If a dealer is unable to answer an owner's or user's question(s) relating to rated capacity, intended use, maintenance, repair, inspection, or operation of the aerial platform, the dealer shall obtain the proper information from the manufacturer or a qualified person if the manufacturer is no longer in business and provide that information to the owner or user.

5.11 Record Retention and Dissemination.

5.11.1 Record Retention. The dealer shall retain the following records for at least four years:

- (1) Name and address of the purchaser of each aerial platform by serial number and date of delivery.
- (2) Records of the pre-delivery preparation performed prior to each delivery.
- (3) Records of frequent and annual machine inspections accomplished .

- (4) Records of repairs accomplished to correct malfunctions and problems.
- (5) Name of the person(s) trained.
- (6) Name of the person(s) providing the training.
- (7) Date of Training.
- (8) Name of person(s) receiving familiarization with the aerial platform upon each delivery unless this individual has been provided with familiarization on the same model, or one having characteristics consistent with the one being delivered, within the prior 90 days.

5.11.2 Proof of training. The dealer should provide trainees who successfully complete training a means to evidence they are trained.

The dealer shall provide such proof if requested by the trainee. The document evidencing training shall include the following information:

- (1) Name of trainee.
- (2) Name of entity providing training or retraining.
- (3) Name of trainer(s).
- (4) Clear identification that training covered Boom-Supported Elevating Work Platforms.
- (5) Date of training.

5.11.3 Record dissemination. Upon request, the dealer shall provide the following information:

- (1) To the owner of the aerial platform, a copy of frequent or annual inspections performed.
- (2) To the owner of the aerial platform, a copy of repairs accomplished.
- (3) To a user, proof of training for an operator, including name of trainer and date of training.
- (4) To a user, the name of the person(s) receiving familiarization upon delivery of the aerial platform.

5.12 Modifications. Modification, alteration or remanufacture of an aerial platform shall be made only with prior written permission of the manufacturer.

5.13 Manufacturer's safety bulletins. The dealer shall comply with safety related bulletins as received from the manufacturer.

5.14 Responsibilities upon sale. When the aerial platform is sold, the dealer:

- (1) Shall, upon delivery, ensure the operating and maintenance manuals are conveyed to the owner.
- (2) Shall, upon delivery, provide a copy of the current Manual of Responsibilities.
- (3) Should, within 60 days of sale, provide repair and parts manuals.
- (4) Shall, within 60 days of the sale, notify the manufacturer or its successor (if existing) of the sale, providing the full name and address of the purchaser.
- (5) Should, if the aerial platform is used, accomplish an annual machine inspection prior to delivery and provide a copy to the purchaser within 60 days of the sale.
- (6) Shall, upon delivery, familiarize the person designated by the receiving entity with the aerial platform being acquired.

6 Responsibilities of Owners.

6.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of the responsibilities

of owners with due consideration of the knowledge that the aerial platform will be carrying personnel.

6.2 Responsibilities Upon Purchase. Upon purchase of the aerial platform, the buyer:

- (1) Shall ensure the operating and maintenance manuals have been received.
- (2) Should acquire repair and parts manuals within sixty days (60) of acquisition.
- (3) Shall within sixty days (60) of acquisition of the aerial platform provide the manufacturer with the full name and address of the buyer along with the model and serial number of the aerial platform acquired.
- (4) Shall, if the aerial platform is used, ensure the frequent inspection and annual inspections are current.
- (5) Shall become familiar with and conform to the responsibilities of owners as set forth in the Manual of Responsibilities for Boom-Supported Elevating Work Platforms.

6.3 Manuals.

6.3.1 Machine Manual(s). Owners shall provide a copy(ies) of the operating and maintenance manual(s) with each rental, lease, or sales delivery by ensuring they are properly stored in the weatherproof compartment that is part of the aerial platform. The manual(s) is considered an integral part of the aerial platform and is vital to communicate necessary safety information to owners, users and operators. In addition, repair and parts manual(s) should be provided with each sale delivery.

6.3.2 Manual of Responsibilities. The current Manual of Responsibilities for dealers, owners, users, operators, lessors, lessees and brokers of boom supported elevating work platforms shall be provided and stored in the weather resistant storage compartment.

6.4 Maintenance, Inspection and Repair.

6.4.1 Maintenance. The owner of an aerial platform shall arrange that the maintenance specified in this standard is properly performed on a timely basis. The owner shall establish a preventive maintenance program in accordance with the manufacturer's recommendations and in accordance with the environment and severity of use of the aerial platform.

6.4.2 Inspection. The owner shall arrange for frequent and annual inspections to be performed in accordance with the recommendations of the manufacturer. All malfunctions and problems identified in the inspection shall be corrected before the aerial platform is returned to service.

6.4.3 Repairs. When the aerial platform is damaged or in need of repair, all malfunctions and problems identified shall be corrected before the aerial platform is returned to service.

6.5 Pre-delivery Preparation. Aerial platforms shall be inspected, serviced, and adjusted in accordance with the manufacturer's specifications prior to each delivery by sale, lease, or rental.

6.6 Frequent Inspection. The owner of an aerial platform shall ensure that a frequent inspection is performed in accordance with the manufacturer's instructions, on an aerial platform:

- (1) That was purchased used. This inspection shall be accomplished unless it is determined that the frequent and annual inspections are current.
- (2) That has been in service for three months or 150 hours, whichever comes first.

- (3) That has been out of service for a period longer than 3 months.

The inspection shall be made by a person qualified as a mechanic on the specific type aerial platform or one having similar design characteristics. The inspection shall be in accordance with items specified by the manufacturer for a frequent inspection and shall include, but not limited to the following:

- (1) All functions and their controls for speed(s), smoothness, and limits of motion.
- (2) Lower controls including the provisions for overriding of upper controls.
- (3) All chain and cable mechanisms for adjustment and worn or damaged parts.
- (4) All emergency and safety devices.
- (5) Lubrication of all moving parts, inspection of filter element(s), hydraulic oil, engine oil, and coolant as specified by the manufacturer.
- (6) Visual inspection of structural components and other critical components such as fasteners, pins, shafts, and locking devices.
- (7) Placards, warnings and control markings.
- (8) Items specified by the manufacturer.
- (9) Emergency lowering means.

6.7 Annual Inspection. The owner of an aerial platform shall ensure that an annual inspection is performed on the aerial platform no later than thirteen (13) months from the date of the prior annual inspection. The inspection shall be made by a person(s) qualified as a mechanic on the specific type of aerial platform or one having similar design characteristics. The inspection shall be in accordance with items specified by the manufacturer for an annual inspection. The owner shall not place the aerial platform into service until all malfunctions and problems have been corrected.

6.8 Maintenance safety precautions. Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable:

- (1) Power plant stopped and starting means rendered inoperative.
- (2) All controls in the "Off" position and all operating systems secured from inadvertent motion by brakes, blocks, or other means.
- (3) Elevating assembly and platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping.
- (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components.
- (5) Safety props or latches installed where applicable as prescribed by the manufacturer.
- (6) Precautions specified by the manufacturer.

6.9 Replacement parts. When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

6.10 Maintenance training. The owners shall train their maintenance personnel in inspection and maintenance of the aerial platform in accordance with the manufacturer's recommendations and Sections 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9 and 6.11 of this standard and with the manufacturer's recommendations.

6.11 Training.

6.11.1 Operator training. Whenever an owner directs or authorizes an employee to operate an aerial platform, (loading, unloading, inspecting or any form of use) the

owner shall assume the responsibilities of the user as specified in Section 7 of this standard and shall ensure the person has been:

- (1) Trained.
- (2) Familiarized with the aerial platform to be operated.
- (3) Made aware of the responsibilities of operators as outlined in Section 8 of this standard.

6.11.2 Assistance to user. Upon request of the user, when an owner sells, leases, rents or provides an aerial platform for any form of beneficial use, the owner at that time shall offer to do training or advise the user where training may reasonably be secured.

6.12 Familiarization upon delivery. Upon delivery for lease, rental or any form of beneficial use, the owner shall have the responsibility with the person designated by the receiving entity for accepting the aerial platform to:

- (1) Identify the weather resistant compartment (for manual(s) storage).
- (2) Confirm all manuals, as specified by the manufacturer, are on the aerial platform.
- (3) Review control functions with the operator or person(s) designated by the user.
- (4) Review safety devices specific to the model aerial platform being delivered.

6.13 Operation. When an owner operates an aerial platform, the owner shall have the responsibilities of users as specified in Section 7 of this standard and his operating personnel shall have responsibilities of operators as specified in Section 8 of this standard.

6.14 Assistance to users and operators. If an owner is unable to answer a user's or operator's question(s) relating to rated capacity, intended use, maintenance, repair, inspection, or operation of the aerial platform, the owner shall obtain the proper information from the dealer or manufacturer and provide that information to the user or operator.

6.15 Record Retention and Dissemination.

6.15.1 Record Retention. The owner shall date and retain the following records for at least 4 years:

- (1) Name and address of the purchaser of each aerial platform by serial number and date of delivery.
- (2) Written records of the frequent and annual inspections performed. The record shall include deficiencies found, corrective action accomplished and identification of the person(s) performing the inspection and repairs.
- (3) Written records of repairs accomplished on the aerial platform. The records shall include corrective action accomplished and identification of the person(s) performing the repairs.
- (4) Pre-delivery preparation performed prior to each delivery.
- (5) Name of the person(s) trained.
- (6) Name of person(s) providing training.
- (7) Name of person(s) receiving familiarization upon each delivery unless the individual has been provided with familiarization on the same model, or one having characteristics consistent with the one being delivered, within the prior 90 days.
- (8) Name of person(s) providing familiarization upon delivery.

6.15.2 Proof of Training. Owners providing training should provide successful trainees a means to evidence their training and shall provide such proof if requested by the

trainee. The document evidencing training shall include the following information:

- (1) Name of entity providing training or retraining.
- (2) Name of trainer(s).
- (3) Clear identification that training covered Boom-Supported Elevating Work Platforms.
- (4) Date of training.
- (5) Name of trainee.

6.15.3 Record dissemination. Upon request, an owner accomplishing training and/or familiarization shall provide the following:

- (1) To a user, proof of training for an operator, including name of trainer and date of training.
- (2) To a user, the name of the person(s) receiving familiarization upon delivery of the aerial platform.

6.16 Modifications. The owner shall not modify or concur in modification or alteration to the aerial platform without the modifications being approved and certified in writing by the manufacturer.

6.17 Manufacturer's Safety Bulletins. The owner shall comply with safety related bulletins as received from the manufacturer or dealer.

6.18 Responsibilities upon Sale. Upon sale of the aerial platform, the seller:

- (1) Shall, upon delivery, ensure the operating and maintenance manuals are conveyed to the new owner.
- (2) Shall, upon delivery, provide a copy of the current Manual of Responsibilities to the new owner.
- (3) Should provide repair and parts manuals to the new owner.
- (4) Shall, upon the request of the new owner, offer training or advise where training may reasonably be obtained.

7 Responsibilities of Users.

7.1 Basic principles. The information in this standard must be supplemented by good job management, safety control, and the application of sound principles of safety, training, inspection, maintenance, application and operation, consistent with all data available regarding the parameters of intended use and expected environment. Since the user has direct control over the application and operation of aerial platforms, conformance with good safety practices in this area is the responsibility of the user and the operating personnel, including the operator. Decisions on the use and operation of the aerial platform must always be made with due consideration for the fact that the aerial platform will be carrying personnel whose safety is dependent on those decisions.

7.2 Manuals.

7.2.1 Machine manuals. Users shall keep and maintain a copy (ies) of the operating and maintenance manual(s) in the weather resistant storage compartment provided by the manufacturer. The manual(s) is considered an integral part of the aerial platform and is vital to communicate necessary safety information to users and operators.

7.2.2 Manual of Responsibilities. The current Manual of Responsibilities for dealers, owners, users, operators, lessors, lessees and brokers of boom supported elevating work platforms shall be provided and stored in the weather resistant storage compartment.

7.3 Inspection and Maintenance. Users shall inspect and maintain the aerial platform as required to ensure proper operation. The frequency of inspection and maintenance

shall be determined by the manufacturer's recommendations and be compatible with operating conditions and the severity of the operating environment. Aerial platforms that are not in proper operating condition shall be immediately removed from service until repaired. Repairs shall be made by a qualified person and the repairs shall be in conformance with the manufacturer's recommendations.

7.3.1 Frequent Inspection. Users of an aerial platform shall ensure that frequent inspections are conducted as outlined in Section 6.6 of this standard.

7.3.2 Annual Inspection. Users of an aerial platform shall ensure that annual inspections are conducted as outlined in Section 6.7 of this standard.

7.3.3 Pre-start inspection. Before use each day or at the beginning of each shift, the aerial platform shall be given a visual inspection and functional test including, but not limited to, the following:

- (1) Operating and emergency controls.
- (2) Safety devices.
- (3) Air, hydraulic and fuel system leaks.
- (4) Cables and wiring harness.
- (5) Loose or missing parts.
- (6) Tires and wheels.
- (7) Placards, warnings, control markings, and operating manual(s).
- (8) Outriggers, stabilizers, extendable axles and other structures.
- (9) Guardrail system.
- (10) Items specified by the manufacturer.

7.3.4 Maintenance Safety Precautions. Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable:

- (1) Power plant stopped and starting means rendered inoperative.
- (2) All controls in the "Off" position and all operating systems secured from inadvertent motion by brakes, blocks, or other means.
- (3) Boom and platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping.
- (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components.
- (5) Safety props or latches installed where applicable as prescribed by the manufacturer.
- (6) Precautions specified by the manufacturer.

7.4 Replacement Parts. When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

7.5 Maintenance Training. The user shall ensure only qualified personnel inspect and maintain the aerial platform in accordance with the manufacturer's recommendations and Section 7.3, 7.4 and 7.6 of this standard and with the manufacturer's recommendations.

7.6 Operator Training and Retraining. Whenever a user directs or authorizes an individual to operate an aerial platform, the user shall ensure that the person has been:

- (1) Trained before being assigned to operate the aerial platform.
- (2) Familiarized with the aerial platform to be operated.
- (3) Made aware of responsibilities of operators as outlined in Section 8 of this standard.

- (4) Retrained, if necessary, based on the user's observation and evaluation of the operator.
- 7.6.1 Trainee Records.** A record of the trainee's aerial platform instruction shall be maintained by the user for at least four (4) years.
- 7.7 Familiarization Before Use.** The user shall permit only properly trained personnel to operate an aerial platform. The user shall ensure that before use the operator is familiar with the model of the aerial platform to be operated, and specifically:
- (1) Knows where the weather resistant compartment for manual(s) storage is located.
 - (2) Knows the operating and maintenance manuals supplied by the manufacturer are stored in the weather resistant compartment and is familiar with the operating and safety manuals.
 - (3) Understands all control functions, placards and warnings.
 - (4) Is aware of and understands all safety devices specific to the model aerial platform being used.
- 7.8 Work Place Inspection.** Before the aerial platform is used and during use, the user shall check the area in which the aerial platform is to be used for possible hazards such as, but not limited to:
- (1) Drop-offs or holes, including those concealed by water, ice, mud, etc.
 - (2) Slope(s).
 - (3) Bumps and floor obstructions.
 - (4) Debris.
 - (5) Overhead obstructions and electrical conductors.
 - (6) Hazardous locations and atmospheres (reference ANSI/NFPA 505-1996).
 - (7) Inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations.
 - (8) Wind and weather conditions.
 - (9) Presence of unauthorized persons.
 - (10) Other possible unsafe conditions.
- 7.9 Determination of Hazardous Locations.** It shall be the responsibility of the user to determine the hazard classification of the intended location of operation. Aerial platforms operated in hazardous locations shall be approved in accordance with, and of the type required, by ANSI/NFPA 505-1996.
- 7.10 Operator Warnings and Instructions.** The user shall direct personnel operating the aerial platform to be in compliance with the provisions set forth in this standard. The user shall monitor their performance and supervise their work to ensure the use, application, and operation of the aerial platform is in conformance with the provisions set forth in Section 8 of this standard, warn personnel of potential hazards, provide means to protect against identified hazards, and explain the potential consequences of not following proper operating guidelines. Instructions and guidelines regarding proper operation shall include, but not necessarily be limited to the following issues and subjects:
- (1) Fall Protection. Principal fall protection is provided by the guardrail system. The user shall direct and monitor the operator to ensure that all components of the guardrail system are in place. The user shall direct and monitor occupants of the work platform to ensure that they wear a personal fall arrest system to protect against the potential effects of ejection or a fall restraint system to prevent free fall.
 - (a) Election of Systems: The user may elect to use either a restraint or an arrest system.
 1. Fall Restraint Systems – An anchorage, belt or harness and a lanyard which prevent free fall. These systems are arranged to keep occupants in the platform in the event of dynamic forces which might cause ejection.
 - (1.1) Occupants shall use a restraint system to keep the occupant(s) within the platform.
 - (1.2) Restraint systems may include either belts or harnesses and do not include arresting or deceleration devices.
 2. Fall Arrest System – An anchorage, full body harness and a lanyard used to arrest an employee in a fall from an aerial platform. Such systems allow a fall over the guardrail system. The force applied to the body shall be limited to 1800 lbs. (8,000N).
 - (2.1) A fall arrest system shall allow workers to move around the platform but provide a minimum of lanyard slack.
 - (2.2) A fall arrest system for aerial lifts shall include a lanyard, and full body harness. A deceleration device if used will not allow a fall further than that required to arrest the fall without exceeding 1800 lbs. (8,000N) of force on the worker. Fall arrest systems, beyond the anchorage, are not part of the aerial work platform and are to be specified and supplied by the user of the aerial work platform.
 - (2) Slope and grade. The aerial platform shall not be operated in any manner on grades, side slopes or ramps exceeding those for which the aerial platform is rated by the manufacturer.
 - (3) Deployment of stability enhancing means. Outriggers, stabilizers, extendable axles, oscillating axles or other stability enhancing means shall be deployed and locked into place as required by the manufacturer.
 - (4) Guardrail system. Guardrails shall be installed and positioned, and access gates or openings shall be properly closed per the manufacturer's instructions.
 - (5) Distribution of load. The load and its distribution on the platform and any platform extension(s) shall be in accordance with the manufacturer's rated capacity for that specific configuration.
 - (6) Maintaining overhead clearance. The operator shall be instructed to ensure that adequate clearance is maintained from overhead obstructions and energized electrical conductors and parts.
 - (7) Electrocutation hazard. All applicable safety related work practices intended to prevent electric shock covered by the Code of Federal Regulations (CFR) 1910.333 shall be defined and explained to the operator by a qualified person. In particular, such person shall direct the operator commensurate with the operators qualifications to maintain the minimum approach distance (MAD) from energized power lines and covered by CFR1910.333c.
 - (8) Personal protective equipment (PPE). The user shall direct the operator to ensure all personnel on the platform wear personal protective equipment (PPE) as required.
 - (9) Personnel footing. Personnel shall maintain a firm footing on the platform floor while working thereon. Climbing by occupants on the mid-rail or top-rail of the aerial platform is prohibited. The use of planks,

- ladders, or any other devices on the platform for achieving additional height or reach is prohibited.
- (10) Precaution for other moving equipment. When other moving equipment and vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace.
- Warnings such as, but not limited to, flags, roped off areas, flashing lights, and barricades shall be used as appropriate.
- (11) Reporting problems or malfunctions. The user shall direct the operator to immediately report to a supervisor any problem(s) or malfunction(s) that become evident during operation. The user shall ensure all problems and malfunctions that affect the safety of operations are repaired prior to continued use.
- (12) Reporting potentially hazardous locations. The user shall direct the operator to immediately report to a supervisor any potentially hazardous location(s) that become evident during operation.
- (13) Hazardous location operation. Operation of aerial platforms not approved and marked for operation in a hazardous location shall be prohibited.
- (14) Entanglement. Care shall be taken to prevent rope, electric cords, and hoses, etc., from becoming entangled in the aerial platform.
- (15) Capacity limitations. Rated capacities and rated number of occupants shall not be exceeded when loads are transferred to the platform at any height.
- (16) Work area. The user shall direct the operator to ensure the area surrounding the aerial platform is clear of personnel and equipment before lowering the platform.
- (17) Fueling. The engine (if applicable) shall be shut down while fuel tanks are being filled. Fueling shall be done in a well ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.
- (18) Battery charging. Batteries shall be charged in a well ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.
- (19) Improper platform stabilization. The aerial platform shall not be positioned against another object to steady the platform or improve stability.
- (20) Misuse as a crane. The aerial platform shall not be used as a crane.
- (21) Unusual operating support conditions. The aerial platform shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment unless the application is approved in writing by the manufacturer or a qualified person.
- (22) Travel speeds. The user shall direct the operator to limit travel speed according to conditions, including the condition of the support surface, congestion, visibility, slope, location of personnel, and other factors leading to hazards which may cause collision(s) or result in potential injury(ies) to personnel.
- (23) Driving requirements. Before and during driving while the platform is elevated, the user shall direct the operator to:
- (a) Maintain a clear view of the support surface and route of travel.
 - (b) Ensure personnel in the worksite area that may be affected are aware of the movement, communicating and maneuvering the aerial platform as required to protect against personal injury.
 - (c) Maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to ensure safe travel.
 - (d) Maintain a safe distance from overhead obstructions and energized electrical conductors.
- (24) Stunt driving. Stunt driving and horseplay are prohibited.
- (25) Securing the aerial platform. The user shall direct the operator to implement means provided to protect against use by an unauthorized person(s).
- (26) Altering safety devices. Interlocks or other safety devices shall not be altered or disabled.
- (27) Snagged platform. If the platform or elevating assembly becomes caught, snagged, or otherwise prevented from normal motion by adjacent structures or other obstacles such that control reversal does not free the platform, all personnel shall be removed from the platform before attempts are made to free the platform using lower controls.
- (28) Vacating (or entering) an elevated aerial platform. If permitted by the manufacturer, personnel shall only vacate or enter a raised aerial platform by following the guidelines and instructions provided by the manufacturer.
- (29) Modifications. Modification or alteration of an aerial platform or the fabrication and attaching of frameworks, or the mounting of attachments for holding tools or materials onto the platform or the guardrail system shall only be accomplished with the prior written permission of the manufacturer.
- (30) Assistance to the operator. If an operator encounters any suspected malfunction of the aerial platform, or any hazard or potentially unsafe condition relating to capacity, intended use or safe operation of the aerial platform, the operator shall cease operation of the aerial platform and request further information from the user.
- (31) Problems or malfunctions. Any problem(s) or malfunction(s) that affect the safety of operations shall be repaired prior to the use of the aerial platform.
- (32) Carrying materials (larger than the platform). The user shall ensure that only properly secured tools and materials which are evenly distributed and can be safely handled by a person(s) working from the platform, are moved.
- (33) Rated horizontal force. The user shall direct the operator not to exceed the manufacturer's rated horizontal force.
- (34) Bridge cranes. When an aerial platform is to operate within the area of travel of a bridge crane or similar equipment, steps shall be taken to prevent a collision with the aerial platform.
- (35) Adequate support requirements. The user shall ensure the support surface is adequate for the aerial platform and the load carried.
- (36) Leveling the aerial platform. Outriggers and leveling devices supplied by the manufacturer shall be utilized to level the aerial platform when provided.

(37) Protecting against unauthorized use. The user shall direct the operator not to use, rent, lease, or provide the aerial platform for any form of beneficial use unless so authorized.

7.11 User as Operator. If a user is also the operator of an aerial platform, the user shall have the responsibilities of operators specified in Section 8 of this standard as well as responsibilities of users as specified in Section 7 of this standard.

7.12 Shutdown of Aerial Platform. The user shall authorize and direct the operating personnel to cease operation of the aerial platform in case of any suspected malfunction(s) of the aerial platform, or any hazard or potentially unsafe condition(s) that may be encountered and to request further information as to safe operation from the owner, dealer, or manufacturer before further operation of the aerial platform.

7.13 Record Retention and Dissemination.

7.13.1 Record Retention. The user shall retain the following records for at least 4 years:

- (1) Names of the operator(s) trained and retrained.
- (2) Names of operator(s) provided familiarization.
- (3) The owner (or the entity designated by the owner) is responsible to ensure frequent and annual inspections are conducted and written records are maintained. The records shall include the date of the inspection, any deficiencies found, the corrective action recommended and identification of the person(s) performing the inspection.
- (4) When employees of the user accomplish repairs on the aerial platform, the user shall maintain written records. The record shall include the date of repair, a description of the work accomplished and identification of the person(s) performing the repair.

7.13.2 Record Dissemination

- (1) When the user directs personnel to accomplish frequent or annual inspections, not later than 60 days after the inspections, the appropriate records shall be provided to the owner of the aerial platform.
- (2) When the user directs personnel to accomplish repairs on the aerial platform, not later than 60 days after the repairs are accomplished, the appropriate records shall be provided to the owner.

7.13.3 Proof of Training. Users providing training should provide successful trainees a means to evidence their training and shall provide such proof if requested by the trainee.

The document evidencing training shall include the following information:

- (1) Name of entity providing training or retraining.
- (2) Name of trainer(s).
- (3) Clear identification that training covered Boom-Supported Elevating Work Platforms.
- (4) Date of training.
- (5) Name of trainee.

7.14 Modifications. Modification, alteration or remanufacture of an aerial platform shall be made only with prior written permission of the manufacturer.

7.15 Manufacturer's Safety Bulletins. The user shall comply with safety related bulletins as received from the manufacturer, dealer, or owner.

8 Responsibilities of Operators.

8.1 Basic Principles. The information in this standard shall be supplemented by good judgment, safety control, and

caution in evaluating each situation. Since the operator is in direct control of the aerial platform, conformance with good safety practices in this area is the responsibility of the operator. The operator shall make decisions on the use and operation of the aerial platform with due consideration for the fact that his or her own safety as well as the safety of others is dependent on those decisions.

8.2 Manuals.

8.2.1 Machine Manuals. The operator shall ensure the operating and maintenance manuals are stored in the weather resistant storage compartment on the aerial platform. The manual(s) is considered an integral part of the aerial platform and is vital to communicate necessary safety information to the operator. The operator shall be familiar with the manuals and reference them as required.

8.2.2 Manual of Responsibilities. The operator shall be familiar with the requirements for operators as set forth in Section 8 of the Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors, Lessees and Brokers of Boom-Supported Elevating Work Platforms. The current Manual of Responsibilities shall be kept with the aerial platform at all times and stored in the weather-resistant compartment when not in use.

8.3 Prestart Inspection. Before use each day or at the beginning of each shift, the aerial platform shall be given a visual inspection and functional test including, but not limited to, the following:

- (1) Operating and emergency controls
- (2) Safety devices
- (3) Personal protective devices
- (4) Air, hydraulic and fuel system(s) leaks
- (5) Cables and wiring harness
- (6) Loose or missing parts
- (7) Tires and wheels
- (8) Placards, warnings, control markings and operating manual(s)
- (9) Outriggers, stabilizers, extendable axles and other structures
- (10) Guardrail system
- (11) Items specified by the manufacturer

8.4 Problems or malfunctions. Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the aerial platform.

8.5 Training, Retraining, and Familiarization

8.5.1 General Training. Only personnel who have received general instructions regarding the inspection, application and operation of aerial platforms, including recognition and avoidance of hazards associated with their operation, shall operate an aerial platform. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:

- (1) The purpose and use of manuals.
- (2) That operating manuals are an integral part of the aerial platform and must be stored properly in the weather resistant compartment when not in use.
- (3) A pre-start inspection.
- (4) Responsibilities associated with problems or malfunctions affecting the operation of the aerial platform.
- (5) Factors affecting stability.
- (6) The purpose of placards and decals.
- (7) Workplace inspection.

- (8) Safety rules and regulations.
- (9) Authorization to operate.
- (10) Operator warnings and instructions.
- (11) Actual operation of the aerial platform.

Under the direction of a qualified person, the trainee shall operate the aerial platform for a sufficient period of time to demonstrate proficiency in the actual operation of the aerial platform.

- 8.5.2 Retraining.** The operator shall be retrained, when so directed by the user, based on the user's observation and evaluation of the operator.
- 8.5.3 Familiarization.** When an operator is directed to operate an aerial platform he/she is not familiar with, the operator shall receive instructions regarding the following items:
- (1) The location of the weather resistant compartment (for manual(s) storage).
 - (2) The purpose and function of all controls.
 - (3) Safety devices and operating characteristics specific to the aerial platform.
- 8.6 Before Operation.** Before operation, the operator shall:
- (1) Read and understand the manufacturer's operating instruction(s) and user's safety rules, or have them explained
 - (2) Understand all labels, warnings, and instructions displayed on the aerial platform or have them explained.
 - (3) Ensure all occupants of the aerial platform wear appropriate personal protective equipment (PPE) for the conditions, including the environment in which the aerial platform will be operated.
- 8.7 Workplace Inspection.** Before the aerial platform is used and during use, the operator shall check the area in which the aerial platform is to be used for possible hazards such as, but not limited to:
- (1) Drop-offs or holes, including those concealed by water, ice, mud, etc.
 - (2) Slope(s).
 - (3) Bumps and floor obstructions.
 - (4) Debris.
 - (5) Overhead obstructions and electrical conductors.
 - (6) Hazardous locations and atmospheres (reference ANSI/NFPA 505-1987).
 - (7) Inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations.
 - (8) Wind and weather conditions.
 - (9) Presence of unauthorized persons.
 - (10) Other possible unsafe conditions.
- 8.8 Prior to each operation.** Before each operation of the platform, the operator shall ensure:
- (1) Outriggers, stabilizers, extendable axles, or other stability enhancing means, are used as required by the manufacturer.
 - (2) Guardrails are installed and access gates or openings are closed per manufacturer's instructions.
 - (3) The load and its distribution on the platform and any platform extension(s) are in accordance with the manufacturer's rated capacity for that specific configuration.
 - (4) All personnel on the aerial platform have appropriate safety gear for the work and environment envisioned.

8.9 Understanding of Hazardous Locations. It shall be the responsibility of the operator to understand the hazard classification of the intended location of operation according to ANSI/NFPA 505-1996.

- 8.10 Operator warnings and instructions.** The operator shall direct personnel operating the aerial platform to be in compliance with the provisions set forth in this standard. The operator shall monitor their performance and supervise their work to ensure the use, application, and operation of the aerial platform is in conformance with the provisions set forth in Section 8 of this standard, warn personnel of potential hazards, provide means to protect against identified hazards, and explain the potential consequences of not following proper operating guidelines. Instructions and guidelines regarding proper operation shall include, but not necessarily be limited to the following issues and subjects:
- (1) Fall protection. While the guardrail system of the aerial platform provides primary fall protection all occupants of the work platform shall wear either fall restraint or fall arrest equipment as directed by their employer.
 - (2) Slope and grade. The aerial platform shall not be operated in any manner on grades, side slopes, or ramps exceeding those for which the aerial platform is rated by the manufacturer.
 - (3) Deployment of stability enhancing means. Outriggers, stabilizers, extendable axles or other stability enhancing means shall be deployed and locked into place as required by the manufacturer.
 - (4) Guardrail system. Guardrails shall be installed and positioned, and access gates or openings shall be properly closed per the manufacturer's instructions.
 - (5) Distribution of load. The load and its distribution on the platform and any platform extension(s) shall be in accordance with the manufacturer's rated capacity for that specific configuration.
 - (6) Maintaining overhead clearance. The operator shall be instructed to ensure that adequate clearance is maintained from overhead obstructions and energized electrical conductors and parts.
 - (7) Electrocution hazard. The operator shall perform only the work for which he or she is qualified, in compliance with all applicable safety related work practices intended to prevent electric shock covered by the Code of Federal Regulations (CFR) 1910.333. The operator's level of competence shall be established only by persons qualified to do so. Operators shall maintain the appropriate minimum approach distance (MAD) from energized power lines and parts covered by CFR 1910.333 (c).
 - (8) Personal Protective Equipment. The operator shall ensure all personnel on the platform wear personal protective equipment as required.
 - (9) Personnel footing. Personnel shall maintain a firm footing on the platform floor while working thereon. Climbing by occupants on the mid-rail or top-rail of the aerial platform is prohibited. The use of planks, ladders, or any other devices on the platform for achieving additional height or reach is prohibited.
 - (10) Precaution for other moving equipment. When other moving equipment and vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace.
- Warnings such as, but not limited to, flags, roped off areas, flashing lights, and barricades shall be used as appropriate.

- (11) Reporting problems or malfunctions. The operator shall immediately report to a supervisor any problem(s) or malfunction(s) that become evident during operation. The operator shall ensure all problems and malfunctions that affect the safety of operations are repaired prior to continued use.
- (12) Reporting potentially hazardous locations. The operator shall immediately report to a supervisor any potentially hazardous location(s) that become evident during operation.
- (13) Hazardous location operation. Operation of aerial platforms not approved and marked for operation in a hazardous location shall be prohibited.
- (14) Entanglement. Care shall be taken to prevent rope, electric cords, and hoses, etc., from becoming entangled in the aerial platform.
- (15) Capacity limitations. Rated capacities shall not be exceeded when loads are transferred to the platform at any height.
- (16) Work area. The operator shall ensure the area surrounding the aerial platform is clear of personnel and equipment before lowering the platform.
- (17) Fueling. The engine (if applicable) shall be shut down while fuel tanks are being filled.
Fueling shall be done in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.
- (18) Battery charging. Batteries shall be charged in a well ventilated area free of flame, sparks or other hazards that may cause fire or explosion.
- (19) Improper platform stabilization. The aerial platform shall not be positioned against another object to steady the platform or improve stability.
- (20) Misuse as a crane. The aerial platform shall not be used as a crane.
- (21) Unusual operating support conditions. The aerial platform shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment unless the application is approved in writing by the manufacturer or a qualified person.
- (22) Travel speeds. The operator shall limit travel speed according to conditions, including the condition of the support surface, congestion, visibility, slope, location of personnel, and other factors leading to hazards which may cause collision(s) or result in potential injury(ies) to personnel.
- (23) Driving requirements. Before and during driving while the platform is elevated, the operator shall:
- Maintain a clear view of the support surface and route of travel
 - Ensure personnel in the worksite area that may be affected are aware of the movement, communicating and maneuvering the aerial platform as required to protect against personal injury
 - Maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to ensure safe travel
 - Maintain a safe distance from overhead obstacles.
- (24) Stunt driving. Stunt driving and horseplay are prohibited.
- (25) Securing the aerial platform. The operator shall implement means provided to protect against use by an unauthorized person(s).
- (26) Altering safety devices. Interlocks or other safety devices shall not be altered or disabled.
- (27) Snagged platform. If the platform or elevating assembly becomes caught, snagged, or otherwise prevented from normal motion by adjacent structures or other obstacles such that control reversal does not free the platform, all personnel shall be removed from the platform before attempts are made to free the platform using lower controls.
- (28) Vacating (or entering) an elevated aerial platform. If permitted by the manufacturer, personnel shall only vacate or enter a raised aerial platform by following the guidelines and instructions provided by the manufacturer.
- (29) Modifications. Modification or alteration of an aerial platform or the fabrication and attaching of frameworks, or the mounting of attachments for holding tools or materials onto the platform or the guardrail system shall only be accomplished with the prior written permission of the manufacturer.
- (30) Assistance to the operator. If an operator encounters any suspected malfunction of the aerial platform, or any hazard or potentially unsafe condition relating to capacity, intended use or safe operation of the aerial platform, the operator shall cease operation of the aerial platform and request further information from the operator.
- (31) Problem(s) or malfunction(s). Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the aerial platform.
- (32) Carrying materials (larger than the platform.) The operator shall ensure that only properly secured tools and materials which are evenly distributed and can be safely handled by a person(s) working from the platform, shall be moved.
- (33) Rated horizontal force. The operator shall not exceed the manufacturer's rated horizontal force.
- (34) Bridge cranes or contact with any electrical conductors. When an aerial platform is to operate within the area of travel of a bridge crane or similar equipment, steps shall be taken to prevent a collision with the aerial platform.
- (35) Adequate support requirements. The operator shall insure the support surface is adequate for the aerial platform and the load carried.
- (36) Leveling the aerial platform. Outriggers and leveling devices supplied by the manufacturer shall be utilized to level the aerial platform when provided.
- (37) Protecting against unauthorized use. The operator shall not use, rent, lease, or provide the aerial platform for any form of beneficial use unless so authorized.
- 8.11 Record of training.** When provided or when obtained upon the operator's request, proof of training by the training entity should be retained by the operator. Records shall contain the following information:
- Name of entity providing training or retraining
 - Name of trainer(s)
 - Clear identification that training covered Boom-Supported Elevating Work Platforms
 - Date of training
 - Name of trainee
- 9 Responsibilities of Lessors**

- 9.1 **Basic principles.** Sound principles of safety, training inspections, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of responsibilities of lessors with due consideration of the knowledge that the aerial platform will be carrying personnel.
- 9.2 **Lessor as a Dealer.** When a lessor uses the aerial platform as a dealer, the lessor shall have the responsibilities of dealers as specified in Section 5 of this standard.
- 9.3 **Lessor as an Owner.** When a lessor uses the aerial platform as an owner, the lessor shall have the responsibilities of owners as specified in Section 6 of this standard.
- 9.4 **Lessor as a User.** When a lessor uses the aerial platform as a user, the lessor shall have the responsibilities of users as specified in Section 7 of this standard.
- 9.5 **Lessor as an Operator.** When a lessor uses the aerial platform as an operator, the lessor shall have the responsibilities of operators as specified in Section 8 of this standard.
- 10 **Responsibilities of Lessees**
- 10.1 **Basic Principles.** Sound principles of safety, training, inspections, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of responsibilities of lessees with due consideration of the knowledge that the aerial platform will be carrying personnel.
- 10.2 **Lessee as a Dealer.** When a lessee uses the aerial platform as a dealer, the lessee shall have the responsibilities of dealers as specified in Section 5 of this standard.

- 10.3 **Lessee as an Owner.** When a lessee uses the aerial platform as an owner, the lessee shall have the responsibilities of owners as specified in Section 6 of this standard.
- 10.4 **Lessee as a User.** When a lessee uses the aerial platform as a user, the lessee shall have the responsibilities of users as specified in Section 7 of this standard.
- 10.5 **Lessee as an Operator.** When a lessee uses the aerial platform as an operator, the lessee shall have the responsibilities of operators as specified in Section 8 of this standard.
- 11 **Responsibilities of Broker**
- 11.1 **Responsibilities upon sale.** The broker shall:
 - (1) Upon delivery, ensure the operating and maintenance manuals are provided to the new owner.
 - (2) Upon delivery, provide a copy of the current Manual of Responsibilities to the new owner.
 - (3) Maintain records of the sale for a minimum of four (4) years.
- 11.2 **Responsibilities with Re-rents, Leases, or Any Other Form of Beneficial Use.** When compensation is received as a result of a re-rent, lease or any form of beneficial use of an aerial platform, the broker shall:
 - (1) Upon delivery, ensure the operating and maintenance manuals are provided to the user.
 - (2) Upon delivery, provide a copy of the current Manual of Responsibilities.
 - (3) Ensure operating personnel are familiarized with the aerial platform prior to use.
 - (4) Retain records of the transaction for a minimum of four (4) years.

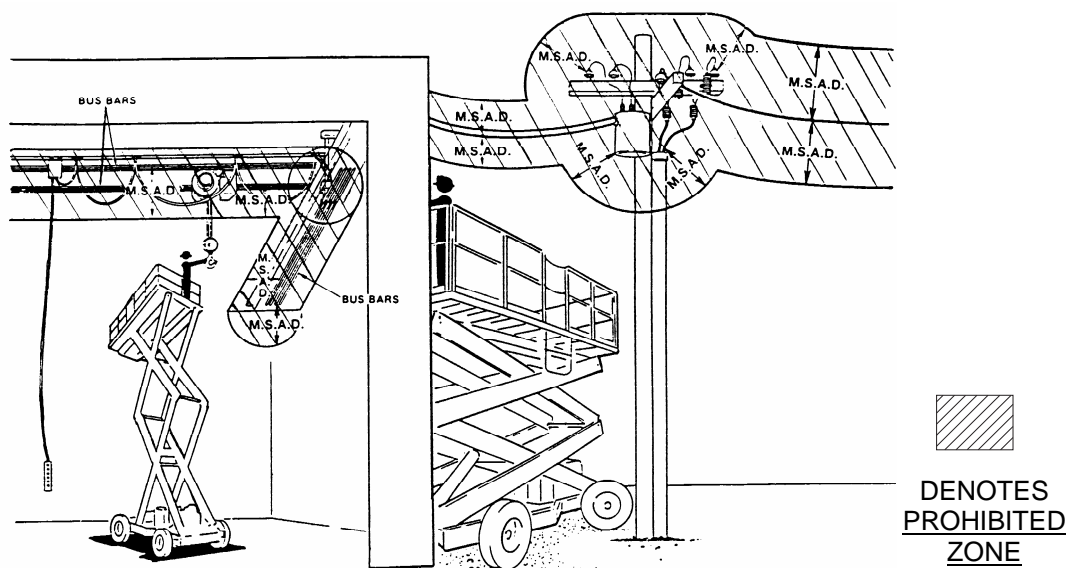


Figure 9-1. Minimum Safe Approach Distance

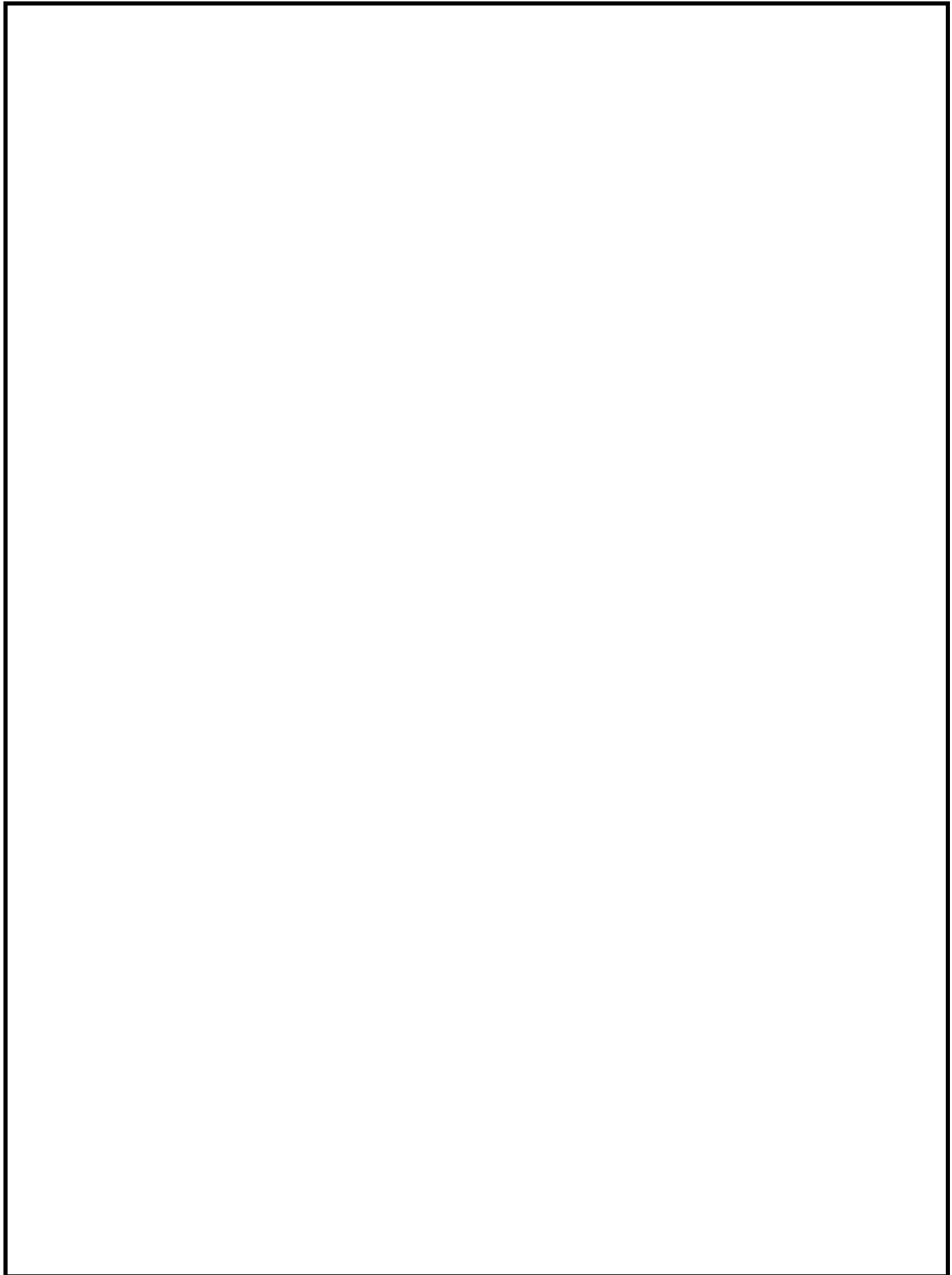
TABLE 9-1. MINIMUM SAFE APPROACH DISTANCES		
Voltage Range (Phase to Phase)	Minimum Safe Approach Distance	
	(Feet)	(Meters)
0 to 300V	Avoid Contact	
Over 300V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72


DANGER

DO NOT allow aerial work platform, personnel, or conductive materials inside prohibited zone. Maintain M.S.A.D from all energized lines and parts as well as those shown. Assume all electrical parts and wires are energized unless known otherwise. Failure to avoid energized power sources will result in death or serious injury.


CAUTION

Diagrams shown are only for purposes of illustration M.S.A.D. work positions, not all work positions.



INSPECTION FORM FOR HAULOTTE AERIAL WORK PLATFORMS

Machine Model No.		Serial No.	
Date of Manufacture:		Inspection Performed by:	
Date of Inspection:		Inspection Location:	

Inspection and Maintenance of the above listed machine shall be performed only by fully trained, authorized and, where applicable, certified personnel. All service checks shall be performed in accordance with manufacturer's recommendations (Refer to the Equipment Maintenance section of this manual). Copy this form as needed. Direct any questions to the Haulotte Group Customer Service Department: at 1-800-537-0540 or visit Haulotte Group online at www.haulotte-usa.com.

Inspector: Initial in the space provided beside each service check as it is completed. Sign and date form after Inspection.
Owner: Keep this form for your records.

Frequency Key:

D=Daily (or before each use); W=Weekly; M=Monthly; A=Annually; SA= Semi-Annually

Service Check Descriptions	Frequency	Initials
Verify that all decals are legible, correctly applied and in plain view.	D	
Verify that all controls and indicators at the ground and platform control stations operate properly.	D	
Verify operation of running and brake lights.	D	
Verify proper tire inflation. See the side wall of the tire for proper inflation.	D	
Inspect tires for damage, or loose or missing lug nuts.	D	
Inspect structural components for obvious damage or debris.	D	
Inspect machine for loose, damaged or missing fasteners, including pins and bolts.	D	
Verify that the boom down limit switches operate correctly.	D	
Verify that outrigger safety interlocks operate correctly.	D	
Inspect hydraulic system and fluid levels.	D	
Check battery electrolyte level.	W	
Inspect electrical wiring for damaged, broken or frayed wires.	W	
Inspect transport hitch for damage. Applicable for machines with trailers.	W	
Inspect boom for missing, loose or damaged hardware.	W	
Inspect all hydraulic system components including power unit, hoses and cylinders, for damage, leaks, loss of pressure or speed, and unusual noise or vibration.	W	
Check Engine oil. Applicable for machines equipped with Engines.	W	
Clean all battery terminals.	M	
Check battery connections.	M	
Verify proper operation of manual lowering valves and hand pump.	M	
Lubricate all compartment hinges and latches, slew ring and mating gear using NLGI Grade 2 multi-purpose grease.	M	
Check Wheel Nut torque.	M	
Check coolant level. Applicable for machines equipped with Engines.	M	
Inspect the Air Filter. Applicable for machines equipped with Engines.	M	
Verify proper level sensor operation (use outriggers to tilt machine, try to operate boom functions).	M	
Check Drive Belt tension.	SA	
Verify Engine rpm. Applicable for machines equipped with Engines.	SA	
Add or replace Hydraulic Oil and Hydraulic Filter annually, replace more frequently in dirty conditions.	A	
Inspect pivot pins and cylinders, including rod ends for wear or damage.	A	
Visually inspect all welds for wear, damage or corrosion.	A	
Inspect outriggers for wear or damage.	A	
Inspect axle and parking brake, adjust as necessary.	A	
Load test all boom functions with a 500lb (227kg) load (440lb/200kg load if machine is equipped with jib/platform rotate).	A	
Check slew ring for wear or damage.	A	
Replace Jib Bushings.	A	

** Refer to Engine Operators Manual for recommended Engine Maintenance

Inspector Signature _____ **Date** / /



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