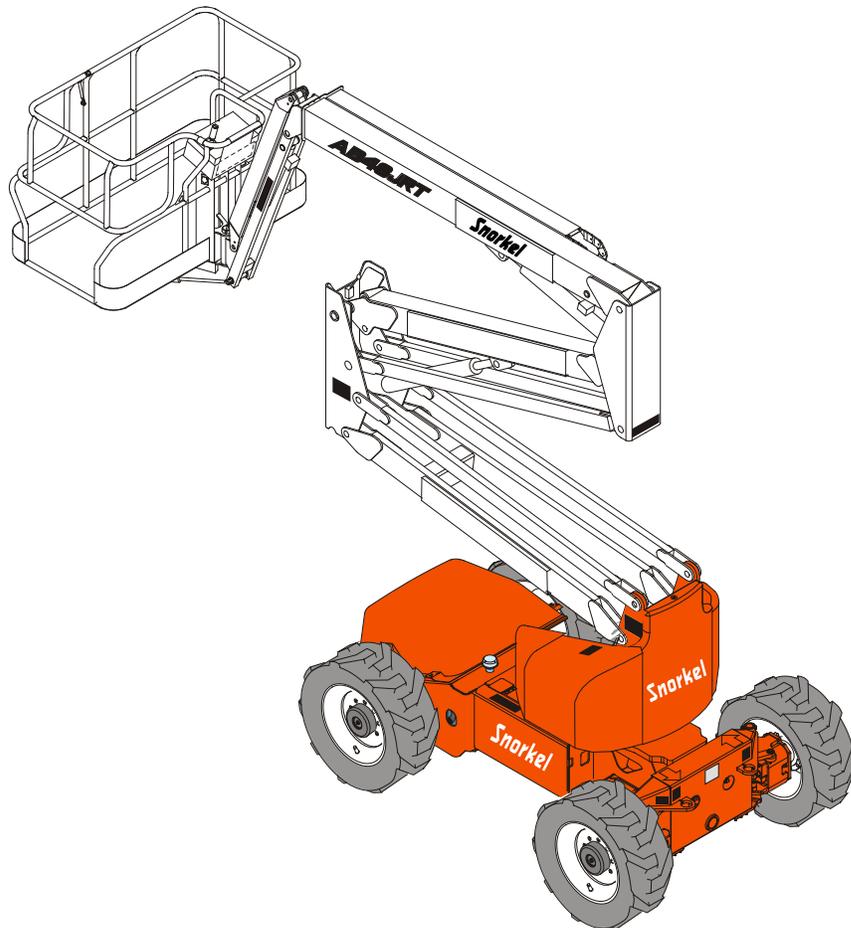


Operator's Manual



AB46JRT

DANGER

The aerial platform is not electrically insulated. Death or serious injury will result from contact with, or inadequate clearance from, an energized conductor.

Do not go closer than the minimum safe approach distance as defined by the Minimum Safe Approach Distance section in Chapter 3–Safety.

Regard all conductors as energized.

Allow for electrical wire sag and aerial platform sway.

If the platform, booms, or any part of the aerial platform contacts a high-voltage electrical conductor, the entire machine can become electrically charged.

If that happens, remain on the machine and do not contact any other structure or object. This includes the ground, adjacent buildings, poles, and any other objects that are not part of the aerial platform.

Such contact could make your body a conductor to the other object, creating an electrical shock hazard resulting in death or serious injury.

If an aerial platform is in contact with an energized conductor the platform operator must warn ground personnel in the vicinity to stay away. Their bodies can conduct electricity creating an electrical shock hazard resulting in death or serious injury.

Do not approach or leave the aerial platform until the electricity has been turned off.

Do not attempt to operate the lower controls when the platform, booms, or any part of the aerial platform is in contact with a high-voltage electrical conductor or if there is an immediate danger of such contact.

Personnel on or near an aerial platform must be continuously aware of electrical hazards, recognizing that death or serious injury can result from contact with an energized conductor.

California

Proposition 65 Warning

Battery posts, terminals, and related accessories contain lead and lead components, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

California

Proposition 65 Warning

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

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Appendix A – Glossary

Limited Warranty

Chapter 1 – Introduction

Aerial Platform Features

The aerial platform is a boom-supported elevating work platform used to raise personnel, their tools, and material to the workstation. The booms are raised and lowered with hydraulic cylinders. Hydraulic motors on the drive wheels provide power to move the aerial platform.

The standard machine includes the following features:

- Proportional controls
- Hour meter
- Tie-down/lifting lugs
- AC 110V electrical outlet with GFCI at platform
- Horn
- 5 degree tilt alarm
- Pivoting front axle
- Four wheel drive
- High engine temperature shut down
- Low oil pressure shut down
- Hydraulic oil level gauge
- 360 degree non-continuous turntable rotation
- Zero tail swing
- 6 foot steel 500 lb capacity platform with three gravity gates: one on each side and one rear
- Kubota V1505-TE diesel engine
- Five year limited warranty

The aerial platform has been manufactured, when applicable, to conform to all applicable requirements of the following organizations:

- Occupational Safety and Health Administration (OSHA)
- American National Standards Institute (ANSI)

Options

The following options may be provided on the machine:

- Airline to platform
- Flashing light
- All motion alarm
- Foam filled tires
- Hydraulic fluid warm-up system
- AC generator – hydraulic powered, 110 V, 2,000 W
- 8 foot steel 500 lb capacity platform with three gravity gates: one on each side and one rear
- Australian Standards (AS) certification
- Canadian Standards Association (CSA) certification

Operator's Manual

This manual provides information for safe and proper operation of the aerial platform. Some information in this manual refers to options that may or may not be on your machine. Read and understand the information in this Operator's Manual before operating the aerial platform on the job.

Additional copies of this manual may be ordered from Snorkel. Supply the model and manual part number from the front cover to assure that the correct manual will be supplied.

All information in this manual is based on the latest product information at the time of publication. Snorkel reserves the right to make product changes at any time without obligation.

Safety Alerts

A safety alert symbol is used throughout this manual to indicate danger, warning, and caution instructions. Follow these instructions to reduce the likelihood of personal injury and property damage. The terms danger, warning, and caution indicate varying degrees of personal injury or property damage that can result if the instruction is not followed.

Danger

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be used in the most extreme situations.

Warning

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

Caution

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Notes

Notes are used to provide special information or helpful hints to assist in aerial platform operation, but do not indicate a hazardous situation.

Operation

The aerial platform has built-in safety features and has been factory tested for compliance with Snorkel specifications and industry standards. However, any personnel lifting aerial platform can be potentially dangerous in the hands of untrained or careless operators.

Warning

The potential for an accident increases when the aerial platform is operated by personnel who are not trained and authorized. Death or serious injury could result from such accidents. Read and understand the information in this manual and on the placards and decals on the machine before operating the aerial platform on the job.

Training is essential and must be performed by a qualified person.

- Become proficient in knowledge and actual operation before using the aerial platform on the job.
- The operator must be trained and authorized to perform any functions of the aerial platform.
- Operation of the aerial platform must be within the scope of the machine specifications.

The operator bears ultimate responsibility for following all manufacturer's instructions and warnings, regulations and safety rules of their employer and/or any state or federal law.

Maintenance

Every person who maintains, inspects, tests, or repairs the aerial platform must be qualified to do so. Following the daily prestart inspection in this Operator's Manual will help keep the aerial platform in optimum working condition. Other maintenance functions must be performed by maintenance personnel who are qualified to work on the aerial platform.

Caution

Welding current can be very intense. Damage to electronic components may result. Connect the ground clamp as close as possible to the area being welded. Disconnect battery cables and any microprocessors and engine control modules before welding on the machine.

If it becomes necessary to weld aerial platform components as a method of repair, take all precautions to prevent damage to electronic circuitry and devices on the machine. This includes, but may not be limited to, disconnecting battery cables and electronic devices.

Do not modify this aerial platform without prior written consent of the Snorkel Engineering Department. Modification may void the warranty, adversely affect stability, or affect the operational characteristics of the aerial platform.

Manual of Responsibilities

All owners and users of the aerial platform must read, understand, and comply with all applicable regulations. Ultimate compliance to OSHA regulations is the responsibility of the user and their employer.

ANSI publications clearly identify the responsibilities of all personnel who may be involved with the aerial platform. A reprint of the "Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors and Lessees of ANSI/SIA A92.5-2006 Boom-Supported Elevating Work Platforms" is available from Snorkel dealers or from the factory upon request.

Copies are also available from:

Scaffold Industry Association, Inc.
P. O. Box 20574
Phoenix, AZ 85036-0574 USA

Additional Information

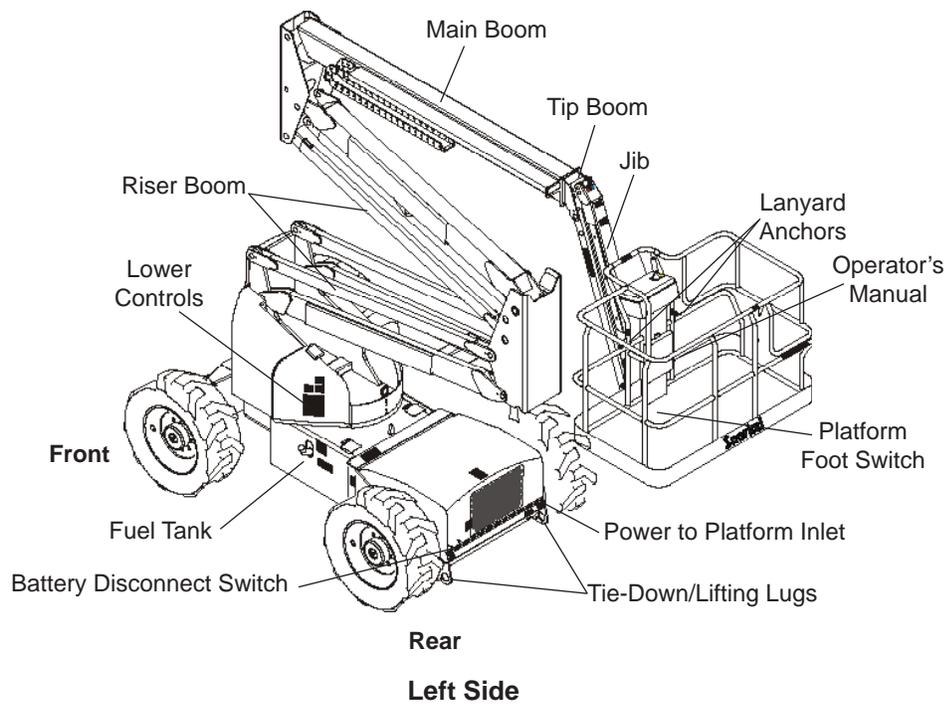
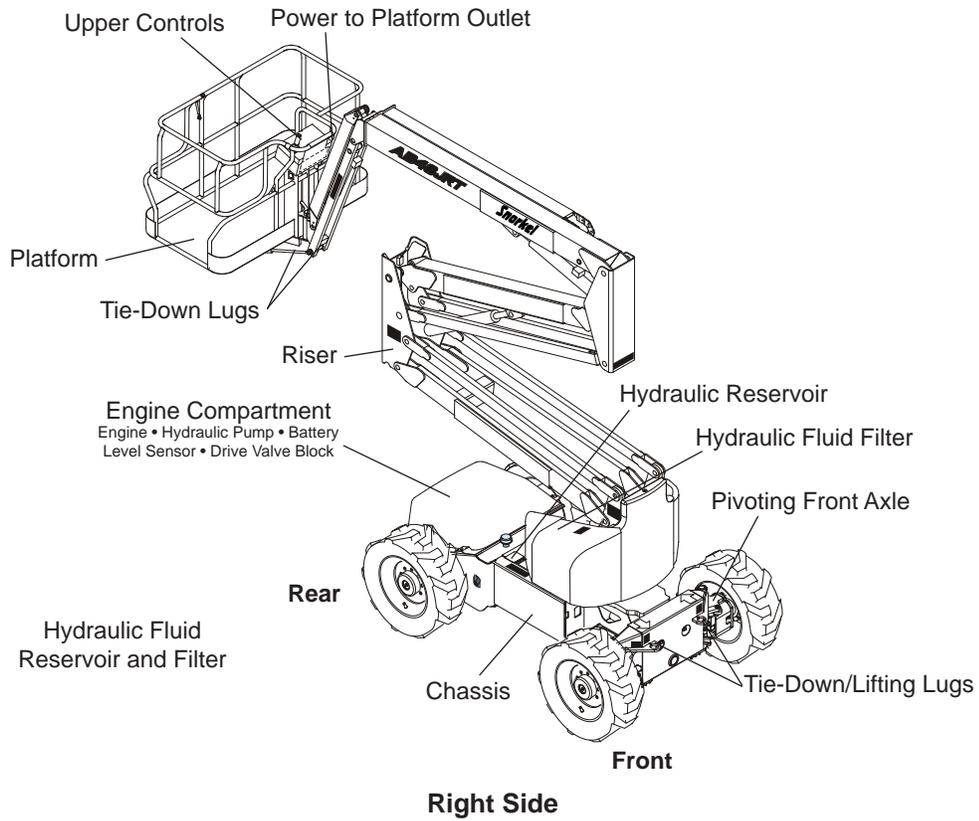
For additional information contact your local dealer or Snorkel at:

Snorkel International
P.O. Box 1160
St. Joseph, MO 64502-1160 USA
1-800-255-0317

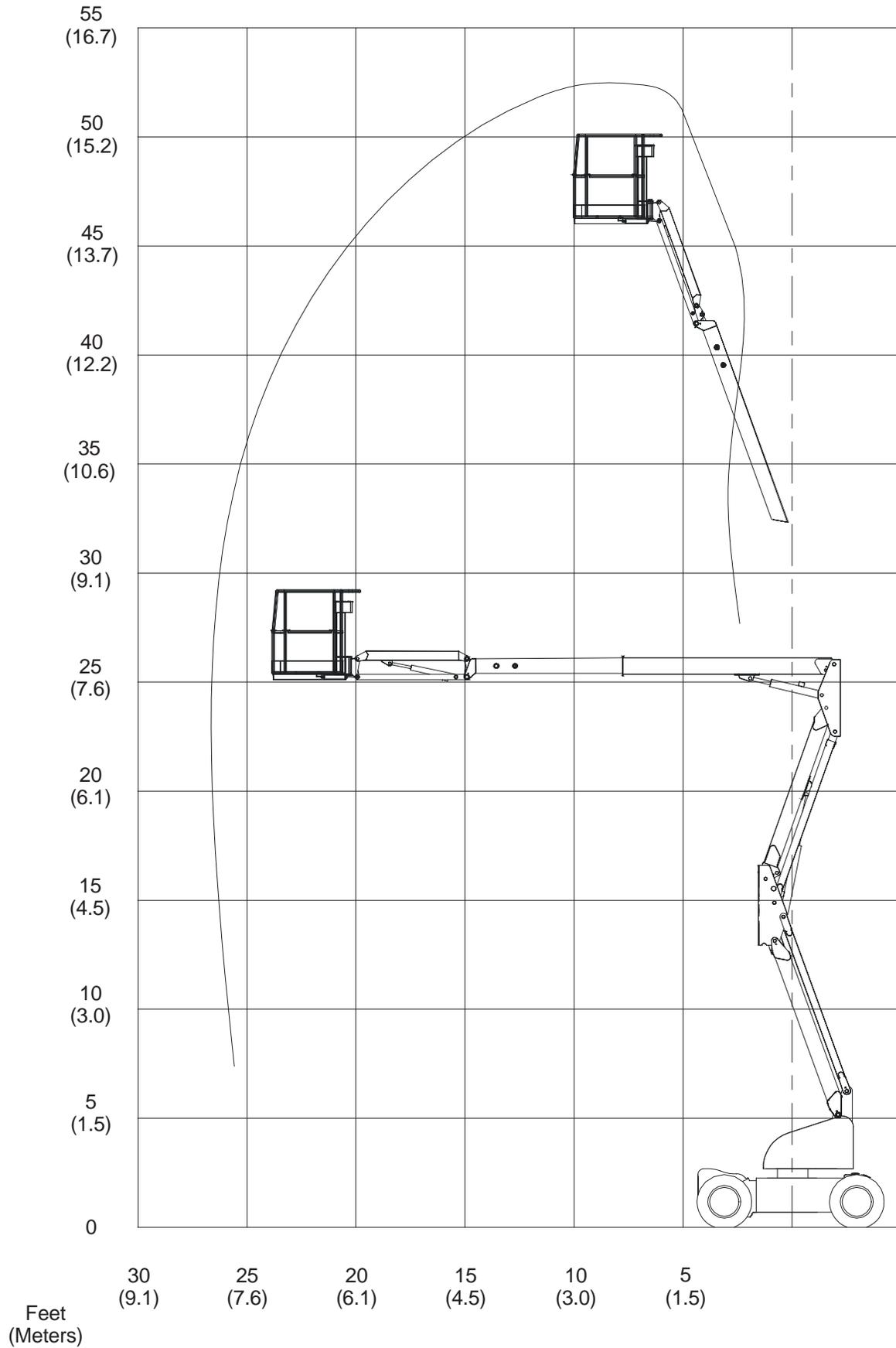
<http://www.snorkelusa.com>

Chapter 2 – Specifications

Component Identification



Working Envelope



General Specifications

Aerial Platform

Working height	52' 4" (15.9 m)
Maximum platform height	46' 4" (14.1 m)
Up and over height	25' 2" (7.6 m)
Maximum horizontal reach	24' 6" (7.4 m)
Main boom	
Articulation	0° to +72°
Extension	80" (2.0 m)
Jib	
Articulation	-70° to +70°
Extension	5' (1.5 m)
Tail swing	0
Turntable rotation	360° non-continuous
Turning radius	
Inside	32" (0.8 m)
Outside	10' 5" (3.1 m)
Wheelbase	8' 6" (2.5 m)
Ground clearance	13" (33 cm)
Maximum wheel load	9,850 lbs (4,470 kg)
Maximum ground pressure	125 psi (8.8 kg/cm ²)
Weight, EVW	
Approximate	14,600 lbs (6,622 kg)
Width	6' 10" (2.1 m)
Stowed length	18' 8" (5.6 m)
Stowed height	7' 2" (2.1 m)

Platform

Dimensions	
Standard Steel	39" x 72" (99 cm x 183 cm)
Optional Aluminum	30" x 96" (76 cm x 244 cm)
Rated work load	
Steel 39" x 72"	500 lb (227 kg)
Aluminum 30" x 96"	500 lb (227 kg)
Toeboard height	6" (15.2 cm)
Rotation	90° CW to 90° CCW
Maximum number of occupants	2 people
Optional AC generator	110 V, 2,000 W

Function Speed

Turntable rotation	65 to 85 seconds
Riser	
Up	35 to 40 seconds
Down	20 to 25 seconds
Main boom	
Up	25 to 30 seconds
Down	20 to 25 seconds
Extend	20 to 25 seconds
Retract	22 to 27 seconds

Platform rotation	16 to 20 seconds
Jib	
Up	12 to 16 seconds
Down	10 to 14 seconds
Drive	
High, booms stowed	4.5 mph (7.2 km/h)
Low, booms raised/extended	0.8 mph (1.2 km/h)

Drive System

Standard	Four wheel drive
Gradeability – theoretical	45%

Tires

Bar lug	355/55D625NHS, 14 ply
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Electrical System

Voltage	12 V DC negative chassis ground
Source	One - 12 V 600 CCA batteries
Fluid recommended	distilled water

Hydraulic System

Drive circuit max. pressure	5,000 psi (34,473 kPa)
Boom circuit max. pressure	2,750 psi (18,960 kPa)
Reservoir capacity	25 US gal (94 l)
System capacity	65 US gal (246 l)
Maximum operating temperature	200°F (93°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	Mobil DTE-13M (ISO VG32)
Below 10°F (-12°C)	Mobil DTE-11M (ISO VG15)

Engine

Diesel	Kubota V1505-TE
--------	-----------------

Fuel Tank Capacity

Diesel	25 US gal (94 l)
--------	------------------

Ambient Air Temperature Operating Range

Fahrenheit	0°F to 110°F
Celsius	-18°C to 43°C

Maximum Wind Speed

Gust or steady	28 mph (45 km/h)
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Engine Specifications

Engine	Displacement	Fuel Grade	Coolant	Oil Capacity	Oil Grade
Kubota V1505-TE	91 cu. in. (1498 cm ³)	Diesel Fuel No. 2-D ASTM D975 ¹	50% water 50% Antifreeze ²	1.77 gal (6.7 liter)	API: CD grade or higher ³

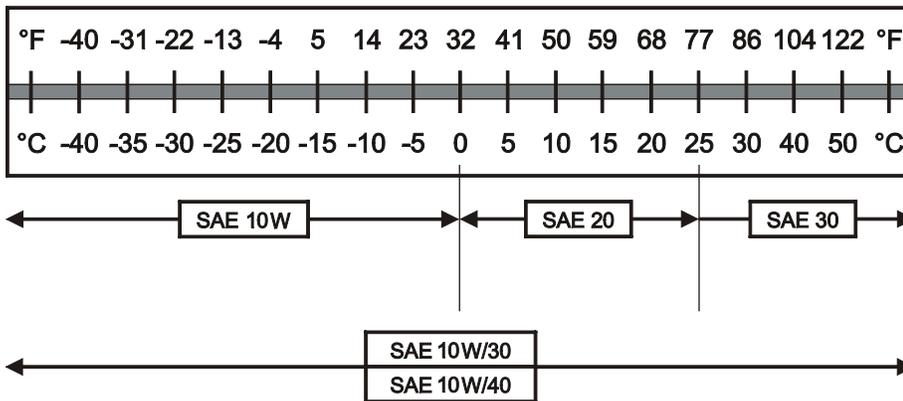
Note 1: Refer to the Kubota Operator's Manual for specific fuel recommendations and specifications.

Note 2: Refer to the Kubota Operator's Manual for specific coolant recommendations and specifications.

Note 3: Refer to the Kubota Operator's Manual for specific lubricating oil recommendations and specifications.

Engine Oil Viscosity

Kubota V1505-TE



Chapter 3 – Safety

Knowledge of the information in this manual, and proper training, provide a basis for safely operating the aerial platform. Know the location of all controls and how they operate to act quickly and responsibly in an emergency.

Safety devices reduce the likelihood of an accident.

- Never disable, modify, or ignore any safety device.
- Safety alerts in this manual indicate situations where accidents may occur.

If any malfunction, hazard or potentially unsafe condition relating to capacity, intended use, or safe operation is suspected, stop aerial platform operation and seek assistance.

The operator bears ultimate responsibility for following all manufacturer's instructions and warnings, regulations and safety rules of their employer and/or any state or federal law.

Electrocution Hazards

The aerial platform is made of metal components and is not insulated. Regard all conductors as energized. Do not operate outside during a thunderstorm.

Minimum Safe Approach Distance

Minimum safe approach distances to energized power lines and their associated parts must be observed while operating the aerial platform.

▲ Danger

The aerial platform is not electrically insulated. Death or serious injury will result from contact with, or inadequate clearance from, an energized conductor. Do not go closer than the minimum safe approach distance as defined by ANSI.

ANSI publications define minimum distances that must be observed when working near bus bars and energized power lines. Table 1 and Figure 3 are reprinted courtesy of Scaffold Industry Association, ANSI/SIA A92.5.

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

Table 1 – Minimum Safe Approach Distance

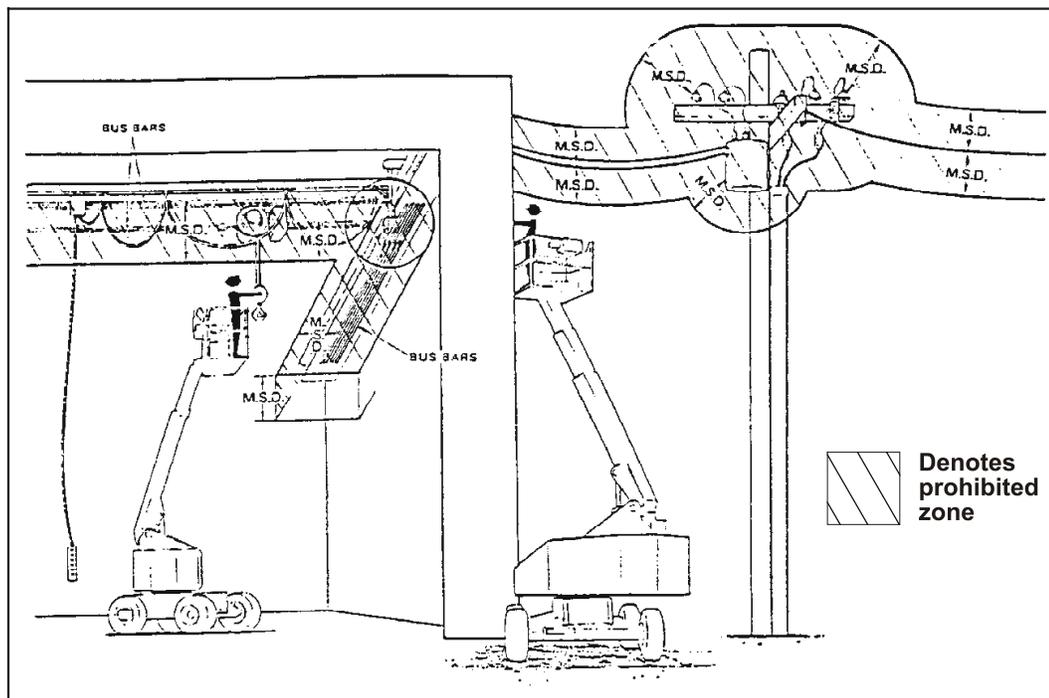


Figure 3 – Minimum Safe Approach Distance

Prestart Inspection

Perform a prestart inspection before each shift as described in Chapter 7. Do not use the aerial platform on the job unless you are trained and authorized to do so.

Work Place Inspection and Practices

Do not use the aerial platform as a ground connection when welding.

- The welding ground clamp must be attached to the same structure that is being welded.
- Electrical current flow can be very intense, causing serious internal damage to some components.

Inspect the area before and during aerial platform use. The following are some potential hazards that may be in the work place:

- Debris
- Slopes
- Drop-offs or holes
- Bumps and floor obstructions
- Overhead obstructions
- Unauthorized persons
- High voltage conductors
- Wind and weather conditions
- Inadequate surface and support to withstand load forces applied by the aerial platform in all operating configurations

Before using the aerial platform in any hazardous (classified) location, make certain it is approved and of the type required by ANSI/NFPA 505 for use in that particular location.

Know and understand the job site traffic-flow patterns and obey the flagmen, road signs, and signals.

While operating the aerial platform, a good safety practice is to have qualified personnel in the immediate work area to:

- Help in case of an emergency
- Operate emergency controls as required
- Watch for loss of control by platform operator
- Warn the operator of any obstructions or hazards that may not be obvious to them
- Watch for soft terrain, sloping surfaces, drop-offs, etc. where stability could be jeopardized
- Watch for bystanders and never allow anyone to be under, or to reach through the booms while operating the aerial platform

Danger

Pinch points may exist between moving components. Death or serious injury will result from becoming trapped between components, buildings, structures, or other obstacles. Make sure there is sufficient clearance around the machine before moving the chassis,

booms, or platform. Allow sufficient room and time to stop movement to avoid contact with structures or other hazards.

Always look in the direction of movement.

- Drive with care and at speeds compatible with the work place conditions.
- Use caution when driving over rough ground, on slopes, and when turning.
- Do not engage in any form of horseplay or permit riders any place other than in the platform.

Secure all accessories, containers, tools, and other materials in the platform to prevent them from accidentally falling or being kicked off the platform. Remove all objects that do not belong in or on the aerial platform.

Never steady the platform by positioning it against another platform.

Warning

The potential for an accident increases when operating an aerial platform that is damaged or malfunctioning. Death or serious injury could result from such accidents. Do not operate the aerial platform if it is damaged or malfunctioning.

Do not operate the aerial platform if it is damaged or not functioning properly. Qualified maintenance personnel must correct the problem before putting the aerial platform back into service.

Operation

Use three points of support when entering or exiting the platform. For example, use two hands and one foot when climbing into the platform.

Never cover the platform floor grating or otherwise obstruct your view below. Make sure the area below the platform is free of personnel before lowering.

Keep both feet positioned firmly on the platform floor.

- Operate the controls slowly and deliberately to avoid jerky and erratic operation.
- Always stop the controls in neutral before going in the opposite direction.

Do not dismount while the aerial platform is in motion or jump off the platform.

Properly stow the aerial platform and secure it against unauthorized operation at the end of each work day, before transporting, or if it is left unattended.

Tip-Over and Falling Hazards

Operate the aerial platform only on a firm, flat, level surface capable of withstanding all load forces imposed by the aerial platform in all operating conditions. Refer to the General Specifications chart for the maximum wheel load and ground pressure. Raise the booms only when the aerial platform is on level ground.

Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Do not drive or position the aerial platform for elevated use near any drop-off, hole, slope, soft or uneven ground, or other tip-over hazard.

All platform occupants must wear a fall restraint device connected to a lanyard anchor point.

It is best not to transfer from the platform to another structure or from the structure to the platform, unless that is the safest way to do the job. Judge each situation separately taking the work environment into account. If it is necessary to transfer from the platform to another structure the following guidelines apply:

1. Where possible, place the platform over a roof or walking structure to do the transfer.
2. Transfer your anchorage from one structure to the other before stepping across.
3. Remember that you might be transferring to a structure where *personal fall arrest* is required.
4. Use the platform entrance, do not climb over or through the guardrails.

Do not operate the aerial platform in windy or gusty conditions. Do not add anything to the aerial platform that will increase the wind loading such as billboards, banners, flags, etc.

Never operate the aerial platform without all parts of the guardrail system in place and the gate closed. Make sure that all protective guards, cowlings, and doors are securely fastened.

Do not exceed the platform capacity as indicated on the platform rating placard on the platform. Do not carry loads that extend beyond the platform guardrails without prior written consent from Snorkel.

Do not operate the aerial platform from trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment unless the application is approved in writing by Snorkel.

Do not use the aerial platform as a crane, hoist, jack, or for any purpose other than to position personnel, tools, and materials.

Do not climb on the guardrails or use ladders, planks, or other devices to extend or increase the work position from the platform.

Take care to prevent rope, electrical cords, and hoses, etc., from becoming caught in or on the aerial platform.

- If the platform or booms becomes caught on an adjacent structure or other obstacle and is prevented from normal motion, reverse the control to free the platform.
- If control reversal does not free the platform, evacuate the platform before attempting to free it.

Electrical System

Charge the batteries in a well-ventilated area free of flame, sparks, or other hazards that might cause fire or explosion.

Do not operate any of the aerial platform functions while the battery charger is plugged in.

Warning

Batteries give off hydrogen and oxygen that can combine explosively. Death or serious injury could result from a chemical explosion. Do not smoke or permit open flames or sparks when checking the batteries.

Battery acid can damage the skin and eyes. Serious infection or reaction could result if medical treatment is not given immediately. Wear face and eye protection when working near the batteries.

- Batteries contain sulfuric acid that could damage your eyes or skin on contact.
- Wear a face shield, rubber gloves, and protective clothing when working around batteries.
- If acid contacts your eyes, flush immediately with clear water and get medical attention
- If acid contacts your skin, wash off immediately with clear water.

Hydraulic System

The hydraulic system contains hoses with hydraulic fluid under pressure.

Danger

Hydraulic fluid escaping under pressure can have enough force to inject fluid into the flesh. Serious infection or reaction will result if medical treatment is not given immediately. In case of injury by escaping hydraulic fluid, seek medical attention at once.

Do not place your hand or any part of your body in front of escaping hydraulic fluid. Use a piece of cardboard or wood to search for hydraulic leaks.

Engine and Fuel Handling Precautions

Refer to the engine manufacturer's Operator's Manual for complete information on safe engine operation, maintenance, and specifications.

Danger

Engine exhaust contains carbon monoxide, a poisonous gas that is invisible and odorless. Breathing engine exhaust fumes will cause death or serious illness. Do not run the engine in an enclosed area or indoors without adequate ventilation.

Be careful not to run the diesel fuel tank empty. Bleed the fuel system if air enters the lines between the tank and the injection pump.

Allow the engine to return to idle before shutting the engine off.

Do not smoke or permit open flames while fueling or near fueling operations.

Never remove the fuel cap or fill the fuel tank while the engine is running or hot. Never allow fuel to spill on hot machine components.

Maintain control of the fuel filler nozzle when filling the tank. Spilled fuel is a potential fire hazard.

Do not overfill the fuel tank. Allow room for expansion.

Clean up spilled fuel immediately.

Tighten the fuel tank cap securely. If the fuel cap is lost, replace it with an approved cap from Snorkel. Use of a non-approved cap without proper venting may result in pressurization of the tank.

Never use fuel for cleaning purposes.

For diesel engines, use the correct fuel grade for the operating season.

Caution

Engine coolant escaping under pressure may cause serious burns. Shut the engine off and let it cool before removing the radiator cap.

Let the engine and radiator cool before adding coolant.

Placards and Decals

The aerial platform is equipped with placards and decals that provide instruction for operation and accident prevention. Do not operate the aerial platform if any placards or decals are missing or not legible.

Chapter 4 – Safety Devices

This aerial work platform is manufactured with safety devices, placards, and decals to reduce the likelihood of an accident.

- For the safety of all personnel, do not disable, modify, or ignore any safety device.
- Safety devices are included in the daily prestart inspection.

Warning

The potential for an accident increases when safety devices do not function properly. Death or serious injury could result from such accidents. Do not alter, disable, or override any safety device.

If any safety devices are defective, remove the aerial platform from service until qualified maintenance personnel can make repairs.

Emergency Stop Controls

There is an emergency stop control at the lower and upper controls.

At the lower controls, the emergency stop is a two-position push button (refer to Figure 4.1).

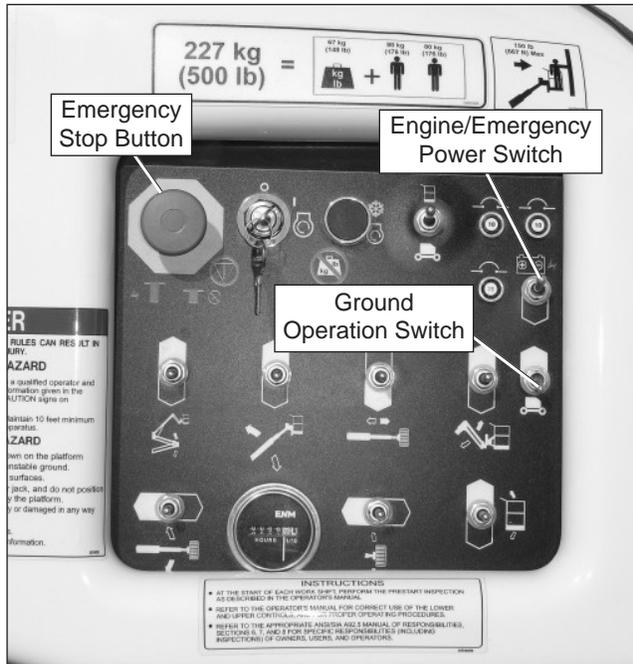


Figure 4.1 – Lower Controls

- Push the emergency stop button inward to disconnect power to all control circuits.
- Pull the button outward to restore power.

Note

The lower controls override the upper controls. If the upper control emergency stop button is engaged, the lower controls can still be used to operate the aerial platform.

At the upper controls, the emergency stop is a two-position push button (refer to Figure 4.2).

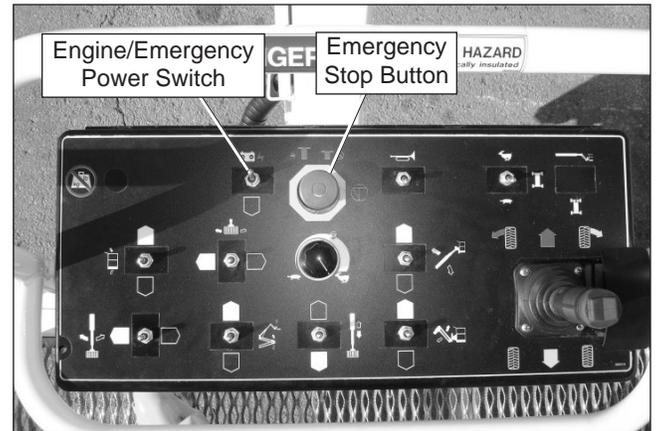


Figure 4.2 – Upper Controls

- Push the emergency stop button inward to disconnect power to the upper control circuits.
- Pull the button outward to restore power.

Emergency Power System

The emergency power system includes a back-up pump, motor, and battery. Use this system to operate the boom and turntable functions to lower the platform if the main power system fails due to engine or pump failure.

Caution

The emergency power system is for emergency lowering and stowing only. The length of time the pump can be operated depends on the capacity of the battery. Do not use this system for normal operation.

- Hold the emergency power switch (refer to Figures 4.1 and 4.2) in the direction of the white arrow to activate the emergency power system.
- Release the switch to disengage the emergency power system.
- The length of time the pump can be operated depends on the capacity of the battery.

Ground Operation Switch

The ground operation switch (refer to Figure 4.1) prevents boom and platform movement if a control switch on the lower control panel is accidentally moved.

Hold the switch up to operate the machine from the lower controls.

Platform Foot Switch

Step down on the platform foot switch (refer to Figure 4.3) to activate the upper controls.

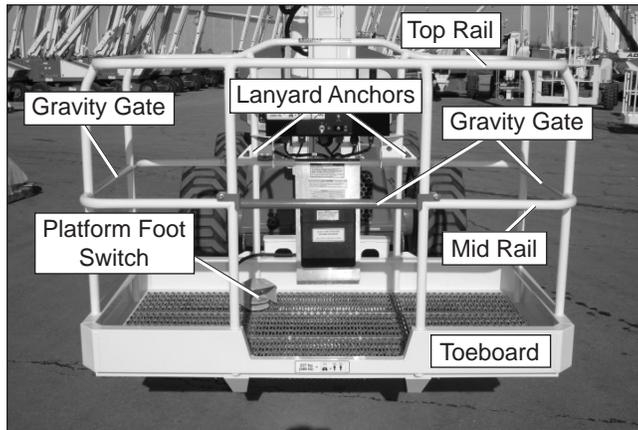


Figure 4.3 – Platform

The foot switch must be engaged and a control must be moved to operate the boom, drive, and/or platform from the upper controls.

Guardrails

The guardrails (refer to Figure 4.3) help protect personnel from falling off the platform.

The guardrail system includes:

- A top rail
- A mid rail
- Three gravity gates: one on each side and one rear
- Toeboards around the sides of the platform.

The gravity gates allow for access to the platform and close automatically after entering or exiting the platform. After entering the platform check to make sure the gates are fully lowered and even with the mid rail.

Lanyard Anchors

Two lanyard anchors for fall restraint anchorage are provided below the upper controls at the front of the platform (refer to Figure 4.3).

Note

The lanyard anchors are not for lifting or tying the machine down.

- All personnel in the platform must connect their fall restraint device to a lanyard anchor before raising the platform.
- Attach only one fall restraint device to each lanyard anchor.
- Do not use the aerial platform for *personal fall arrest* anchorage.

Ground Fault Circuit Interrupter

The electrical power outlet at the platform (refer to Figure 4.4) contains a ground fault circuit interrupter (GFCI) to provide protection for personnel.

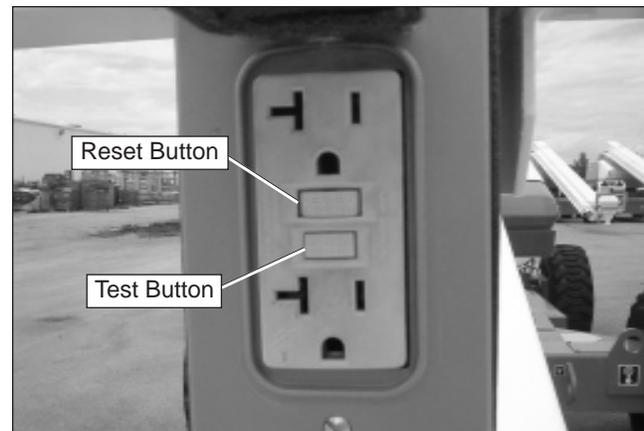


Figure 4.4 – Electrical Power Outlet

Tilt Alarm

If the aerial platform chassis is out of level more than five degrees when the main boom is raised or extended, or when the riser boom is raised, an alarm will sound. The tilt alarm is located under the upper control panel.

▲ Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Do not drive or position the aerial platform for elevated use near any drop-off, hole, slope, soft or uneven ground, or other tip-over hazard.

Completely lower the booms and then drive to a level surface when the tilt alarm sounds.

The tilt alarm is for added protection and does not justify operating on anything other than firm, flat, level surfaces.

Engine Protection Systems

A constant tone alarm will sound to warn against high engine temperature or low oil pressure.

The engine will shut-down:

- if the operating temperature exceeds a preset level
- or if the oil pressure is too low for safe operation.

High Engine Temperature Alarm

If the coolant exceeds the engine operating temperature an alarm will sound and the engine will shut off.

Do not restart the engine until the condition that caused the overheating has been corrected.

Low Oil Pressure Alarm

The low oil pressure alarm sounds when the engine oil pressure is near the lower limit for safe engine operation. If the alarm sounds, lower the platform to the ground and then turn the engine off.

- If the engine oil pressure falls below a safe operating value the engine will shut off.
- The engine can be restarted with low oil pressure, but it will only run for a few seconds before it shuts off again.
- Do not restart the engine until the condition that caused the low oil pressure has been corrected.

Horn

The horn may be used to warn personnel on the ground. The horn switch is to the right of the emergency stop button on the upper control panel (refer to Figure 4.5). The horn is operational when the machine is set up for operation from the upper controls.



Figure 4.5 – Upper Controls

All Motion Alarm

An optional all motion alarm may be provided on the machine. The alarm sounds, in short beeps, anytime the machine functions are being operated. The alarm is used to warn personnel in the work area to stand clear.

Flashing Light

An amber flashing light may be located on the top of the counterweight. The flashing light warns personnel that the aerial platform is in the area.

The light flashes at approximately one flash per second when the engine is running.

Chapter 5 – Gauges and Displays

The aerial platform is equipped with several gauges to monitor the condition of the machine before and during operation.

Hour Meter

The hour meter is located on the lower control panel (refer to Figure 5.1). It measures the accumulated engine operating time.



Figure 5.1 – Lower Controls

Fuel Gauge

The fuel gauge is located on top of the fuel tank. Access the gauge by opening the door on the top, left rear of the chassis (refer to Figure 5.2). Read the fuel level at the line in the clear plastic window. The gauge indicates the fuel tank level in fractions of a full tank.

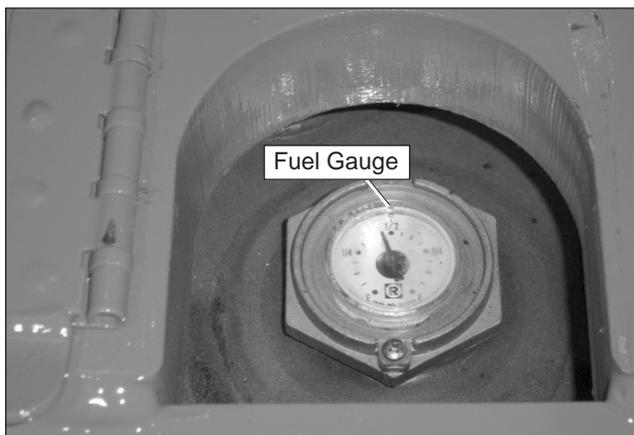


Figure 5.2 – Fuel Tank

Note

Do not run a diesel fuel tank empty. Air in the fuel line makes the engine hard to start.

Engine Oil

The engine oil level is measured with a dipstick. The dipstick is the only way to accurately determine the engine oil level. The engine oil level should always be between the add and full marks on the dipstick.

Hydraulic Fluid Filter Gauge

The fluid filter gauge (refer to Figure 5.3) is located on the control valve behind the door on the right side of the turntable.

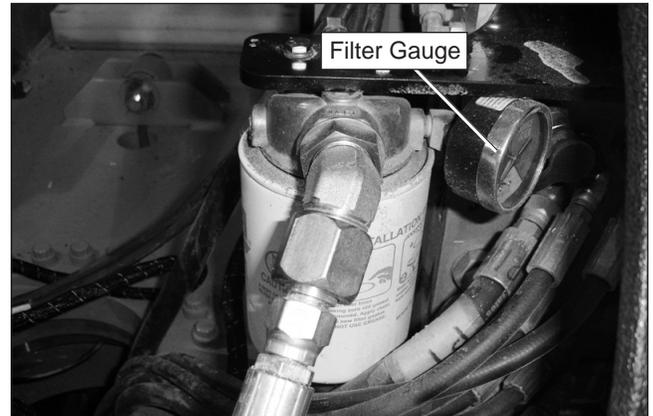


Figure 5.3 – Hydraulic Fluid Filter Gauge

- During high pump flow situations, the gauge indicates the condition of the filter.
- When the needle on the gauge is in the red zone, its time to change the filter.

Hydraulic Fluid Level Sight Gauge

A sight gauge on the end of the reservoir displays the level of the hydraulic fluid (refer to Figure 5.4).

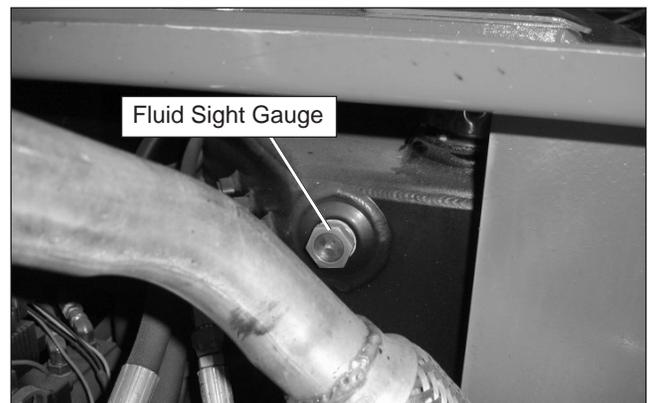


Figure 5.4 – Hydraulic Fluid Gauge

Remove the engine cover and check the fluid level with the aerial platform in the stowed position, booms completely down and retracted. Otherwise, the cylinders act as large reservoirs for hydraulic fluid making the level appear too low. The fluid should be visible in the sight gauge.

Chapter 6 – Controls

⚠ Danger

Pinch points may exist between moving components. Death or serious injury will result from becoming trapped between components, buildings, structures, or other obstacles. Make sure all personnel stand clear while operating the aerial platform.

- Controls to position the platform are located on the lower control panel on the turntable and on the upper control panel in the platform.
- Controls to drive the aerial platform are located on the upper control panel only.

Battery Disconnect Switch

The battery disconnect is located at the left rear of the chassis (refer to Figure 6.1).

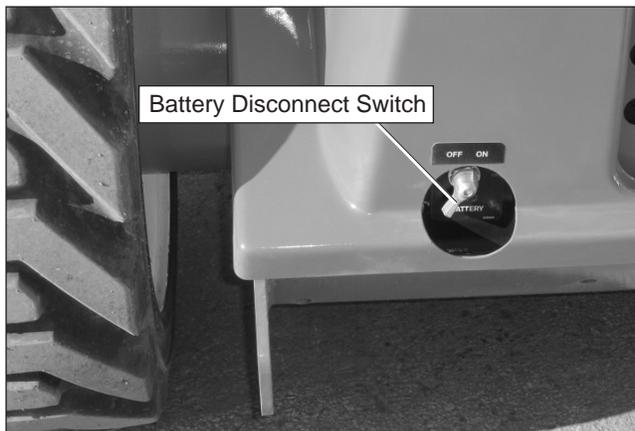


Figure 6.1 – Battery Disconnect Switch

The battery disconnect removes electrical power from all electrically controlled functions when in the off position.

- Place the switch in the on position to electrically connect the battery to the electrical system.

⚠ Caution

Only authorized personnel should operate the aerial platform. Unqualified personnel may cause injury to coworkers or property damage. Lock the battery disconnect switch in the off position before leaving the aerial platform unattended.

- Lock the battery disconnect switch in the off position to prevent unauthorized use of the aerial platform.

Lower Controls

The lower controls (refer to Figure 6.2) are located on the left side of the turntable. Boom and platform functions can be operated from the lower controls. The following are located on the lower control panel:

- Preheat button
- Start switch
- Emergency stop button
- Controls selector switch
- Ground operation switch
- Rotation switch
- Riser switch
- Boom elevation switch
- Boom extension switch
- Jib articulation switch
- Platform level switch
- Platform rotation switch
- Engine/Emergency power switch
- Hydraulic system warm-up switch (option)

Preheat Button

The preheat button (refer to Figure 6.2) is a two-position, black push button. This button operates the glow plugs to aid in starting the engine when the start switch is in the on position.

- When the engine is warmed up or the ambient temperature is above 50°F (10°C), it is not necessary to operate the glow plugs before starting the engine.
- When the ambient temperature range is 50°F (10°C) to 23°F (-5°C), press and hold the preheat button for five seconds before starting the engine.
- When the ambient temperature is below 23°F (-5°C), press and hold the preheat button for ten seconds before starting the engine.

Start Switch

The start switch (refer to Figure 6.2) works like an automobile ignition switch.

- Hold the switch in the start position until the engine starts, then release it to on.
- If the engine dies, the switch must be turned to off before it can be turned back to start.

An alarm sounds, when the switch is turned on, to warn others that the machine engine is being started.

Note

On some machines it may be necessary to pause about three seconds in the on position before going to start so the starter can engage.

If the platform is to stay in a particular position for a long time, turn the start switch to off to shut off the engine and save fuel.

Emergency Stop Button

The emergency stop (refer to Figure 6.2) is a two-position, red push button.

- Push the button inward to disconnect power to all control circuits.
- Pull the button outward to restore power.

Controls Selector Switch

Use the controls switch (refer to Figure 6.2) to select between lower control and upper control operation.

- Place the switch in the upward position to operate the aerial platform from the upper controls.
- Place the switch in the downward position for lower control operation.

Ground Operation Switch

Hold the ground operation switch (refer to Figure 6.2) upward continually to operate the machine from the lower controls. The engine speed increases when the switch is held upward. This switch is spring returned to the off position.

Rotation Switch

The rotation switch (refer to Figure 6.2) is used to rotate the turntable in a clockwise or counterclockwise direction. The switch is spring returned to the center off position.

- Hold the switch to the right to rotate the turntable counterclockwise.
- Hold the switch to the left to rotate the turntable clockwise.

Riser Switch

The riser switch (refer to Figure 6.2) is used to raise or lower the riser booms. The switch is spring returned to the center off position.

- Hold the switch upward to raise the riser booms.
- Hold the switch downward to lower the riser booms.

Boom Elevation Switch

The boom elevation switch (refer to Figure 6.2) is used to raise or lower the main boom. The switch is spring returned to the center off position.

- Hold the switch upward to raise the main boom.
- Hold the switch downward to lower the main boom.

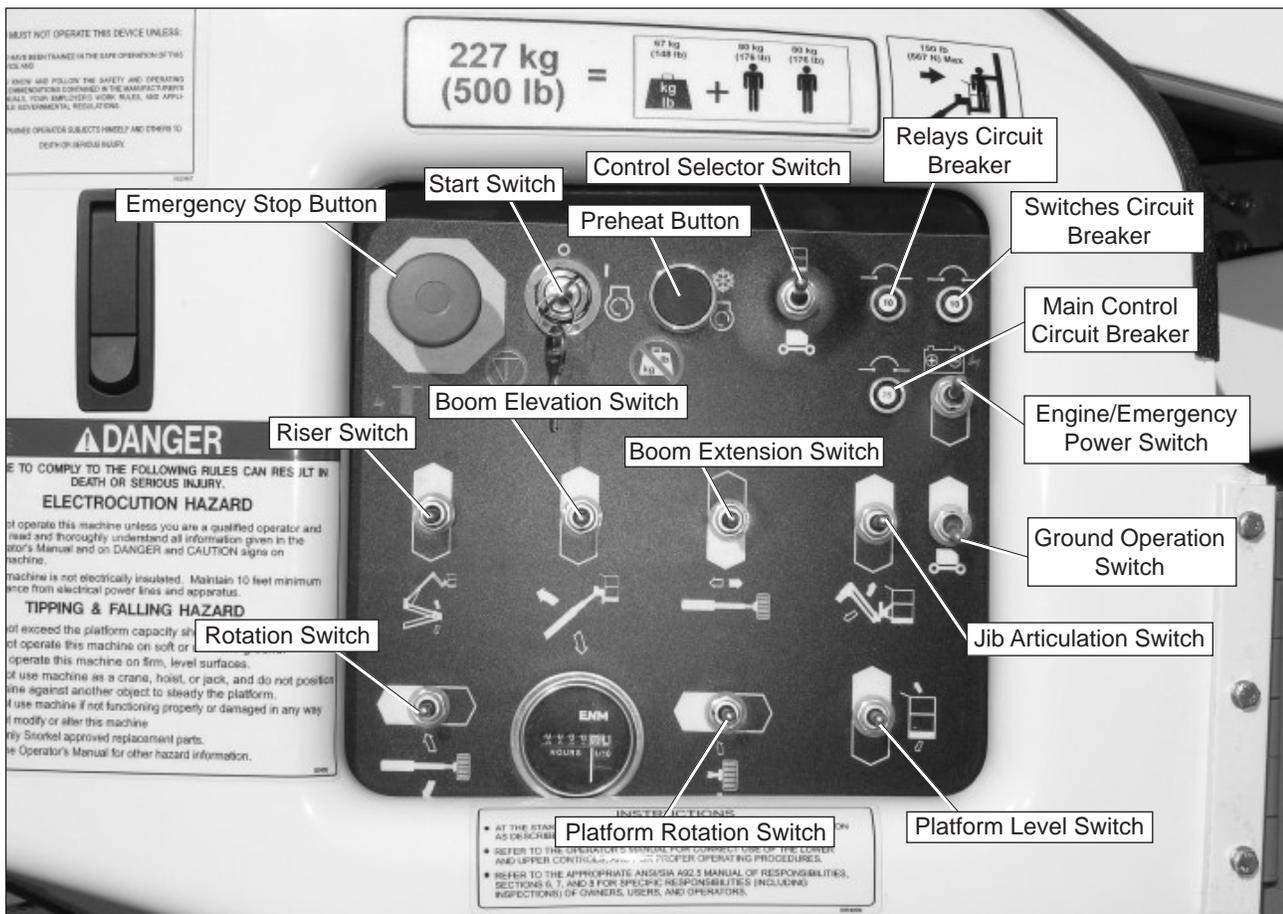


Figure 6.2 – Lower Controls

Boom Extension Switch

The boom extension switch (refer to Figure 6.2) is used to extend or retract the booms. The switch is spring returned to the center off position.

- Hold the switch to the right to extend the booms.
- Hold the switch to the left to retract the booms.

Jib Articulation Switch

The jib switch (refer to Figure 6.2) is used to raise or lower the jib. The switch is spring returned to the center off position.

- Hold the switch upward to raise the jib.
- Hold the switch downward to lower the jib.

Platform Level Switch

The platform level switch (refer to Figure 6.2) is used to level the platform floor with respect to the ground. The switch is spring returned to the center off position.

- Hold the switch upward to tilt the platform floor upward or away from the ground.
- Hold the switch downward to tilt the platform floor downward or toward the ground.

Platform Rotation Switch

The platform rotation switch (refer to Figure 6.2) is used to rotate the platform relative to the end of the tip boom. The switch is spring returned to the center off position.

- Hold the switch to the right to rotate the platform counterclockwise.
- Hold the switch to the left to rotate the platform clockwise.

Engine/Emergency Power Switch

The engine/emergency power switch (refer to Figure 6.2) is used to operate turntable, boom, and platform functions using the emergency power system. The switch is spring returned to the engine position for aerial platform engine operation.

⚠ Caution

The emergency power system is for emergency lowering and stowing only. The length of time the pump can be operated depends on the capacity of the battery. Do not use this system for normal operation.

- Hold the engine/emergency power switch downward in the direction of the white arrow to activate the emergency power system.
- Release the switch to disengage the emergency power system.

If the engine is running, it will stop when the switch is placed in the emergency power position.

Hydraulic Oil Warm-Up Switch

The optional hydraulic fluid warm-up switch is used to warm the hydraulic fluid when the ambient temperature is below 32°F (0°C) and boom movement is sluggish because of cold fluid.

⚠ Caution

Not all hydraulic fluid is suitable to use in the hydraulic system. Some have poor lubricating characteristics and may increase component wear. Only use hydraulic fluid as recommended.

Use cold weather hydraulic oil as recommended in the machine General Specifications in temperatures of 10°F (0°C) or below.

The toggle switches for the warm-up system are on the lower control panel and on the front of the upper control panel.

Note

Machine functions are not operational while using the hydraulic warm-up system.

To warm-up the hydraulic fluid from the lower controls:

1. Start the engine from the lower controls.
2. Place the hydraulic fluid warm-up switch in the on position.
 - The engine throttle speed will increase to warm the hydraulic fluid.
 - The engine throttle speed will decrease and return to idle once the hydraulic fluid reaches a preset temperature.
 - If the warm-up switch is left on the engine speed will continue to increase and decrease to keep the hydraulic fluid at a preset temperature.
3. When the engine throttle speed returns to idle, place the hydraulic fluid warm-up switch in the off position.

Circuit Breaker Reset Buttons

The lower control panel electrical system has a 10 amp circuit breaker for both the internal relays and the toggle switches, and a 25 amp circuit breaker for the main control system circuit. There is a reset button for each circuit breaker at the top of the lower control panel (refer to Figure 6.2).

The upper control panel has a 10 amp circuit breaker for the upper control system circuit, with the reset button on the front of the upper control panel (refer to Figure 6.3).

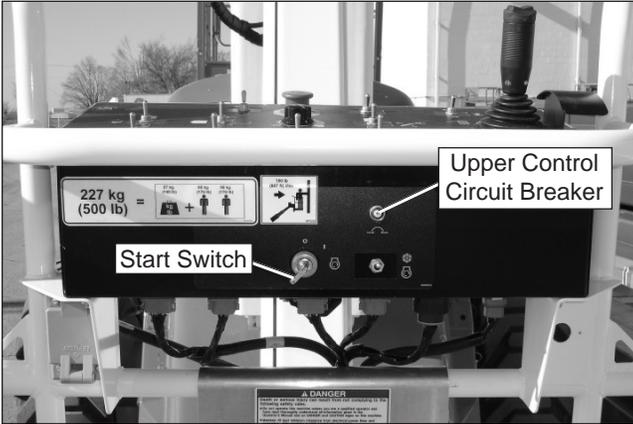


Figure 6.3 – Upper Control Panel Front

The electrical power outlet at the platform has a 15 amp circuit breaker. The reset button is on the left side of the electrical box (refer to Figure 6.4).

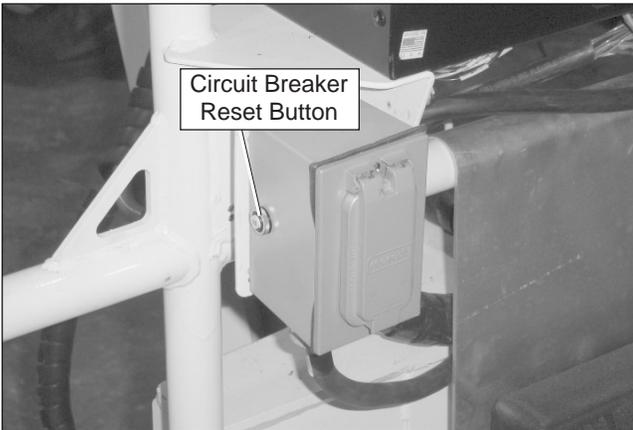


Figure 6.4 – Electrical Power Outlet

The battery disconnect panel has a 15 amp circuit breaker for the engine throttle circuit and a 25 amp circuit breaker for the glow plug circuit. The reset buttons are on the bottom right side of the battery disconnect panel (refer to Figure 6.5).

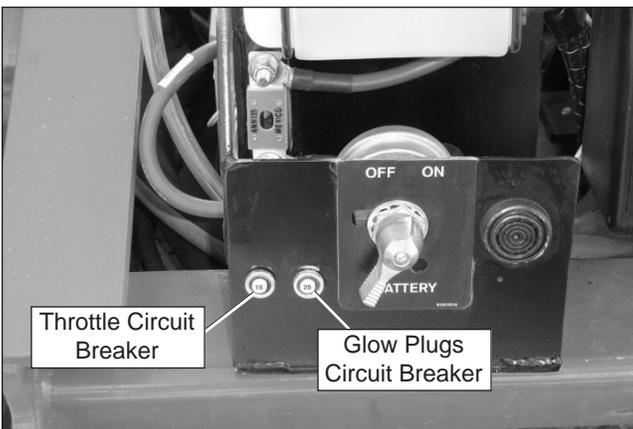


Figure 6.5 – Battery Disconnect Panel

The circuit breakers protect the electrical wiring and components from electrical overload in case of a short circuit or other fault.

⚠ Caution

A tripped circuit breaker indicates a malfunction in the electrical system. Component damage can result if the cause of the malfunction is not corrected. Do not operate the aerial platform if the circuit breaker trips repeatedly.

Push the button to reset the circuit breaker.

Upper Controls

The upper controls (refer to Figure 6.6) are located on the control panel at the platform. Boom, platform, and drive functions can be operated from the upper controls. The following controls are located on the upper control panel.

- Preheat switch
- Start switch
- Emergency stop button
- Drive joystick
- Steer switch
- Drive range switch
- Boom speed knob
- Rotation switch
- Riser switch
- Boom elevation switch
- Boom extension switch
- Jib articulation switch
- Platform level switch
- Platform rotation switch
- Engine/Emergency power switch
- Horn
- AC generator switch (option)
- Hydraulic system warm-up switch (option)

Preheat Switch

The preheat switch (refer to Figure 6.7) is a momentarily on toggle switch. This switch operates the glow plugs to aid in starting the engine when the start switch is in the on position.

- When the engine is warmed up or the ambient temperature is above 50°F (10°C), it is not necessary to operate the glow plugs before starting the engine.
- When the ambient temperature range is 50°F (10°C) to 23°F (-5°C), press and hold the preheat button for five seconds before starting the engine.
- When the ambient temperature is below 23°F (-5°C), press and hold the preheat button for ten seconds before starting the engine.

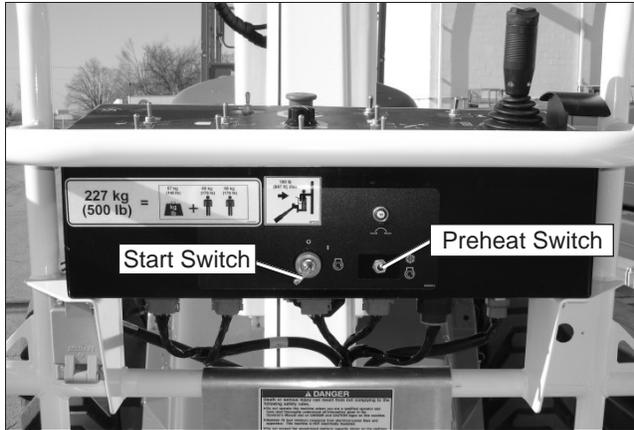


Figure 6.7 – Upper Control Panel Front

Start Switch

The engine can be started from the platform using the start switch on the front of the upper control panel (refer to Figure 6.7).

This switch is similar to an automobile ignition switch.

- Turn the switch to start until the engine starts, then release it to on.
- If the engine dies, the switch must be turned to off before it can be turned back to start.

An alarm sounds, when the switch is turned on, to warn others that the machine engine is being started.

Note

On some machines it may be necessary to pause about three seconds in the on position before going to start so the starter can engage.

If the platform is to stay in a particular position for a long time, turn the start switch to off to shut off the engine and save fuel.

Emergency Stop Button

The emergency stop is a two-position, red push button on the top of the upper control panel (refer to Figure 6.6).

- Push the button inward to disconnect power from all control circuits at the upper controls.
- Pull the button outward to restore power.

Note

The lower controls override the upper controls. If the upper control emergency stop button is engaged the lower controls can still be used to operate the aerial platform.

- Push the emergency stop button inward when the upper controls are not in use to protect against unintentional operation.

Drive Joystick

The drive joystick (refer to Figure 6.6) is used to control forward and reverse motion of the aerial platform. The distance the joystick is moved is proportional to the machine drive speed.

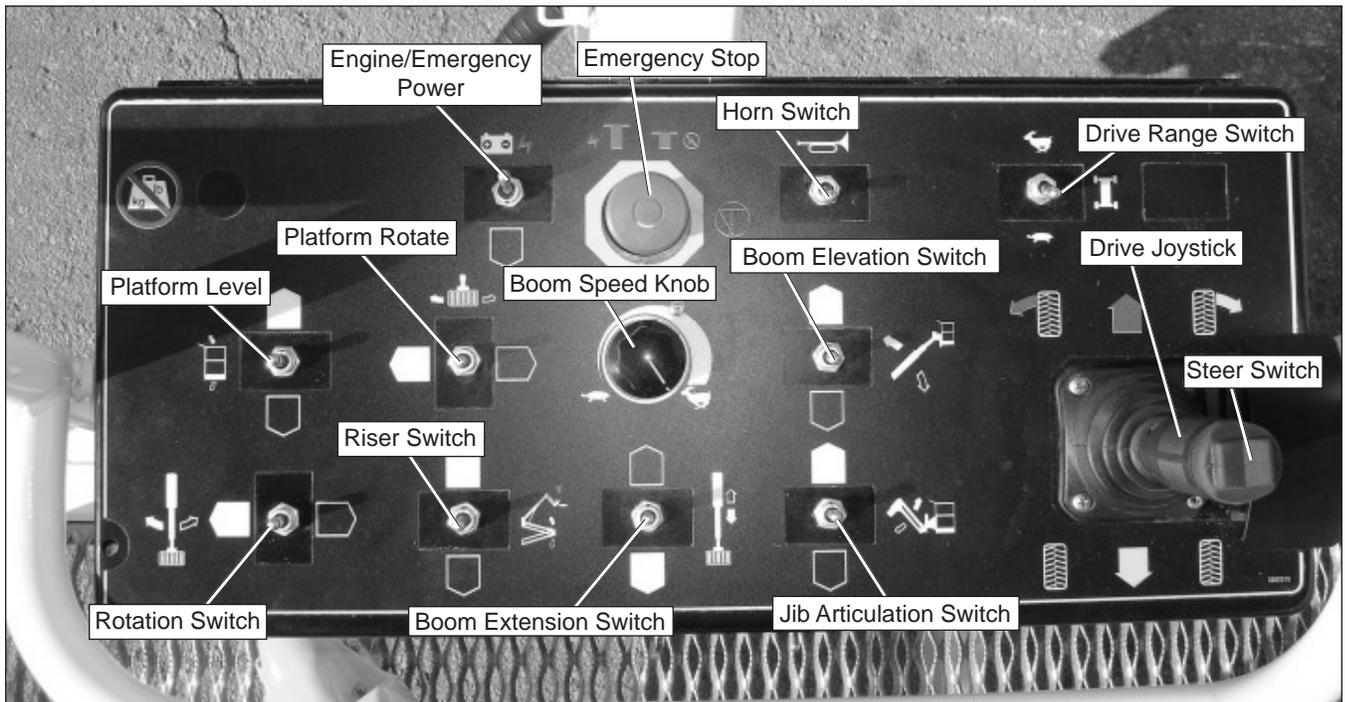


Figure 6.6 – Upper Control Panel Top

Hold the joystick forward to move the aerial platform forward and backward to move in reverse as indicated by the directional arrows on the chassis.

Drive and steer functions may be operated simultaneously.

Steer Switch

The steer switch (refer to Figure 6.6) is a momentary contact, rocker switch on top of the drive joystick. This switch controls the two front wheels to steer the aerial platform.

- To steer to the right, hold down the right side of the steer switch.
- To steer to the left, hold down the left side of the steer switch.

Note

The steering wheels are not self-centering. Set the steering wheels straight ahead after completing a turn.

Drive Range Switch

The drive range switch (refer to Figure 6.6) has two positions to select drive wheel operation when the booms are in the stowed position; tip boom fully retracted and main boom fully lowered.

- High range (rabbit) – high speed drive (4.5 mph) with booms in the stowed position.
- Low range (turtle) – creep speed (0.8 mph) with high torque drive operation with booms in any position.

The drive range operates in low when the booms are out of the stowed position, regardless of the position of the drive range switch.

Boom Speed Knob

Use the boom speed control knob (refer to Figure 6.6) to control the speed of the following boom functions:

- Main boom raise/lower
- Main boom extend/retract
- Turntable rotation clockwise/counterclockwise

Set the knob to slow (turtle) when beginning a boom movement. The speed may be increased by slowly rotating the knob toward fast (rabbit). For smooth operation, rotate the knob to slow when ending boom movement.

Rotation Switch

The rotation switch (refer to Figure 6.6) is used to rotate the turntable in a clockwise or counterclockwise direction. The switch is spring returned to the center off position.

- Hold the switch to the right to rotate the turntable counterclockwise.
- Hold the switch to the left to rotate the turntable clockwise.

Riser Switch

The riser switch (refer to Figure 6.6) is used to raise or lower the riser booms. The switch is spring returned to the center off position.

- Hold the switch upward to raise the riser booms.
- Hold the switch downward to lower the riser booms.

Boom Elevation Switch

The boom elevation switch (refer to Figure 6.6) is used to raise or lower the main boom. The switch is spring returned to the center off position.

- Hold the switch upward to raise the main boom.
- Hold the switch downward to lower the main boom.

Boom Extension Switch

The boom extension switch (refer to Figure 6.6) is used to extend or retract the booms. The switch is spring returned to the center off position.

- Hold the switch downward to extend the booms.
- Hold the switch upward to retract the booms.

Jib Articulation Switch

The jib articulation switch (refer to Figure 6.6) is used to raise or lower the jib. The switch is spring returned to the center off position.

- Hold the switch upward to raise the jib.
- Hold the switch downward to lower the jib.

Platform Level Switch

The platform level switch (refer to Figure 6.6) is used to level the platform floor with respect to the ground. The switch is spring returned to the center off position.

- Hold the switch up to tilt the platform floor upward or away from the ground.
- Hold the switch downward to tilt the platform floor downward or toward the ground.

Platform Rotation Switch

The platform rotation switch (refer to Figure 6.6) is used to rotate the platform relative to the end of the tip boom. The switch is spring returned to the center off position.

- Hold the switch to the right to rotate the platform counterclockwise.
- Hold the switch to the left to rotate the platform clockwise.

Engine/Emergency Power Switch

The engine/emergency power switch (refer to Figure 6.6) is used to operate turntable, boom, and platform functions using the emergency power system. The switch is

spring returned to the engine position for aerial platform engine operation.

⚠ Caution

The emergency power system is for emergency lowering and stowing only. The length of time the pump can be operated depends on the capacity of the battery. Do not use this system for normal operation.

- Hold the engine/emergency power switch downward in the direction of the white arrow to activate the emergency power system.
- Release the switch to disengage the emergency power system.

If the engine is running, it will stop when the switch is placed in the emergency power position.

Horn Switch

The horn switch is to the right of the emergency stop button on the upper control panel (refer to Figure 6.6).

Hold the switch upward to sound the horn.

Platform Foot Switch

The upper controls are interlocked through the platform foot switch (refer to Figure 6.8).

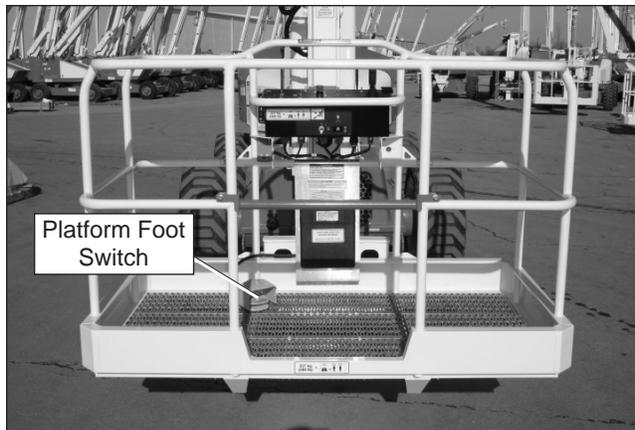


Figure 6.8 – Platform

Step down on and hold the platform foot switch to activate the drive and boom functions from the upper controls.

AC Generator Switch

The switch for the optional AC generator is located on the front of the upper control panel.

With the engine running, place the switch in the generator position to provide electrical power to the electrical outlet at the platform. Return the switch to the off position to turn off the generator and resume machine operation.

Machine functions will not operate while the switch is in the generator position.

Hydraulic Oil Warm-Up Switch

The optional hydraulic fluid warm-up switch is used to warm the hydraulic fluid when the ambient temperature is below 32°F (0°C) and boom movement is sluggish because of cold fluid.

⚠ Caution

Not all hydraulic fluid is suitable to use in the hydraulic system. Some have poor lubricating characteristics and may increase component wear. Only use hydraulic fluid as recommended.

Use cold weather hydraulic oil as recommended in the machine General Specifications in temperatures of 10°F (-12°C) or below.

The toggle switches for the warm-up system are on the lower control panel and on the front of the upper control panel.

Note

Machine functions are not operational while using the hydraulic warm-up system.

To warm-up the hydraulic fluid from the upper controls:

1. Start the engine from the upper controls.
2. Place the hydraulic fluid warm-up switch in the on position.
 - The engine throttle speed will increase to warm the hydraulic fluid.
 - The engine throttle speed will decrease and return to idle once the hydraulic fluid reaches a preset temperature.
 - If the warm-up switch is left on the engine speed will continue to increase and decrease to keep the hydraulic fluid at a preset temperature.
3. When the engine throttle speed returns to idle, place the hydraulic oil warm-up switch in the off position.

Chapter 7 – Prestart Inspection

Potential service and safety problems may be detected by inspecting the aerial platform. This chapter includes information on properly inspecting the aerial platform and includes a prestart inspection check list at the end of the chapter to ensure that no areas are overlooked.

Warning

The potential for an accident increases when operating an aerial platform that is damaged or malfunctioning. Death or serious injury could result from such accidents. Do not operate the aerial platform if it is damaged or malfunctioning.

Perform a prestart inspection at the beginning of each shift, before using the aerial platform on the job. The inspection site must have a smooth and level surface.

Operator's Manual Holder

The manual holder is located at the front of the platform (refer to Figure 7.1).

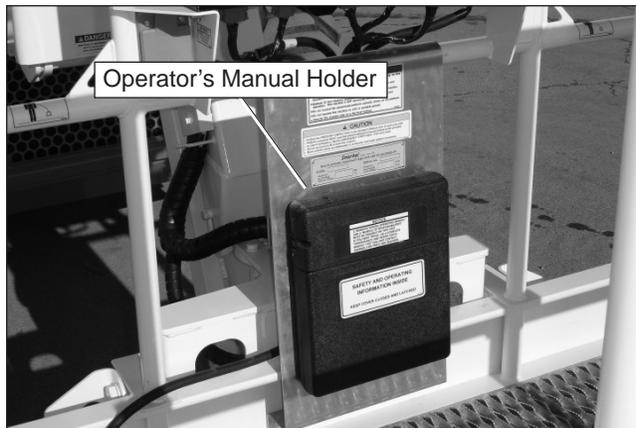


Figure 7.1 – Operator's Manual Holder

To inspect the Operator's Manual holder:

1. Make certain the Operator's Manual holder is securely fastened in place.
2. Check to see that the proper Operator's Manual is in the holder.
3. Check to see that the manual is complete with all pages intact and in readable condition.
4. Make certain ANSI publication "Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors and Lessees of ANSI/SIAA92.5-2006 Boom-Supported Elevating Work Platforms" is in the manual holder.

Engine

Remove the keeper pins and release the latches on either side of the engine cover (refer to Figure 7.2). Remove the engine cover to access the engine compartment.

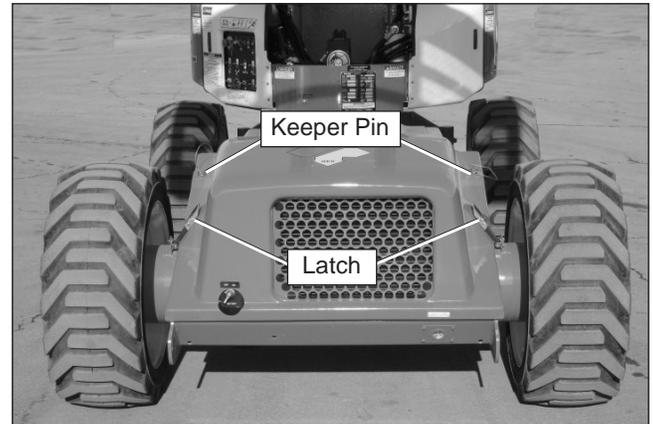


Figure 7.2 – Engine Cover

To inspect the engine:

1. Visually inspect the engine and its components with the engine off.
2. Inspect the cover pin and latch mechanisms to make certain they are in good working condition to hold the engine cover in place.
3. Make sure that the engine cover is fully closed, latched, and that the keeper pins are securely fastened before operating the machine after inspection or service.

Oil Level

The proper oil level is between the two marks on the dipstick.

To inspect the oil level:

1. Make sure the engine has been off for at least five minutes before checking the oil level. This will allow time for the oil to drain to the pan for a more accurate oil level reading.
2. Remove the dipstick and check to see that the oil level is between the two marks.
3. If necessary, add oil before starting the engine.

Note

Refer to Chapter 2 for the correct engine oil grade and weight.

Coolant

The engine is liquid cooled.

- When the engine is cold, the coolant level should be between the Hot and Cold marks on the coolant reservoir (refer to Figure 7.3).
- When the engine is at operating temperature, the coolant should be at the Hot level.

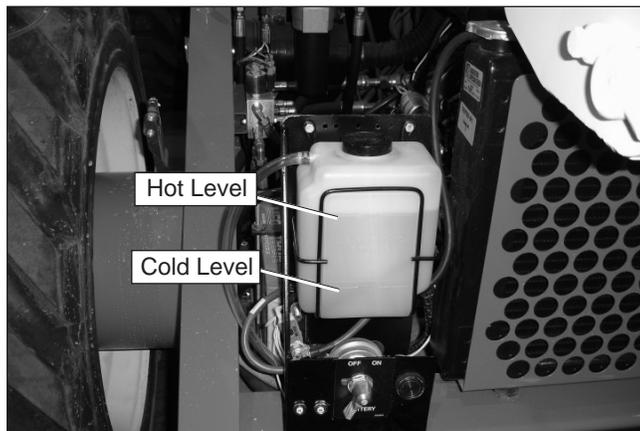


Figure 7.3 – Coolant Reservoir

To inspect the coolant level:

⚠ Caution

Engine coolant escaping under pressure may cause serious burns. Shut the engine off and let it cool before removing the radiator cap.

1. Shut the engine off and wait for it to cool.
2. Check to make sure the coolant level is between the Hot and Cold marks.
3. If necessary, remove the cap from the coolant reservoir and add coolant. Tightly replace the cap.

Note

Refer to Chapter 2 for engine coolant specifications. The need to regularly add fluid indicates a leak that should be corrected.

Radiator

To inspect the radiator:

1. Inspect the radiator hoses and clamps for wear, leakage, or damage.
2. Make sure the hoses are not hardened, cracked, or feel spongy.
3. Make sure the cap is in place and tight.
4. Check under the chassis for coolant that has leaked. Coolant leaks are easily visible on the ground.

5. Make sure the radiator core and ventilation openings on the cover are free of bugs, dirt, or foreign material that might restrict airflow.

Fuel Tank

The fuel level gauge is behind the door on the left side of the chassis (refer to Figure 7.4). The gauge measures the level of fluid in 1/16ths of a tank full.

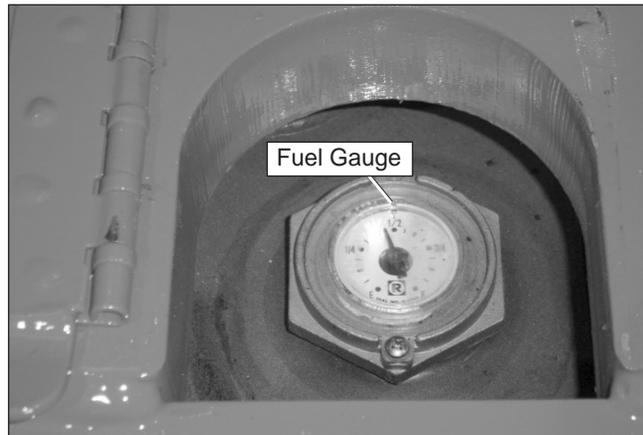


Figure 7.4 – Fuel Level Gauge

To check the fuel level:

1. Open the door to access the fuel gauge.
2. Read the fuel level indicated on the gauge.
3. If necessary, add fuel.

Note

Refer to Chapter 2 for fuel grade specifications.

4. Make sure the cap is securely fastened.

Fuel Line

To inspect the fuel line:

1. Visually inspect the entire length of the fuel line starting at the fuel tank.
2. Trace the line to the engine, inspecting for leaks and damage.

Electrical System

Electrical power is supplied from a 600 CCA, 12 volt battery. The battery is under the engine cover on the left side of the engine (refer to Figure 7.5). The battery supplies 12 volt DC electrical power to operate the aerial platform electrical and electrohydraulic components, including the emergency power system.

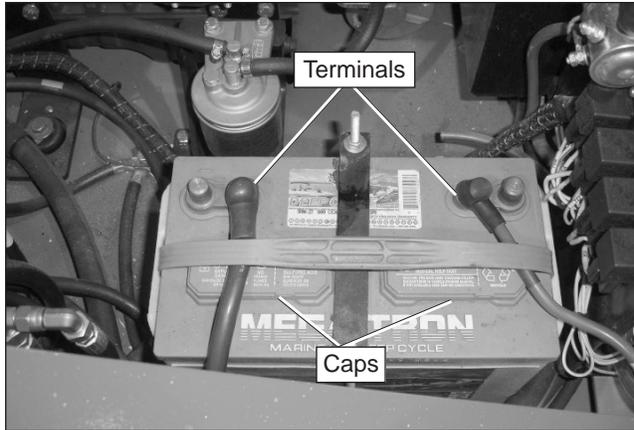


Figure 7.5 – Battery

⚠ Warning

Batteries give off hydrogen and oxygen that can combine explosively. Death or serious injury could result from a chemical explosion. Do not smoke or permit open flames or sparks when checking the batteries.

⚠ Caution

Even with low voltage electrical systems, severe arcing can occur. Electrical shock or component damage may result from contact with energized conductors. Use caution when working with any electrical device.

The battery is automatically charged when the engine is running. Include the battery when inspecting and servicing the electrical system.

For optimal battery performance the battery fluid level must be maintained and the battery connections must be kept clean.

Battery Fluid Level

To inspect the battery fluid level:

1. Remove the caps from the battery (refer to Figure 7.5).
2. Visually check the battery fluid level making sure the level is within $\frac{1}{4}$ " (6 mm) of the bottom of the filler neck inside each hole.
3. If necessary, add distilled water.

Note

Use only distilled water when refilling the battery. Tap water may contain metallic solids such as iron which can reduce the life of the battery.

4. Replace the caps on the battery. The caps must be in place and tight during machine operation.

Battery Terminals

To inspect the battery terminals:

1. Check the top of the battery, the terminals, and cable ends. They should be clean and free of corrosion (refer to Figure 7.5).
2. If necessary, clean the top of the battery. Clean the terminals and cable ends with a wire brush or terminal cleaning tool.
3. Make sure all cable ends are securely fastened to the terminals.

Cables and Wiring Harness

To inspect the cables and wiring harnesses:

1. Visually inspect all cables and wiring for wear and/or physical damage such as loose connections, broken wires, and frayed insulation.
2. Check the wiring in areas where a change in routing direction may cause them to become pinched.
3. Make sure the cables and wires are properly routed to avoid sharp edges, pinching, and scuffing.

Hydraulic System

Hydraulic power is supplied from an engine driven variable displacement piston pump.

⚠ Danger

Hydraulic fluid escaping under pressure can have enough force to inject fluid into the flesh. Serious infection or reaction will result if medical treatment is not given immediately. In case of injury by escaping hydraulic fluid, seek medical attention at once.

The hydraulic reservoir is inside the right side of the chassis. The pump is mounted on the engine.

Fluid Level

To inspect the fluid level:

1. Make sure the aerial platform is fully stowed on a level surface.
2. Remove the engine cover to access the engine compartment.
3. Visually check to make sure the fluid is visible in the sight glass (refer to Figure 7.6).

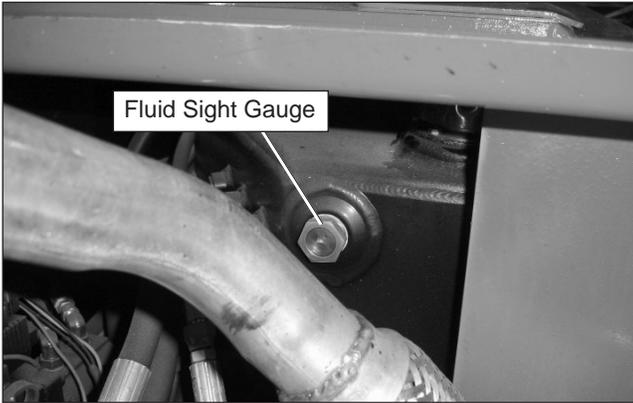


Figure 7.6 – Fluid Level Indicator

⚠ Caution

Not all hydraulic fluid is suitable to use in the hydraulic system. Some have poor lubricating characteristics and may increase component wear. Only use hydraulic fluid as recommended.

4. If necessary, remove the filler cap and add fluid of the proper type. Replace the cap making sure it is tightly in place.

Note

Refer to Chapter 2 for the proper type and grade of hydraulic fluid to use. The need to regularly add fluid indicates a leak that should be corrected.

Fluid Filter

Checking the condition of the hydraulic fluid filter is part of the machine maintenance schedule and should not be performed by the operator.

Hoses, Tubes, and Fittings

To inspect the hoses, tubes, and fittings:

1. Inspect all hydraulic hoses, tubes, and fittings for wear, leakage, or damage (refer to Figure 7.7).



Figure 7.7 – Hoses, Tubes, and Fittings

2. Make sure the hoses are properly routed to avoid sharp edges, kinking, and scuffing.
3. Inspect the tubes for dents or other damage that may restrict fluid flow.
4. Make sure all hoses and tubes are held firmly in their support brackets.
5. Check under the chassis for fluid that has leaked. Hydraulic fluid leaks are easily visible on the ground.

Tires and Wheels

Visually inspect the tires and wheels (refer to Figure 7.8) to make sure they are suitable for service.



Figure 7.8 – Tires and Wheels

The aerial platform may have air or foam filled tires. Different types of tires have different inspection requirements.

Air Filled

Air filled tires have a tire pressure decal near the valve stem. The valve stem also has a valve core like an automobile tire.

⚠ Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Do not operate the aerial platform if a tire is leaking air or is in poor condition where a blow out could occur.

To inspect air filled tires and wheels:

1. Check the wheel lug nuts to see that none are missing, damaged, or loose.
2. Carefully inspect the tires for wear, cuts, punctures, or imbedded objects.

3. Test the air pressure with a pressure gauge to make sure the tires are properly inflated. Check the tires several times throughout the day to see that they are properly inflated.

Foam Filled

Foam filled tires do not have a pressure decal or a valve core.

To inspect foam filled tires and wheels:

1. Check the wheel lug nuts to see that none are missing, damaged, or loose.
2. Carefully inspect for large holes or cuts where foam is coming out of the tire.
3. Look for large imbedded objects, such as angle iron, that can rip a tire open.

Note

Punctures caused by bolts, screws, or nails are not a problem for foam filled tires.

Lower Control Station

With no personnel in the platform, test the operation of each control from the lower controls (refer to Figure 7.9).

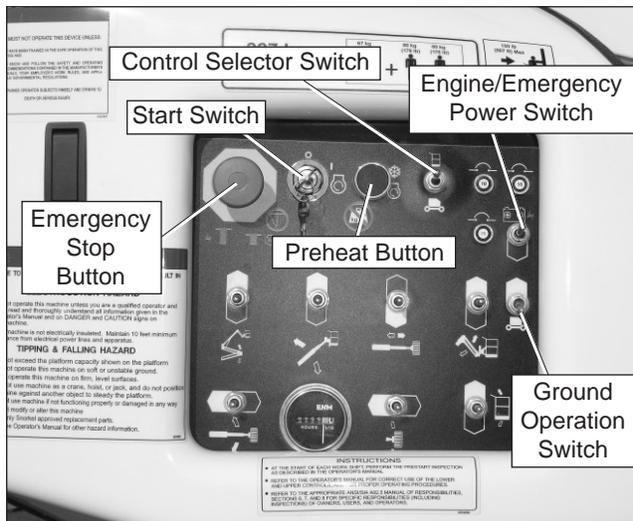


Figure 7.9 – Lower Controls

Operating Controls

Use the following procedure to operate the machine from the lower controls.

1. Turn the battery disconnect switch on.
2. At the lower controls, pull the emergency stop button outward. Place the control selector switch in the lower control position.

3. Insert the key into the start switch and turn the switch to start to the on position. Operate the preheat button if required.

- When the engine is warmed up or the ambient temperature is above 50°F (10°C), it is not necessary to operate the glow plugs before starting the engine.
- When the ambient temperature range is 50°F (10°C) to 23°F (-5°C), press and hold the preheat button for five seconds before starting the engine.
- When the ambient temperature is below 23°F (-5°C), press and hold the preheat button for ten seconds before starting the engine.

4. Turn the start switch until the engine starts, then release.
5. Let the engine warm to operating temperature.
6. Hold the ground operation switch upward.

▲Danger

Pinch points may exist between moving components. Death or serious injury will result from becoming trapped between components, buildings, structures, or other obstacles. Make sure all personnel stand clear of the aerial platform while performing the prestart inspection.

▲Warning

The potential for an accident increases when operating an aerial platform that is damaged or malfunctioning. Death or serious injury could result from such accidents. Do not operate the aerial platform if it is damaged or malfunctioning.

7. Test the operation of each function in both directions.

Note

When checking the turntable rotation function in the counterclockwise direction, the turntable will rotate toward you.

Emergency Stop

To test the emergency stop button from the lower controls:

1. Push the emergency stop button inward to turn off electrical power.
2. Test the lower control functions to make sure they no longer operate.

Emergency Power

To test the emergency power system from the lower controls:

1. Place the battery disconnect switch, the emergency stop switch, and the start switch in the on position.
2. Hold the engine/emergency power switch down and the ground operation switch upward to operate the aerial platform from the lower controls using the emergency power system.

Level Sensor

Use the following procedure to test the level sensor:

1. Position the aerial platform on a smooth, flat, level surface.
2. Remove all persons and materials from the platform.
3. Start the engine and raise the main boom above horizontal, approximately 15 to 20 degrees.
4. Remove the engine cover. The level sensor is in the right side of the engine compartment (refer to Figure 7.10).

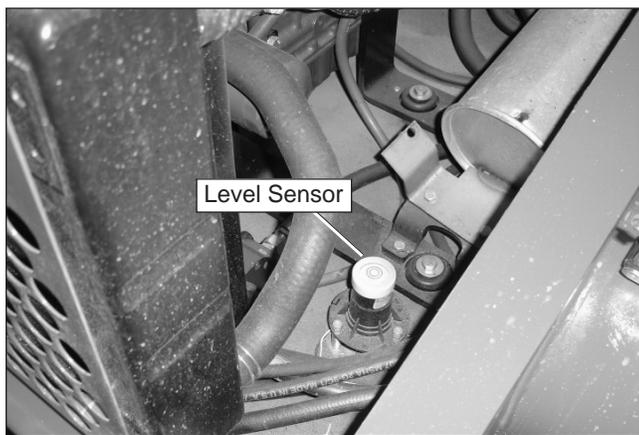


Figure 7.10 – Level Sensor

5. Pull the level sensor to the side as far as possible to activate the tilt alarm.

⚠ Warning

The potential for an accident increases when safety devices do not function properly. Death or serious injury could result from such accidents. Do not alter, disable, or override any safety device.

6. If the alarm does not sound, remove the machine from service until the problem is corrected.
7. Lower the main boom.

Flashing Light

The machine may be equipped with an optional flashing light mounted to the top of the counterweight.

To inspect the flashing light:

1. Turn the battery disconnect, pull the emergency stop button outward at the lower controls, and turn the start switch on.
2. Visually check to see that the light is flashing approximately one flash per second.

Note

There is not an off switch for the flashing light. The light cannot be turned off while the start switch is in the on position.

Structures

Visually inspect all weldments and related components. It is important to inspect the fasteners that connect the components.

Weldments

To inspect the weldments:

1. Visually inspect all weldments for abnormal wear, abrasion, or deformation that could cause interference between moving parts.
2. Inspect the welds on the structural components. Pay particular attention to boom welds. The area to be inspected should be clean and free of dirt and grease.
3. Look for visible cracks in the welds and at the weld to parent material joints. A bright light may be used to provide adequate visibility of the inspection area.

Boom Slide Pads

The main boom has slide pads (refer to Figure 7.11) between the main and tip boom sections.

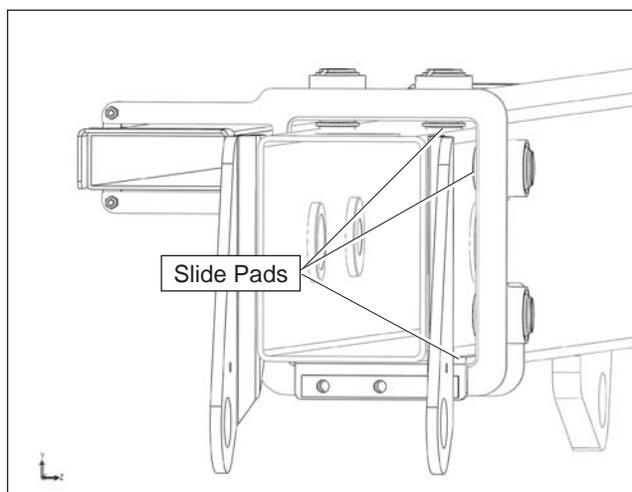


Figure 7.11 – Slide Pads at Tip End of Boom

To inspect the slide pads:

1. Use the lower controls to position the main boom near horizontal. Extend the tip boom about 1' (30 cm).
2. Visually inspect the slide pads to make sure they are securely fastened to the main boom.
3. Inspect the surface where the pads contact the tip boom. The paint must be in place with no signs of bare metal.

Fasteners

To inspect the component fasteners:

1. Visually inspect all fasteners to see that none are missing or loose.
2. Inspect all of the bolts, nuts, rollpins, collars, and snap rings that connect the booms and cylinders. They should all be present, tight, and not damaged in any way.
3. Raise the riser boom to access the inner race rotation bearing bolts in the turntable (refer to Figure 7.12). The outer race bolts can be viewed through the openings in the turntable. Rotate the turntable to inspect all of the outer race bolts.

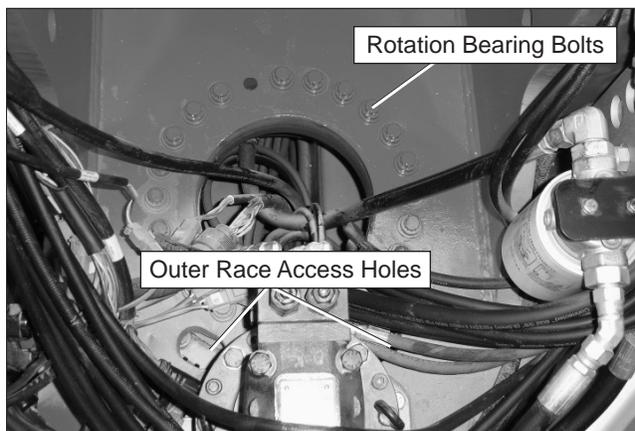


Figure 7.12 – Rotation Bearing Bolts

4. Inspect the inner and outer race rotation bearing bolts to ensure that none are missing, damaged, or loose.

Upper Control Station

Inspect the platform and upper controls, after verifying all functions operated properly from the lower controls.

Guardrail System

The guardrail system includes (refer to Figure 7.13):

- A top rail
- A mid rail
- Three entry gates: one on each side and one rear
- Toeboards around the sides of the platform.

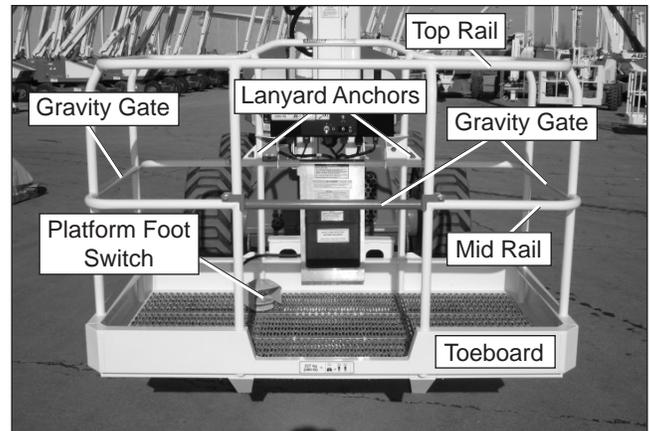


Figure 7.13 – Guardrail System

To inspect the guardrail system:

1. Visually inspect all components of the guardrail system. Make sure the rails and toeboards are all in place and free of any damage or deformation.
2. Visually inspect the rail and toeboard welds for cracks.
3. Visually inspect all bolts and nuts fastening the platform in place. They must be present and not show any signs of looseness.
4. Inspect the gravity gates to be sure they are present, are not damaged, and move freely.

Lanyard Anchors

There are two lanyard anchors below the upper control panel (refer to Figure 7.13).

To inspect the lanyard anchors:

1. Visually inspect the lanyard anchors to make sure they are in place and are not deformed.
2. Look for visible cracks in the welds and at the weld to parent material joints. A bright light may be used to provide adequate visibility of the inspection area.

Operating Controls

Use the following procedure to operate the machine from the upper controls:

1. Turn the battery disconnect switch on.
2. At the lower controls, place the emergency stop switch and the start switch in the on position. Place the controls switch in the upper control position.
3. At the upper controls (refer to Figure 7.14), pull the emergency stop button outward.

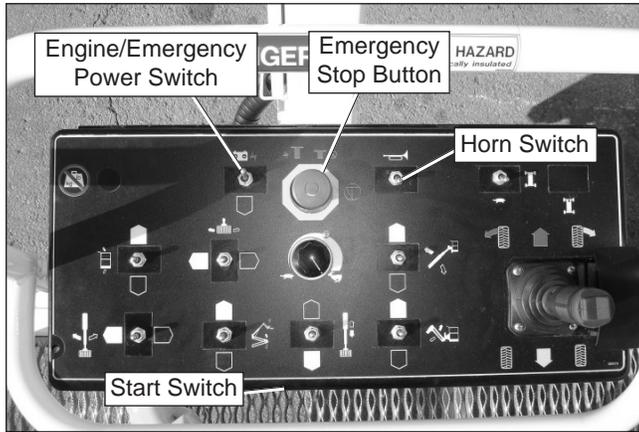


Figure 7.14 – Upper Controls

4. Turn the start switch on the front of the upper control panel to start until the engine starts, then release it.
5. Let the engine warm to operating temperature.

⚠ Danger

Pinch points may exist between moving components. Death or serious injury will result from becoming trapped between components, buildings, structures, or other obstacles. Make sure all personnel stand clear of the aerial platform while performing the prestart inspection.

⚠ Warning

The potential for an accident increases when operating an aerial platform that is damaged or malfunctioning. Death or serious injury could result from such accidents. Do not operate the aerial platform if it is damaged or malfunctioning.

6. Test the platform foot switch by moving a boom function control without stepping on the foot switch. If movement occurs the interlock is not functioning properly. Do not operate the machine until the problem is corrected.
7. Test the operation of each control in both directions from the upper controls.
8. The drive range switch and maximum travel speeds are interlocked through limit switches on the riser and the main boom that senses the position of the booms.
 - When the main boom is raised approximately 1 ½" (3.8 cm) or extended approximately 1" (2.5 cm), the machine should travel in low speed only.
 - To operate in high speed the booms must be stowed.

Emergency Stop

To test the emergency stop button from the upper controls:

1. At the lower controls, start the engine and place the control selector switch in the upper control position.
2. At the upper controls, push the emergency stop button inward to turn off electrical power.
3. Verify that the engine shuts off and the upper control functions do not operate.

Emergency Power

To test the emergency power system from the upper controls:

1. Turn the battery disconnect switch on.
2. At the lower controls, pull the emergency stop button outward and place the start switch in the on position. Place the control selector switch in the upper control position.
3. At the upper controls (refer to Figure 7.14), pull the emergency stop button outward and place the start switch in the on position.
4. Hold the engine/emergency power switch in the emergency power position and step on the platform foot switch to verify operation of the aerial platform using the emergency power system.

Horn Switch

The machine may be equipped with an optional horn. Operate the horn switch (refer to Figure 7.14) to ensure that it sounds to warn personnel in the area.

Electrical Power Outlet

Connect a source of 110 volt AC power to the power-input connector on the right side of the chassis (refer to Figure 7.15).

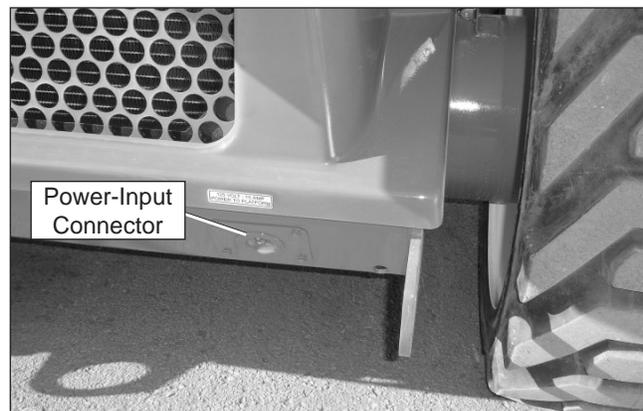


Figure 7.15 – Power-Input Connector

Some machines may have an electrical outlet at the platform, but no power-input connector on the chassis. In that case, power is supplied by an optional AC generator. An external power source is not required.

With the engine running, place the AC generator switch in the generator position to provide electrical power to the electrical outlet at the platform and to the outlet on the end of the generator housing.

Plug an electrical tool into the receptacle at the platform and at the generator and try to operate the tool to verify proper operation of the outlet.

The outlet is equipped with a ground fault circuit interrupter (GFCI). Use the following procedure to test the GFCI.

1. Push the test button (refer to Figure 7.16).

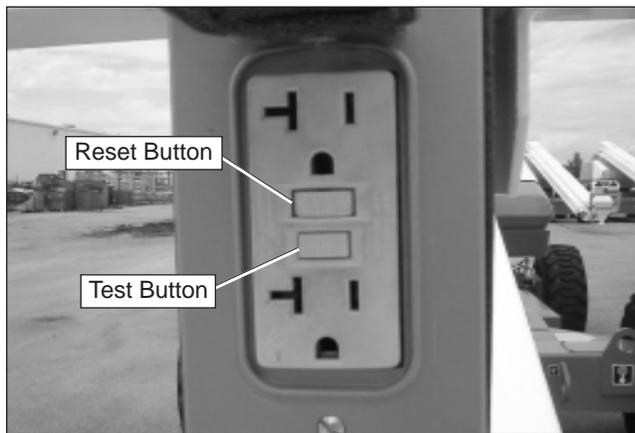


Figure 7.16 – Electrical Power Outlet

2. Plug an electrical tool into the outlet and verify the power is off.
 - If the power was off, push the reset button to restore power.
 - If the power was on, repair or replace the receptacle.

All Motion Alarm

The machine may be equipped with an optional all motion alarm.

- Operate machine functions to ensure that the alarm sounds to warn personnel in the area that the aerial platform is in motion.

Placards and Decals

To inspect the placards and decals:

1. Inspect all safety and operational placards and decals. Make certain they are in place, in good condition, and are legible.
2. Clean the placards and decals with soap and water, and a soft cloth if the words or pictures cannot be seen.

⚠ Caution

Solvents may contain hazardous ingredients. Follow the manufacturer's label for proper use and disposal. Wear protective gloves and splash-proof safety glasses when using solvents.

3. Remove wet paint overspray using a natural biodegradable solvent and a soft cloth.
4. Replace any missing or illegible placards or decals before operating the aerial platform.

Placard and decal kits are available from Snorkel.

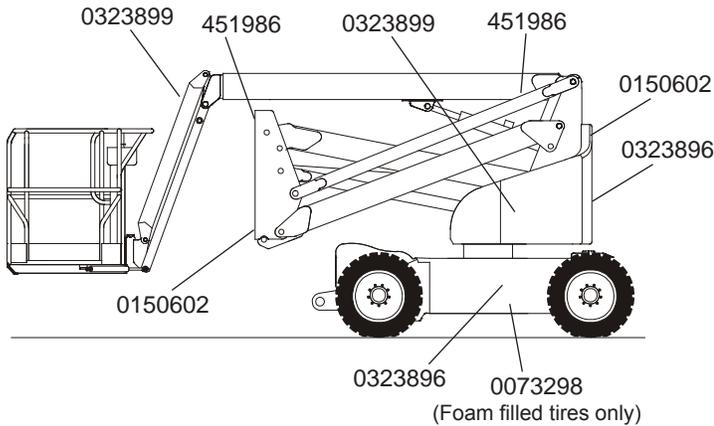
The safety related placards and decals are illustrated on the following pages.



0323899



451986



Right Side



0150602



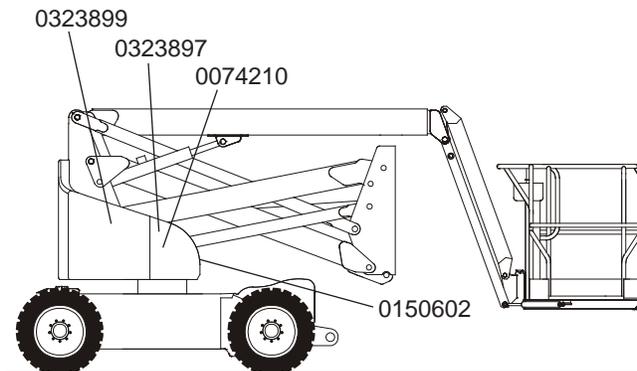
0323896



0073298



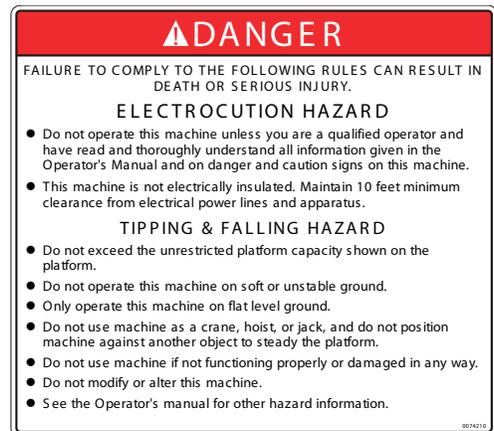
0323899



Left Side



0323897



0074210



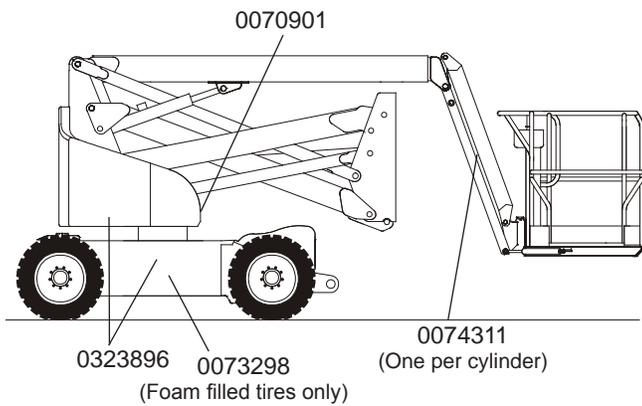
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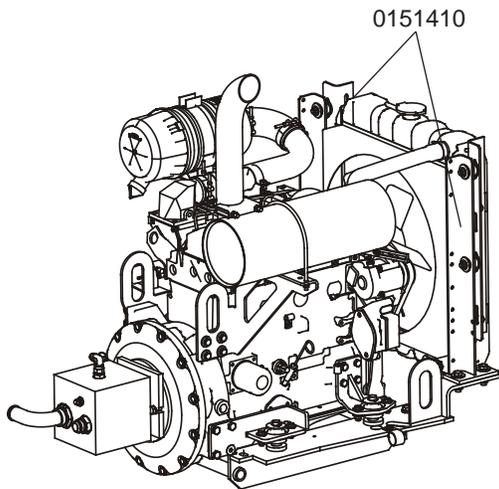
Left Side

Snorkel		1-800-255-0317	Snorkel International
http://www.snorkel-lifts.com		Made in the USA	2002 Steppert Road
			Elwood, KS 66024
MODEL NUMBER		SERIAL NUMBER	
MONTH / YEAR OF MANUFACTURE		SLOPE SENSOR ALARM SETTING	deg
MAXIMUM MACHINE WEIGHT	lbs kg	MAXIMUM WHEEL LOAD	lbs kg
ENGINE POWERED MODELS	hp kW	BATTERY POWERED MODELS ONLY	DRIVE MOTORS V BATTERIES V Ah
MAXIMUM ALLOWABLE MANUAL FORCE (SIDE PULL)	lbs N	MAXIMUM ALLOWABLE WIND SPEED	mph m/s
PLATFORM SIZE	in cm	MAXIMUM PLATFORM REACH	ft m
MAXIMUM PLATFORM HEIGHT	ft m	MAXIMUM DRIVE HEIGHT	ft m
RATED NUMBER OF OCCUPANTS		UNRESTRICTED PLATFORM CAPACITY	lbs kg
CAUTION			
Do not remove any weight from this machine. Any weight added must be distributed equally on each axle. Proper stability and axle weights of this machine are based on the platform size shown above.			
Axle weights with machine in the stowed - travel position.			
STEER AXLE	lbs	kg	
DRIVE AXLE	lbs	kg	

0070901



0074311



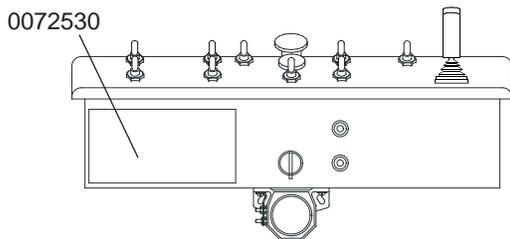
Radiator



0151410



0072530



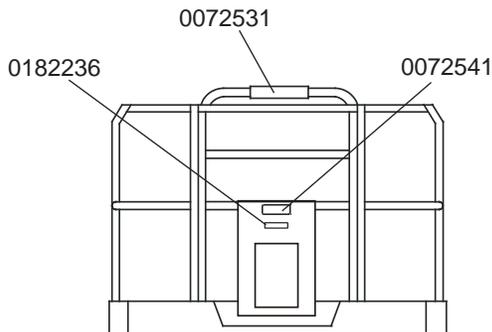
Upper Controls



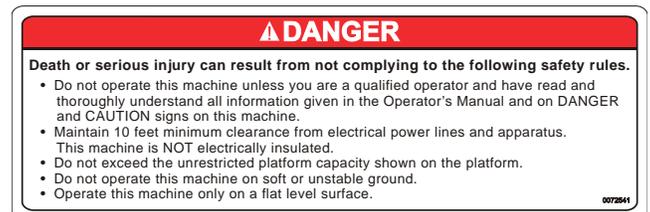
0182236



0072531



Platform



0072541

Prestart Inspection Checklist

Item	Inspect For	Ok
Operator's Manual	In place, all pages readable and intact	
Engine		
Oil level	Between full and add marks	
Coolant	Proper fluid level	
Radiator	Cap tight, good condition and clean	
Fuel tank and line	Tank full, cap in place and tight/no leaks	
Electrical System		
Battery	Condition and charged for proper operation	
Battery fluid level and terminals	Proper level/clean, connectors tight	
Cables and wiring harness	No wear or physical damage	
Hydraulic System		
Fluid level	Between full and add marks	
Fluid filter	Verify operation in the green zone	
Hoses, tubes, and fittings	No leaks	
Cold weather warm-up	Proper operation	
Tires		
Air filled	Good condition, proper inflation	
Foam filled	Good condition	
Wheels	All wheel lug nuts present and properly torqued	
Lower Control Station		
Operating controls	Proper operation	
Emergency stop and emergency power	Shuts off lower controls/proper operation	
Level Sensor	Sounds tilt alarm	
Flashing Light	Proper operation	
All Motion Alarm	Sounds when machine is operated and/or driven	
Structures		
Weldments – Chassis, turntable, booms, platform, etc.	Welds intact, no damage or deformation	
Slide pads	In place, no damage or deformation	
Fasteners	In place and tight	
Upper Control Station		
Guardrail system and lanyard anchors	Welds intact, no damage or deformation	
Operating controls	Proper operation	
Emergency stop and emergency power	Shuts off upper controls/proper operation	
Horn	Sounds when activated	
Electrical power outlet – GFCI	Proper operation	
Placards and Decals	In place and readable	

Chapter 8 – Operation

The aerial platform may be operated from either the lower or upper controls.

Danger

The aerial platform is not electrically insulated. Death or serious injury will result from contact with, or inadequate clearance from, an energized conductor. Do not go closer than the minimum safe approach distance as defined by ANSI.

Pinch points may exist between moving components. Death or serious injury will result from becoming trapped between components, buildings, structures, or other obstacles. Make sure there is sufficient clearance around the machine before moving the chassis, booms, or platform. Allow sufficient room and time to stop movement to avoid contact with structures or other hazards.

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Operate the aerial platform on a firm, flat, level surface. Avoid travel speeds and/or rough terrain that could cause sudden changes in platform position. Do not drive or position the aerial platform for elevated use near any drop-off, hole, slope, soft or uneven ground, or other tip-over hazard.

The platform rated work load is the total weight of the personnel and equipment that may be lifted in the platform.

The work loads are stated on the platform rating placard at the:

- rear of the platform
- lower controls
- upper controls

Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Do not exceed the capacity values indicated on the platform rating placard.

Capacity values indicate the rated lifting capacity and do not indicate aerial platform stability.

Note

When the riser booms are stowed and the oscillating axle is articulated more than 4", turntable rotation may be restricted between the riser booms and the elevated tire.

The operator bears ultimate responsibility for ensuring that the aerial platform is properly set up for the particular conditions encountered.

Cold Weather Start-Up

If the ambient temperature is 32°F (0°C) or below, the engine and hydraulic system oil may need to be warmed

before operation. Do not operate the engine at more than a fast idle until the engine and hydraulic oil has had a chance to warm.

Cold, thick hydraulic oil does not flow well and may cause delay in response to control movement and improper voltage output of the AC generator. Cold hydraulic oil may also cause cavitation and pump damage. The hydraulic system may be equipped with an optional cold weather warm-up kit.

Hydraulic System Cold Weather Warm-Up

Some machines may have a hydraulic fluid warm-up system that will automatically warm the fluid upon activating the warm-up switch. The hydraulic fluid may also be warmed manually if the machine is not equipped with the optional warm-up system.

Caution

Not all hydraulic fluid is suitable to use in the hydraulic system. Some have poor lubricating characteristics and can increase component wear. Only use hydraulic fluid as recommended.

Use cold weather hydraulic oil as recommended in the machine General Specifications in temperatures of 10°F (-12°C) or below.

Hydraulic System Warm-Up Switch

This system may be used to warm the hydraulic fluid when the ambient temperature is below 32°F (0°C) and boom movement is sluggish because of cold fluid.

There may be a toggle switch for the warm-up system on the lower control panel and/or one on the front of the upper control panel.

The engine must be running and the switch used to turn the system on must be at the same location that the engine was started. For example, if the engine was started from the lower controls, the warm-up switch at the lower controls must be used for the system to operate.

To operate the warm-up system:

1. Start the engine.
2. From the same control station that the engine was started, place the warm-up switch in the on position. The engine throttle speed will increase while the warm-up system is on.
3. After the hydraulic fluid has been warmed to operating temperature and the throttle speed returns to idle, place the warm-up switch in the off position.

Manually Warming The Hydraulic System

The hydraulic oil may be warmed by bottoming out the boom extension cylinder. Raise the main boom so it is horizontal and operate the boom retract function while the

machine is stowed. With the cylinder bottomed out the oil flow will produce heat to warm the hydraulic oil.

⚠ Caution

Not all hydraulic fluid is suitable to use in the hydraulic system. Some have poor lubricating characteristics and may increase component wear. Only use hydraulic fluid as recommended.

Use cold weather hydraulic oil as recommended in the machine General Specifications in temperatures of 10°F (-12°C) or below.

Preparing for Operation

Use the following procedure to prepare the aerial platform for operation.

1. Perform a prestart inspection as described in Chapter 7.
2. Place the battery disconnect switch in the on position.
3. Close and latch the cowling doors.

Lower Controls

The lower controls override the upper controls. This means that the lower controls can always be used to operate the platform regardless of the position of the upper control emergency stop button.

Boom, turntable, and platform functions may be operated from the lower controls. The lower controls may be used for initial set up of the aerial platform, and for testing and inspection.

Use the following procedure to operate boom, turntable, or platform functions using the lower controls.

1. Place the emergency stop switch (refer to Figure 8.1) in the on position and place the controls switch in the ground position.

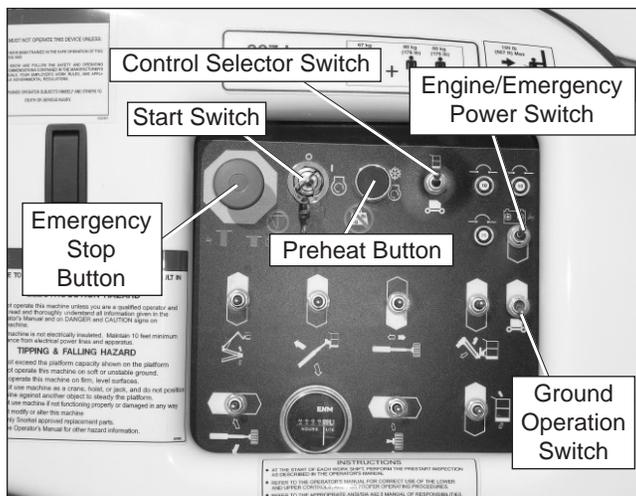


Figure 8.1 – Lower Controls

2. Insert the key into the start switch, turn the switch to the on position and pause a few seconds while the alarm sounds to alert others that the machine is about to start. Operate the preheat button if required.

- When the engine is warmed up or the ambient temperature is above 50°F (10°C), it is not necessary to operate the glow plugs before starting the engine.
- When the ambient temperature range is 50°F (10°C) to 23°F (-5°C), press and hold the preheat button for five seconds before starting the engine.
- When the ambient temperature is below 23°F (-5°C), press and hold the preheat button for ten seconds before starting the engine.

3. Turn the switch to start, then release it to on. The engine will not start if the switch is left in the on position for 30 seconds or longer before turning it to start. The switch must be turned back to off before the engine will start.
4. Let the engine warm to operating temperature.
5. Hold the ground operation switch in the on position while operating the boom and turntable control toggle switches.
6. Hold the appropriate toggle switch in the desired direction.
7. Release the toggle switch to stop movement.
8. Place the ground operation switch in the off position when no functions are being operated.

Upper Controls

The upper controls may be used for driving the aerial platform and positioning the booms and platform while on the job.

Use the following procedure to operate machine functions using the upper controls.

1. At the lower controls, place the emergency stop switch in the on position and turn the start switch on. Place the controls switch in the platform position.
2. Enter the platform and securely close the gate.
3. Attach the fall restraint lanyard to one of the anchor points.
4. Pull the emergency stop outward (refer to Figure 8.2).

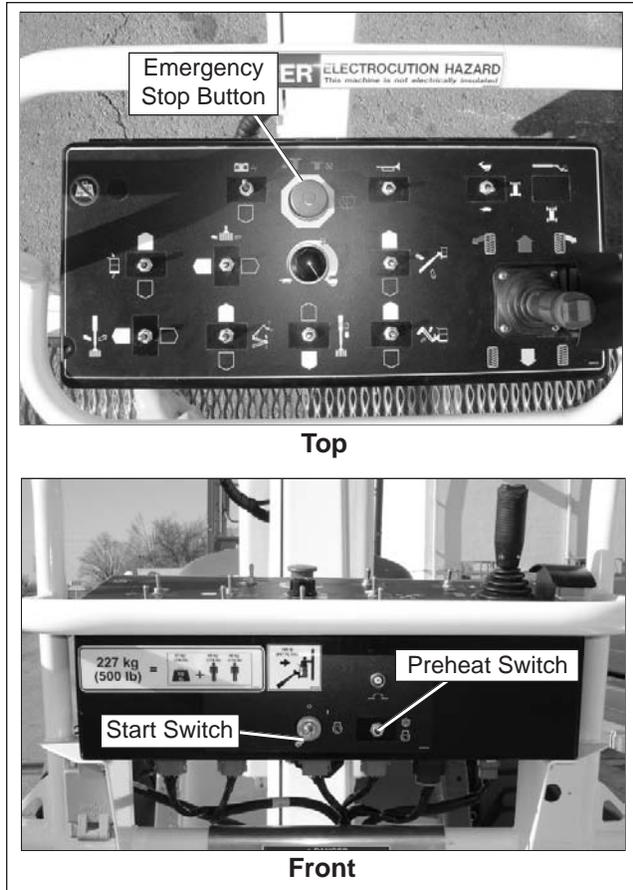


Figure 8.2 – Upper Controls

5. Turn the start switch to the on position and pause a few seconds while the alarm sounds to alert others that the machine is about to start. Operate the preheat switch if required.
 - When the engine is warmed up or the ambient temperature is above 50°F (10°C), it is not necessary to operate the glow plugs before starting the engine.
 - When the ambient temperature range is 50°F (10°C) to 23°F (-5°C), press and hold the preheat button for five seconds before starting the engine.
 - When the ambient temperature is below 23°F (-5°C), press and hold the preheat button for ten seconds before starting the engine.
6. Turn the switch to start, then release it to on. The engine will not start if the switch is left in the on position for 30 seconds or longer before turning it to start. The switch must be turned back to off before the engine will start.
7. Let the engine warm to operating temperature.

Boom Operation

Use the following procedure to operate the turntable, boom, or platform functions.

1. Step down on the platform foot switch (refer to Figure 8.3). This switch must be held down to operate the upper controls.

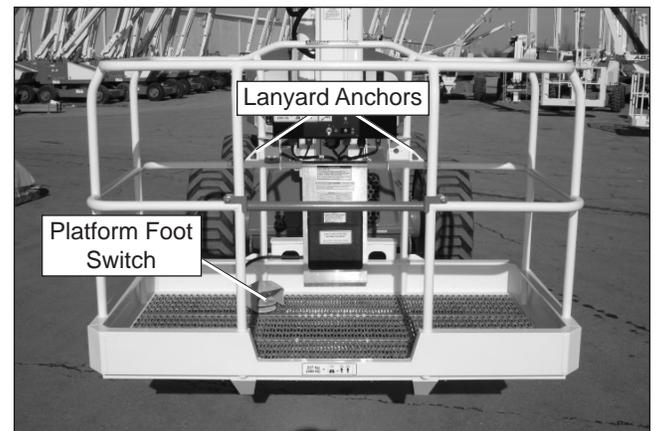


Figure 8.3 – Platform

2. Hold the appropriate control in the desired direction. Always look in the direction of movement.
3. To stop movement release the control to its neutral position or release the foot switch.

Driving and Steering

▲ Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Do not drive an elevated aerial platform on soft, uneven, or sloping surfaces. Do not drive the machine on grades that exceed 40 percent.

For operation on grades up to 40 percent, it is recommended that the main boom be near horizontal and the jib be elevated just enough to provide adequate ground clearance.

A 40 percent grade is a 48" (1.2 m) vertical rise in 10' (3.05 m) horizontal length.

Avoid driving with the platform over the front end of the chassis. In this position the machine is difficult to control because:

- Drive and steer control movements and their resulting machine movements are reversed.
- When driving fast, sudden turns or stops produce more severe reactions to platform occupants.
- More turning space is required to prevent the platform from colliding with obstacles several feet beyond the path of the tires.

Warning

Death or serious injury could result from improperly driving or steering the aerial platform. Read and understand the information in this manual and on the placards and decals on the machine before operating the aerial platform on the job.

The blue and yellow arrows on the chassis indicate the direction the chassis will move when the drive or steer control is moved toward the corresponding color.

When the machine is in the stowed position, with the booms centered between the rear wheels, the direction of drive and steer control movement corresponds with the direction of chassis movement.

When the turntable is rotated from the stowed position, with the booms to either side of or in front of the chassis, the direction of control movement does not correspond with the direction of chassis movement.

- To avoid confusion, always drive to the work area or move between work areas with the turntable and booms in the stowed position.
- After arriving at the work area, the booms may be positioned to the side or the front of the chassis for final positioning.
- Always look in the direction of movement as indicated by the directional arrows on the chassis.

Use the following procedure to operate the drive and steer functions.

1. Determine the desired drive range for the specific driving conditions. Place the switch in the appropriate position to achieve the desired drive wheel operation.
 - Use high range (rabbit) when traveling across firm, flat, level surfaces. High range can only be activated when the booms are stowed. High range is for high speed, low torque operation.
 - Use low range (turtle) for driving on loading ramps or other steep grades and when safety considerations demand slow deliberate machine movement. Low range is for low speed, high torque operation.
2. Step down on the platform foot switch.
3. Push the drive joystick forward to move the chassis forward, the direction of the blue arrow. Pull the joystick backward to move the chassis backward, the direction of the yellow arrow. The drive speed is proportional to the joystick position.
4. To stop drive motion, return the joystick to neutral.

5. The steer switch is a momentary contact, rocker switch on top of the drive joystick. This switch controls the two front wheels to steer the aerial platform.

- To steer to the right, hold down the right side of the steer switch.
- To steer to the left, hold down the left side of the steer switch.

Note

The steering wheels are not self-centering. Set the steering wheels straight ahead after completing a turn.

6. After driving to the desired location, release the foot switch, or push the emergency stop button to apply the parking brakes.

Drive Speeds

The drive speed is proportional to the joystick position. The farther the joystick is moved, the faster the travel speed.

Always slow down and shift the drive system to low range before traveling over rough terrain or any sloped surface.

Drive speed ranges are interlocked through limit switches that sense the main and riser boom position.

- When either boom is elevated or extended, only the slowest drive speed will work regardless of the drive range switch position.
- To avoid a sudden speed change from high to low elevated boom speed, always bring the machine to a stop before raising the booms from the stowed position.

Warning

The potential for an accident increases when safety devices do not function properly. Death or serious injury could result from such accidents. Do not alter, disable, or override any safety device.

Do not use the aerial platform if it drives faster than 0.8 miles per hour (35 feet in 30 seconds) when any of the booms are out of the stowed position.

Pivoting Front Axle

When the machine is in the stowed position, with the booms lowered and retracted, the front axle pivots to keep all four wheels in contact with the ground surface.

While driving between work site, the pivoting axle:

- Improves traction
- Reduces ground pressure

When the main or riser boom is raised from its rest, the axle locks into position to maximize the stability of the machine while the platform is elevated.

All Motion Alarm

The optional all motion alarm sounds loud intermittent beeps anytime the machine functions are being operated.

Gradeability

Gradeability refers to the maximum slope that the aerial platform is capable of travel. Gradeability can be described as “theoretical” or “actual” with the slope, or grade, measured in percent of slope or degree of slope.

Theoretical Gradeability

Theoretical machine gradeability refers to the maximum slope that the machine is capable of travel under perfect, or theoretical, conditions. It is based on mathematical calculation, not practical application.

Some of the factors taken into consideration when calculating theoretical gradeability include:

- Drive motor efficiency
- Machine weight
- Machine center of gravity
- Tire traction
- Tire contact
- Condition of slope

The value for theoretical gradeability will most always be high when compared to the actual gradeability value. The perception then is that the machine can climb a steeper slope than is actually practical.

Actual Gradeability

Actual machine gradeability refers to the maximum slope that the machine is capable of travel under practical conditions. It, too, is based on mathematical calculation, but it also takes into account the practical application.

At any given moment when driving the machine on a slope, at least one, if not all, of the factors contributing to achieving theoretical gradeability will not be at optimal performance. For example, tire contact may not be the same at each drive wheel or the slope conditions may not be optimal, which would then allow for loss of traction.

The value for actual gradeability will always be lower than the theoretical gradeability value. The perception then is that the machine can not climb a slope as steep as it should.

Percent vs. Degree of Slope

Gradeability is most often referenced as a percentage. That value is based on a slope angle of 45° representing 100% grade.

Angle indicators, or inclinometers, often measure the angle of the slope in degrees not the percent slope. Because of that, it may be useful to understand the relationship between percent slope and the degree of the slope angle as shown in Figure 8.4.

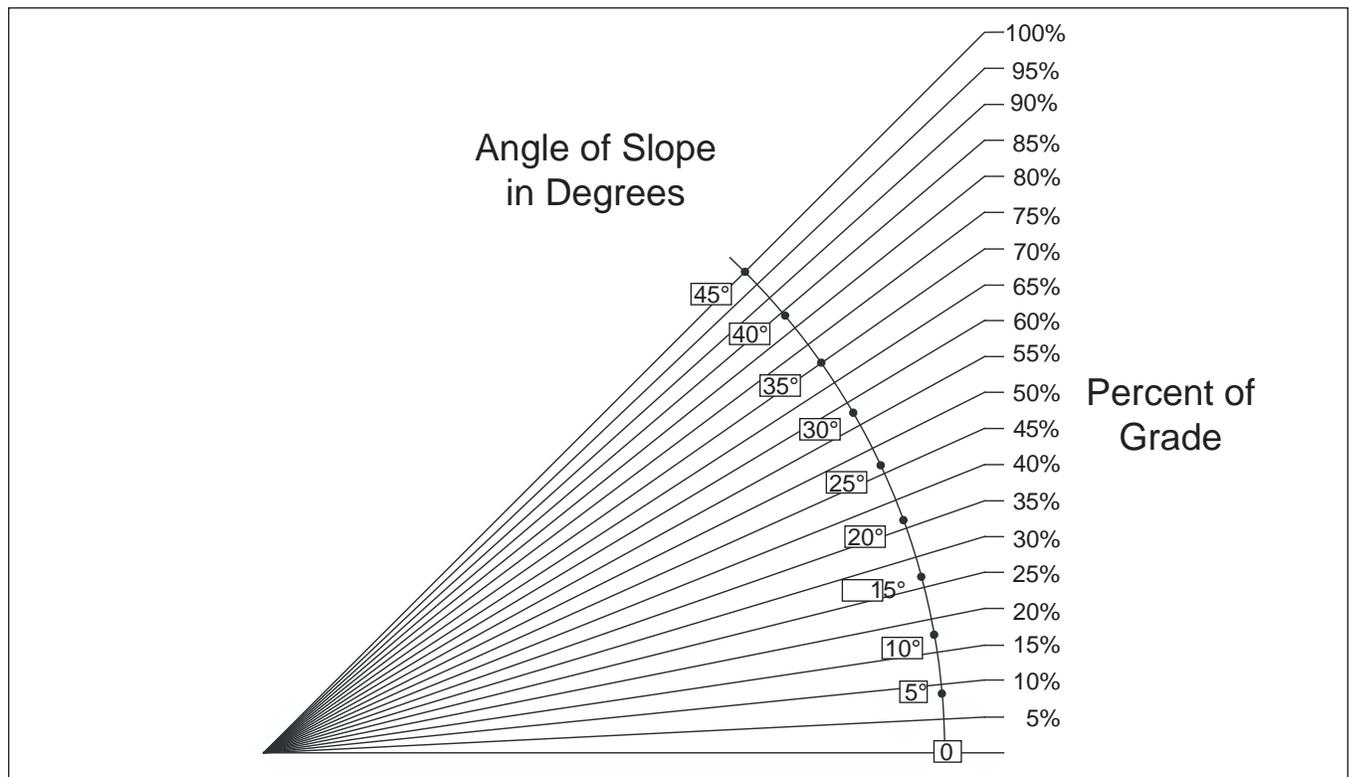


Figure 8.4 – Slope Percent/Degree Conversion

Driving on a Slope

The machine should only be driven on a slope or loading ramp in the stowed position with the platform on the downhill side.

▲ Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Do not drive on slopes that exceed 40 percent grade, or where conditions of the slope could cause driving to be hazardous.

Place the drive range switch in the low position before attempting to drive the machine on a slope.

Drive the aerial platform only on slopes, or loading ramps that are within the 40 percent grade capability of the aerial platform.

Calculate the percent grade:

- before attempting to climb an unknown grade
- if it is believed that there is a malfunction to determine if the slope is within the actual grade capability of the aerial platform.

Calculating Percent Grade

The percent grade equals the height (rise) of the slope divided by the length (run) times 100. Refer to Figure 8.5.

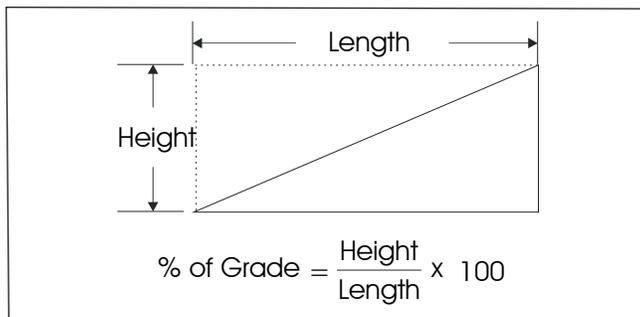


Figure 8.5 – Percent Grade Formula

The grade can be measured with an inclinometer or by using a tape measure, a level, and a straight 2 x 4. If using an inclinometer, refer to the conversion diagram if necessary.

To measure the grade without an inclinometer, use the following procedure.

1. With the 2 x 4 laying parallel with the slope, lay the level lengthwise on the 2 x 4.
2. Holding the downhill end, raise the 2 x 4 until the level indicates that the board is level (refer to Figure 8.6).

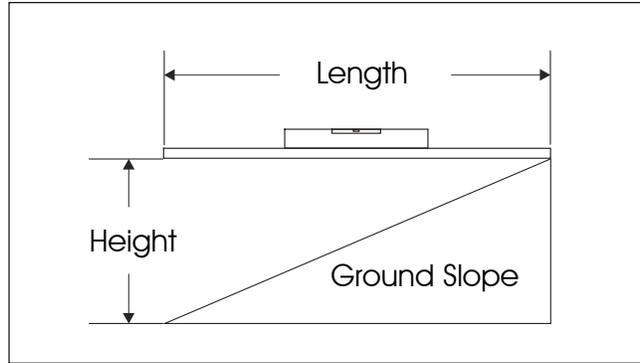


Figure 8.6 – Percent Grade Calculation

3. Use the tape measure to measure the distance (height) from the end of the 2 x 4 to the ground. Record the height distance.
4. Measure the length of the 2 x 4 and record this measurement.
5. Use the formula in Figure 8.5 to calculate the percent of the grade.

Machine Gradeability

The gradeability specification for the AB46JRT aerial platforms is listed below.

Gradeability – theoretical.....45%

Theoretically, when all contributing factors are optimal, the machine can be driven on a slope of 45%. A slope with a percent grade of 45% is a slope with an angle of 24.2 degrees.

Gradeability – actual.....40%

An actual gradeability of 40%, indicates that in most normal working conditions the machine can be driven on a slope with an angle of 21.8 degrees.

Electrical Power Outlet

The electrical outlet at the platform has 2, 3-prong, 110 volt AC electrical connectors. Their combined output is limited by a 15 amp circuit breaker.

Power may be supplied to the outlet using an external power source or by operating the optional AC generator.

To use the outlet, plug a source of power into the power-input connector on the right side of the chassis (refer to Figure 8.7). Unplug the source of power before moving the aerial platform.

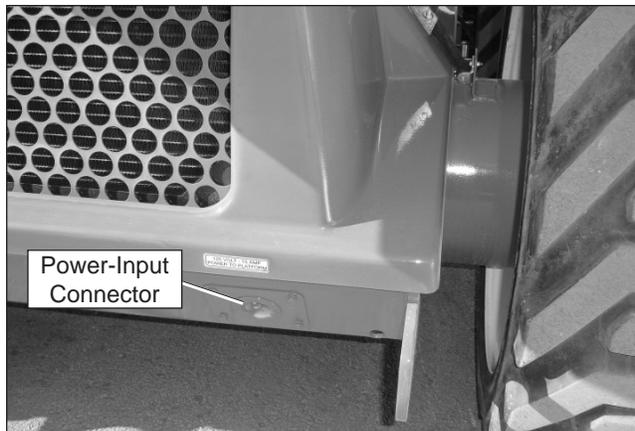


Figure 8.7 – Power-Input Connector

AC Generator

The optional generator supplies power to the electrical outlet only when the engine is running and the machine is stationary. The machine functions will not operate when the generator switch is in the generator position.

⚠ Caution

Cold hydraulic oil does not flow well and may produce improper generator output voltage. Improper outlet voltage can damage some electrical power tools and equipment. Warm the hydraulic oil before operating the generator.

Do not operate the generator unless the hydraulic oil is at operating temperature. Refer to Cold Weather Start-Up for a hydraulic oil warm-up procedure.

To supply power to the electrical power outlet, start the engine and place the generator switch in the generator position.

The engine will run at high idle while the generator is operating. The generator will continue to operate as long as the engine is running and the switch is in the generator position.

Air Line

The optional air line may be used to conduct air for tool operation at the platform.

- The input connector is at the rear of the chassis and the output connector is at the platform on the rotator guard.
- The maximum working pressure of the line is 250 psi (1,723 kPa).

The air line may be used to conduct fluids such as water or antifreeze. Contact Snorkel for compatibility information before using the air line to conduct other fluids.

⚠ Caution

Fluid in the air line may damage some air tools or freeze and damage the line. Drain and blow out the air line after using it to conduct fluids.

Use the following procedure to drain the air line.

1. Close the input connector on the rear of the turntable.
2. Open the output connector at the platform.
3. Raise the riser and main booms slightly above horizontal.
4. Open the input connector on the turntable.
5. Allow the fluid to drain from the line.
6. Lower the boom and close both connections.

Chapter 9 – Stowing and Transporting

To prevent unauthorized use and damage, properly stow the aerial platform at the end of each work day. It must also be properly stowed while transporting.

Stowing

The properly stowed position is shown in Figure 9.1.

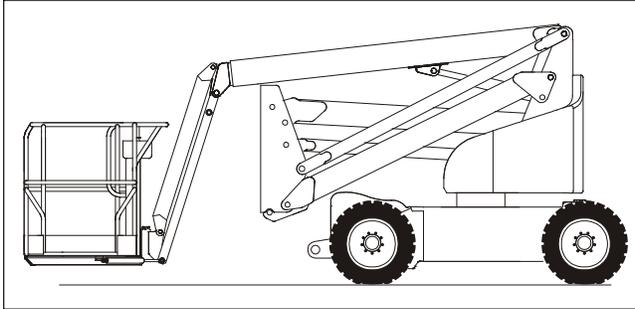


Figure 9.1 – Stowed Position

Use the following procedure to properly stow the aerial platform.

1. Rotate the platform so it is perpendicular to the end of the boom.
2. Fully retract the tip boom and then fully lower the riser and main booms.
3. Fully lower the jib boom to allow for exiting the platform.
4. Center the booms between the rear wheels.
5. If the engine has just been under load and is hot, let it idle for five minutes before turning the start switch off.
6. Push the lower controls emergency stop button inward. Place the start switch in the off position and remove the key.
7. Turn the battery disconnect switch off.
8. Close and latch the cowling doors.

Transporting

The aerial platform may be moved on a transport vehicle. Depending on the particular situation, the aerial platform may be driven, winched, or hoisted onto a vehicle such as a truck or trailer. Driving is the preferred method.

▲ Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Do not drive on ramps that exceed 40 percent grade, or where conditions of the ramp could cause driving to be hazardous.

Drive the aerial platform onto the transport vehicle if the ramp incline is within the 40 percent grade capability of the aerial platform.

A 40 percent grade is a 48" (1.2 m) vertical rise in 10' (3.05 m) horizontal length.

Use a winch to load and unload the aerial platform on ramps that exceed the grade capability of the machine. A winch may also be used when conditions of the ramp could cause driving to be hazardous.

The equipment used to load, unload, and transport the aerial platform must have adequate capacity. Refer to Chapter 2 to determine the approximate weight of the aerial platform.

The user assumes all responsibility for:

- Choosing the proper method of transportation.
- Choosing the proper selection and use of transportation and tie-down devices.
- Making sure the equipment used is capable of supporting the weight of the aerial platform.
- Making sure that all manufacturer's instructions and warnings, regulations and safety rules of their employer, the DOT and/or any other state or federal law are followed.

Driving

Use the following procedure to drive the aerial platform onto the transport vehicle.

1. Locate the transport vehicle so it is in a straight line with the loading ramp.
2. Chock the vehicle wheels so it cannot roll away from the ramp while the machine is loaded.
3. Remove any unnecessary tools, materials, or other loose objects from the platform.
4. Drive the machine to the foot of the loading ramp with the front wheels nearest the ramp. Make sure the machine is centered with the ramps and that the steering wheels are straight.
5. Rotate the platform so it is perpendicular to the boom.
6. Retract the tip boom and raise the main boom or jib so it is horizontal.
7. Rotate the turntable slightly to the side so you can see the front wheels.
8. Verify that the machine wheels, loading ramps, and transport vehicle are aligned.

⚠ Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Set the drive range to low before driving up or down a grade.

9. Place the drive range switch in the low position.
10. Drive the aerial platform onto the transport vehicle in a straight line through the grade transitions with minimal turning.
11. Rotate the turntable to align the main boom between the rear wheels.
12. When driving down the ramp, always back the machine with the platform on the downhill side only.

Winching

Use the following procedure to winch the aerial platform onto the transport vehicle.

1. Locate the transport vehicle so the aerial platform will not roll forward after it is loaded.
2. Remove any unnecessary tools, materials, or other loose objects from the platform.
3. Drive the machine to the foot of the loading ramp with the front wheels nearest the ramp. Make sure the machine is centered with the ramps and that the steering wheels are straight.
4. Fully retract the booms. Lower the main boom as much as possible making sure there is adequate ground clearance between the platform and the ramp.
5. Attach the winch to the tie-down lugs (refer to Figure 9.2) on the front of the chassis.



Figure 9.2 – Front Tie-Down/Lifting Lugs

6. At each drive wheel, remove the two bolts from the disconnect plate (refer to Figure 9.3). Turn the plate over so the nipple points inward. Reinstall the two bolts.

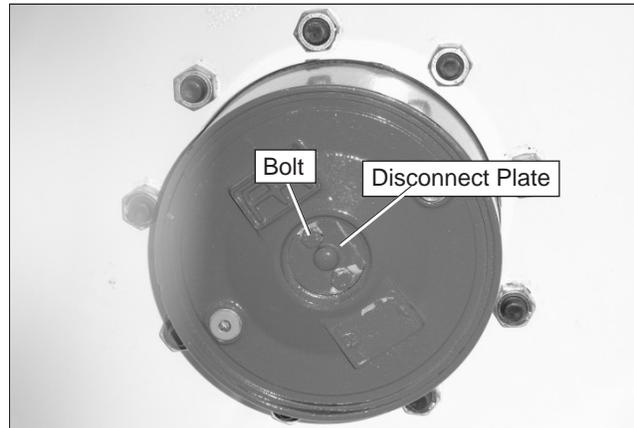


Figure 9.3 – Drive Wheel

7. Use the winch to position the aerial platform on the transport vehicle.

⚠ Warning

The aerial platform is free to move when the drive hubs are disabled. Death or serious injury can result. Re-enable the drive hubs before operating the aerial platform.

8. At each drive wheel, remove the two bolts and return the plate to its original position as shown in Figure 9.3.
9. Start the engine and operate the drive control in forward and reverse several times to engage the drive hubs.

Hoisting

Use a four point sling arrangement attached to the lifting lugs when hoisting the aerial platform. Machine damage can occur if the sling is attached to the booms, turntable, or platform.

⚠ Warning

The potential for an accident increases when the aerial platform is lifted using improper equipment and/or lifting techniques. Death or serious injury could result from such accidents. Use proper equipment and lifting techniques when lifting the aerial platform.

Know the weight of the aerial platform and the capacity of the lifting devices before hoisting.

- Lifting devices include the hoist or crane, chains, straps, cables, hooks, sheaves, shackles, slings, and other hardware used to support the machine.
- The empty vehicle weight is stamped on the serial number placard and is listed in Chapter 2.

The user assumes all responsibility for:

- Making sure the equipment used is capable of supporting the weight of the aerial platform.
- Making sure all manufacturer’s instructions and warnings, regulations and safety rules of their employer and/or any state or federal law are followed.

Use the following procedure to hoist the aerial platform onto the transport vehicle.

1. Properly stow the aerial platform.
2. Inspect the front lifting lugs (refer to Figure 9.2) and the rear lifting lugs (refer to Figure 9.4) to make sure they are free of cracks and are in good condition. Have any damage repaired by a qualified service technician before attempting to hoist the machine.



Figure 9.4 – Rear Tie-Down/Lifting Lugs

3. Remove all personnel, tools, materials, or other loose objects from the platform.
4. Connect the chains or straps to the lifting lugs using bolted shackles. Hooks that fit properly in the lugs and that have latching mechanisms to prevent them from falling out under a slack line condition may also be used.

Do not run the sling cable through the lifting lugs.

- Cable damage and/or failure can result from the cable contacting the sharp corners of the lug.
 - There is no effective way of putting a corner protector in the hole of the lifting lug.
5. Use spreader bars of sufficient length to keep the chains, straps, or cables from contacting the turntable, booms, and steer cylinders.
 - When using cables, use rigid corner protectors at any point where the cable contacts sharp corners to prevent damaging the cable.

- Careful rigging of the spreaders is required to prevent machine damage.

6. Adjust the length of each chain or strap so the aerial platform remains level when raised off the ground.
7. Use the hoist or crane to carefully raise and position the aerial platform onto the transport vehicle.

Securing for Transport

Use the following procedure to secure the aerial platform on the transport vehicle.

1. Chock the wheels.
2. Remove all personnel, tools, materials, or other loose objects from the platform.
3. Raise the main boom about 1’ (0.3m).
4. Place a large wood block under the platform support braces (refer to Figure 9.5). Lower the platform so it rests on the wood block.

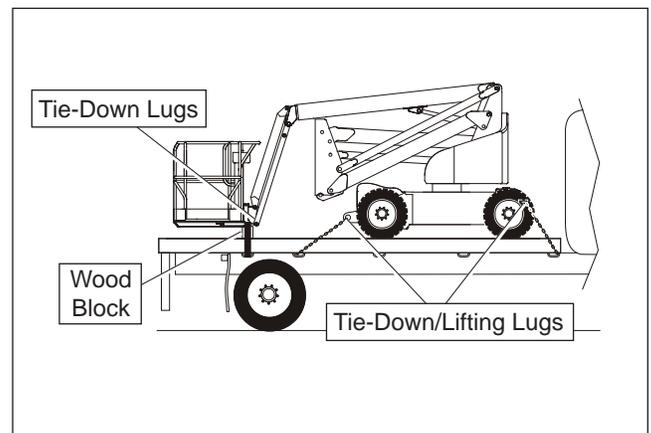


Figure 9.5 – Platform

5. Place the lower controls emergency stop switch in the off position. Turn the start switch off and remove the key.
6. Turn the battery disconnect switch off and close and latch the cowling doors.
7. Use wire-ties to fasten the gravity gates to the guardrails to prevent the them from bouncing. Also, use wire-ties to fasten the platform foot switch to the platform floor.

⚠ Caution

Ratchets, winches, and come-alongs may produce enough force to damage machine components. Do not over tighten the straps or chains when securing the aerial platform to the transport vehicle.

8. Use a nylon strap to securely fasten the platform against the wood block. Thread the strap through the tie-down brackets at the front of the platform.
9. Use chains or straps to securely fasten the aerial platform to the transport vehicle using the tie-down lugs as attachment points. Proper tie-down and hauling are the responsibility of the carrier.

Chapter 10 – Emergency Operation

If the main hydraulic system fails the aerial platform may be lowered and stowed using the emergency power system.

Emergency Power System

The emergency power system can be used to operate the machine from the lower or upper controls.

⚠ Caution

The emergency power system is for emergency lowering and stowing only. The length of time the pump can be operated depends on the capacity of the battery. Do not use this system for normal operation.

Only use the emergency power system if the main power system fails.

Lower Controls

Use the following procedure to operate the machine using the emergency power system from the lower controls.

1. Place the battery disconnect switch in the on position (refer to Figure 10.1).

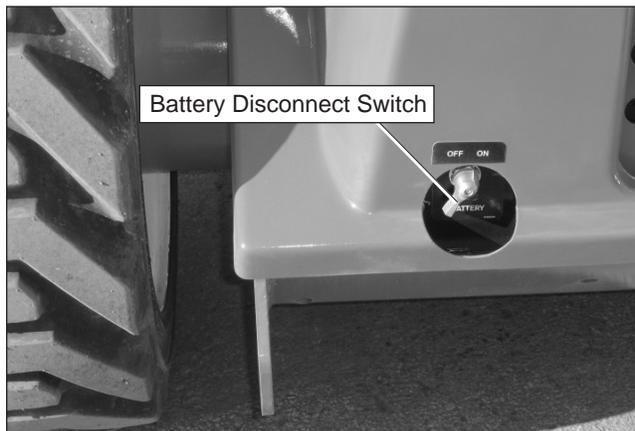


Figure 10.1 – Battery Disconnect Switch

2. Place the key in the start switch (refer to Figure 10.2) and turn the start switch to the on position.
3. Pull the emergency stop button outward.

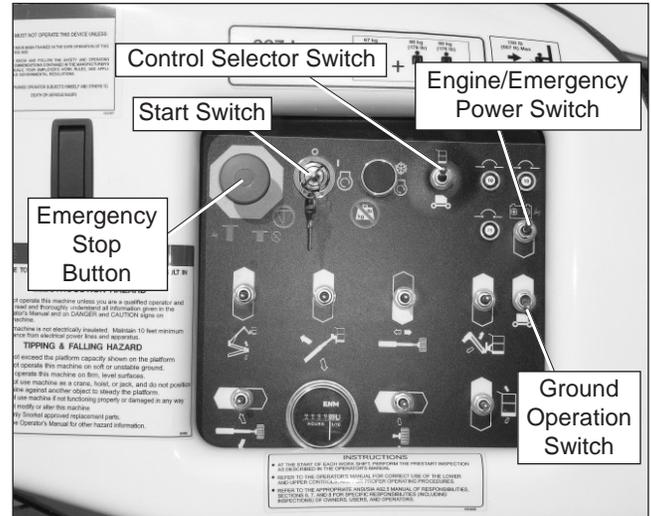


Figure 10.2 – Lower Controls

4. Place the controls switch in the lower control position.
5. Hold the ground operation switch in the on position while holding the engine/emergency power switch in the emergency power position.
6. Hold the appropriate function toggle switch in the desired direction.

Upper Controls

For the upper controls to be operational:

- The battery disconnect switch must be in the on position.
- The start switch at the lower controls must be turned on.
- The emergency stop button at the lower controls must be in the on position.
- The control selector switch at the lower controls must be in the platform position.

Use the following procedure to operate the machine using the emergency power system from the upper controls.

1. Pull the emergency stop button outward (refer to Figure 10.3).
2. Turn the start switch on.

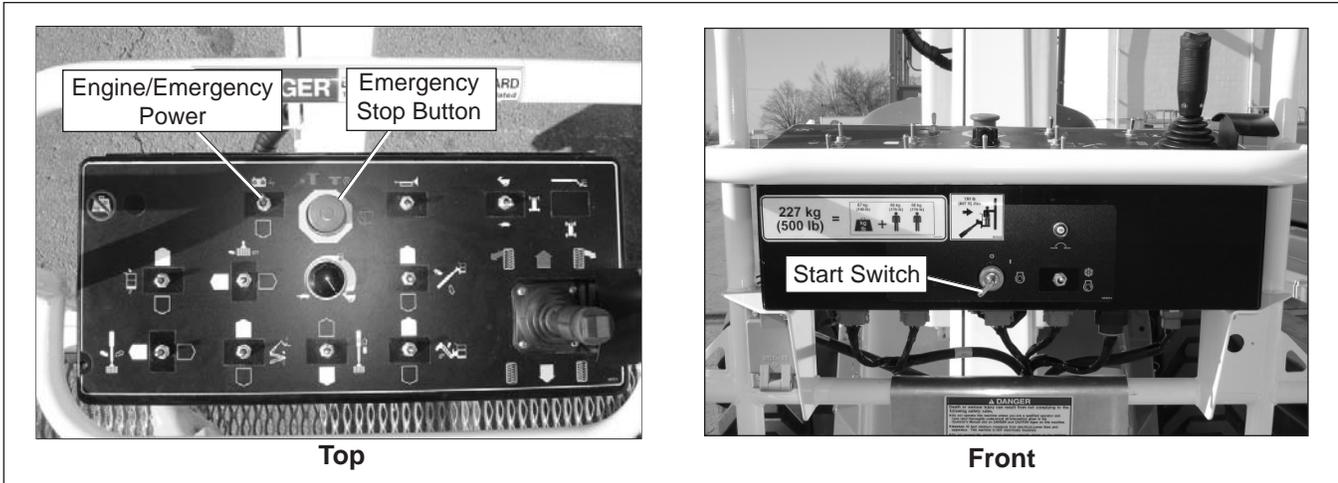


Figure 10.3 – Upper Controls

3. Step down on the platform foot switch (refer to Figure 10.4).

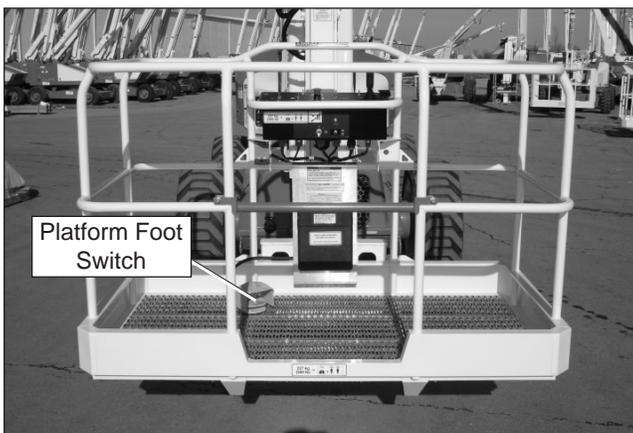


Figure 10.4 – Platform Foot Switch

4. Hold the engine/emergency power switch in the emergency power position.
5. Hold the appropriate function toggle switch in the desired direction.

Chapter 11 – Troubleshooting

The troubleshooting chart may be used to locate and eliminate situations where machine operation may be interrupted. If the problem cannot be corrected with the

action listed, stow the machine and remove it from service. Repairs must be made by qualified maintenance personnel.

Troubleshooting Chart

Symptom	Possible Cause	Corrective Action
Engine will not start from lower or upper controls.	Out of fuel. The engine will crank, but will not start.	Add correct type of fuel. Try starting the engine for 20 seconds and then let the starter motor cool for 60 seconds. Repeat as necessary.
	Engine is cold.	When the ambient temperature range is 50°F (10°C) to 23°F (-5°C), press and hold the preheat button for five seconds before starting the engine.
		When the ambient temperature is below 23°F (-5°C), press and hold the preheat button for ten seconds before starting the engine.
	High engine temperature.	Let engine cool. Do not restart the engine until the cause of overheating has been corrected.
	Low oil pressure.	Do not try to start the engine until the cause of low oil pressure has been corrected. The engine can be restarted with low oil pressure, but it will only run a few seconds before it shuts off again.
Engine will not start from lower controls.	Switches are set wrong. The engine will not crank.	Turn the battery disconnect switch on and then at the lower controls: <ul style="list-style-type: none"> • Turn the start switch off. • Pull emergency stop button outward. • Place the controls switch in the lower control position. • Place the start switch in the on position for 5 seconds and then turn the switch to start.
	The start switch was left in the on position for 30 seconds or longer before turning it to start.	Turn the start switch back to off, then to start within 30 seconds.
	The main system circuit breaker on the lower control panel has tripped. The engine will not crank.	Push the main system circuit breaker button back in. If the button pops back out, refer the problem to a qualified service technician.

Symptom	Possible Cause	Corrective Action
Engine will not start from upper controls.	Switches are set wrong. The engine will not crank.	<p>Turn the battery disconnect switch on and then at the lower controls:</p> <ul style="list-style-type: none"> • Turn the start switch off. • Pull the emergency stop button outward. • Place the controls switch in the upper control position. • Place the start switch in the on position. <p>From the upper controls:</p> <ul style="list-style-type: none"> • Turn the start switch off. • Pull the emergency stop button outward. • Place the start switch in the on position for 5 seconds and the then turn the switch to start.
	Platform foot switch is activated.	Do not step on foot switch while starting the engine.
	The start switch was left in the on position for 30 seconds or longer before turning it to start.	Turn the start switch back to off, then to start within 30 seconds.
	The circuit breaker on the upper control panel has tripped. The engine will not crank.	Push the circuit breaker button back in. If the button pops back out, refer the problem to a qualified service technician.
Engine starts from the upper controls but no boom functions work – machines with AC generator option only.	The AC generator switch is in the generator position.	Place the switch in the machine position to operate machine functions.
Engine dies when the control selector switch at the lower controls is placed in the upper control position.	Upper controls are not set-up properly.	At the upper controls, pull the emergency stop button upward and turn the start switch on.
Constant tone alarm sounds while the engine is running.	High engine temperature.	Lower the platform and reduce the engine speed to idle for five minutes. Turn the engine off and let it cool. Do not restart the engine until the cause of overheating has been corrected.
	Low oil pressure.	Lower the platform and turn the engine off. Do not restart the engine until the cause of low oil pressure has been corrected.
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Symptom	Possible Cause	Corrective Action
Constant tone alarm sounds while the engine is running.	No alternator current/broken fan belt.	Turn the engine off. Do not restart the engine until the cause of no alternator current has been corrected or the fan belt is replaced.
Constant tone alarm sounds and engine shuts off.	High engine temperature.	Let the engine cool. Do not restart the engine until the cause of overheating has been corrected.
	Low oil pressure.	Do not restart the engine until the cause of low oil pressure has been corrected. The engine can be re-started with low oil pressure, but it will only run a few seconds before it shuts off again.
All functions stop working.	Low fluid level in reservoir.	Check fluid level. Add correct type of fluid if necessary.
	Engine or pump failure.	Manually stow the machine using the emergency power system.
	Circuit breaker is tripped.	Push circuit breaker button in to reset.
	Electrical system malfunction.	Manually lower the boom using the emergency power system.
Lower controls do not work.	Battery disconnect switch turned off.	Place switch in the on position.
	Emergency stop button at lower controls is pushed in to the off position.	Pull the emergency stop button outward.
	Controls switch is in the upper control position.	Place the switch in the lower control position.
	Ground operation switch not held in the on position.	Hold the ground operation switch in the on position while operating the control toggle switches.
Upper controls do not work.	Battery disconnect switch turned off.	Place switch in the on position.
	Emergency stop button at lower and upper controls is in the off position.	Pull the emergency stop buttons outward.
	Control selector switch at lower controls is in the lower control position.	Place switch in the upper controls position.
	Platform foot switch not engaged.	Step down on platform foot switch while operating controls.
Boom and drive functions seem sluggish.	Hydraulic oil is cold and thick.	Use cold weather hydraulic oil as recommended for weather conditions. Warm oil before operating the machine.
Turntable and main boom functions do not work from the upper controls.	Boom speed knob set too slow.	Turn knob toward fast.

Symptom	Possible Cause	Corrective Action
Riser and/or main boom drifts down.	Hydraulic system malfunction.	Stow the machine and do not operate until repairs are made.
Drive functions do not work.	Load capacity exceeded.	Remove load from platform. Refer to platform capacity placard for maximum capacity.
	Machine on too steep a grade.	Lower the booms and drive to a level surface.
	Drive hubs are disengaged.	Turn drive wheel disconnect plates around so nipples point outward.
	Low hydraulic system pressure.	Stow the machine and do not operate until repairs are made.
Can not reach maximum drive speed of 4.5 mph (7.2 km/h).	Booms are not retracted and lowered.	Fully retract and lower the booms.
	Drive range switch is in low (turtle).	Place the switch in the high (rabbit) position.
Wheels will not turn when winching.	Drive hubs are engaged.	Turn drive wheel disconnect plates around so nipples point inward.
Tilt alarm does not work.	Booms are stowed.	Normal operation. The tilt alarm is not operational when the booms are stowed.
Circuit breaker will not reset.	Electrical circuit has not had time to cool.	Wait a minute or two for circuit to cool, then push circuit breaker button in to reset.
	Electrical system malfunction.	Do not operate machine until repairs are made.
Electrical outlet does not work.	Power supply not plugged in.	Plug a source of power into the power-input connector on the chassis.
	GFCI is tripped.	Push reset button on outlet.
	AC generator switch not in the generator position.	With the engine running, place the AC generator switch in the generator position.
	Power cord to platform is not plugged into the AC generator.	Plug power cord into the outlet on the generator.
Improper AC generator output voltage.	Hydraulic oil is cold and thick.	Use cold weather hydraulic oil as recommended for weather conditions. Warm oil before operating the machine.
Hydraulic fluid temperature 200°F (93°C) or more.	Prolonged boom operation or driving.	Stop operation until fluid cools.
	High pressure fluid return to reservoir caused by kinked or twisted hose.	Remove the kink or twist from the hose. Let fluid cool before operating.
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Symptom	Possible Cause	Corrective Action
Hydraulic fluid temperature 200°F (93°C) or more.	Hydraulic system component failure.	Stow the machine and do not operate until repairs are made.
Severe hydraulic leak.	Failure of hose, tube, fitting, seal, etc.	Do not operate machine until repairs are made.

Appendix A – Glossary

aerial platform – a mobile device that has an adjustable position platform, supported from ground level by a structure.

ambient temperature – the air temperature of the immediate environment.

authorized personnel – personnel approved as assigned to perform specific duties at a specific location.

base – the relevant contact points of the aerial platform that form the stability support (e.g. wheels, casters, outriggers, stabilizers).

boom – a movable cantilever beam which supports the platform.

center of gravity – the point in the aerial platform around which its weight is evenly balanced.

chassis – the integral part of the aerial platform that provides mobility and support for the booms.

fall restraint – a system that is used while working on a boom lift within the boundaries of platform guardrails to provide restraint from being projected upward from the platform. This system includes a harness or belt, lanyard, and a lanyard anchor. Federal OSHA, ANSI, and Snorkel require the use of additional fall protection beyond the platform guardrails on boom supported aerial platforms.

floor or ground pressure – the maximum pressure, expressed in pounds per square inch, a single wheel concentrates on the floor or ground.

gradeability – the maximum slope that the aerial platform is capable of travel.

ground fault circuit interrupter (GFCI) – a fast-acting circuit breaker that opens to stop electrical circuit flow if it senses a very small current leakage to ground. The GFCI is used to protect personnel against a potential shock hazard from defective electrical tools or wiring.

guardrail system – a vertical barrier around the platform to prevent personnel from falling.

hazardous location – any location that contains, or has the potential to contain, an explosive or flammable atmosphere as defined by ANSI/NFPA 505.

jib – an articulating boom attached to the tip boom which increases the overall boom reach.

level sensor – a device that detects a preset degree of variation from perfect level. The level sensor is used to sound an alarm if operating on a slope greater than the preset value.

lower controls – the controls located at ground level for operating some or all of the functions of the aerial platform.

main boom – a boom assembly located between the riser and the jib.

manufacturer – a person or entity who makes, builds or produces an aerial platform.

maximum travel height – the maximum platform height or the most adverse configuration(s) with respect to stability in which travel is permitted by the manufacturer.

maximum wheel load – the load or weight that can be transmitted through a single wheel to the floor or ground.

Minimum Safe Approach Distance – the minimum safe distance that electrical conductors may be approached when using the aerial platform. Also called M.S.A.D.

operation – the performance of any aerial platform functions within the scope of its specifications and in accordance with the manufacturer's instructions, the users work rules, and all applicable governmental regulations.

operator – a qualified person who controls the movement of an aerial platform.

personal fall arrest system – a fall protection system that is used while working on an unprotected edge (such as a roof top with no guardrail). This system includes a harness, lanyard or other connecting device, a fall arrester, an energy absorber or decelerator, an anchorage connector, and a secure anchorage such as a building beam, girders or columns. An aerial platform is not a fall arrest anchorage.

platform – the portion of an aerial platform intended to be occupied by personnel with their tools and materials.

platform height – the vertical distance measured from the floor of the platform to the surface upon which the chassis is being supported.

prestart inspection – a required safety inspection routine that is performed daily before operating the aerial platform.

qualified person – a person, who by reason of knowledge, experience, or training is familiar with the operation to be performed and the hazards involved.

rated work load – the designed carrying capacity of the aerial platform as specified by the manufacturer.

riser – the structure that connects the riser boom to the main boom.

riser boom – an articulating boom section. The riser boom is between the turntable and the main boom.

stow – to place a component, such as the platform, in its rest position.

tip boom – a telescopic boom section that extends and retracts from within the main boom. The tip boom is nearest the platform.

turning radius – the radius of the circle created by the wheel during a 360° turn with the steering wheels turned to maximum. Inside turning radius is the wheel closest to the center and outside turning radius is the wheel farthest from the center.

turntable – the structure above the rotation bearing which supports the booms. The turntable rotates about the centerline of rotation.

unrestricted rated work load – the maximum designed carrying capacity of the aerial platform allowed by the manufacturer in all operating configurations.

upper controls – the controls located on or beside the platform used for operating some or all of the functions of the aerial platform.

wheelbase – the distance from the center of the rear wheel to the center of the front wheel.

working envelope – the area defined by the horizontal and vertical limits of boom travel that the platform may be positioned in.

working height – platform height plus six feet.

LIMITED WARRANTY

Snorkel warrants each new machine manufactured and sold by it to be free from defects in material and workmanship for a period of one (1) year from date of delivery to a Customer or for one year after the machine has been placed in first service in a Dealer rental fleet, whichever comes first. Any part or parts which, upon examination by the Snorkel Service Department, are found to be defective, will be replaced or repaired, at the sole discretion of Snorkel, through its local Authorized Dealer at no charge.

Snorkel further warrants the structural components; specifically, the mainframe chassis, turntable, booms and scissor arms, of each new machine manufactured by it to be free from defects in material and workmanship for an additional period of four (4) years. Any such part or parts which, upon examination by the Snorkel Service Department, are found to be defective will be replaced or repaired by Snorkel through its local Authorized Dealer at no charge; however, any labor charges incurred as a result of such replacement or repair will be the responsibility of the Customer or Dealer.

The Snorkel Service Department must be notified within forty-eight (48) hours of any possible warranty situation during the applicable warranty period. Personnel performing warranty repair or replacement must obtain specific approval by Snorkel Service Department prior to performing any warranty repair or replacement.

Customer and Dealer shall not be entitled to the benefits of this warranty and Snorkel shall have no obligations hereunder unless the "Pre-Delivery and Inspection Report" has been properly completed and returned to the Snorkel Service Department within ten (10) days after delivery of the Snorkel product to Customer or Dealer's rental fleet. Snorkel must be notified, in writing, within ten (10) days, of any machine sold to a Customer from a Dealer's rental fleet during the warranty period.

At the direction of the Snorkel Service Department, any component part(s) of Snorkel products to be replaced or repaired under this warranty program must be returned freight prepaid to the Snorkel Service Department for inspection. All warranty replacement parts will be shipped freight prepaid (standard ground) from the Snorkel Service Department or from Snorkel's Vendor to Dealer or Customer.

REPLACEMENT PARTS WARRANTY

Any replacement or service part made or sold by Snorkel is not subject to the preceding Limited Warranty beyond the normal warranty period of the machine upon which the part was installed.

THIS WARRANTY EXCLUDES AND SNORKEL DOES NOT WARRANT:

1. Engines, motors, tires and batteries which are manufactured by suppliers to Snorkel, who furnish their own warranty. Snorkel will, however, to the extent permitted, pass through any such warranty protection to the Customer or Dealer.
2. Any Snorkel product which has been modified or altered outside Snorkel's factory without Snorkel's written approval, if such modification or alteration, in the sole judgment of Snorkel's Engineering and/or Service Departments, adversely affects the stability, reliability or service life of the Snorkel product or any component thereof.
3. Any Snorkel product which has been subject to misuse, improper maintenance or accident. "Misuse" includes but is not limited to operation beyond the factory-rated load capacity and speeds. "Improper maintenance" includes but is not limited to failure to follow the recommendations contained in the Snorkel Operation, Maintenance, Repair Parts Manuals. Snorkel is not responsible for normal maintenance, service adjustments and replacements, including but not limited to hydraulic fluid, filters and lubrication.
4. Normal wear of any Snorkel component part(s). Normal wear of component parts may vary with the type application or type of environment in which the machine may be used; such as, but not limited to sandblasting applications.
5. Any Snorkel product that has come in direct contact with any chemical or abrasive material.
6. Incidental or consequential expenses, losses, or damages related to any part or equipment failure, including but not limited to freight cost to transport the machine to a repair facility, downtime of the machine, lost time for workers, lost orders, lost rental revenue, lost profits or increased cost.

This warranty is expressly in lieu of all other warranties, representations or liabilities of Snorkel, either expressed or implied, unless otherwise amended in writing by Snorkel's President, Vice President-Engineering, Vice President-Sales or Vice President-Marketing.

SNORKEL MAKES NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THIS LIMITED WARRANTY. SNORKEL MAKES NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND DISCLAIMS ALL LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO INJURY TO PERSONS OR PROPERTY.

The Customer shall make all warranty claims through its local Authorized Dealer and should contact the Dealer from whom the Snorkel product was purchased for warranty service. Or, if unable to contact the Dealer, contact the Snorkel Service Department for further assistance.

Effective July 1995

