

# snorkel

## A46JRT



CE

## **OPERATOR'S** **MANUAL**

ANSI/CSA/CE/AS/NZS  
Replaces October 2023

Part Number 0260996  
November 2023  
Original Instructions – English

# 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 sections 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.

# ⚠ DANGER



Do NOT Go Closer Than The Minimum Safe Approach Distance



Do NOT Operate Outside During a Thunderstorm



Do NOT Operate in Windy or Gusty Conditions



Do NOT Add Anything That Will Increase Wind Loading



Do NOT Drive an Elevated MEWP on Soft, Uneven or Sloping Surfaces



Do NOT Operate an Elevated MEWP on Rough or Uneven Terrain



Do NOT Operate a Stowed MEWP on Rough or Uneven Terrain



Do NOT Operate an Elevated MEWP Near Any Drop-off or Hole



Do NOT Operate a Stowed MEWP Near Any Drop-off or Hole



Do NOT Use The MEWP As a Lifting Tool or Crane



Do NOT Exceed The Maximum Allowable Manual Side Force



Do NOT Operate The MEWP Without Sufficient Clearance



Do NOT Raise The Platform Without First Checking For Obstructions



Do NOT Lower The Platform Without Checking For Obstructions



Do NOT Allow Ground Personnel Near the MEWP During Operation



Do NOT Carry Loads That Extend Beyond The Guardrails



Do NOT Operate an MEWP From Trucks, Trailers, or Similar Equipment



Do NOT Exceed The Platform Rated Work Load



Do NOT Climb on The MEWP



Do NOT Climb on The Guardrails



Do NOT Engage In Any Form of Horseplay



Do NOT Operate an MEWP With Tires That Are in Poor Condition



Do NOT Operate an MEWP That is Damaged or Not Functioning Properly



Do NOT Leave the MEWP With The Key In It



Do NOT Operate an MEWP While Physically Impaired



Do NOT Strike or Bump Stationary Objects With an Elevated MEWP

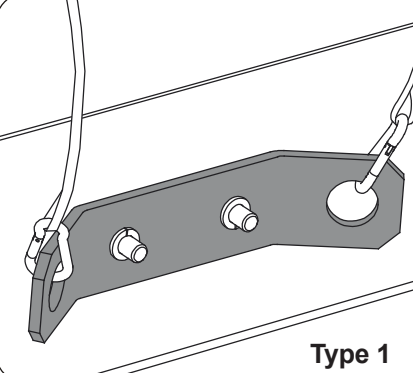
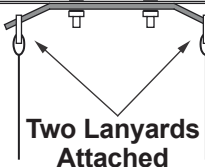
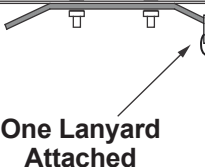
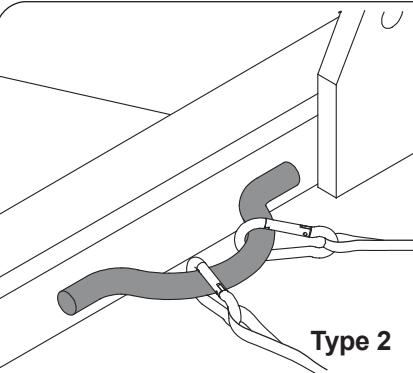
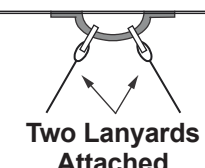
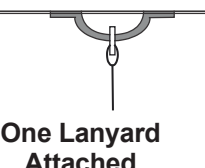
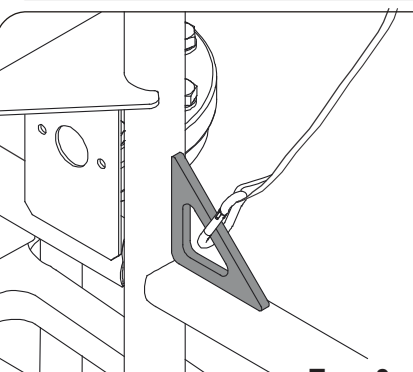
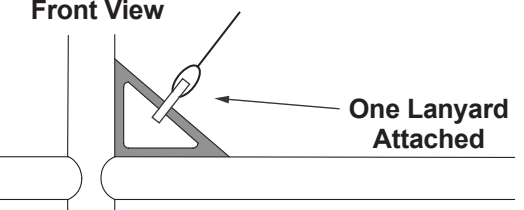
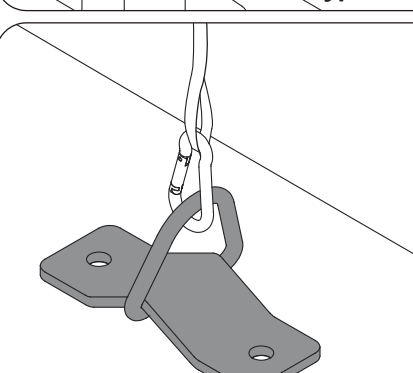
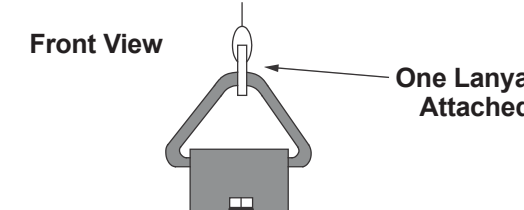


Do NOT Strike or Bump Stationary Objects With a Stowed MEWP

## Fall Restraint Lanyard Anchor Points

All fall restraint lanyard anchor points on Snorkel aerial work platforms have been tested with a force of 3,650 lbs (16.3 kN) per person.

See below examples of anchor points used on Snorkel machines with their corresponding per person rating.

 <p><b>Type 1</b></p>	<p>Anchor point Type 1 is rated for one lanyard attachment per loop. Refer to machine "Specifications" and platform decals for maximum number of platform occupants.</p>	<p><b>Top View</b></p>  <p><b>Two Lanyards Attached</b></p>	<p><b>Top View</b></p>  <p><b>One Lanyard Attached</b></p>
 <p><b>Type 2</b></p>	<p>Anchor point Type 2 is rated for two lanyard attachments per loop. Refer to machine "Specifications" and platform decals for maximum number of platform occupants.</p>	<p><b>Top View</b></p>  <p><b>Two Lanyards Attached</b></p>	<p><b>Top View</b></p>  <p><b>One Lanyard Attached</b></p>
 <p><b>Type 3</b></p>	<p>Anchor point Type 3 is rated for one lanyard attachment per loop. Refer to machine "Specifications" and platform decals for maximum number of platform occupants.</p>	<p><b>Front View</b></p>  <p><b>One Lanyard Attached</b></p>	
 <p><b>Type 4</b></p>	<p>Anchor point Type 4 is rated for one lanyard attachment per loop. Refer to machine "Specifications" and platform decals for maximum number of platform occupants.</p>	<p><b>Front View</b></p>  <p><b>One Lanyard Attached</b></p>	

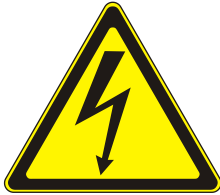
NOTE: There can be more anchor points in the platform than the maximum number of occupants allowed in the platform. Refer to the machine specifications for the correct occupancy rating before use.

# SAFETY RULES

## ⚠Warning

All personnel shall carefully read, understand and follow all safety rules and operating instructions before operating or performing maintenance on any Snorkel aerial work platform.

### Electrocution Hazard



**THIS MACHINE IS NOT INSULATED!**

### Tip Over Hazard



**NEVER** elevate the platform or drive the machine while elevated unless the machine is on a firm, level surface

### Collision Hazard



**NEVER** position the platform without first checking for overhead obstructions or other hazards.

### Fall Hazard



**NEVER** climb, stand, or sit on platform guardrails or midrail.

**USE OF THE AERIAL WORK PLATFORM:** This aerial work platform is intended to lift persons and his tools as well as the material used for the job. It is designed for repair and assembly jobs and assignments at overhead workplaces (ceilings, cranes, roof structures, buildings etc.). Uses or alterations to the aerial work platform must be approved by **Snorkel**.

**THIS AERIAL WORK PLATFORM IS NOT INSULATED!** For this reason it is imperative to keep a safe distance from live parts of electrical equipment!

Exceeding the specified permissible maximum load **is prohibited!** See "Platform Capacity" for details.

The use and operation of the aerial work platform as a lifting tool or a crane **is prohibited!**

**NEVER** exceed the manual force allowed for this machine. See "Manual Force" for details.

**DISTRIBUTE** all platform loads evenly on the platform.

**NEVER** operate the machine without first surveying the work area for surface hazards such as holes, drop-offs, bumps, curbs, or debris; and avoiding them.

**OPERATE** machine only on surfaces capable of supporting wheel loads.

**NEVER** operate the machine when wind speeds exceed this machine's wind rating. See "Beaufort Scale" for details.

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

**IN CASE OF EMERGENCY** push EMERGENCY STOP switch to deactivate all powered functions.

**IF ALARM SOUNDS** while platform is elevated, STOP, carefully lower platform. Move machine to a firm, level surface.

Climbing up the railing of the platform, standing on or stepping from the platform onto buildings, steel or prefab concrete structures, etc., **is prohibited!**

Dismantling the entry gate or other railing components **is prohibited!** Always make certain that the entry gate is closed!

**It is prohibited** to keep the entry gate in an open position when the platform is raised!

To extend the height or the range by placing of ladders, scaffolds or similar devices on the platform **is prohibited!**

**NEVER** perform service on machine while platform is elevated without blocking elevating assembly.

**INSPECT** the machine thoroughly for cracked welds, loose or missing hardware, hydraulic leaks, loose wire connections, and damaged cables or hoses before using.

**VERIFY** that all labels are in place and legible before using.

**NEVER** use a machine that is damaged, not functioning properly, or has damaged or missing labels.

To bypass any safety equipment **is prohibited** and presents a danger for the persons on the aerial work platform and in its working range.

**NEVER** charge batteries near sparks or open flame. Charging batteries emit explosive hydrogen gas.

Modifications to the aerial work platform **are prohibited** or permissible only at the approval by **Snorkel**.

**AFTER USE**, secure the work platform from unauthorized use by turning the keyswitch off and removing key.

The driving of MEWP's on the public highway is subject to national traffic regulations.

Certain inherent risks remain in the operation of this machine despite utilizing proper design practices and safeguarding.

Harness attachment points are provided in the platform and the manufacturer recommends the usage of a fall restraint harness, especially where required by national safety regulations.

Care must be taken to ensure that the machines meets the requirements of stability during use, transportation, assembly, dismantling when out of service, testing, or foreseeable breakdowns.

In the event of an accident or breakdown see "Emergency Operation." 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.

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# 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
- Four wheel drive
- Foam filled tires
- Pivoting front axle
- Hour meter
- Tie-down/lifting lugs
- AC 110V electrical outlet with GFCI at platform
- Boom/drive cut-out – machines manufactured after March 2021
- Flashing amber light
- Horn
- Drive motion alarm
- 3.5 degree tilt alarm
- 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
- Diagnostic center display
- Five year limited warranty

The machine may be powered with one of the following engines.

- Kubota – Diesel
- Kubota – Gasoline, LPG, or dual fuel

The aerial platform has been manufactured 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:

- Dual fuel
- Dual platform capacity system – 650 and 750 lb
- 5 degree tilt alarm
- Airline to platform
- Tow package
- Motion alarm
- Non-marking tires
- Sandblast protection kit
- Platform overload system
- Cold weather start kit
- 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

- European conformity (CE) compliance
- Australian/New Zealand Standards (AS/NZS) compliance
- Canadian Standards Association (CSA) compliance

## 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

Complete machine inspection consists of periodic visual and operational checks, along with periodic minor adjustments that assure proper performance. Daily inspection will prevent abnormal wear and prolong the life of all systems. The inspection and maintenance schedule should be performed at the specified intervals and after prolonged periods of storage before returning the machine to service. Inspection and maintenance shall be performed by personnel who are trained and familiar with mechanical and electrical procedures.

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. Modifi-

cation may void the warranty, adversely affect stability, or affect the operational characteristics of the aerial platform.

## Used Material Disposal

For proper used material disposal, refer to all applicable national and/or employer standards before disposal of any environmentally sensitive material including, but not limited to, hydraulic fluid, batteries, and battery fluid.

## Manual of Responsibilities – ANSI

All owners and users of the aerial platform must read, understand, and comply with all applicable regulations as stated in ANSI A92.20. Ultimate compliance to ANSI and 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 Manufacturers, Dealers, Owners, Users, Supervisors, Operators, Occupants, Lessors, Lessees and Brokers of ANSI/SIA A92.22-2020 Safe Use & ANSI/SIAA92.24-2018 Training Requirements for the Use, Operation, Inspection, Testing and Maintenance of Mobile Elevating Work Platforms (MEWP)" is available from Snorkel dealers or from the factory upon request.

Copies are also available from:  
Scaffold & Access Industry Association  
400 Admiral Boulevard  
Kansas City, MO 64106 USA

## MEWP Safe Use – AS/NZS

All owners and users of the aerial platform must read, understand, and comply with all applicable regulations as stated in AS/NZS 2550.10:2006. Ultimate compliance is the responsibility of the user and their employer.

## AS/NZS 1418.10 Commissioning

Per AS/NZS 1418.10, a machine has been commissioned upon return to Snorkel of a satisfactory completed Pre-Delivery and Inspection Record (PDIR). The PDIR inspection is performed by Snorkel, or it's agent, before the machine is delivered to the customer. A completed PDIR form can be obtained, by request, from the sales agent.

## CE Compliance

The aerial work platform meets and exceeds the requirements of both EN280:2013 and ANSI A92.5.

## Additional Information

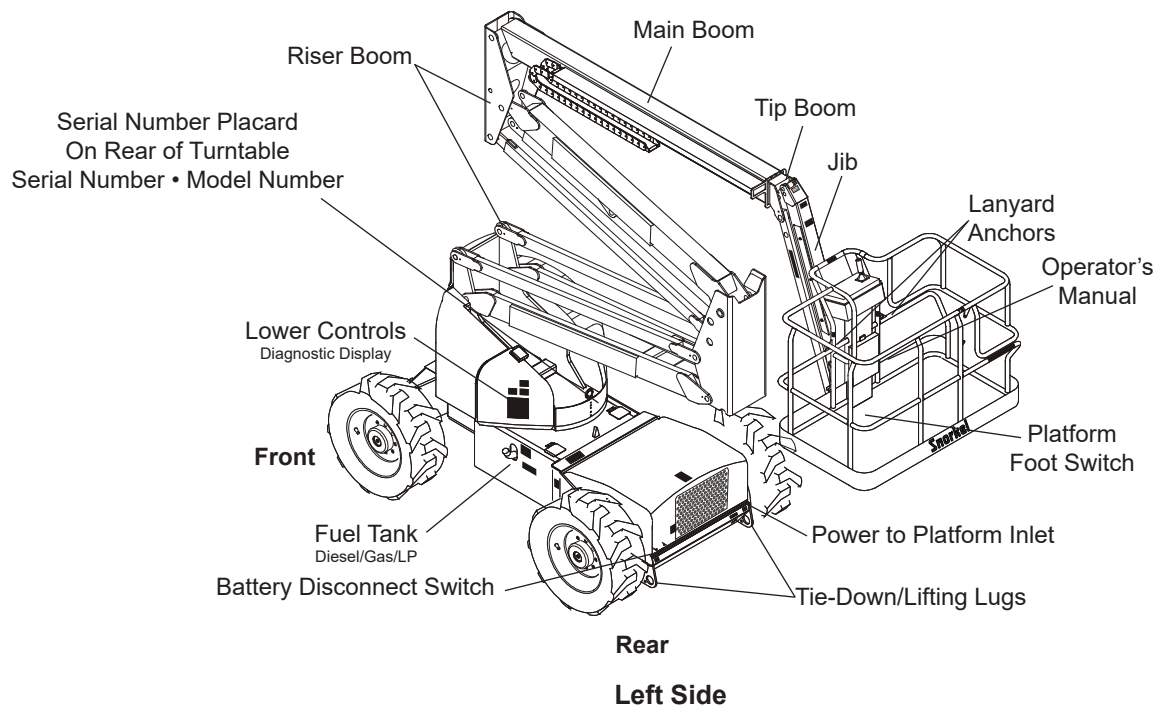
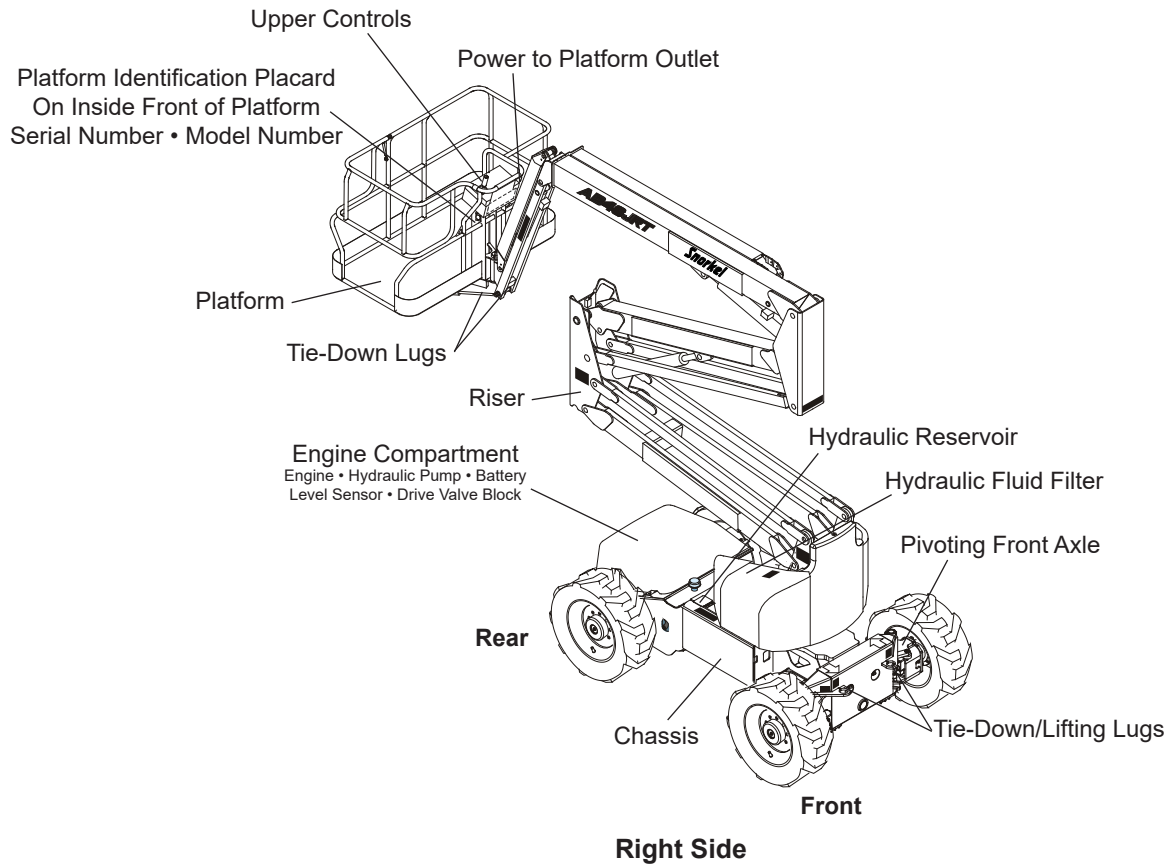
For additional information contact your local dealer or Snorkel at:

Snorkel International  
P.O. Box 1160  
St. Joseph, MO 64502-1160 USA  
1-800-255-0317  
<http://www.snorkellifts.com>

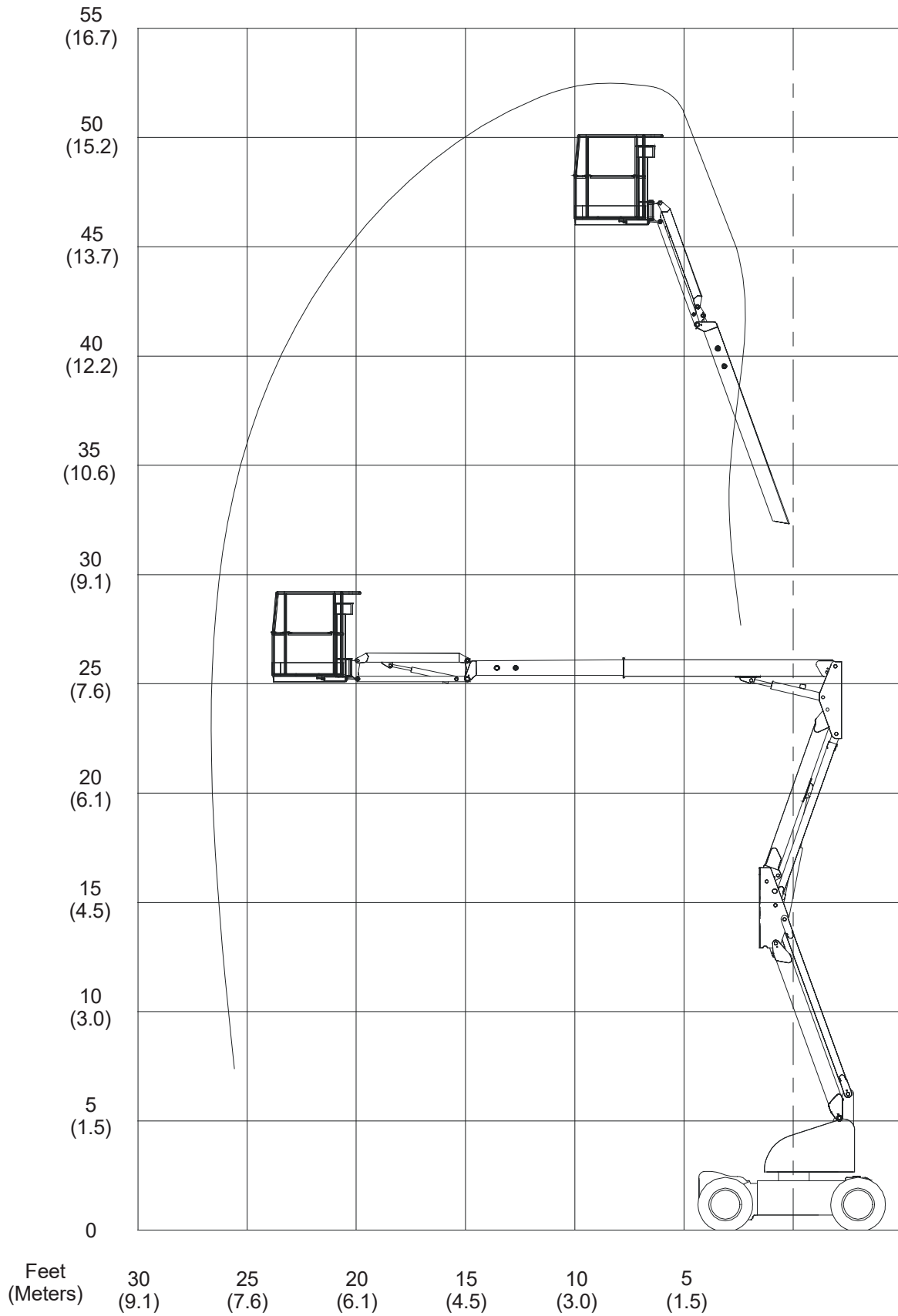
Regional contact information is located on the back cover of this manual.

# Chapter 2 – Specifications

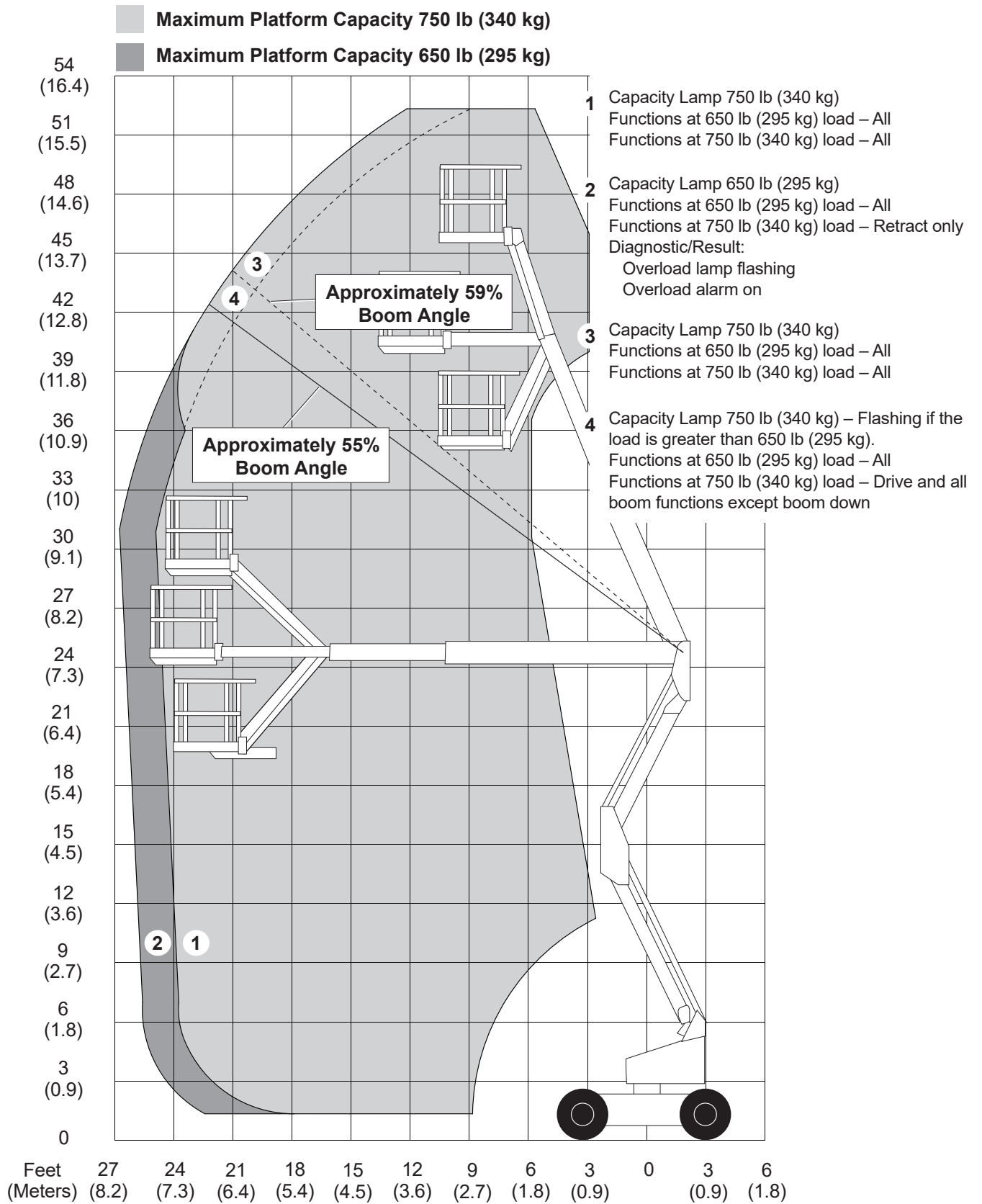
## Component Identification



### Working Envelope – Single Capacity



Working Envelope – Dual Capacity



**General Specifications – Single Capacity**

**Aerial Platform**

Working height	52' 11" (16.3 m)
Maximum platform height	46' 11" (14.3 m)
Up and over height	25' 2" (7.67 m)
Maximum horizontal reach	24' 11" (7.35 m)
Main boom	
Articulation	0° to +72°
Extension	80" (2.0 m)
Jib	
Articulation	-70° to +70°
Extension	5' (1.5 m)
Turntable rotation	360° non-continuous
Turning radius	
Inside	2' 8" (0.81 m)
Outside	10' 5" (3.17 m)
Tail swing	0
Wheelbase	8' 6" (2.5 m)
Ground clearance	13" (330 mm)
Maximum wheel load	7,940 lbs (3,609.1 kg)
Maximum ground bearing pressure	144 psi (10.08 kg/cm <sup>2</sup> )
Maximum distributed floor load	222 psf (1,084 kg/m <sup>2</sup> )
Level sensor setting	
Standard	3.5 degrees
Optional	5 degrees
Weight, EVW Approximate	16,620 lbs (7,540 kg)
Maximum allowable manual force (side pull)	90 lb (400 N)
Width	6' 10" (2.1 m)
Stowed length	18' 8" (5.7 m)
Stowed height	7' 2" (2.16 m)

**Platform**

Dimensions	
Standard Steel	39" x 72" (99 cm x 183 cm)
Rated work load	500 lb (227 kg)
Optional Aluminum	30" x 96" (76 cm x 244 cm)
Rated work load	500 lb (227 kg)
Optional Aluminum	30" x 60" (76 cm x 153 cm)
Rated work load	550 lb (250 kg)
Toeboard height	6" (15.2 cm)
Rotation	80° CW to 80° 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	20 to 25 seconds
Down	30 to 35 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	4WD
Gradeability	45%
Axle	front oscillating
Maximum drive height	46' 11" (14.3 m)

**Tires**

Bar lug	355/55D625NHS, 14 ply
Width	9" (22.9 cm)
Weight	175 lb (79.4 kg)
Turf Flotation – air filled	33/16LL500
Pressure	42 psi (7 kPa)

**Electrical System**

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

**Hydraulic System**

Pressure	
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	43 US gal (162 l)
Maximum operating temperature	200°F (93°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

**Engine**

Diesel	Kubota V1505-TE
Gas/LP dual fuel	Kubota WG1605

**Fuel Tank Capacity**

Diesel	25 US gal (94 l)
Dual fuel	
Gasoline	25 US gal (94 l)
LPG	43.5 lbs (19.7 kg)

**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 (12.5 m/s) Beaufort scale 6
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**Vibration**

less than 2.5 m/sec<sup>2</sup>  
0.3 m/sec<sup>2</sup> (measured)

**Sound Pressure Level**

At work station	below 100 dB(A)
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**Sound Power Level**

below 107 dB(A)

**Group Classification**

Heavy duty – intended life	100,000 load cycles
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## General Specifications – Dual Capacity

### Aerial Platform

Working height	52' 4" (15.95 m)
Maximum platform height	46' 4" (14.12 m)
Up and over height	25' 2" (7.67 m)
Maximum horizontal reach	
At 650 lb capacity	24' 9" (7.54 m)
At 750 lb capacity	22' 11" (6.98 m)
Main boom	
Articulation	0° to +72°
Extension	80" (2.0 m)
Jib	
Articulation	-70° to +70°
Extension	5' (1.5 m)
Turntable rotation	360° non-continuous
Turning radius	
Inside	4' 2" (1.27 m)
Outside	13' 9" (4.19 m)
Tail swing	0
Wheelbase	8' 6" (2.5 m)
Ground clearance	12" (304.8 mm)
Maximum wheel load	8,200 lbs (3,719.5 kg)
Maximum ground bearing pressure	144 psi (10.08 kg/cm <sup>2</sup> )
Maximum distributed floor load	222 psf (1,084 kg/m <sup>2</sup> )
Level sensor setting	
Standard	3.5 degrees
Optional	5 degrees
Weight, EVW Approximate	17,400 lbs (7,892.5 kg)
Maximum allowable manual force (side pull)	90 lb (400 N)
Width	7' 5" (2.26 m)
Stowed length	18' 8" (5.7 m)
Stowed height	7' 4" (2.23 m)

### Platform

Dimensions	
Standard Aluminum	30" x 72" (76 cm x 183 cm)
Rated work load unrestricted	650 lb (295 kg)
Rated work load restricted	750 lb (340 kg)
Optional Aluminum	
With swing gate	30" x 60" (76 cm x 153 cm)
Rated work load unrestricted	650 lb (227 kg)
Rated work load restricted	750 lb (227 kg)
Toeboard height	6" (15.2 cm)
Rotation	80° CW to 80° CCW
Maximum number of occupants	2 people
Optional AC generator	110 V, 2,000 W

### Function Speed

Turntable rotation	65 to 85 seconds
Total raise time	101 seconds
Total lower time	98 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	20 to 25 seconds
Down	30 to 35 seconds
Drive	
High, booms stowed	4.25 mph (6.8 km/h)
Low, booms raised/extended	0.8 mph (1.2 km/h)

### Drive System

Standard	4WD
Gradeability	45%
Axle	front oscillating
Maximum drive height	46' 4" (14.12 m)

### Tires

Bar lug – foam filled	355/55D625NHS, 14 ply
Width	9" (22.9 cm)
Weight	175 lb (79.4 kg)

### Electrical System

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

### Hydraulic System

Pressure	
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	43 US gal (162 l)
Maximum operating temperature	200°F (93°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

### Engine

Diesel	Kubota V1505-TE
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### Fuel Tank Capacity

Diesel	25 US gal (94 l)
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### 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 (12.5 m/s) Beaufort scale 6
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### Vibration

	less than 2.5 m/sec <sup>2</sup> 0.3 m/sec <sup>2</sup> (measured)
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### Sound Pressure Level

At work station	below 100 dB(A)
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### Sound Power Level

	below 107 dB(A)
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### Group Classification

Heavy duty – intended life	100,000 load cycles
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## Engine Specifications

Engine	Displacement	Fuel Grade	Coolant	Oil Capacity	Oil Grade
<b>Dual Fuel Kubota WG1605</b>	93.79 cu. in. (1.537 liter)	Gas – Unleaded gasoline  LPG – Commercial LPG	More than 50% water Less than 50% Antifreeze <sup>2</sup>	1.59 gal (6 liter)	API: SL or higher <sup>3</sup>
<b>Diesel Kubota V1505-TE</b>	91 cu. in. (1498 cm <sup>3</sup> )	Diesel Fuel No. 2-D ASTM D975 <sup>1</sup>	50% water 50% Antifreeze <sup>2</sup>	1.77 gal (6.7 liter)	API: CD grade or higher <sup>3</sup>

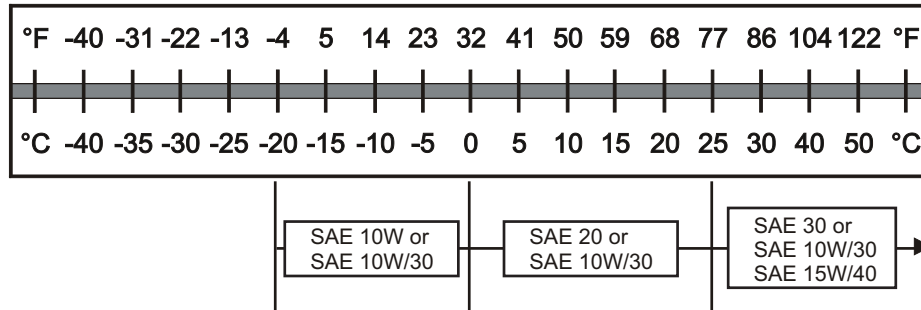
Note 1: Refer to the Kubota Operator's Manual for specific fuel recommendations and specifications.

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

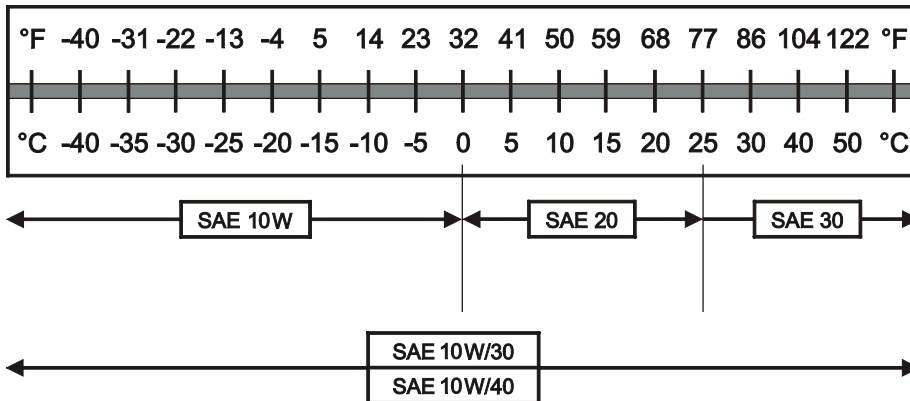
Note 3: Refer to the Kubota Operator's Manual for specific lubricating oil recommendations and specifications.

## Engine Oil Viscosity

### Kubota WG1605



### 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 – ANSI

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

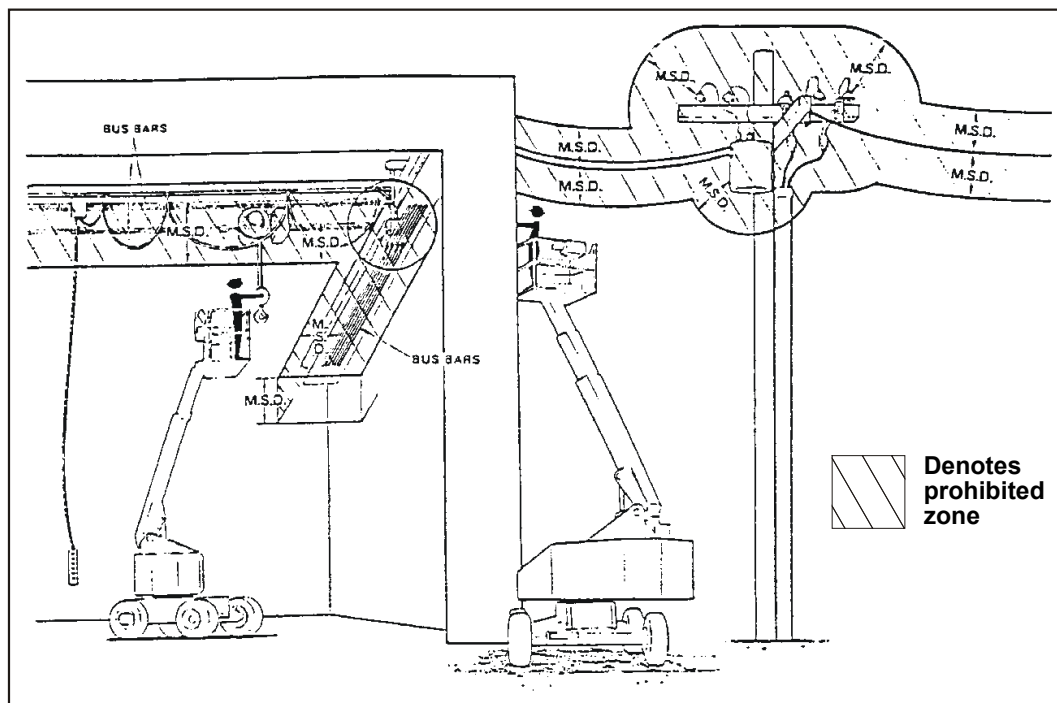
### **▲**Danger

**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**

**Minimum Safe Approach Distance – AS/NZS**  
 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 national safety regulations.**

AS/NZS 2550.10:2006 define minimum distances that must be observed when working near overhead power lines on poles and overhead power lines on towers. Refer to the clearance requirements decals on the machine to determine safe approach distances (refer to Figure 1).

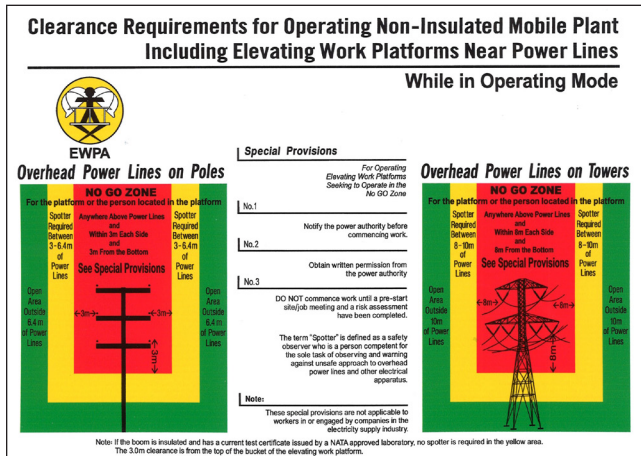


Figure 1 – Minimum Safe Approach Distance

**Platform Capacity**

Two people and their work materials may occupy the platform.

**⚠ 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 machine decals, placards, and in the machine specifications in this manual.**

The maximum unrestricted rated load capacity and the maximum number of occupants for the aerial platform are stated on machine decals, placards, and in the machine specifications in this manual.

**Manual Force**

Manual force is the force applied by the occupants to objects such as walls or other structures outside the work platform.

**⚠ 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 maximum allowable manual force indicated on the machine decals, placards, and in the machine specifications in this manual.**

The maximum allowable manual force is limited to 90 lb (400 N).

**Wind Speeds**

Do not add anything to the aerial platform that will increase the wind loading such as billboards, banners, flags, etc.

**⚠ 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 machine in wind speeds of 28 mph (12.5 m/s) or greater.**

Do not operate the aerial platform in windy conditions with wind gusts or steady wind speeds of 28 mph (12.5 m/s) or greater. Refer to Figure 2.

**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.

BEAUFORT RATING	WIND SPEED				GROUND CONDITIONS
	m/s	km/h	ft/s	mph	
3	3,4~5,4	12,25~19,4	11.5~17.75	7.5~12.0	Papers and thin branches move, flags wave.
4	5,4~8,0	19,4~28,8	17.75~26.25	12.0~18	Dust is raised, paper whirls up, and small branches sway.
5	8,0~10,8	28,8~38,9	26.25~35.5	18~24.25	Shrubs with leaves start swaying. Wave crests are apparent in ponds or swamps.
6	10,8~13,9	38,9~50,0	35.5~45.5	24.5~31	Tree branches move. Power lines whistle. It is difficult to open an umbrella.
7	13,9~17,2	50,0~61,9	45.5~56.5	31.~38.5	Whole trees sway. It is difficult to walk against the wind.

Figure 2 – Beaufort Scale

- 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 or fall arrest device connected to a fall protection anchor as required by national or local regulations and standards.

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.

Never operate the aerial platform without all parts of the guardrail system in place and the gates 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. Thoroughly rinse away any spilled fluid with clean water.**

- 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.**

Operate dual fuel machines on LPG fuel when indoors to reduce exhaust fumes and carbon monoxide.

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.

### **General Safety Rules**

This aerial work platform is intended to lift persons, their tools and materials used for the job. It is designed for repair, assembly, and assignments at workplaces above head height (ceilings, cranes, roof structures, buildings, etc.). Uses or alterations to the aerial work platform must be approved by Snorkel.

This aerial work platform is not insulated. Refer to applicable national/governmental/local regulations for safe approach distances.

Exceeding the specified permissible maximum load is prohibited.

The use and operation of the aerial work platform as a lifting tool or a crane is prohibited.

Never exceed the manual force allowed for this machine.

Distribute all platform loads evenly on the platform.

Never operate the machine without first surveying the work area for stationary or moving obstacles and surface hazards such as holes, drop-offs, bumps, curbs, or debris; and avoiding them. Never strike or bump into stationary or moving obstacles while driving or raising and lowering the platform.

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

Platform passengers should watch their hands and fingers for pinch points while holding on the guardrails while the platform is moving.

Operate machine only on surfaces capable of supporting wheel loads.

Never operate the machine when wind speeds exceed the machine's wind rating.

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.

In case of an emergency, push the emergency stop button to deactivate all powered functions.

If an alarm sounds while the platform is elevated, stop and carefully lower platform. Move the machine to a firm, level surface.

Climbing up the railing of the platform, standing on or stepping from the platform onto buildings, steel or prefab concrete structures, etc., is prohibited. Never exit or enter the platform when it is elevated.

For AS/NZS operators, no person shall access or egress from the platform in the elevated position (excepts in an emergency) unless the requirements of AS2550.10 have been met. For full requirements refer directly to AS2550.10

Dismantling the entry gate or other railing components is prohibited. Always make certain that the entry gate is closed.

It is prohibited to keep the entry gate in an open position when the platform is raised.

To extend the height or the range by placing of ladders, scaffolds or similar devices on the platform is prohibited.

Never perform service on machine while the platform is elevated without blocking booms.

Inspect the machine thoroughly for cracked welds, loose or missing hardware, hydraulic leaks, loose wire connections, and damaged cables or hoses before using.

Verify that all placards and decals are in place and legible before using the machine.

Never use a machine that is damaged, not functioning properly, or has damaged or missing placards and decals.

To bypass any safety equipment is prohibited and presents a danger for the persons on the aerial work platform and in its working range.

Never charge batteries near sparks or open flame. Charging batteries emit explosive hydrogen gas.

Modifications to the aerial work platform are prohibited or permissible only at the approval by Snorkel.

After use, secure the work platform from unauthorized use by turning the keyswitch off and removing key.

Driving MEWP's on public highways is subject to national traffic regulations.

Certain inherent risks remain in the operation of this machine despite utilizing proper design practices and safeguarding.

Fall protection anchors are provided in the platform and the manufacturer recommends the usage of a fall restraint or fall arrest device as required by national or local regulations and standards.

Care must be taken to ensure that the machines meets the requirements of stability during use, transportation, assembly, dismantling when out of service, testing, or foreseeable breakdowns.

In the event of an accident or breakdown see Chapter 10 – Emergency Operation. 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.

## 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**

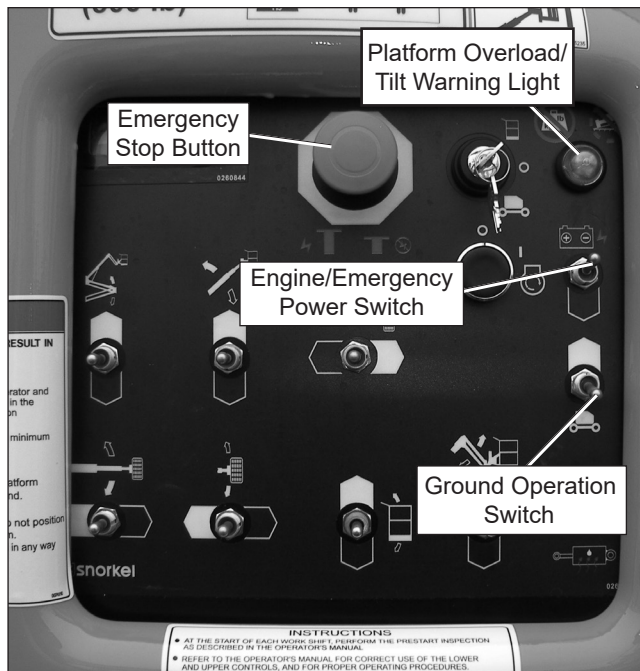
**The potential for an accident increases when safety devices do not function properly. Death or serious injury could result from such accidents. Do not alter, disable, or override any safety device.**

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).



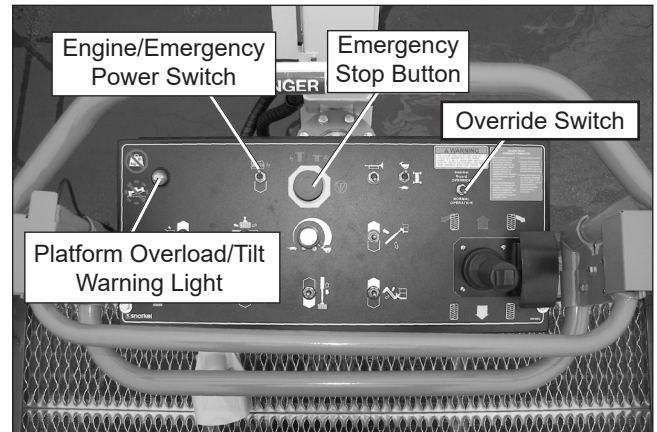
**Figure 4.1 – Lower Controls**

- 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 batteries. 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 batteries. Do not use this system for normal operation.**

- Hold the emergency power switch (refer to Figures 4.1 and 4.2) in the proper position 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 batteries.

### 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.

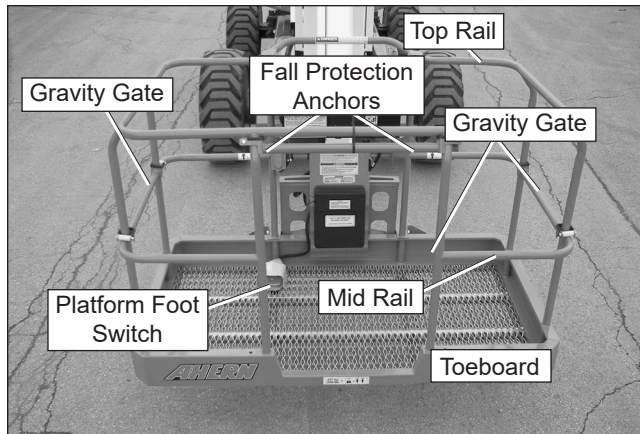


Figure 4.3 – Platform

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 gates close automatically after entering or exiting the platform. After entering the platform check to make sure the gates are fully closed.

### Fall Protection Anchors

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

#### Note

*The fall protection anchors are not for lifting or tying the machine down.*

- All personnel in the platform must connect their fall protection device to a fall protection anchor before raising the platform.
- Attach only one fall protection device to each anchor.

### Ground Fault Circuit Interrupter

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

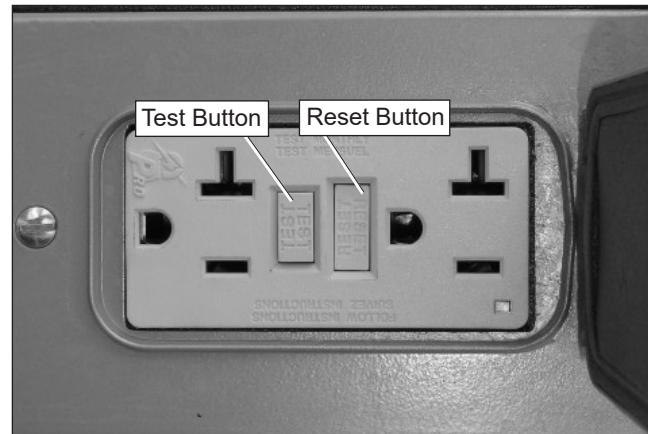


Figure 4.4 – Electrical Power Outlet

### Platform Overload Sensing System

All functions are stopped from the upper and lower controls, when the platform overload limit is exceeded. The horn will sound intermittently and the platform overload light (refer to Figure 4.1 and 4.2) will blink until the excess load is removed from the platform. At that time, the machine functions are again operational.

If the platform becomes significantly overloaded, or if an upward force on the platform exceeds approximately 500 lb (2225 N), the system will enter into error mode, stopping all functions from the upper and lower controls. The horn will then sound constantly and the overload light will stay illuminated at the upper and lower controls.

The system will remain in error mode until the excess load is removed from the platform and the emergency stop button or start switch is cycled off and back on, resetting the system. At that time, the machine functions are operational.

### ⚠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 batteries. Do not use this system for normal operation.**

If the platform overload sensing system is tripped while operating the machine or if the system is in error mode and can not be reset, the emergency power system may still be used for emergency machine operation from either the lower or 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.**

The overload sensing system is not active when the machine is being driven with the booms in the stowed position. This allows the machine to be driven without the system sensing an overload due to rough ground conditions.



To eliminate repeated tripping of the system during machine operation, there is a five second delay in machine functions following:

- starting the engine.
- removing excess load from the platform.

### Boom/Drive Cut-out

On machines manufactured after March 2021, boom and drive functions will be cut-out, disabled, when the main boom is elevated, extended, or the riser is elevated from the stowed position and the ground slope exceeds the chassis slope sensor settings. The override switch may be used to stow the machine which then allows all functions to be returned to normal. The emergency power system may be used at this time as well.

Refer to the machine serial number placard to determine the slope sensor alarm setting.

### 3.5 Degree Slope Sensor Alarm Setting

When driving the machine unstowed onto a slope, at 3 degrees slope drive is paused, an audible two-tone alarm will sound, and the tilt warning light will come on. This warning indicates that the machine may be backed off the slope or stowed without the use of the override switch to do so. If the degree of slope continues to increase to 3.5 degrees, a constant alarm will sound and boom and drive functions will become disabled requiring the use of the override control to stow the machine.

### 5 Degree Slope Sensor Alarm Setting – Option

When driving the machine unstowed onto a slope, at 4.5 degrees slope drive is paused, an audible two-tone alarm will sound, and the tilt warning light will come on. This warning indicates that the machine may be backed off the slope or stowed without the use of the override switch to do so. If the degree of slope continues to increase to 5 degrees, a constant alarm will sound and boom and drive functions will become disabled requiring the use of the override control to stow the machine.

### Tilt Alarm/Warning Lights

If the aerial platform chassis is out of level more than the machine specified slope sensor alarm setting when the main boom is raised or extended, or when the riser boom is raised, an alarm will sound and the tilt warning light on the lower and upper control panels (refer to Figures 4.1 and 4.5) will illuminate. 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 and warning lights are for added protection and do 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.

### Engine Warning Light

On dual fuel machines, there is an engine warning light on the upper control panel (refer to Figure 4.5). When the engine light comes on, stop operation of the machine as soon as possible and have the engine serviced by an authorized and qualified service technician.

### 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.

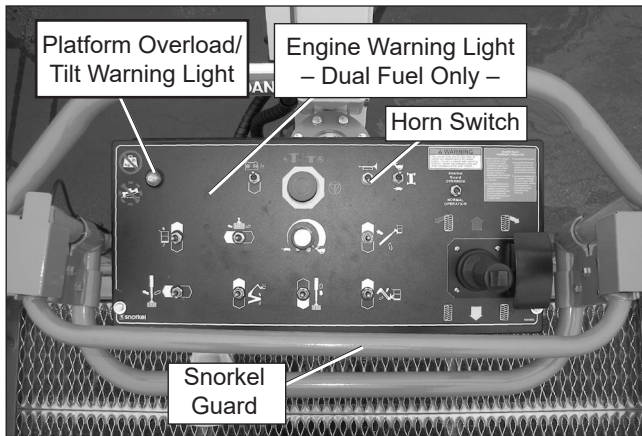


Figure 4.5 – Upper Controls

### Drive Motion Alarm

A drive motion alarm is provided on the machine. The alarm sounds, in short beeps, anytime the machine drive functions are being operated. The alarm is used to warn personnel in the work area to stand clear.

### 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 Lights

An amber flashing light may be located on the top of the counterweight, on each side of the machine. The flashing lights warn personnel that the aerial platform is in the area.

The lights flash at approximately one flash per second when the machine is set up for operation:

- from the lower controls and the ground operation switch is activated, or
- from the upper controls with the foot switch activated

### Driving Lights

Optional headlights and blinking tail lights may be installed on the machine. The headlights are located on the top of the front cowling. The tail lights are mounted on the sides of the rear cowling.

Driving lights help improve visibility while driving the aerial platform and help others see it too. Driving lights are not for driving on public roadways.

### Platform Work Lights

Optional platform work lights may be located on the top rail of the platform, one on each side of the upper control panel.

### Snorkel Guard

The Snorkel Guard (refer to Figure 4.6) is a mechanically activated guarding system which offers an additional level of protection to the operator at the upper controls.

If an operator is involuntarily pushed against the spring-loaded Snorkel Guard rail that is mounted above the upper control panel, the machine functions are disabled.

When the Snorkel Guard is activated:

- the horn sounds.
- the blue light under the upper control panel flashes.
- only main boom down and jib down functions will operate.

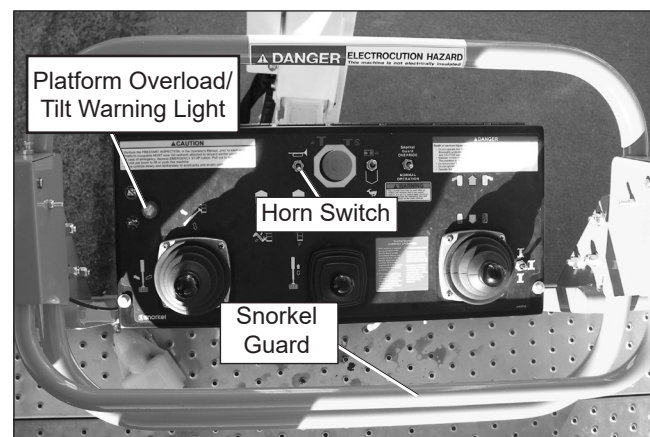


Figure 4.6 – Upper Controls

The lower controls are not affected by the Snorkel Guard activation.

## Chapter 5 – Gauges and Displays

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

### Diagnostic Center Displays

Diagnostic center displays are used to monitor the operation of the machine and the engine. Different engine types use different diagnostic center displays.

The display used with each engine is shown below:

- Kubota V1505-TE – Diagnostic Center LCD
- Kubota WG1605 – Dual Fuel Engine Display

### Diagnostic Center LCD

The diagnostic center LCD display (refer to Figure 5.1) is located at the top left of the lower control panel. Kubota Tier 4 diesel engine machines do not have an LCD diagnostic center display.

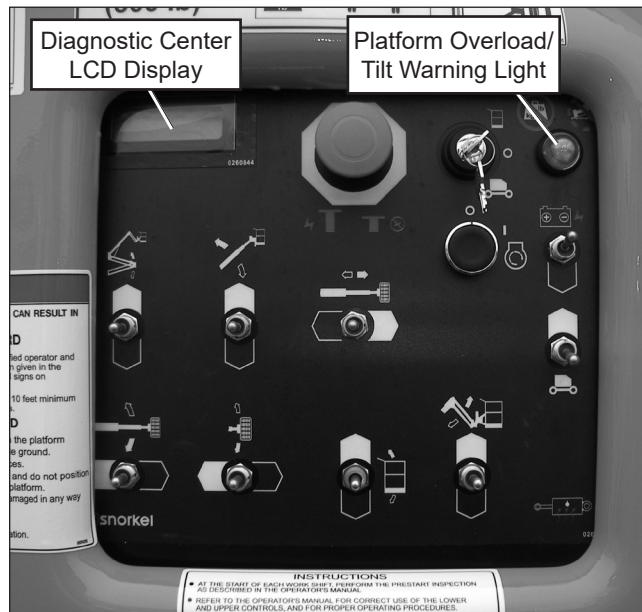


Figure 5.1 – Lower Controls

When the battery disconnect is in the on position and the emergency stop button is enabled at the lower controls, the LCD display shows:

- The accumulated aerial platform operating time.
- “Mode Neutral” is displayed when no functions are being operated. When the machine is operated, the display will indicate the name of that function.

This display is also used by service technicians to troubleshoot and diagnose errors that may occur with the machine operating system.

### Dual Fuel Engine Display

The dual fuel engine display (refer to Figure 5.2) is located behind the front right cowling door, on the left side of the lower control panel.

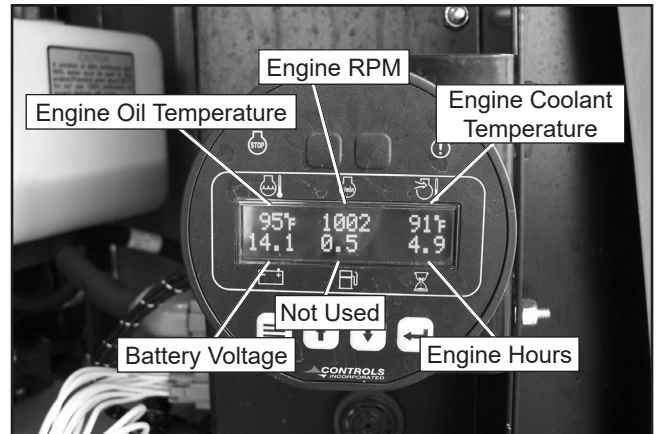


Figure 5.2 – Dual Fuel Engine Display

When the engine is running the digital display shows:

- Engine oil temperature
- Engine RPM
- Engine coolant temperature
- Battery voltage
- Accumulated engine hours.

This display is also used by service technicians to troubleshoot and diagnose engine fault errors.

### Platform Overload/Tilt Warning Lights

There is a platform overload/tilt warning light on the lower control panel (refer to Figure 5.1) and on the upper control panel (refer to Figure 5.3).



Figure 5.3 – Upper Controls

If the aerial platform chassis is out of level more than the machine specified slope sensor alarm setting when the main boom is raised or extended, an alarm will sound and the tilt warning light on the lower and upper control panels will illuminate.

If the platform is at capacity or if platform capacity is exceeded, the platform overload light on the lower and upper control panels will illuminate.

### Dual Platform Capacity System

The optional dual platform capacity system restricts the movement of the platform to keep it within safe work parameters, based on the boom position. The platform capacity will either be 650 lb or 750 lb.

The 750 lb capacity is active from the boom fully retracted position, to an extend limit that is determined by a boom length limit switch. When the boom is extended beyond the 750 lb capacity limit distance, the 650 lb capacity becomes active until the main boom is elevated above a specific boom angle that is determined by boom angle sensors.

There are two indicator lights on the lower and upper control panels (refer to Figure 5.4) that indicate whether the platform is in the 650 lb or 750 lb region of the working envelope. Some boom control functions prevent positioning the boom into a restricted position.

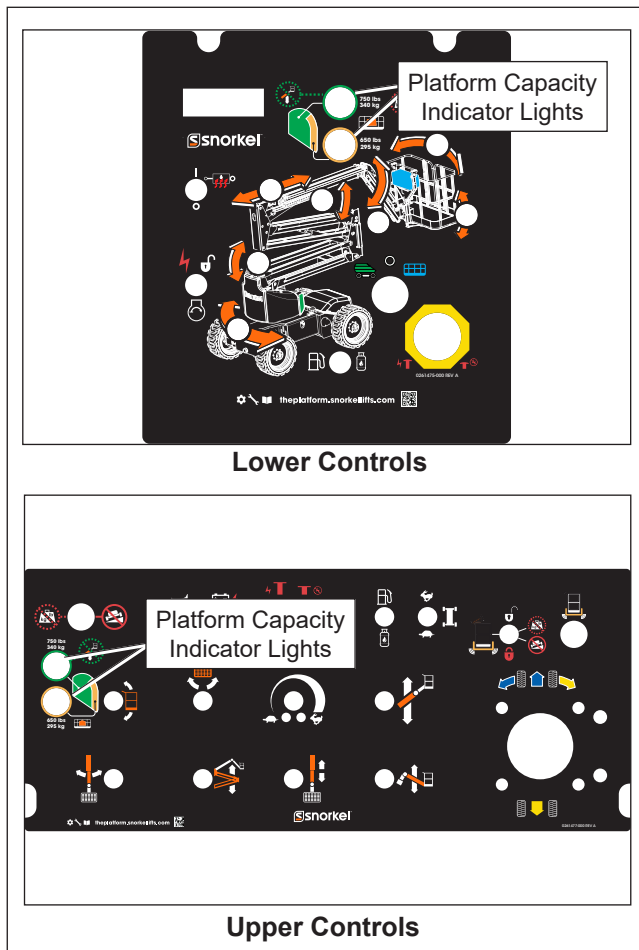


Figure 5.4 – Dual Capacity Control Panels

### 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 5.5). 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.

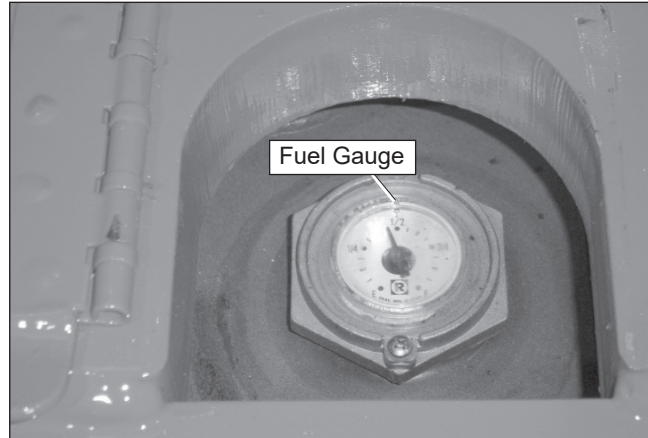


Figure 5.5 – Fuel Tank

#### Note

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

LPG tanks have a fuel gauge that has two scales. One scale measures the fuel level when the tank is mounted vertical and the other is used when the tank is mounted horizontal (refer to Figure 5.6).

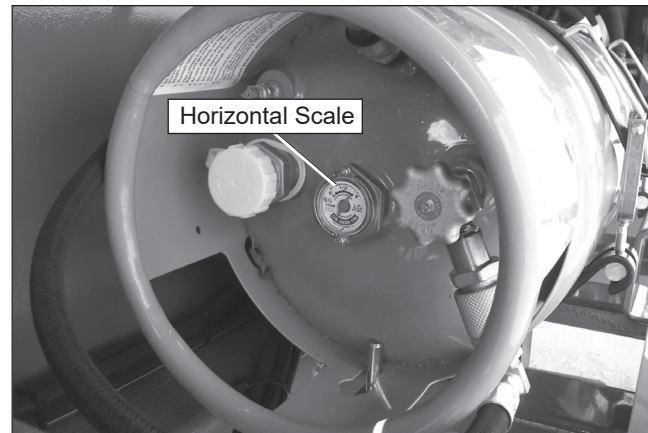


Figure 5.6 – LPG Fuel Tank

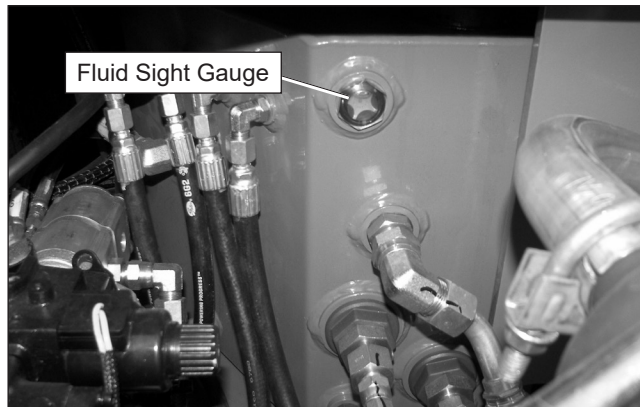
The LPG tank is mounted horizontally on the left side of the chassis. Read the horizontal scale to determine the fuel level.

### 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 5.7) is located on the control valve behind the door on the right side of the turntable.

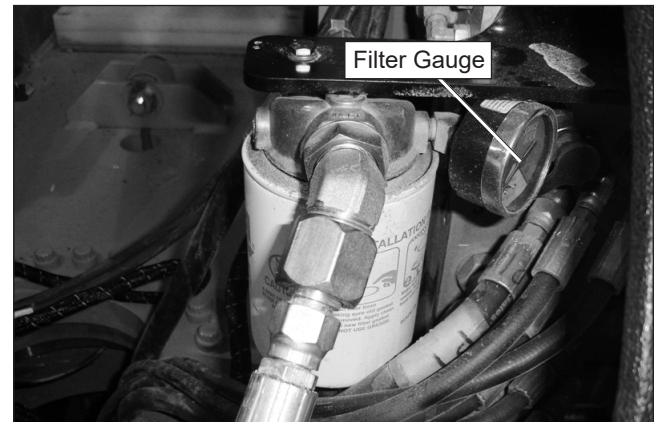


**Figure 5.7 – Hydraulic Fluid Filter Gauge**

- 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 5.8).



**Figure 5.8 – 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

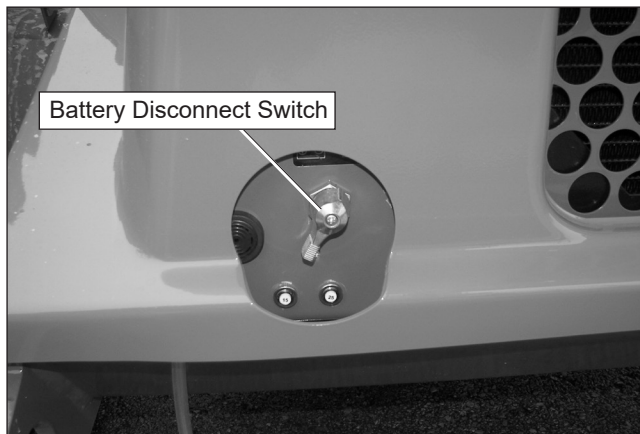
### **⚠ Danger**

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:

- Start button
- 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
- Fuel switch (dual fuel machines)
- Hydraulic system warm-up switch (option)

### **Start Button**

The start button (refer to Figure 6.2) works like an automobile ignition button. Press and hold the button inward to start the engine.

### **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. An alarm sounds, when the button is pressed, to warn others that the machine engine is being started.
- If the platform is to stay in a particular position for a long time, turn the switch to off to shut off the engine and save fuel.

### **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.

**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.

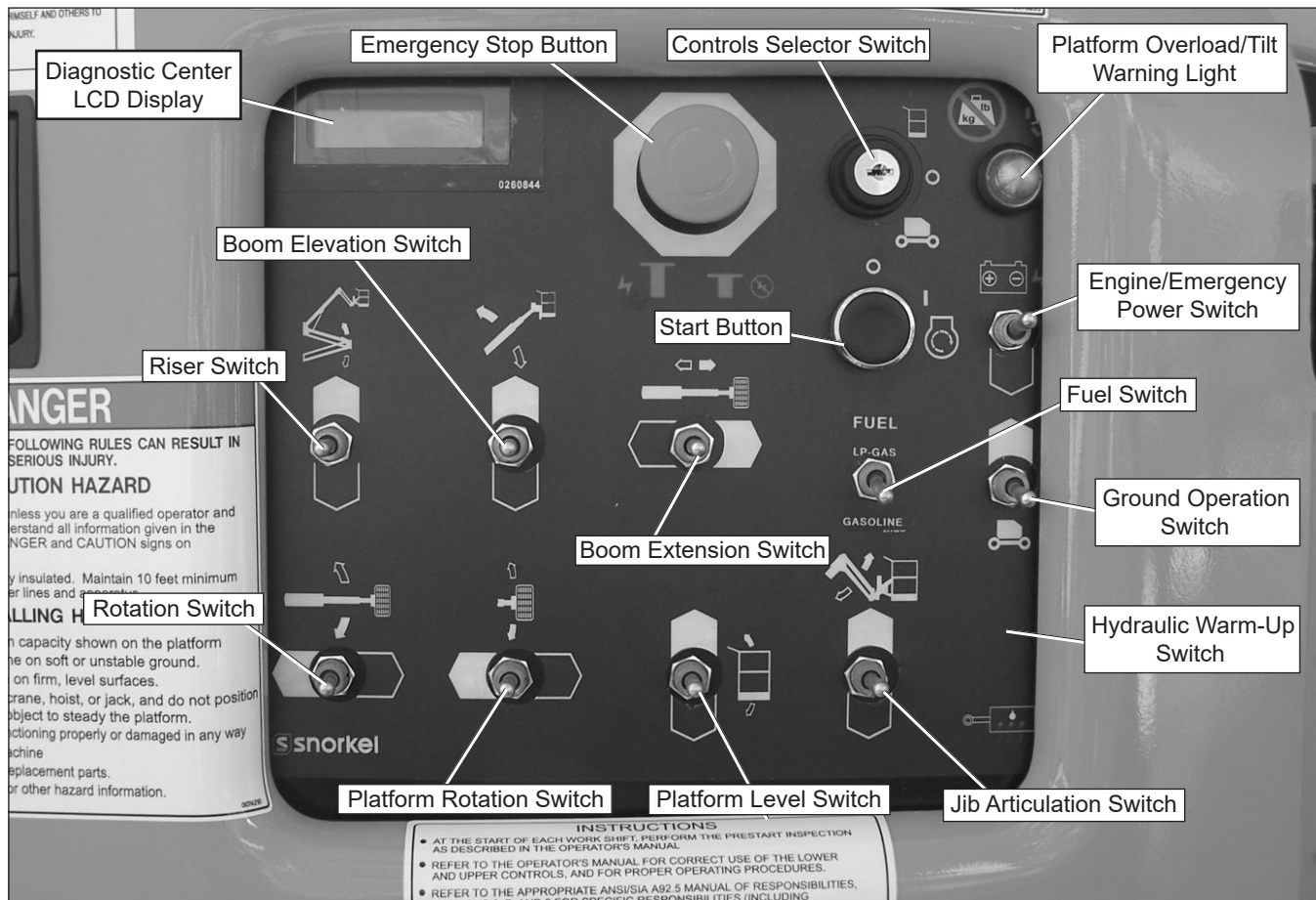


Figure 6.2 – Lower Controls



### 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.

The emergency power system may be used at the lower controls to lower the platform during a platform overload situation.

### Fuel Switch

Engines on machines with the dual fuel option can be operated using gasoline or liquefied petroleum gas (LPG). Dual fuel machines have a gasoline tank inside the left side of the chassis and an LPG tank mounted on the outside of the chassis on the left side.

The fuel switch (refer to Figure 6.2) may be used to select between gasoline and LPG operation.

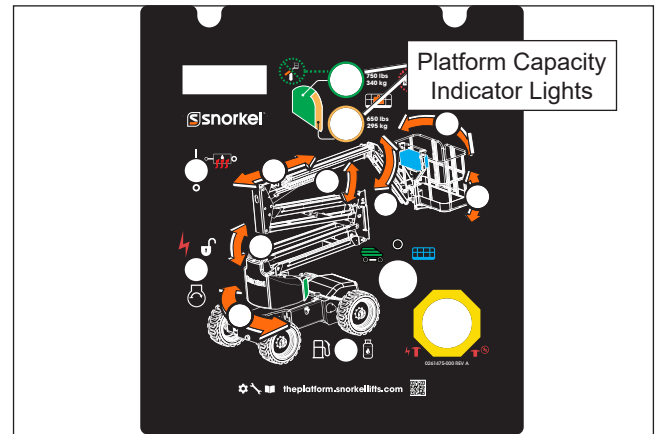
Place the switch in the proper position depending on the type of fuel that is required.

### Platform Overload Warning Light

When the platform overload limit is exceeded, the horn will sound intermittently and the platform overload light (refer to Figure 6.2) will blink until the excess load is removed from the platform.

### Dual Platform Capacity System – Option

There are two indicator lights on the lower control panel (refer to Figure 6.3) that indicate whether the platform is in the 650 lb or 750 lb region of the working envelope. Some boom control functions prevent positioning the boom into a restricted position.



**Figure 6.3 – Dual Capacity Lower Controls**

### Tilt Alarm

If the aerial platform chassis is out of level more than the machine specified slope sensor alarm setting when the main boom is raised or extended, an alarm will sound and the tilt warning light on the lower control panel (refer to Figure 6.2) will illuminate.

### Diagnostic Center Display

The diagnostic center LCD display (refer to Figure 6.2) is located on the left side of the lower control panel.

When the battery disconnect is in the on position and the emergency stop button is enabled at the lower controls, the LCD display shows:

- The accumulated aerial platform operating time.
- “Mode Neutral” is displayed when no functions are being operated. When the machine is operated, the display will indicate the name of that function.

This display is also used by service technicians to troubleshoot and diagnose errors that may occur with the machine operating system.

### 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 battery disconnect panel at the rear of the chassis has two circuit breakers to help protect the machine electrical system. The reset buttons for the circuit breakers are on the front of the battery disconnect panel (refer to Figure 6.4). The main control system circuit breaker is 25 amp and the throttle circuit is 15 amp.

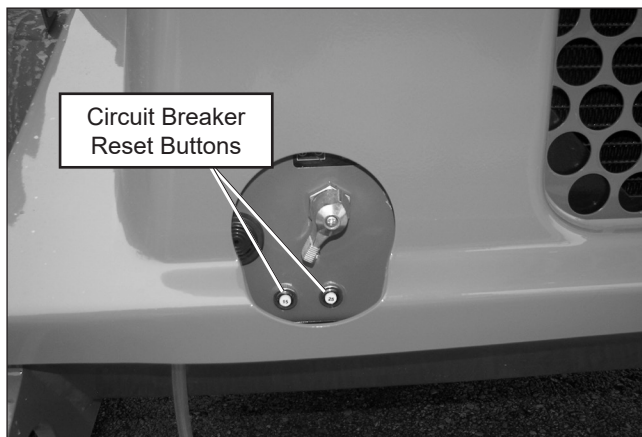


Figure 6.4 – Battery Disconnect Panel

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 6.5).

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

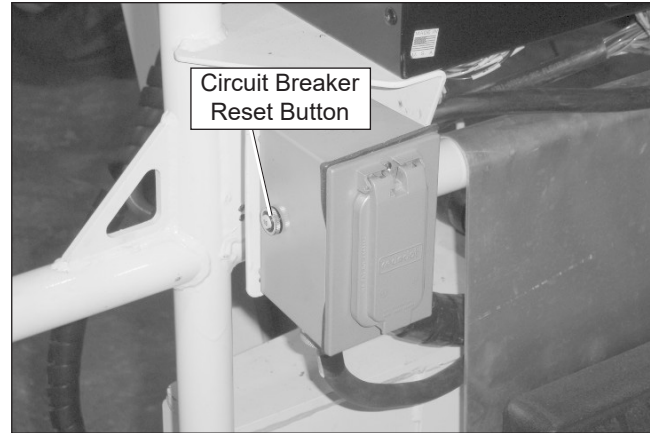


Figure 6.5 – Electrical Power Outlet

### ⚠ Caution

A tripped circuit breaker indicates a malfunction in the electrical system. Component damage may 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.

- 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
- Override switch
- Fuel switch (dual fuel machines)
- AC generator switch (option)
- Hydraulic system warm-up switch (option)

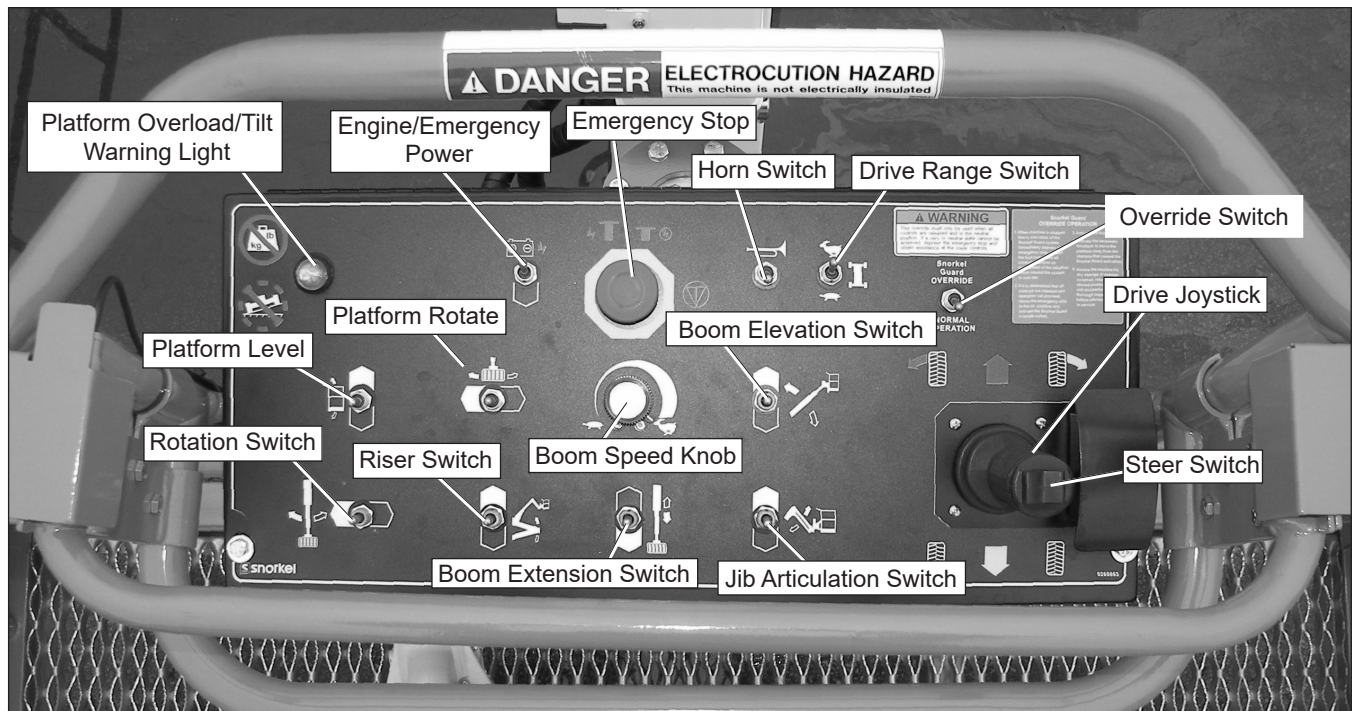


Figure 6.6 – Upper Control Panel Top

### 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).



Figure 6.7 – Upper Control Panel Front

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 6.5).

- 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 6.5) 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.

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 6.5) 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 6.5) 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 6.5) 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 6.5) 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 6.5) 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 6.5) 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 6.5) 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 6.5) 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 6.5) 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 6.5) 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 6.5) 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 6.5).

Hold the switch upward to sound the horn.

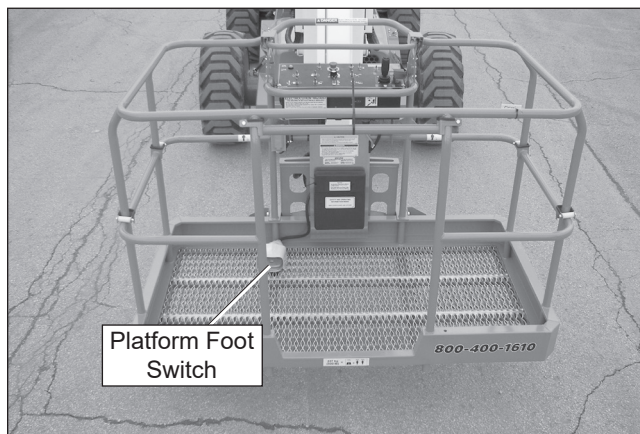
**Override Switch**

When the Snorkel Guard, platform overload system, or boom/drive cut-out is activated, the override switch (refer to Figure 6.5) is used to override the system to operate riser up/down, main boom up/down/retract, jib boom up/down, or turntable rotation and drive functions. The switch is spring returned to the normal operation position.

- Hold the switch upward to override the Snorkel Guard or the platform overload system.
- Release the switch to the downward position to resume normal machine operation.

**Platform Foot Switch**

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



**Figure 6.8 – Platform**

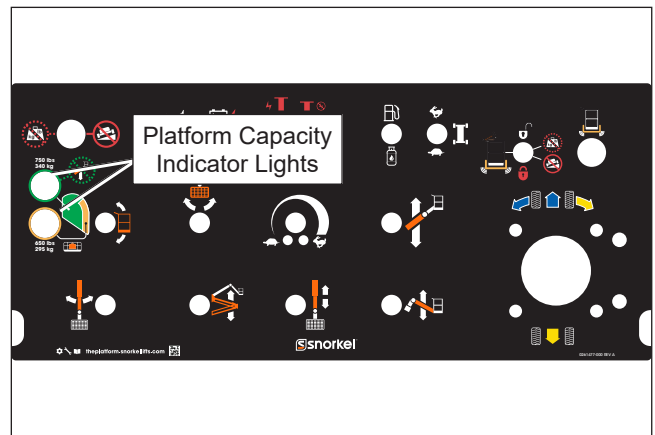
Step down on and hold the platform foot switch to activate the drive and boom functions from the upper controls.

**Platform Overload Warning Light**

When the platform overload limit is exceeded, the horn will sound intermittently and the platform overload light (refer to Figure 6.5) will blink until the excess load is removed from the platform.

**Dual Platform Capacity System – Option**

There are two indicator lights on the lower and upper control panels (refer to Figure 6.9) that indicate whether the platform is in the 650 lb or 750 lb region of the working envelope. Some boom control functions prevent positioning the boom into a restricted position.



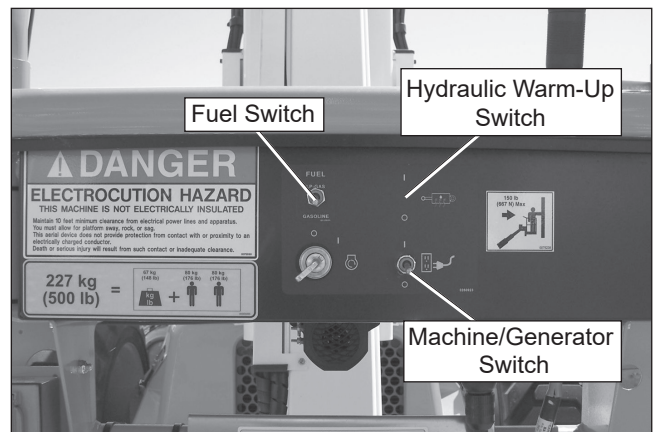
**Figure 6.9 – Upper Control Panel Front**

**Tilt Alarm**

If the aerial platform chassis is out of level more than the machine specified slope sensor alarm setting when the main boom is raised or extended, an alarm will sound and the tilt warning light on the lower control panels (refer to Figure 6.5) will illuminate.

**AC Generator Switch**

The switch for the optional AC generator is located on the front of the upper control panel (refer to Figure 6.10).



**Figure 6.10 – Upper Control Panel Front**

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.

### Dual Fuel

Engines on machines with the dual fuel option can be operated using gasoline or liquefied petroleum gas (LPG). Dual fuel machines have a gasoline tank inside the left side of the chassis and an LPG tank mounted on the outside of the chassis on the left side.

There is a fuel switch to select between gasoline and LPG operation on both the lower and upper control panels (refer to Figure 6.2 and 6.8).

Place the switch in the proper position depending on the type of fuel that is required.

### 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 (refer to Figure 6.2 and 6.8).

### 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.

### Driving and Platform Work Lights

The control for the optional driving and tail lights is on the front of the upper control panel. Place the switch in the on position to operate the driving and work lights.

## 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**

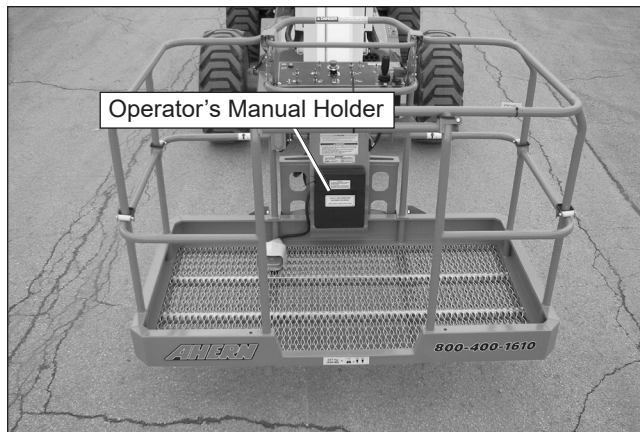
**The potential for an accident increases when operating an aerial platform that is damaged or malfunctioning. Death or serious injury could result from such accidents. Do not operate the aerial platform if it is damaged or malfunctioning.**

Carefully read, understand and follow all safety rules, operating instructions, decals/placards and any applicable national safety instructions/requirements while performing the prestart inspection.

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 that is unobstructed to allow for full elevation, and be capable of supporting the machine maximum wheel load.

### **Operator's Manual Holder**

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



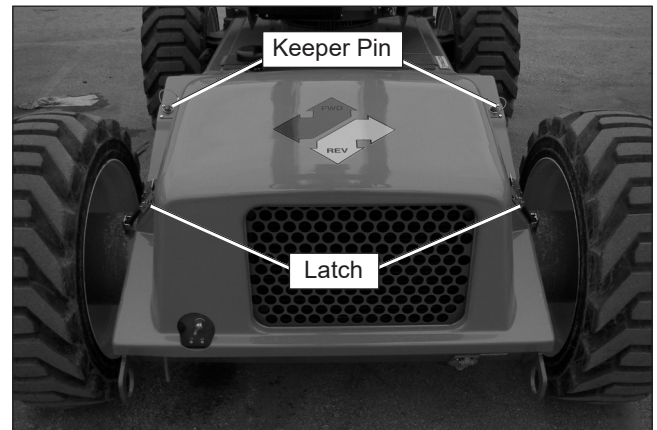
**Figure 7.1 – Operator's Manual Holder**

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**

- Visually inspect the engine and its components with the engine off.
- Inspect the fasteners to make certain they are in good working condition to hold the engine tray in place.
- 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.

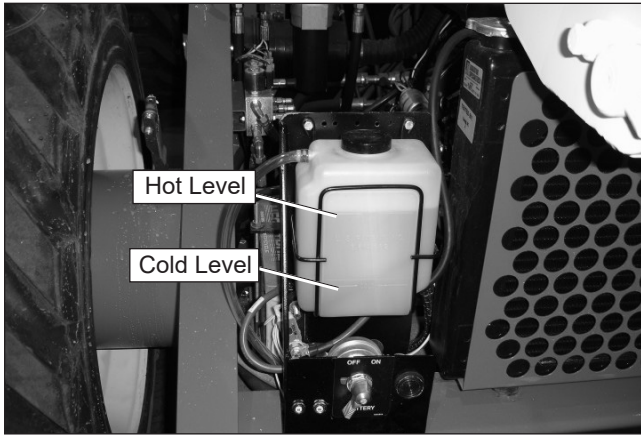


Figure 7.3 – Coolant Reservoir

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.

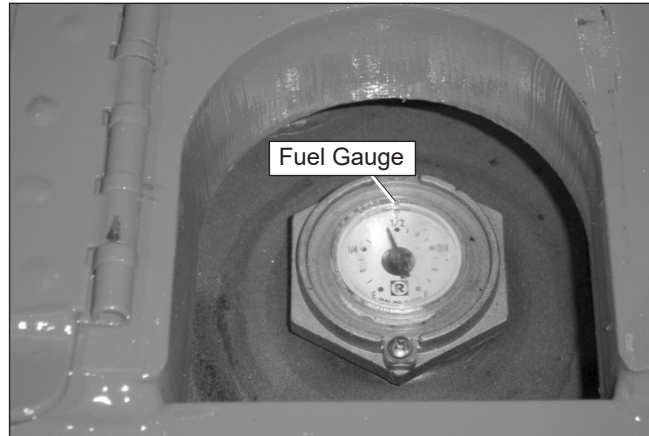


Figure 7.4 – Fuel Level Gauge

### Note

Refer to Chapter 2 for fuel grade specifications.

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.

Use the following procedure to change the LPG tank.

1. Close the shutoff valve (refer to Figure 7.5).

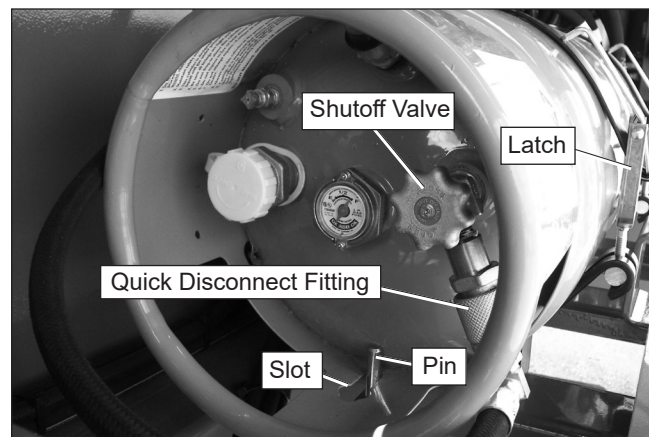


Figure 7.5 – LPG Tank



- Remove the fuel line from the tank using the quick disconnect fitting.
- Pull on each latch to release the straps from the tank.
- Carefully lift the tank from the cradle.
- Place a full tank in the cradle making sure the slot in the tank aligns with the pin.
- Latch both straps to secure the tank.
- Connect the fuel line and open the shutoff valve.

### Fuel Line

To inspect the fuel line:

- Visually inspect the entire length of the fuel line starting at the fuel tank.
- 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 7.6). The battery supplies 12 volt DC electrical power to operate the aerial platform electrical and electrohydraulic components, including the emergency power system.

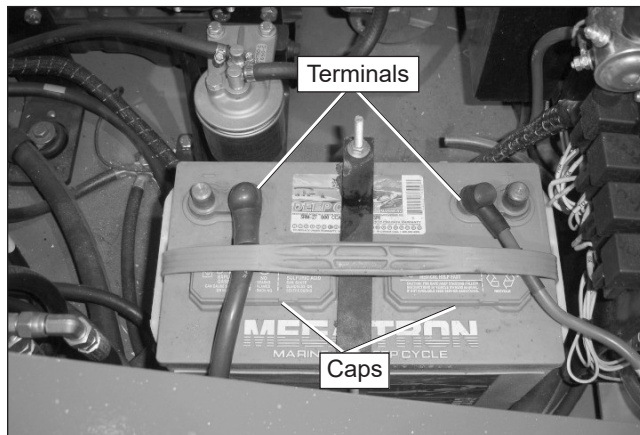


Figure 7.6 – Battery

### **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 may 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:

- Remove the caps from the battery (refer to Figure 7.6).
- 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.
- 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.

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

### Battery Terminals

To inspect the battery terminals:

- Check the top of the battery, the terminals, and cable ends. They should be clean and free of corrosion (refer to Figure 7.6).
- If necessary, clean the top of the batteries. Clean the terminals and cable ends with a wire brush or terminal cleaning tool.
- Make sure all cable ends are securely fastened to the terminals.

### Cables and Wiring Harness

To inspect the cables and wiring harnesses:

- Visually inspect all cables and wiring for wear and/or physical damage such as loose connections, broken wires, and frayed insulation.
- Check the wiring in areas where a change in routing direction may cause them to become pinched.
- 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 7.7).

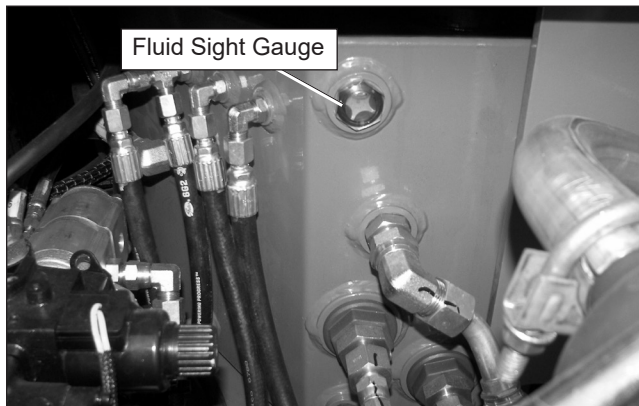


Figure 7.7 – Fluid Level Indicator

### **⚠ 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 7.8).

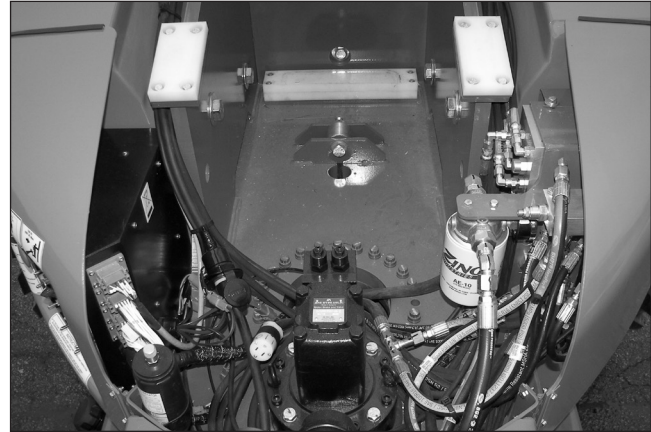


Figure 7.8 – Hoses, Tubes, and Fittings

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 7.9) to make sure they are suitable for service.



Figure 7.9 – 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 7.10).

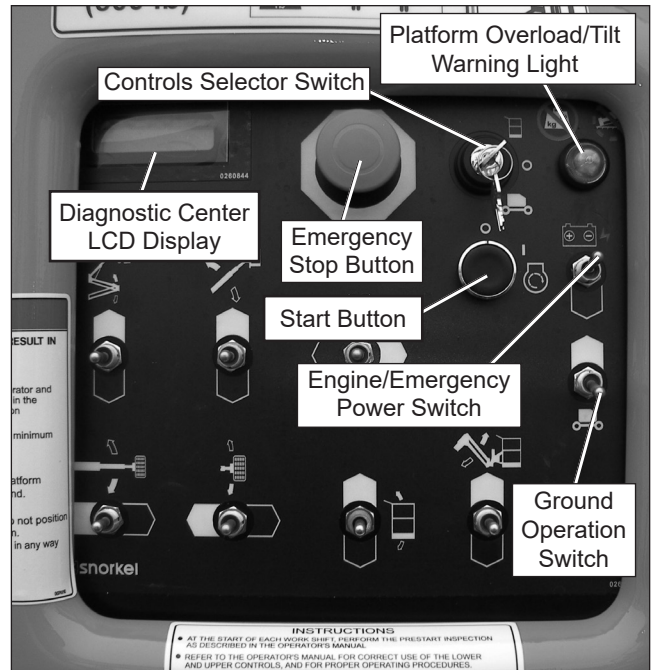


Figure 7.10 – Lower Controls

### Operating Controls

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

1. Turn the battery disconnect switch on.
2. Pull the emergency stop button outward. Place the controls selector switch in the lower control position. The engine starts to preheat when the switch is placed in the lower control position.
3. Press and hold the start button until the engine starts, then release.
4. Let the engine warm to operating temperature.
5. 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.**

6. 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 do not operate.

### Emergency Power

To test the emergency power system from the lower controls:

1. Place the battery disconnect switch and the emergency stop button in the on position. Place the control selector in the lower control 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.

### Diagnostic Center Display

To test the diagnostic center display on the lower control panel (refer to Figure 7.10), from the lower controls:

1. Turn the battery disconnect switch on.
2. Pull the emergency stop button outward to the on position.
3. The display on the LCD screen should indicate:
  - The accumulated aerial platform operating time.
  - “Mode Neutral” when no functions are being operated. When the machine is operated, the display will indicate the name of that function.

### Flashing Lights

The machine may be equipped with two optional flashing lights mounted to the top of the counterweight.

To inspect the flashing lights:

1. At the lower controls, pull the emergency stop button outward and turn the controls selector switch to the lower control position. Start the engine. Hold the ground operation switch upward to verify operation of the lights.

2. Turn the controls selector switch to the upper control position.
3. At the upper controls, pull the emergency stop button outward and turn the start switch to the on position. Step on the foot switch to verify operation of the lights.

### Note

*There is not an off switch for the flashing light. The light cannot be turned off.*

### Structures

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

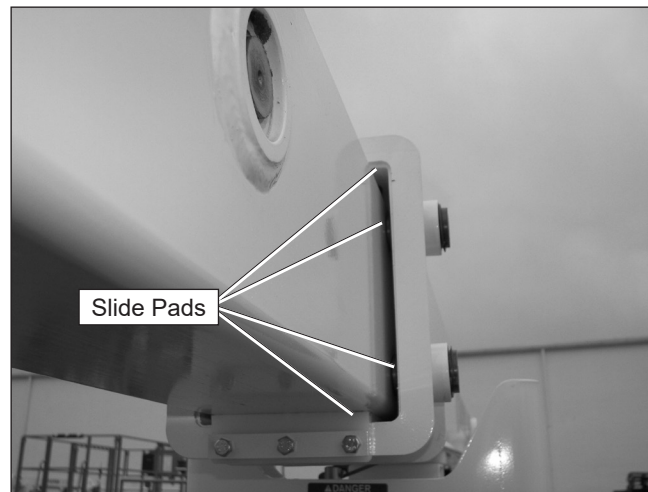
### Weldments

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:

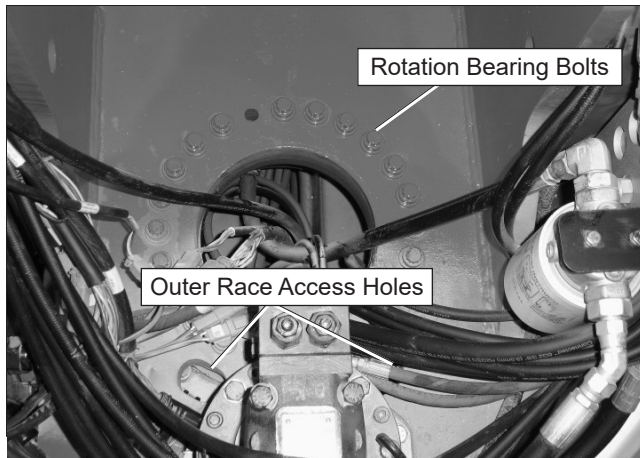
1. Use the lower controls to position the main boom near horizontal. Extend the tip boom about 1' (30 cm).

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, roll pins, 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.

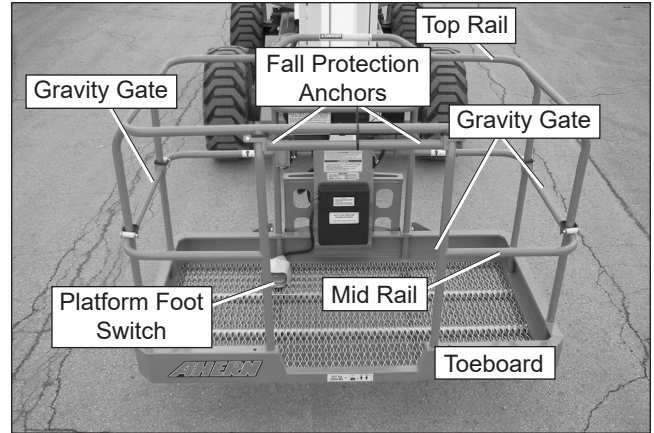
**Upper Control Station**

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 gates to be sure they are present, are not damaged, and move freely.

**Fall Protection Anchors**

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

To inspect the anchors:

1. Visually inspect the fall protection 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, pull the emergency stop switch outward to 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.

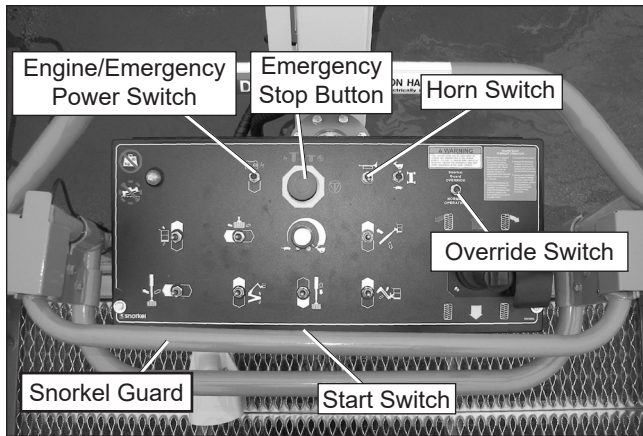


Figure 7.14 – Upper Controls

4. Turn the start switch on the front of the upper control panel to the on position. Wait for ten seconds for the engine to preheat.
5. Turn the start switch until the engine starts, then release.
6. 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.

7. 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.
8. Test the operation of each control in both directions from the upper controls.
9. 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. Start the engine from the upper controls.
2. 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 controls 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 is equipped with a horn. Operate the horn switch (refer to Figure 7.14) to ensure that it sounds to warn personnel in the area.

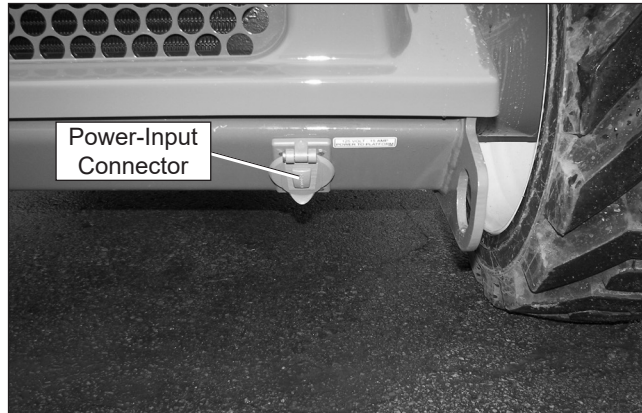
### **Snorkel Guard**

To test the Snorkel Guard system:

1. Turn the battery disconnect switch on.
2. At the lower controls, pull the emergency stop button outward and place the controls selector switch in the upper control position.
3. At the upper controls, pull the emergency stop button outward (refer to Figure 7.14).
4. Step down on the platform foot switch.
5. Press down on the Snorkel Guard rail and verify that:
  - the horn sounds.
  - the blue light under the upper control panel flashes.
  - only main boom down and jib down functions will operate.
6. Release the Snorkel Guard rail and the override switch. Verify that all other machines function operate.

### 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**

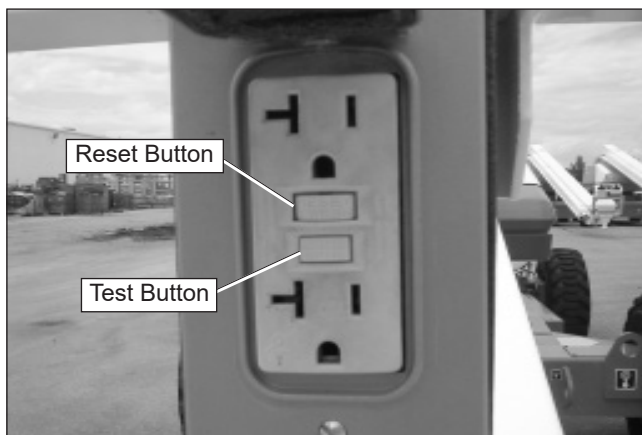
Some machines may have an electrical outlet at the platform, but no power-input connector on the chassis. In that case, power is supplied by an optional AC generator. An external power source is not required.

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.

### Level Sensor

Use the following procedure to test the level sensor:

#### **⚠ 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 30 percent.**

1. With the machine in the stowed position, drive on a grade that is between 5 and 10 degrees. Stop to ensure the brakes engage.

On machines manufactured after March 2021, extend the main boom from the stowed position before driving onto a grade that is between 5 and 10 degrees. Boom and drive functions will be disabled when the machine reaches or exceeds the limit of the chassis slope sensor settings, requiring the use of the override switch to enable those functions.

2. On machines manufactured before April 2021, extend the tip boom about 2' (60 cm).
3. Verify that the tilt alarm sounds and the tilt warning light on the lower and upper control panels are illuminated.

#### **⚠ 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.**

4. If the alarm does not sound, the warning lights do not illuminate, or boom and drive functions remain operational, remove the machine from service until the problem is corrected.
5. Retract the tip boom and drive the machine to a smooth, flat, level surface.

### Drive Motion Alarm

The machine is equipped with a drive motion alarm.

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

### All Motion Alarm

The machine may be equipped with an 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.

### Sandblast Protection Kit

The optional sandblast protection kit protects the cylinders from abrasion while sandblasting or from paint overspray. Rubber covers protect each cylinder rod as it extends and retracts. The covers prevent sand and paint from damaging the cylinder seals and rod.

- Inspect the covers while operating the machine to ensure they are securely fastened and completely cover the cylinder rod. Make sure there are no holes in the covers.

### Air Line to Platform

The machine may be equipped with an optional air line to the platform.

- Inspect the components, including the air line, mounting hardware, and the caps on the input and output connectors, etc. to verify all components are present and are in working condition.

### Driving and Platform Work Lights

The machine may be equipped with driving lights and/or platform work lights.

- Turn the engine on and use the switch on the upper control panel to momentarily turn the lights on to verify proper operation.

### Tow Kit

The machine may be equipped with an optional tow kit.

- Inspect the components, including the tow bar, steer arm, and chains, etc. to verify all components are present and are in working condition.

### Platform Glazier Package

The machine may be equipped with an optional platform glazier package.

- Inspect the glazier trays (refer to Figure 7.17) and keeper pins to make sure they are in good condition and are not bent or distorted. The straps and padding must be in good condition and not worn, cut or frayed.

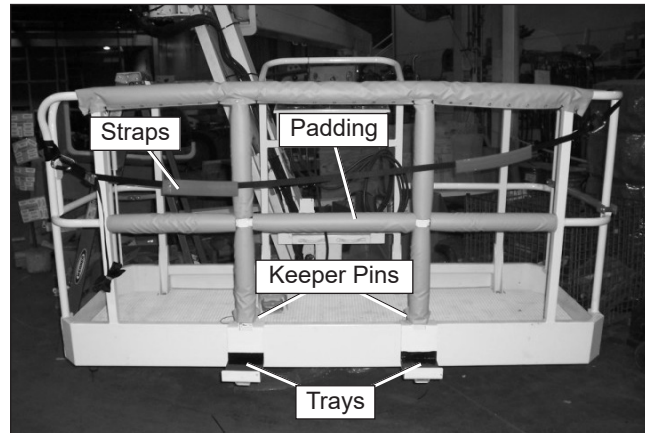


Figure 7.17 – Platform Glazier Package

### Platform Welder

The machine may be equipped with an optional welder mounted in the platform.

- Inspect the components, including the welder mounting, welder, cables, safety decals, fire extinguisher, etc. to verify all components are present and are in working condition.

### 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

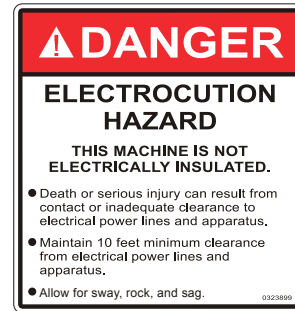
**Solvents may contain hazardous ingredients. Follow the manufacturer's label for proper use and disposal. Wear protective gloves and splash-proof safety glasses when using solvents.**

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.

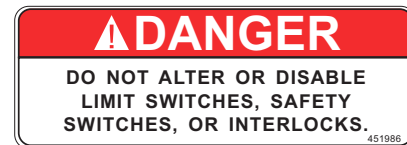
Placard and decal kits are available from Snorkel.

Safety related placards and decals are illustrated on the following pages. Refer to the appropriate decal page in the machine parts manual for specific operational and safety placards and decals.

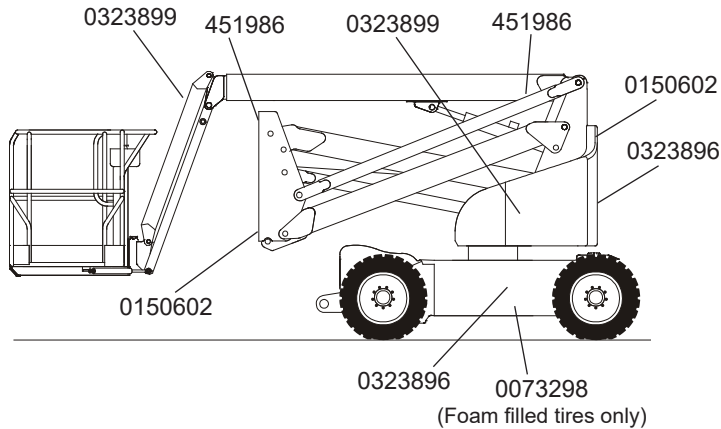




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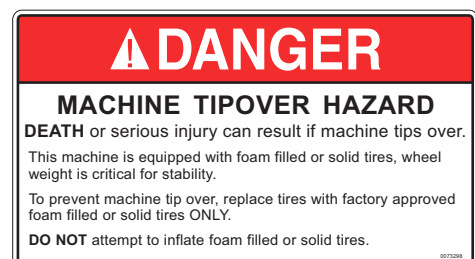
Right Side



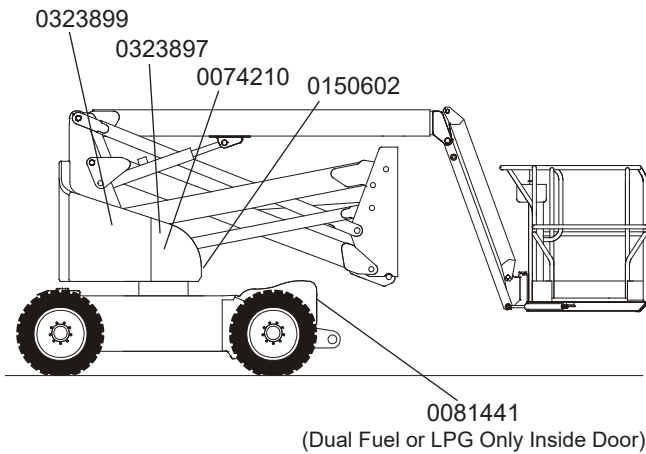
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0073298



Left Side

**⚠ DANGER**

**ELECTROCUTION HAZARD**

**THIS MACHINE IS NOT ELECTRICALLY INSULATED.**

- Death or serious injury can result from contact or inadequate clearance to electrical power lines and apparatus.
- Maintain 10 feet minimum clearance from electrical power lines and apparatus.
- Allow for sway, rock, and sag.

0323899

**⚠ DANGER**

**YOU MUST NOT OPERATE THIS DEVICE UNLESS:**

1. YOU HAVE BEEN TRAINED IN THE SAFE OPERATION OF THIS DEVICE AND
2. YOU KNOW AND FOLLOW THE SAFETY AND OPERATING RECOMMENDATIONS CONTAINED IN THE MANUFACTURER'S MANUALS, YOUR EMPLOYER'S WORK RULES, AND APPLICABLE GOVERNMENTAL REGULATIONS.

AN UNTRAINED OPERATOR SUBJECTS HIMSELF AND OTHERS TO DEATH OR SERIOUS INJURY.

0323897

0323897

**⚠ DANGER**

**FAILURE TO COMPLY TO THE FOLLOWING RULES CAN RESULT IN DEATH OR SERIOUS INJURY**

**ELECTROCUTION HAZARD**

- Do not operate this machine unless you are a qualified operator and have read and thoroughly understand all information given in the Operator's Manual and on DANGER and CAUTION signs on this machine.
- This machine is not electrically insulated. Maintain 10 feet minimum clearance from electrical power lines and apparatus.

**TIPPING & FALLING HAZARD**

- Do not exceed the platform capacity shown on the platform.
- Do not operate this machine on soft or unstable ground.
- Only operate this machine on firm, level surfaces.
- Do not use machine as a crane, hoist, or jack, and do not position machine against another object to steady the platform.
- Do not use machine if not functioning properly or damaged in any way.
- Do not modify or alter this machine.
- Use only Snorkel approved replacement parts.
- See the Operator's Manual for other hazard information.

0074210

0074210

**⚠ DANGER**

**KEEP CLEAR OF DESCENDING BOOM**

**DEATH OR SERIOUS INJURY CAN OCCUR FROM DESCENDING BOOM**

0150602

0150602

**⚠ CAUTION**

THIS MACHINE IS EQUIPPED WITH

**LIQUID WITHDRAWAL**

L.P. GAS SYSTEM

- LIQUID OR VAPOR WITHDRAWAL L.P.-GAS CYLINDER MAY BE USED.
- ALWAYS KEEP L.P.-GAS CYLINDER SHUT-OFF VALVE CLOSED WHEN NOT USING L.P.-GAS SYSTEM.

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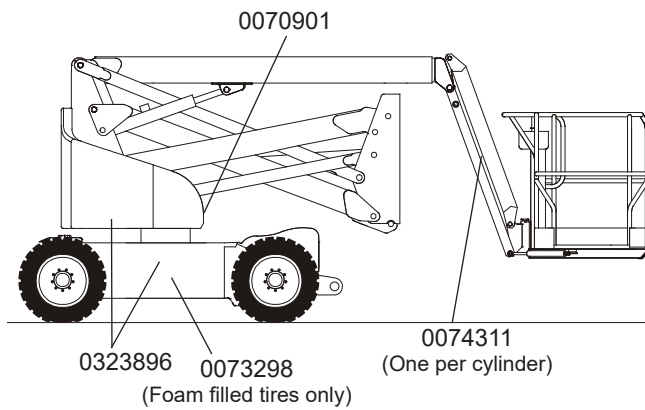
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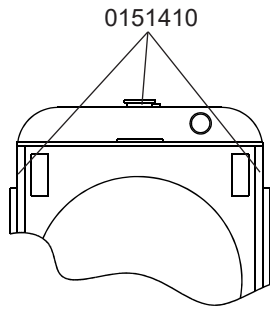
Left Side

<b>Snorkel</b>		1-800-255-2317	
Snorkel International, LLC 2009 Roseport Road Cheverly, MD 20842		Snorkel International, LLC 3550 Eastgate Road Henderson, NV 89015	
TYPE <b>MEWP</b>		SERIAL NUMBER	
MODEL NUMBER		SLOPE SENSOR ALARM SETTING	
MONTH/YEAR OF MANUFACTURE		FRONT TO BACK <input type="checkbox"/> deg SIDE TO SIDE <input type="checkbox"/> deg	
EMPTY VEHICLE WEIGHT <input type="text"/> lbs		MAXIMUM WHEEL LOAD <input type="text"/> lbs	
ENGINE POWERED MODELS <input type="text"/> hp		BATTERY POWERED MODELS <input type="text"/> V	
MAXIMUM OUTRIGGER LOAD <input type="text"/> kg		BATTERIES <input type="text"/> Ah	
MAXIMUM GRADEABILITY <input type="text"/> %		CHARGER INPUT <input type="text"/> V	
MAXIMUM ALLOWABLE MANUAL FORCE (SIDE PULL) <input type="text"/> lbs		MAXIMUM ALLOWABLE WIND SPEED <input type="text"/> mph	
MAXIMUM PLATFORM HEIGHT <input type="text"/> ft		MAXIMUM PLATFORM REACH <input type="text"/> m	
MAXIMUM PLATFORM HEIGHT <input type="text"/> m		MAXIMUM DRIVE HEIGHT <input type="text"/> m	
RATED NUMBER OF OCCUPANTS <input type="text"/>		UNRESTRICTED PLATFORM CAPACITY <input type="text"/> lbs	
		UNRESTRICTED PLATFORM CAPACITY <input type="text"/> kg	
<b>CAUTION</b>			
Do not remove any weight from this machine. Any weight added must be distributed equally on each axle.			
Axle weights with machine in the stowed position.			
STEER AXLE <input type="text"/> lbs		DRIVE AXLE <input type="text"/> lbs	

0070901



0074311



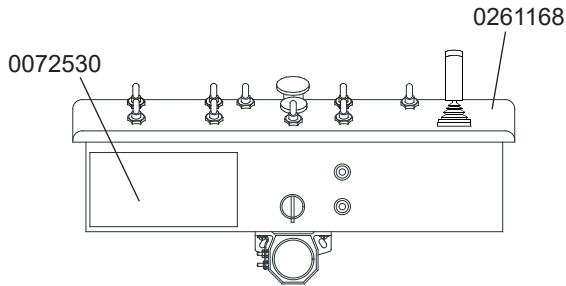
Radiator



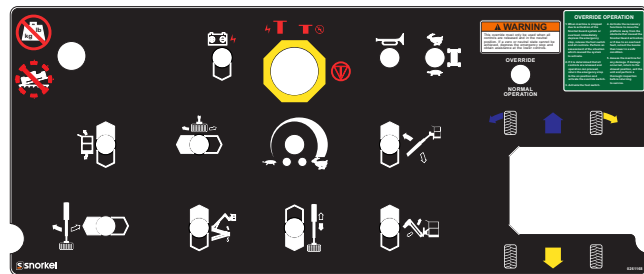
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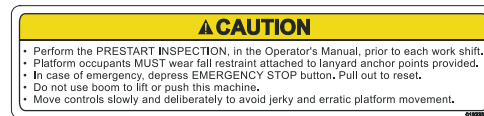
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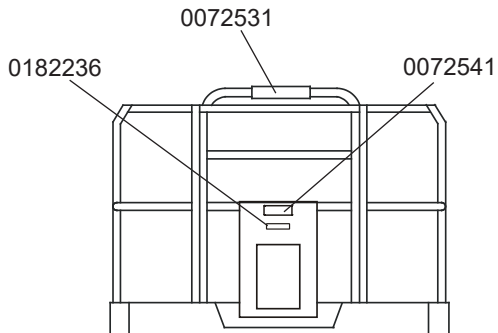
Upper Controls



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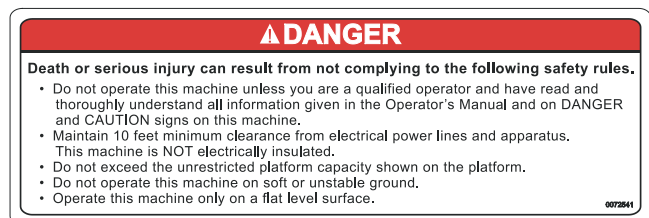
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Platform



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## Prestart Inspection Checklist

Item	Inspect For	P/F/R
<b>Operator's Manual</b>	In place, all pages readable and intact	
<b>Engine</b>		
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	
<b>Electrical System</b>		
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	
<b>Hydraulic System</b>		
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	
<b>Tires</b>		
Air filled	Good condition, proper inflation	
Foam filled	Good condition	
<b>Wheels</b>	All wheel lug nuts present and properly torqued	
<b>Lower Control Station</b>		
Operating controls	Proper operation	
Emergency stop and emergency power	Shuts off lower controls/proper operation	
<b>Flashing Light</b>	Proper operation	
<b>Structures</b>		
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	
<b>Upper Control Station</b>		
Guardrail system and fall protection 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	
Snorkel Guard	Proper operation	
Electrical power outlet – GFCI	Proper operation	
<b>Level Sensor</b>		
Machines manufactured before April 2021	Sounds tilt alarm	
Machines manufactured after March 2021	Unstowed disables boom/drive, alarm/tilt light on	
<b>Drive Motion Alarm</b>	Sounds when machine is driven	
<b>Sandblast Protection Kit</b>	In place and proper operation	
<b>Air Line to Platform</b>	No damage or deformation, caps in place	
<b>Drive and Working Lights</b>	No damage or deformation, proper operation	
<b>Tow Kit</b>	In place, no damage or deformation	
<b>Placards and Decals</b>	In place and readable	

Maintenance Table Key: P = Pass, F = Fail, R = Repaired

Performed by: \_\_\_\_\_ Date: \_\_\_\_\_

Model Number: \_\_\_\_\_ Serial Number: \_\_\_\_\_

## Inspection and Maintenance Schedules

### **Caution**

Frequency and extent of periodic inspections may depend on national regulations.

The complete inspection consists of periodic visual and operational checks, along with periodic minor adjustments that assure proper performance. Daily inspection will prevent abnormal wear and prolong the life of all systems. The inspection and maintenance schedule should be performed at the specified intervals and after prolonged periods of storage before returning the machine to service. Inspection and maintenance shall be performed by personnel who are trained and familiar with mechanical and electrical procedures.

### **Warning**

Before performing preventative maintenance, familiarize yourself with the operation of the machine. Always block the elevating assembly whenever it is necessary to perform maintenance while the platform is elevated.

The Daily Preventative Maintenance Checklist has been designed for machine service and maintenance. Please photocopy the Daily Preventative Maintenance Checklist and use the checklist when inspecting the machine.

## 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 or by national safety regulations.**

**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 load capacity 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.

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. 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 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.

### **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.
4. Before painting or sandblasting make sure the sandblast protection kit and the platform control cover are properly installed. These options, when used properly will protect the control placards and cylinder rods from paint overspray and abrasion while sandblasting.

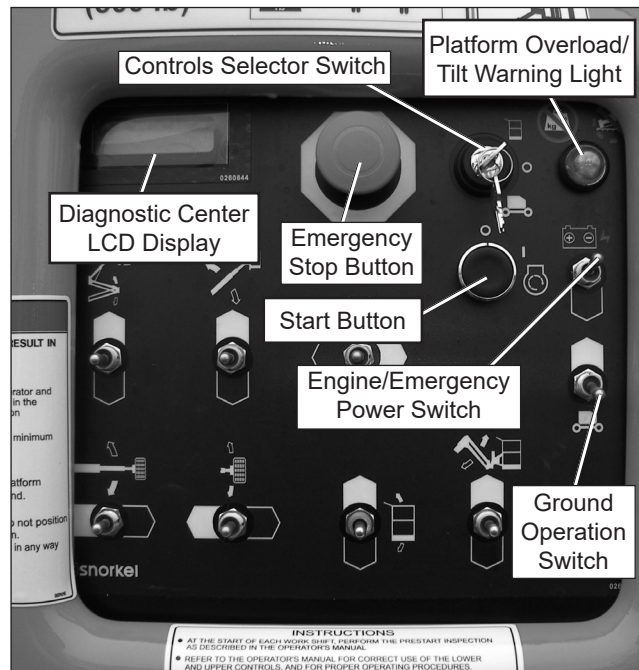
**Lower Controls**

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. On dual fuel machines, set the fuel switch to either LPG or gasoline.
2. Open the shut-off valve on the tank if using LPG.
3. Place the emergency stop button (refer to Figure 8.1) in the on position and place the controls switch in the lower control position. The engine starts to preheat when the switch is placed in the lower control position. Wait ten seconds for the engine to preheat, if required.



**Figure 8.1 – Lower Controls**

4. Press and hold the start button until the engine starts, then release.
5. Let the engine warm to operating temperature.
6. Hold the ground operation switch upward while operating the boom and turntable control toggle switches.

**Note**

If a machine function is not operated within 10 seconds of activating the ground operation switch, no functions will operate until the switch is released and again placed in the enable position.

7. Hold the appropriate toggle switch in the desired direction.
8. Release the toggle switch to stop movement.
9. Release the ground operation switch to 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, pull the emergency stop button outward and place the controls selector switch in the upper control position.
2. On dual fuel machines, set the fuel switch (refer to Figure 8.2) to either LPG or gasoline.



3. Open the shut-off valve on the tank if using LPG.
4. Enter the platform and securely close the gate.
5. Attach the fall protection lanyard to one of the anchor points.
6. Pull the emergency stop outward (refer to Figure 8.2).

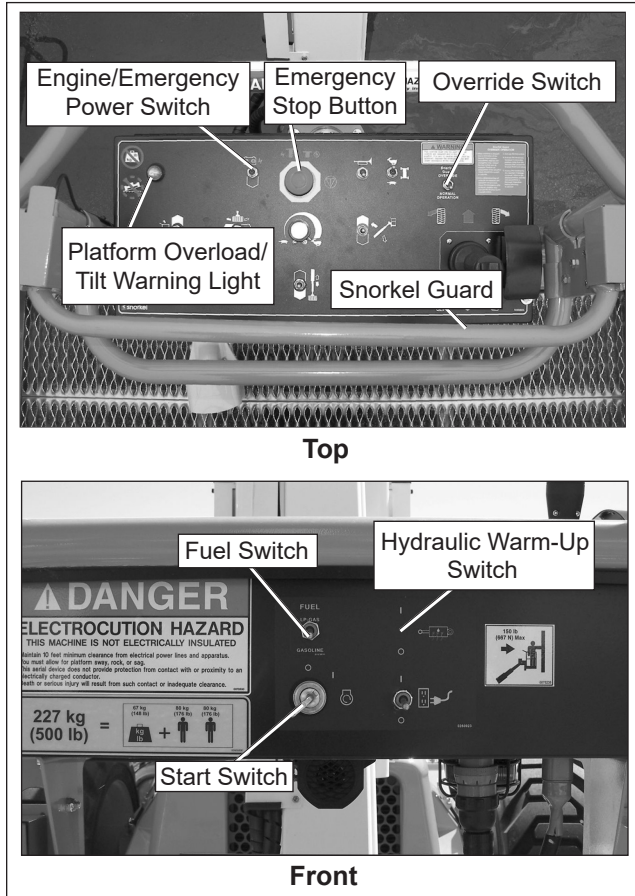


Figure 8.2 – Upper Controls

7. 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. Wait ten seconds for the engine to preheat, if required.
8. 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.
9. 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.

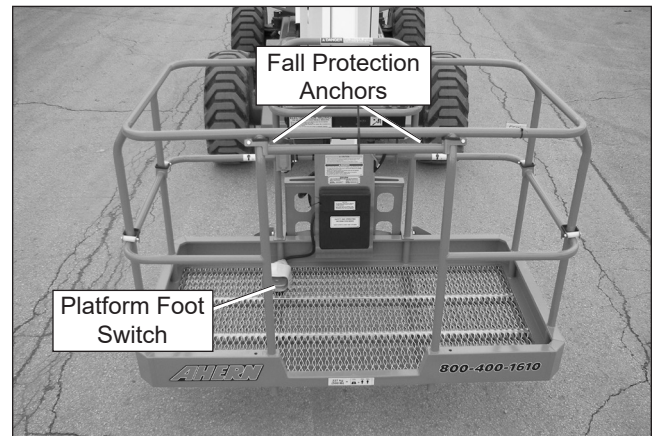


Figure 8.3 – Platform

*Note*

If a machine function is not operated within 10 seconds of activating the foot switch, no functions will operate until the switch is released and again placed in the enable position.

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.

**Dual Platform Capacity System**

The optional dual platform capacity system restricts the movement of the platform to keep it within safe work parameters, based on the boom position. The platform capacity will either be 650 lb or 750 lb.

The 750 lb capacity is active from the boom fully retracted position, to an extend limit that is determined by a boom length limit switch. When the boom is extended beyond the 750 lb capacity limit distance, the 650 lb capacity becomes active until the main boom is elevated above a specific boom angle that is determined by boom angle sensors.

There are two indicator lights on the lower and upper control panels that indicate whether the platform is in the 650 lb or 750 lb region of the working envelope. Some boom control functions prevent positioning the boom into a restricted position. The dual platform capacity logic is shown in Figure 8.4.

Boom Extension	Boom Elevation	Load in Platform	Function	Capacity Light/Result
Retracted	Fully lowered	650 lb	Extend	750 lb/Can extend
At 650/750 limit	Horizontal	650 lb	Extend	750 lb/Transition to 650 lb as boom is extended
At 650/750 limit	Horizontal	750 lb	Extend	750 lb/Transition to 650 lb as boom is extended to limit, then extend and boom down become inactive with tilt/overload light illuminated. Can retract and boom up.
Fully Extended	Fully Elevated	750 lb	Boom Down	750 lb/Can boom down
Fully Extended	At 650/750 limit	750 lb	Boom Down	750 lb/Transition to 650 lb as boom is extended to limit, then extend and boom down become inactive with tilt/overload light illuminated. Can retract and boom up.

Figure 8.4 – Dual Platform Capacity Logic

### 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 45 percent.**

For operation on grades up to 45 percent, it is recommended that the main boom be near horizontal and the jib be elevated just enough to provide adequate ground clearance.

A 45 percent grade is a 4.5' (1.37 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. The drive speed is proportional to the joystick position.
  - 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.
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.

Stow the booms before driving the machine to reposition it when operating on uneven surfaces. With the booms stowed, the front axle pivots to keep all four wheels in contact with the ground surface.

### Drive Motion Alarm

The drive motion alarm sounds loud intermittent beeps anytime the machine is being driven.

### Boom/Drive Cut-out

On machines manufactured after March 2021, boom and drive functions will be cut-out, disabled, when the main boom is elevated, extended, or the riser is elevated from the stowed position and the ground slope exceeds the chassis slope sensor settings. The override switch may be used to stow the machine which then allows all functions to be returned to normal. The emergency power system may be used at this time as well.

Refer to the machine serial number placard to determine the slope sensor alarm setting.

### 3.5 Degree Slope Sensor Alarm Setting

When driving the machine unstowed onto a slope, at 3 degrees slope drive is paused, an audible two-tone alarm will sound, and the tilt warning light will come on. This warning indicates that the machine may be backed off the slope or stowed without the use of the override switch to

do so. If the degree of slope continues to increase to 3.5 degrees, a constant alarm will sound and boom and drive functions will become disabled requiring the use of the override control to stow the machine.

### 5 Degree Slope Sensor Alarm Setting – Option

When driving the machine unstowed onto a slope, at 4.5 degrees slope drive is paused, an audible two-tone alarm will sound, and the tilt warning light will come on. This warning indicates that the machine may be backed off the slope or stowed without the use of the override switch to do so. If the degree of slope continues to increase to 5 degrees, a constant alarm will sound and boom and drive functions will become disabled requiring the use of the override control to stow the machine.

### Platform Overload Sensing System

When the platform is at full capacity, the platform overload light at the lower and upper controls (refer to Figures 8.1 and 8.2) will be solid on.

When the platform overload limit is exceeded, all functions are stopped from the upper and lower controls. The horn will sound intermittently and the platform overload lights will blink until the excess load is removed from the platform. At that time, the machine functions are again operational.

If the platform becomes significantly overloaded, or if an upward force on the platform exceeds approximately 500 lb (2225 N), the system will enter into error mode, stopping all functions from the upper and lower controls. The horn will then sound constantly and the overload light will stay illuminated at the upper and lower controls.

The system will remain in error mode until the excess load is removed from the platform and the emergency stop button or start switch is cycled off and back on, resetting the system. At that time, the machine functions are operational.

### 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.**

If the platform overload sensing system is tripped while operating the machine or if the system is in error mode and can not be reset, the emergency power system may still be used for emergency machine operation from either the lower or 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.**

The overload sensing system is not active when the machine is being driven with the booms in the stowed position. This allows the machine to be driven without the system sensing an overload due to rough ground conditions.

To eliminate repeated tripping of the system during machine operation, there is a five second delay in machine functions following:

- starting the engine.
- removing excess load from the platform.

### Snorkel Guard

The Snorkel Guard (refer to Figure 8.2.) is a mechanically activated guarding system which offers an additional level of protection to the operator at the upper controls.

If an operator is involuntarily pushed against the spring-loaded Snorkel Guard rail that is mounted above the upper control panel, the machine functions are disabled.

When the Snorkel Guard is activated:

- the horn sounds.
- the blue light under the upper control panel flashes.
- only main boom down and jib down functions will operate.

The lower controls are not affected by the Snorkel Guard activation.

### Override Switch

The override switch at the upper controls may be used to override the platform overload and the Snorkel Guard system, when either one is activated.

When the platform overload system is activated, the override or the emergency power switch (refer to Figure 8.2) at the upper controls may be used to override the system to operate riser up/down, main boom up/down/retract, jib boom up/down, or turntable rotation and drive functions. The switch is spring returned to the normal operation position.

When the Snorkel Guard system is activated, the override switch (refer to Figure 8.2) at the upper controls may be used to override the system to operate riser up/down, main boom up/down/retract, jib boom up/down, or turntable rotation functions.

### Warning

**The potential for an accident increases when safety devices do not function properly. Death or serious injury could result from such accidents. The override switch must only be used when all controls are released and in the neutral position. If a zero or neutral state cannot be achieved, depress the emergency stop and obtain assistance at the lower controls.**

1. When the machine is stopped due to activation of the Snorkel Guard system or overload, immediately depress the emergency stop, release the foot switch and all controls. Perform an assessment of the situation which caused the system to activate.
2. If it is determined that all controls are released and operation can proceed, return the emergency stop to the on position, and activate the override switch.
3. Activate the foot switch.
4. Activate the necessary functions to move the platform away from the obstacle that caused the Snorkel Guard activation or if due to an overload fault, retract the booms then lower in a safe condition.
5. Assess the machine for any damage. If damage occurred, return to the stowed position, exit the unit and perform a thorough inspection before returning to service.

### Gradeability

Machine gradeability refers to the maximum slope that the aerial platform is capable of travel under practical conditions. It 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.

### 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 8.5.

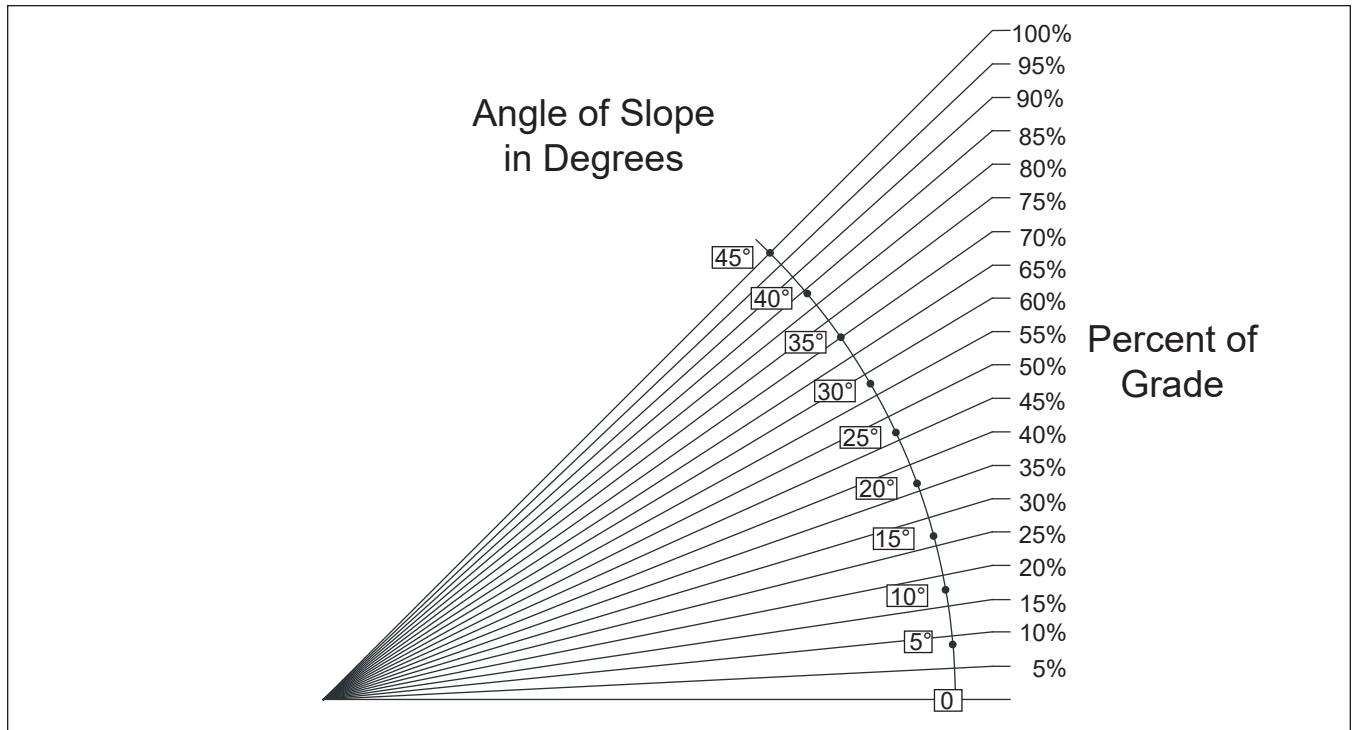
### Driving on a Slope

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 45 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.



**Figure 8.5 – Slope Percent/Degree Conversion**

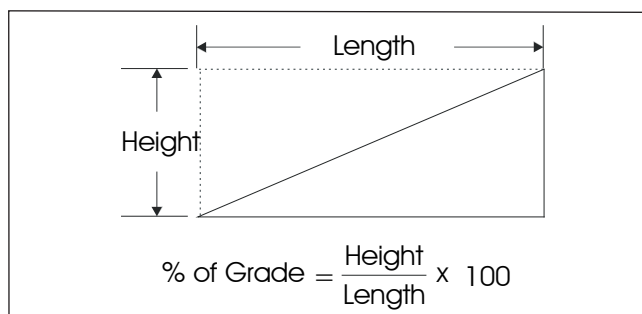
Drive the aerial platform only on slopes, or loading ramps that are within the 45 percent grade capability of the aerial platform.

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 8.6.

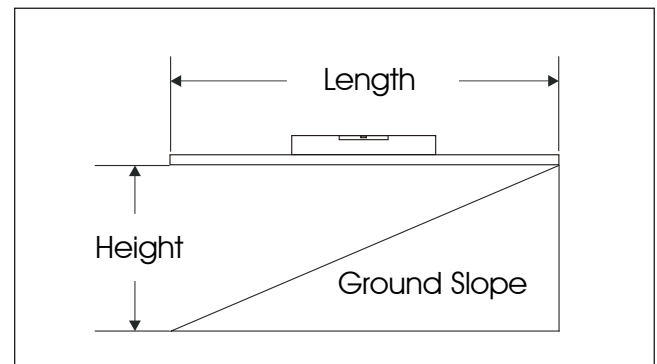


**Figure 8.6 – Percent Grade Formula**

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 8.7).



**Figure 8.7 – 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 A46JRT aerial platforms is 45%. An actual gradeability of 45%, indicates that in most normal working conditions the machine can be driven on a slope with an angle of 24.2 degrees.

### Electrical Power Outlet

The electrical outlets at the platform have 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 8.8). Unplug the source of power before moving the aerial platform.

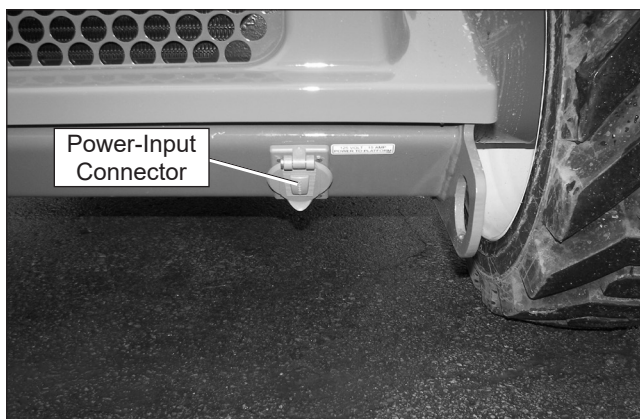


Figure 8.8 – Power-Input Connector

### 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 may 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 machine/generator switch (refer to Figure 8.9) in the generator position.

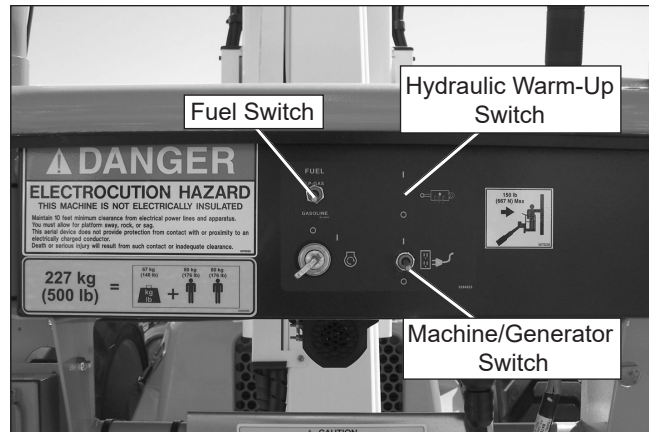


Figure 8.9 – Upper Controls

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.

### Dual Fuel

The dual fuel switch is located on the front of the lower control panel (refer to Figure 8.9).

Before starting the engine, place the fuel switch in the gasoline or the LPG position. Open the shut-off valve on the LPG gas tank if using LPG. Always keep the LPG tank shut-off valve closed when not using LPG.

To switch from gasoline to LPG with the engine running:

1. Open the shut-off valve on the LPG tank.
2. Place the fuel switch in the LPG position.

To switch from LPG to gasoline with the engine running:

1. Place the fuel switch in the gasoline position.
2. Close the shut-off valve on the LPG tank.

### Air Line

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

- The input connector is on the left side of the turntable 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 left side of the turntable.
2. Open the output connector at the platform.
3. Raise the 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.

### **Driving Lights**

The optional driving lights are for use in dimly lit areas and are not intended for driving on public roadways. There are two headlights at the front of the chassis and two blinking taillights at the rear of the chassis.

The lights are operational when the machine is set up for operation from the upper controls and the light switch is turned on.

If the engine is running, the idle speed increases when the driving lights are turned on.

#### *Note*

*Working with the driving or platform work lights on, while the engine is off, can discharge the batteries enough that the engine will not start or the emergency power system will not operate. If the engine cannot be left running while the lights are on, start and run the engine for at least 15 minutes each hour.*

### **Platform Work Lights**

The optional platform work lights are located on the top rail of the platform next to the upper controls (refer to Figure 8.10). The direction a light points can be adjusted by using two  $\frac{1}{2}$ " wrenches to loosen the clamp below the light.



**Figure 8.10 – Upper Controls**

The lights are operational when the machine is set up for operation from the upper controls.

### **After Use Each Day**

1. Ensure that the platform is fully lowered.
2. Park the machine on a firm level surface, preferably under cover, secure against vandals, children and unauthorized operation.
3. Turn the controls selector switch to OFF and remove the key to prevent unauthorized operation.



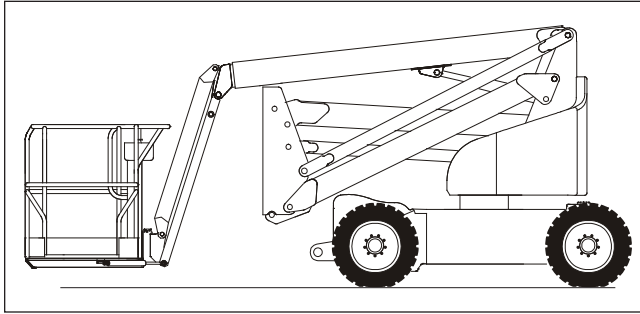


## Chapter 9 – Stowing and Transporting

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. Lower the jib boom until the platform is near the ground 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 engine off.
6. Push the lower controls emergency stop button inward. Place the controls selector switch in the off position and remove the key.
7. Turn the battery disconnect switch off.
8. On dual fuel machines, close the shut-off valve on the LPG tank.
9. 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 45 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 45 percent grade capability of the aerial platform.

A 45 percent grade is a 4.5' (1.37 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 and 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**

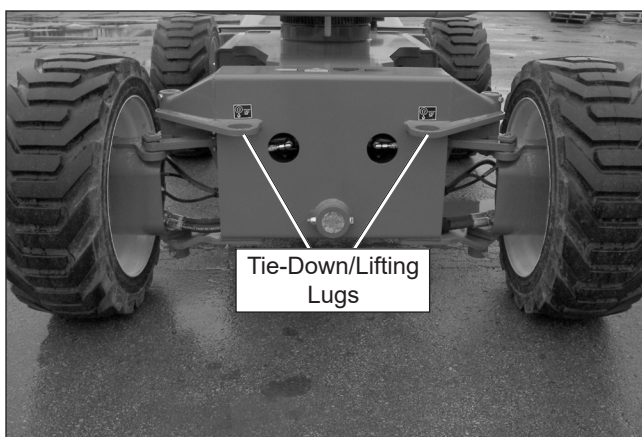
The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Set the drive range to low before driving up or down a grade.

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**

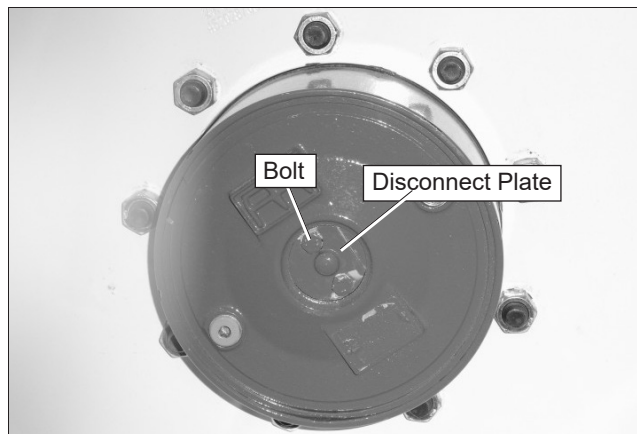
Use the following procedure to winch the aerial platform onto the transport vehicle.

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 tip boom. 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 could 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.

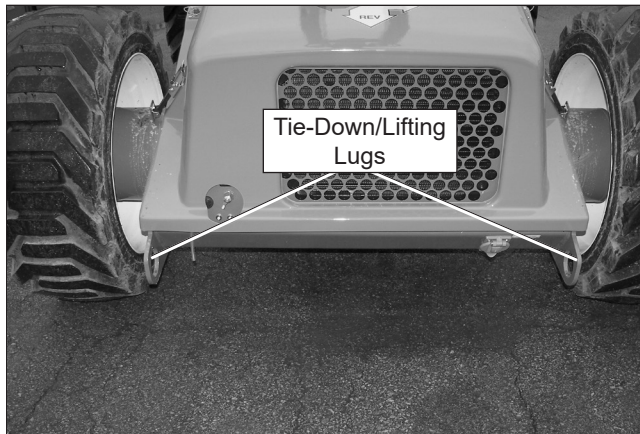


Figure 9.4 – Rear Tie-Down/Lifting Lugs

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.

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’ (0.3 m).
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.

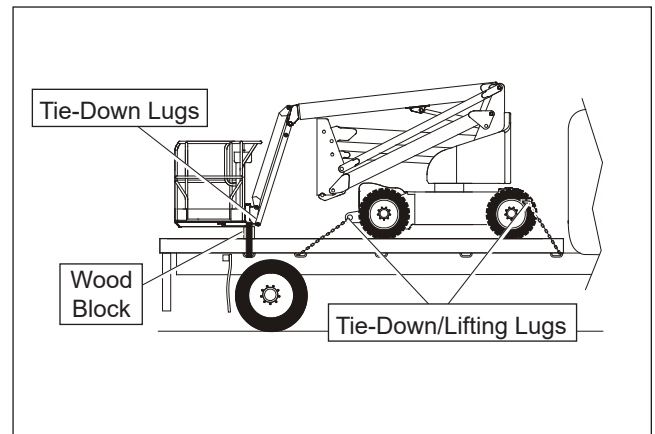


Figure 9.5 – Platform

5. Turn the start switch off and place the platform control cover over the upper controls if the machine is equipped with that option.
6. Place the lower controls emergency stop switch in the off position. Turn the controls selector to the center position and remove the key.
7. Turn the battery disconnect switch off and close and latch the cowling doors.
8. On dual fuel machines, close the shut-off valve on the LPG tank.
9. 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.**

10. 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.

11. 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.

### **Storage**

No service is required when storing, or removing the machine from service, for less than one week.

If the machine functions are not cycled for longer than one week:

- Grease exposed cylinder rods with a light, white lithium grease.
- Periodically charge the batteries.

## Chapter 10 – Emergency Operation

If the main hydraulic system fails, the aerial platform may be lowered and stowed using the emergency power system. The machine may be towed if the drive system fails. Refer to Emergency Power System or Towing for the appropriate procedure.

### Emergency Power System

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

#### **⚠ Caution**

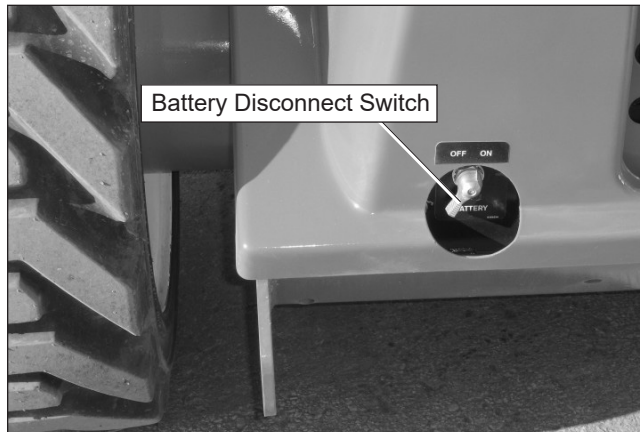
**The emergency power system is for emergency lowering and stowing only. The length of time the pump can be operated depends on the capacity of the batteries. Do not use this system for normal operation.**

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

#### Lower Controls

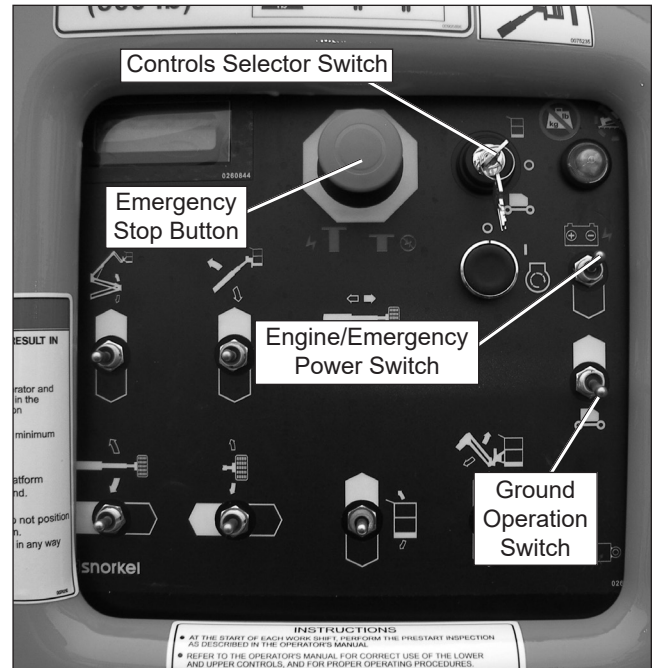
Use the following procedure to operate the machine using the emergency power system from the lower controls.

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 controls selector switch (refer to Figure 10.2) and turn it to the lower control position.



**Figure 10.2 – Lower Controls**

3. Pull the emergency stop button outward.
4. Hold the ground operation switch in the on position while holding the engine/emergency power switch in the emergency power position.
5. 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 emergency stop button at the lower controls must be in the on position.
- The controls selector switch at the lower controls must be in the upper control 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).

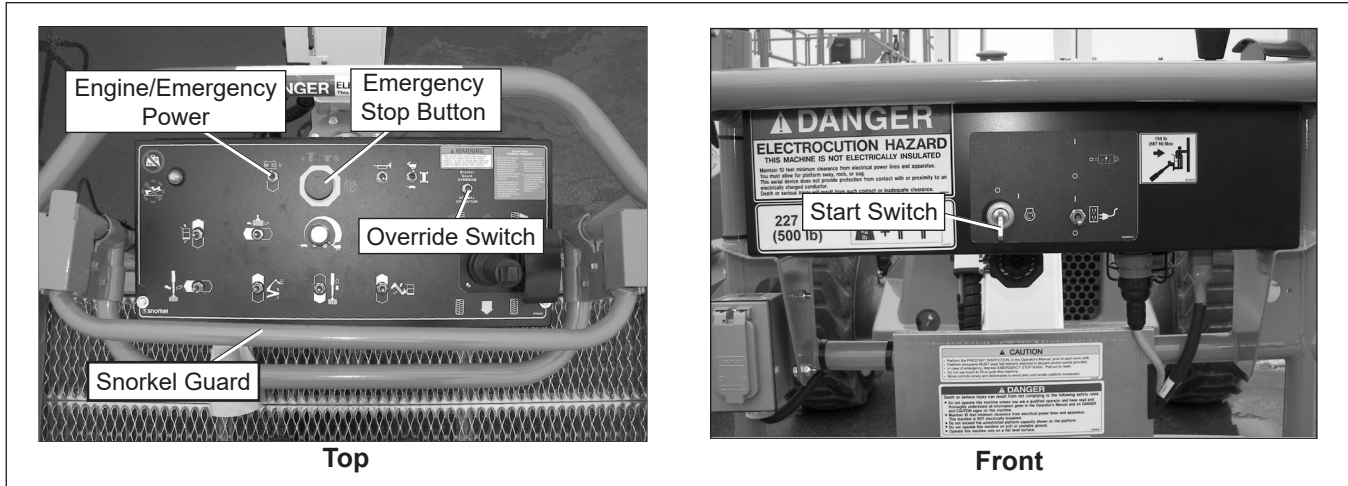


Figure 10.3 – Upper Controls

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

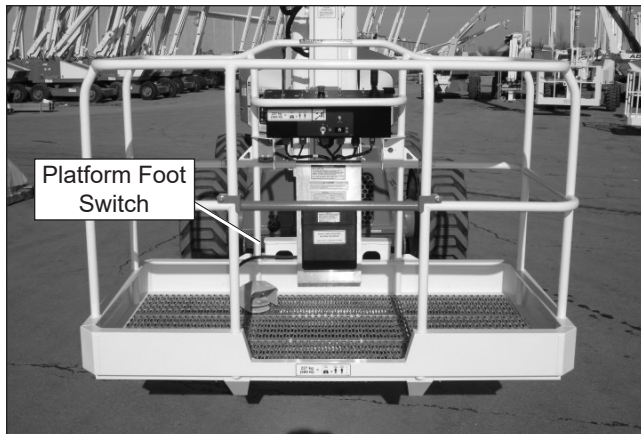


Figure 10.4 – Platform Foot Switch

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

### Override Switch

The override switch at the upper controls may be used to override the platform overload and the Snorkel Guard system, when either one is activated.

When the platform overload system is activated, the override or the emergency power switch (refer to Figure 10.3) at the upper controls may be used to override the system to operate riser up/down, main boom up/down/retract, jib boom up/down, or turntable rotation and drive functions. The switch is spring returned to the normal operation position.

When the Snorkel Guard system is activated, the override switch (refer to Figure 10.3) at the upper controls may be used to override the system to operate riser up/down, main boom up/down/retract, jib boom up/down, or turntable rotation functions.

The lower controls are not affected by the Snorkel Guard activation.

### **Warning**

The potential for an accident increases when safety devices do not function properly. Death or serious injury could result from such accidents. The override switch must only be used when all controls are released and in the neutral position. If a zero or neutral state cannot be achieved, depress the emergency stop and obtain assistance at the lower controls.

1. When the machine is stopped due to activation of the Snorkel Guard system or overload, immediately depress the emergency stop, release the foot switch and all controls. Perform an assessment of the situation which caused the system to activate.
2. If it is determined that all controls are released and operation can proceed, return the emergency stop to the on position, and activate the override switch.
3. Activate the foot switch.
4. Activate the necessary functions to move the platform away from the obstacle that caused the Snorkel Guard activation or if due to an overload fault, retract the booms then lower in a safe condition.
5. Assess the machine for any damage. If damage occurred, return to the stowed position, exit the unit and perform a thorough inspection before returning to service.

## Towing

The aerial platform may be towed at slow speeds using the optional tow kit. The tow vehicle must have sufficient capacity to safely tow and stop itself and the aerial platform on the steepest grade and type of surface that may be encountered. Refer to Chapter 2 for the approximate weight of the aerial platform.

### ⚠Warning

**The aerial platform is free to move when the drive hubs are disabled. Death or serious injury could result. Securely fasten the tow vehicle to the aerial platform before disabling the drive hubs.**

Use the following procedure to manually disengage the drive hubs and tow the machine.

1. With the machine in the stowed position, remove the tow bar from the storage cradles on the chassis and lay the tow bar near the front of the chassis.

### ⚠Danger

**Pinch points may exist between machine components. Death or serious injury will result from becoming trapped between components. Do not attach the tow bar to the tow vehicle until the counterweight is to the side of the chassis.**

2. Rotate the turntable, until the booms are to the side of the chassis, to allow room to attach the tow bar.
3. Attach the tow bar to the tow lug with the tow pin and snap pin.
4. Attach the tie rod to the tow bar and the right hand steering yoke.
5. Position the tow vehicle in front of the aerial platform. Set the brakes on the tow vehicle.
6. Attach the ring end of the tow bar to the tow vehicle.
7. Rotate the turntable so the booms are back at the front of the chassis in the stowed position. It may be necessary to raise the booms slightly to keep the platform from scraping the ground if the machine will be towed on a slope.
8. Shut the engine off and turn the battery disconnect switch off.

9. Pull the steering float valve knob outward and twist it to lock it in position. The steering float valve is at the front of the chassis beside the steering arm.
10. At each drive wheel, remove the two bolts from the disconnect plate (refer to Figure 10.5). Turn the plate over so the nipple points inward. Reinstall the two bolts.

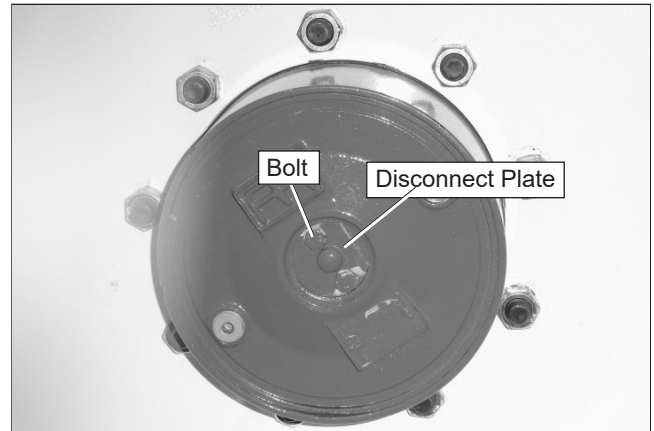


Figure 10.5 – Drive Wheel

11. Do not exceed 10 mph (16 km/h) when towing. Use caution when traveling around a curve or when turning a corner. If a corner is turned too tightly the steering mechanism might be damaged or the tow vehicle and the aerial platform could jackknife.

### ⚠Warning

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

12. After towing, pull and twist, then push the steering float valve knob inward.
13. At each drive wheel, remove the two bolts and return the plate to its original position as shown in Figure 10.5.
14. Unfasten the tow vehicle from the machine and replace the tow bar on the storage cradles.
15. Verify that the drive system operates properly.





## 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), let the engine preheat for five seconds before starting the engine.  When the ambient temperature is below 23°F (-5°C), let the engine preheat 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.
	Dual fuel machines. The fuel switch on the lower control panel is set incorrectly. The engine cranks, but will not start.	<ul style="list-style-type: none"> <li>• Place the fuel switch on the lower control panel in the proper position for the fuel being used.</li> <li>• Make certain there is fuel in the fuel tank.</li> <li>• If using LPG make certain that the fuel shutoff valve is open.</li> <li>• Try starting the engine for 20 seconds and then let the starter motor cool for 60 seconds. Repeat as necessary.</li> </ul>
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"> <li>• Pull emergency stop button outward.</li> <li>• Place the controls switch in the lower control position.</li> </ul>
Continued on next page...		

Symptom	Possible Cause	Corrective Action
Engine will not start from lower controls.	Switches are set wrong. The engine will not crank.	<ul style="list-style-type: none"> <li>Place the controls selector switch in the lower control position for 10 seconds and then start the engine.</li> </ul>
	The controls selector switch was left in the on position for 30 seconds or longer before turning it to start.	Turn the 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.
Engine will not start from upper 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"> <li>Turn the controls selector switch off.</li> <li>Pull the emergency stop button outward.</li> <li>Place the controls selector switch in the upper control position.</li> </ul> From the upper controls: <ul style="list-style-type: none"> <li>Turn the start switch off.</li> <li>Pull the emergency stop button outward.</li> <li>Place the start switch in the on position for 5 seconds and the then turn the switch to start.</li> </ul>
		Platform foot switch is activated.
		The start switch was left in the on position for 30 seconds or longer before turning it to start.
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 controls 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.

Symptom	Possible Cause	Corrective Action
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.
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.
	Ground operation switch held upward for too long without operating a function. A function must be operated within 10 seconds of activating the ground operation switch, or no functions will operate.	Release the ground operation switch. Operate machine function within 10 seconds of operating the ground operation switch.
Upper controls do not work.  Continued on next page...	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.

Symptom	Possible Cause	Corrective Action
Upper controls do not work.	Controls 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.
	Foot switch held down for too long without operating a function. A function must be operated within 10 seconds of activating the foot switch, or no functions will operate.	Release the foot switch. Operate machine function within 10 seconds of operating the foot switch.
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.
Main boom will not raise or extend.	Boom switch error. Faulty switch.	Stow the machine and do not operate until repairs are made.
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.
	Low engine rpm.	Stow the machine and do not operate until repairs are made.
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.

Symptom	Possible Cause	Corrective Action
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.
	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 protection** – a system to protect against falls that may include either a fall restraint or personal fall arrest system as required by national or local regulations and standards.

**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 turntable 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.

**MEWP** – Mobile Elevating Work Platform.

**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 arrestor, 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 load capacity** – 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.

**Snorkel Guard** – a mechanically activated guarding system with a spring-loaded rail mounted above the upper control panel. Pushing against the rail activates the system, disabling the machine functions to stop upward movement of the platform.

**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 load capacity** – 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.









## Appendix C – Inspection Checklists

### Prestart Inspection Checklist

Item	Inspect For	P/F/R
<b>Operator's Manual</b>	In place, all pages readable and intact	
<b>Engine</b>		
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	
<b>Electrical System</b>		
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	
<b>Hydraulic System</b>		
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	
<b>Tires</b>		
Air filled	Good condition, proper inflation	
Foam filled	Good condition	
<b>Wheels</b>	All wheel lug nuts present and properly torqued	
<b>Lower Control Station</b>		
Operating controls	Proper operation	
Emergency stop and emergency power	Shuts off lower controls/proper operation	
<b>Flashing Light</b>	Proper operation	
<b>Structures</b>		
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	
<b>Upper Control Station</b>		
Guardrail system and fall protection 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	
Snorkel Guard	Proper operation	
Electrical power outlet – GFCI	Proper operation	
<b>Level Sensor</b>		
Machines manufactured before April 2021	Sounds tilt alarm	
Machines manufactured after March 2021	Unstowed disables boom/drive, alarm/tilt light on	
<b>Drive Motion Alarm</b>	Sounds when machine is driven	
<b>Sandblast Protection Kit</b>	In place and proper operation	
<b>Air Line to Platform</b>	No damage or deformation, caps in place	
<b>Drive and Working Lights</b>	No damage or deformation, proper operation	
<b>Tow Kit</b>	In place, no damage or deformation	
<b>Placards and Decals</b>	In place and readable	

*Maintenance Table Key: P = Pass, F = Fail, R = Repaired*

Performed by: \_\_\_\_\_ Date: \_\_\_\_\_

Model Number: \_\_\_\_\_ Serial Number: \_\_\_\_\_

Appendix C – Inspection Checklists

**Frequent Inspection and Maintenance – Every 90 Days or 150 Hours**

Item	Procedure	Information	P/F/R
<b>Chassis</b>			
Structural	Check for damage and cracked welds		
Pins	Check for wear and damage		
Steering cylinder pin caps and retaining bolts	Verify that all fasteners are in place		
Oscillating axle lock cylinders, rollpin, and lynch pin	Verify that all fasteners are in place		
Steering linkage	Check for proper operation		
Tires	Check for wear and damage		
	Proper inflation	70 psi to 75 psi Air filled tires only	
Hydraulic tubes and hoses	Check for leaks, wear, and damage		
Decals and placards	Check for damage and readability Order replacements as necessary		
Torque drive and steer wheel lug nuts per placard on wheel	Torque lug bolts/nuts to proper value on machine placard	4x4 front: 200 to 225 ft lb 4x2 front: 70 to 80 ft lb All rear: 200 to 225 ft lb	
Right drive motor(s)	Check for leaks		
Left drive motor(s)	Check for leaks		
<b>Turntable</b>			
Structural	Check for damage and cracked welds		
Pins	Check for wear and damage		
Torque turntable top bolts	Torque to proper value	190 ft lbs	
Torque turntable bottom bolts	Torque to proper value	190 ft lbs	
Hydraulic tubes and hoses	Check for leaks, wear, and damage		
Cowling	Check for wear/damage and that fasteners are in place and are tight		
Wire harness	Check for wear/damage and that fasteners are in place and are tight		
Tilt alarm	Check for proper operation		
<b>Lower Booms</b>			
Structural	Check for damage and cracked welds		
Pins	Check for wear and damage		
Boom lift cylinder retaining bolts	Verify that all fasteners are in place and are tight		
Boom lift cylinder and holding valve	Check for leaks, wear, damage, and for proper operation		
Riser lift cylinder forged pin retainer/retaining bolt	Verify that all fasteners are in place and are tight		
Riser lift cylinder and holding valve	Check for leaks, wear, damage, and for proper operation		
Master level cylinder forged pin retainer	Verify that all fasteners are in place and are tight		
Hydraulic tubes and hoses	Check for leaks, wear, and damage		
Electrical Wires	Check for wear and damage		
<b>Left Hand Access Door</b>			
Boom control valve	Check for leaks, wear, damage, and for proper operation		
Boom circuit system pressure	Check maximum system pressure	2,700 to 2,800 psi	
Filter minder gauge	Check for proper operation		

### Frequent Inspection and Maintenance – Every 90 Days or 150 Hours

Item	Procedure	Information	P/F/R
<b>Engine Compartment</b>			
Structural	Check for damage and cracked welds		
Fuel tank	Check for leaks, wear, and damage		
Fuel gauge	Check for proper operation		
Fuel tank cap	Check for leaks, wear, and damage		
Engine air filter	Check for wear and damage		
Engine belts and hoses	Check for wear and damage		
Engine oil	Check for wear and damage/level	Between add and full marks	
Engine coolant level	Check for level	Between hot and cold level	
Engine	Check for proper operation		
Engine start – stop	Check for proper operation		
Electric throttle	Check for proper operation		
Engine charging system	Check for proper operation		
Engine shutdown, low oil pressure	Check for proper operation		
Hydraulic pump	Check for proper operation		
Hydraulic oil reservoir	Check for wear/damage/leaks		
Hydraulic oil reservoir filler/breather cap	Verify that all fasteners are in place and are tight		
Hydraulic oil reservoir fluid level	Check for proper level	Above 10°F (-12°C) ISO VG32 Below 10°F (-12°C) ISO VG15	
Hydraulic oil return filter	Replace after the first 50 hours, every 90 days or 150 hours thereafter		
	Inspect filter for foreign matter that could indicate component wear		
Drive system control valve	Verify that all fasteners are in place and are tight		
<b>Upper Booms</b>			
Structural	Check for damage and cracked welds		
Pins	Check for wear and damage		
Electrical wires	Check for wear and damage		
Extension cylinder pins, snap rings, and forged pin retainers	Verify that all fasteners are in place and are tight		
Extension cylinder and holding valve	Check for leaks, wear, damage, and for proper operation		
Jib cylinder pin and retainer bolt	Verify that all fasteners are in place and are tight		
Jib cylinder and holding valve	Check for leaks, wear, damage, and for proper operation		
Slave level cylinder pin caps and retainer bolt	Verify that all fasteners are in place and are tight. Torque to proper values.	.250-20 x 1.5 12ft lbs (16.5 Nm) M10 x 1.5 47ft lbs (64 Nm)	
Slave level cylinder holding valves	Check for leaks, wear, damage, and for proper operation		
Hose carrier assembly	Check for residue buildup/proper operation		
Hydraulic hoses and tubes	Check for leaks, wear, and damage		

Appendix C – Inspection Checklists

**Frequent Inspection and Maintenance – Every 90 Days or 150 Hours**

Item	Procedure	Information	P/F/R
<b>Upper Booms</b>			
Platform rotator, pin and forged pin retaining system	Verify that all fasteners are in place and are tight		
Platform rotator, pin and forged pin retaining system	Verify that all fasteners are in place and are tight		
Platform rotation holding valve	Verify that all fasteners are in place and are tight		
Rotator mounting bolts	Verify that all fasteners are in place and are tight		
Overload cell	Check for proper operation		
<b>Platform</b>			
Structural	Check for damage and cracked welds		
Decals and placards	Check for damage and readability Order replacements as necessary		
Platform gates	Check for damage/proper operation		
Platform mounting bolts	Verify that all fasteners are in place and are tight		
Operator's Manual	Proper manual in document holder		
<b>Batteries</b>			
Battery terminals	Clean terminals and check cable condition		
Electrolyte	Check for proper level	Add distilled water if necessary	
Indicator gauges (if equipped)	Check for proper operation/condition		
<b>Lower Control Station</b>			
Station selector switch in the lower controls position	Check for proper operation	With the selector in the lower controls position, the upper controls do not work	
Station selector switch in the upper control position	Check for proper operation	With the selector in the upper controls position, the lower controls do not work	
Preheat button	Check for proper operation		
Keyed start switch	Check for proper operation		
Throttle interlock	Check for proper operation		
Audible alarms	Check for proper operation		
Turntable rotation CW – CCW	Check for proper operation	65 to 85 seconds for each direction	
Riser boom lift Up – Down	Check for proper operation	Up: 35 - 40 sec Down: 20 - 25 sec	
Main boom lift Up – Down	Check for proper operation	Up: 25 - 30 sec Down: 20 - 25 sec	
Jib boom lift Up – Down	Check for proper operation	Up: 20 - 25 sec Down: 30 - 35 sec	
Boom extension In – Out	Check for proper operation	Ext: 20 - 25 sec Ret: 22 - 27 sec	
Platform leveling Up – Down	Check for proper operation		
Platform rotation CW – CCW	Check for proper operation	Full cycle: 16 - 20 seconds	
Emergency power, all functions	Check for proper operation		
Emergency stop	Check for proper operation		
Hour meter	Check for proper operation		

**Frequent Inspection and Maintenance – Every 90 Days or 150 Hours**

Item	Procedure	Information	P/F/R
<b>Upper Control Station</b>			
Foot switch	Check for proper operation	Functions should be operational when foot switch is engaged	
Start switch	Check for proper operation		
Throttle	Check for proper operation	Engine should throttle up when the foot switch is engaged	
Preheat switch	Check for proper operation		
Boom speed knob	Check for proper operation		
Horn	Check for proper operation		
Turntable rotation CW – CCW	Check for proper operation		
Riser boom lift Up – Down	Check for proper operation		
Main boom lift Up – Down	Check for proper operation		
Boom extension In – Out	Check for proper operation		
Jib boom lift Up – Down	Check for proper operation		
Emergency power, all functions	Check for proper operation		
Emergency stop	Check for proper operation		
Gradual start to stop, drive/steer controls	Check for proper operation		
Drive speed limit switch, main boom lift	Check for proper operation		
Drive speed limit switch, tip boom extend	Check for proper operation		
Drive speed limit switch, riser boom lift – CE only	Check for proper operation		
110 volt AC power to platform	Check for proper operation		
Boom extension In – Out	Check for proper operation		
Platform leveling Up – Down	Check for proper operation		
Platform rotation CW – CCW	Check for proper operation		
Drive range – booms stowed	Check for proper operation	Slow speed only with boom raised	
Drive speed	Boom down and retracted High – 4.25 to 4.5 mph	50 ft in 7.6 to 8 sec	
	Boom up or extended Low – 0.7 to 0.8 mph	50 ft in 42.5 to 48.5 sec	
<b>Optional Equipment</b>			
Air line to platform	Check for proper operation		
All motion warning alarm	Check for proper operation		
Flashing light	Check for proper operation		
Hydraulic warm-up system	Check for proper operation		
AC generator	Check for proper operation		

Maintenance Table Key: P = Pass, F = Fail, R = Repaired

Performed by: \_\_\_\_\_ Date: \_\_\_\_\_

Model Number: \_\_\_\_\_ Serial Number: \_\_\_\_\_

**Appendix C – Inspection Checklists**

**Frequent Maintenance – Every 90 Days or 150 Hours**

Item	Procedure	Information	P/F/R
Daily maintenance	Perform maintenance as per schedule	Retain copy of checklist	
Preventive inspection maintenance checklist	Perform inspection, complete form	Retain copy of checklist	
Placards and decals inspection	Inspect using drawing and parts listing in Section 1 – Repair Parts Manual	Replace any missing or unreadable decals/placards	
Door hinges and latches	Lubricate	SAE 10W oil or spray lubricant	
Rotation bearing	Lubricate	Extreme pressure grease Above 10° F NLGI Grade 2 Below 10° F NLGI Grade 1	
Rotation bearing teeth and pinion	Lubricate	Open gear lubricant ASTM D 445	
Gear hubs	Check fluid level, fill if low	Gear lubricant SAE Grade 80W-90	
Platform rotator	Check for proper operation	Repair or replace if not working properly	
Platform controller	Check smooth operation & speeds		
Batteries	Check specific gravity	1.260/1.275 at 80° F	
Charging system	Check operation		
Engine RPM	Check for proper engine RPM	See engine owner's manual	
Engine oil and filter	Replace per engine owner's manual	See engine owner's manual	
Engine fuel filter	Check condition	Replace every 6 months or if dirty	

*Maintenance Table Key: P = Pass, F = Fail, R = Repaired*

Performed by: \_\_\_\_\_ Date: \_\_\_\_\_

Model Number: \_\_\_\_\_ Serial Number: \_\_\_\_\_



**Annual Maintenance – Every 500 Hours**

Item	Procedure	Information	P/F/R
90 day or 150 hour maintenance	Perform maintenance per schedule	Retain copy of checklist	
Hydraulic oil reservoir	Clean and replace fluid	Above 10°F (-12°C) ISO VG32 Below 10°F (-12°C) ISO VG15	
Hydraulic return filter	Replace	After first 50 hours, then at recommended interval	
Hydraulic reservoir suction filter	Clean and reinstall		
Hydraulic pressures	Drive pump setting	Differential pressure: 450-500 psi	
		Maximum pressure: 5,000-5,100 psi	
	Boom pump setting	Maximum pressure: 2,750-2,800 psi	
	Function pressures: check at manifold, except level	Steer right/left: 2,700-2,800 psi	
		Riser boom down: 3,300-3,400 psi	
		Main boom down: 1,400-1,500 psi	
		Extend: 1,900-2,000 psi	
		Jib up/down: 2,700-2,800 psi	
		Rotate: 1,200 psi max on level	
		Pressure reducing valve: 2,700-2,800 psi	
Drive/boom relief: 3,000 psi			
Level Pressure: install gauge between valve and slave cylinder	Level: 2,000-2,050 psi		
Gear hubs	Replace fluid	Gear lubricant SAE Grade 80W-90	
Swing drive	Replace fluid	Gear lubricant SAE Grade 80W-90	
Engine coolant	Check condition	See engines owner's manual	

*Maintenance Table Key: P = Pass, F = Fail, R = Repaired*

Performed by: \_\_\_\_\_ Date: \_\_\_\_\_

Model Number: \_\_\_\_\_ Serial Number: \_\_\_\_\_





## Snorkel Product Warranty Policy

1. Snorkel warrants, its authorized sales and service centers (herein referred to as "SSC"), each new machine manufactured and sold by it to be free from defects in material and workmanship for a period of two (2) years from date of delivery to any customer. The warranty will apply subject to the machine being operated in accordance with the rules, precautions, instructions and maintenance requirements outlined in the relevant Snorkel Operator and Parts/Service manuals. Snorkel further warrants the structural components, specifically the mainframe chassis, turntable, booms and/or scissor arms of each new machine manufactured by it to be free from defects in material and workmanship for an additional period of three (3) years. Any such part or parts which, upon examination by the Snorkel Warranty Department or appointed representative, are found to be defective will be replaced or repaired by Snorkel through local authorized Dealers. The structural warranty specifically excludes adverse effects on the machine structure arising from damage, abuse or misuse of the equipment.
2. Machines may be held in an authorized Distributor/ SSC's stock for a maximum period of six (6) months from the date of shipment from Snorkel, before the warranty period is automatically initiated on each machine.
3. It is the responsibility of the Distributor/SSC to complete and return to Snorkel a Pre-delivery Inspection Record, Warranty Registration Form, before the act of rental / loan / demonstration of the machine or delivery to an end user. In the case of direct sale to end customers the same responsibility lies with the end customer.
4. Any end customer, SSC, distributor or dealer shall not be entitled to the benefits of this warranty and Snorkel shall have no obligations here under unless the "Pre-Delivery and Inspection Record" has been properly completed and returned to the Snorkel Warranty department within fifteen (15) days after delivery of the Snorkel product to the Customer or Dealer's demonstration / rental fleet. Snorkel must be notified, in writing, within ten (10) days, of any machine sold to a Customer from a Dealer/SSC's rental fleet during the warranty period.
5. Any part or parts which upon examination by the Snorkel Product Support Department are found to be defective within the specified warranty period, will be replaced or repaired at the sole discretion of Snorkel through its local Authorized Distributor/SSC, at no charge. Any parts replaced under warranty must be original Snorkel parts obtained through an authorized Snorkel Distributor/SSC unless expressly agreed otherwise in writing and in advance by Snorkel's warranty department.
6. All parts claimed under warranty must be held available for return and inspection upon request for a period of 90 days from date of claim submission, it is necessary that all parts are individually tagged or marked with their part number and the warranty claim number. All parts returning should be still in a factory state, free of any alteration to the original design. If the parts are subject to repair it will need to be pre authorized by the Snorkel Product Support Group and or Warranty Department prior to the repair being completed. After 90 days all parts replaced under warranty which have not been returned, to Snorkel should be destroyed. Failure to produce parts requested by the Warranty Administrator for inspection within a period of 14 days will result in the claim being automatically rejected in full. Materials returned for warranty inspection must have the following procedure:
  - Carefully packaged to prevent additional damage during shipping
  - Drained of all contents and all open ports capped or plugged
  - Shipped in a container tagged or marked with the RMA number
  - Shipped PREPAID (ground service only). Any item(s) returned for warranty by any other means
  - may be refused and returned, unless prior approval is agreed with Snorkel.



## Snorkel Product Warranty Policy

7. At the direction of the Snorkel Warranty department, any component part(s) of Snorkel products to be replaced or repaired under this warranty program must be returned freight prepaid for inspection. An RMA (Returns material authorization) must be requested from Snorkel Warranty department, a copy to be placed with the returning component part(s).
8. All warranty replacement parts will be shipped freight prepaid (standard charges, ground shipping only) from the Snorkel Parts department, Service Department or from the Vendor to Dealer/SSC or Customer. Any other shipping method is the customer responsibility.
9. All warranty claims are subject to approval by Snorkel Service department. Snorkel reserves the right to limit or adjust claims with regard to defective parts, labor or travel time based on usual and customary guidelines.
10. Reimbursement policy, labor will be paid at 75% of posted hourly shop rate. Travel time will be paid at \$50 per hour up to a maximum of 3 hours. Snorkel will pay 1 hour of troubleshooting time per warranty claim, unless expressly agreed otherwise in writing and in advance by Snorkel's Warranty Department. An annual rate declaration must be supplied to the Snorkel Warranty administrator by January 31st and will be used as the reimbursable rate for that calendar year.

### REPLACEMENT PARTS WARRANTY

- Any part replaced under this limited warranty is not subject to further warranty cover beyond the normal warranty period of the machine upon which the part was installed.
- Any replacement parts sold (not delivered under a warranty claim) will be subject to a warranty period of (6) six months from the date of invoice.
- Parts held by an authorized Distributor/SSC are covered under warranty for a period of (12) twelve months from the date of invoice, provided that those parts have been subject to appropriate storage to prevent damage and deterioration (conditional on Snorkel review).

### CLAIM PROCEDURE

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

When a Distributor/SSC/Customer perceive a warranty issue to exist the following steps must be adhered to:

- Customer/SSC/Distributor to place a purchase order for genuine Snorkel replacement parts.
- Snorkel to dispatch parts via the requested method (in line with the required response time).
- Confirmation that a qualified technician is available to replace the part and that this person has been accepted by Snorkel to carry out such work under the warranty of the machine. Failure to do this may nullify the warranty.
- Customer/SSC/Distributor to allocate a warranty claim number to the repair.
- All correspondence in respect of the claim to be on an official Snorkel warranty claim form as supplied by Snorkel's warranty department.
- All warranty claims must be submitted within 30 days of the date of the machine repair.

### FREIGHT DAMAGE

- If a machine is received in a damaged condition, then the damage must be noted on the bill of lading and/or delivery documents and photographs must be taken at the point of delivery, prior to signing acceptance of the consignment.
- The freight company and Snorkel must be contacted by the Distributor and a damage claim registered by either party immediately.
- The above requirements apply only to freight damage associated with equipment supplied by Snorkel transport. Customer freight issues are excluded from this warranty policy.



## Snorkel Product Warranty Policy

### **THIS PRODUCT WARRANTY POLICY SPECIFICALLY EXCLUDES:**

1. Engines, motors, tires and batteries are manufactured by specialist suppliers to Snorkel, who furnish their own warranty policies. Snorkel will, however, to the extent permitted pass through any such warranty protection to the Distributor/SSC/Customer.
2. Any Snorkel product which has been modified or altered outside Snorkel factories without written approval, if such modification or alteration, in the sole judgment of Snorkel 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 and abuse, 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, and repair Parts Manuals.
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. Routine maintenance, routine maintenance items and minor adjustments are not covered by this warranty, including but not limited to hydraulic fluid, filters and lubrication, paint and decals, engine tune-up, brake adjustments etc. Snorkel will not cover leaks from fittings, hoses and any other connection points after the unit has been in service for 90 days or 150 hours of operation which ever comes first.
6. Any Snorkel product that has come into direct contact with any chemical or abrasive material.
7. 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, expenses 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.
8. Snorkel warranty policy does not cover any duties, taxes, environmental fees including without limitation, disposal or handling of tires, batteries and petrochemical items.
9. Items specifically excluded are: fuel injectors, motor brushes, glow plugs, contactor tips and springs, filters, lamp bulbs, lamp lenses, coolants, lubricants, brake pads and cleaning materials.
10. Failure of replacement parts due to fault misdiagnosis or incorrect fitting by the Distributor/SSC/Customer.

**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.**



## Snorkel Product Warranty Policy

Wherever possible the end customer shall obtain all warranty support and make all warranty claims through the local Snorkel authorized Distributor/SSC/Dealer. Warranty support should be from the Distributor/SSC/Dealer from whom the Snorkel product was purchased. Where Snorkel equipment is supplied directly from the factory the end customer, or if unable to contact the Distributor/SSC/Dealer, may contact the Snorkel Warranty Department for further assistance.

### APPEAL

The buyer may appeal in writing against a rejected or adjusted claim to Snorkel warranty department within a period of 21 days of receiving the rejection or adjustment notice. The appeal should be grounded on express reasons and supported by relevant evidence. Appeals received outside of this time limit will not be considered.

### SNORKEL WARRANTY SCHEDULE

#### Limited Warranty Periods

Item	Warranty Period
New machine materials and workmanship	2 year parts replacement
Structural components (Chassis, Turntable, Booms, Scissors)	5 years parts replacement or repair
Parts held in a Distributor's stock	12 months from date of invoice, subject to adequate storage/protection
Parts sold (non warranty)	6 months from date of invoice
Batteries supplied on new machines	6 months from warranty registration date
Other specifically excluded parts: Fuel injectors Motor brushes Glow plugs Contactor tips and springs Oils Filters Lamp bulbs Lamp lenses Coolants Lubricants Cleaning materials All consumable/wear parts	Not covered by Warranty

**Manufacturer's Address**  
Snorkel International LLC  
8350 Eastgate Road  
Henderson, NV 89015 USA

**Authorized Representative**  
Snorkel Europe Ltd  
Vigo Centre, Birtley Road  
Washington, Tyne & Ware, NE38 9DA, UK

**Local Distributor / Lokaler Vertiebshändler / Distributeur local  
El Distribuidor local / Il Distributore locale**

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